

Introduction to Dental Public Health

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Dental Public Health - Class 1

Department of Social Medicine and Public Health

Registration



Welcome!

- **Practical classes:** every week, 90 minutes
- **Lectures:** 90 minutes, **every second week** this semester
- Next semester lectures move to **every week**; teaching continues through the summer
- **Lecturer:** Assoc. Prof. Ts. Miteva, DMD, PhD
- **Two progress tests (colloquia)** offering bonus points
- **Examination:** summer examination session

How we will work

In the practical classes:

- Working with data, indices and epidemiological measures
- Discussing cases drawn from dental practice
- Short exercises and structured discussion, not a repetition of the lecture

What is expected of you:

- Regular attendance and active participation
- Preparation from the lecture material before each class
- The colloquia are written during class time and are not rescheduled

Learning resources

- Examination syllabus
- Lecture slides in SharePoint - **the main resource for preparation**
- Lecturer's website - reading and tasks for the practical classes
- **There is no official textbook** for this discipline

Preparation for the examination rests on the lecture slides and the syllabus.

Outline

1. Public health: the framework
2. Dental public health
3. Determinants and risk factors
4. Methods and instruments
5. The clinician and the specialist
6. Conclusion

Public health: the framework

What is public health?

Winslow (1920), adopted in substance by the WHO:

The science and art of preventing disease, prolonging life and promoting health through the **organized efforts of society**.

Three elements carry the weight:

- Prevention, not treatment alone
- Organized, collective action rather than individual good intentions
- A population, rather than a person, as the object of care

The clinical and the population question

The clinical question looks for the sick individual:

- Which of my patients has caries, and how should I treat it?

The population question looks for the sick population:

- Why does this district have more caries than the next one?
- What shifts the **whole distribution** of risk?

Geoffrey Rose (1985): “Sick individuals and sick populations”

The prevention paradox

Rose: a large number of people at small risk produce more cases than a small number of people at high risk.

In dental practice:

- A few children carry a very high risk of caries
- Many children carry a moderate risk - and they are the majority
- Most new lesions therefore arise in the **large middle group**

Consequence: working only with high-risk groups does not solve the population's problem.

Levels of prevention

Primary - before disease occurs:

- Fluoride, fissure sealants, oral hygiene instruction, diet

Secondary - early detection and limitation:

- Check-ups, restoration of early lesions, screening for oral cancer

Tertiary - limiting the consequences:

- Prosthetic treatment, restoring function and quality of life

Dental public health

Definition

Dental public health is the science and art of preventing and controlling oral diseases and promoting oral health through **organized community efforts**.

It is the form of dental practice in which **the community is the patient** rather than the individual.

The community as a patient

The analogy is exact, and it structures the whole discipline:

- A community is **examined** - by an epidemiological survey, not a mirror and probe
- It is **diagnosed** - a mean DMFT, a distribution, untreated decay concentrated in particular neighbourhoods
- It receives a **treatment plan** - a programme, a policy, a change in financing
- The outcome is **evaluated** - by measuring the population again, and accepting that the plan may have failed

Oral health: the modern understanding

FDI (2016): oral health is multi-faceted and includes the ability to speak, smile, taste, chew, swallow and convey emotion through facial expression - **with confidence and without pain or discomfort.**

What follows from this:

- Oral health is not merely the absence of caries
- It is part of general health and of quality of life
- It is measured clinically **and** by asking people how their mouth affects their life

Why the discipline is needed

The scale of the problem (WHO, 2022):

- About **3.5 billion** people live with an oral disease
- Untreated caries of the permanent teeth is the **most common** health condition in the world
- Severe periodontal disease affects close to one billion people
- Oral cancers are among the most common cancers globally

Consequence: a problem of this size cannot be solved from the surgery.

What makes oral disease suited to a population approach

- **Almost universal** - affecting practically every age group
- **Cumulative and irreversible** - lost tooth substance is never recovered
- **Highly preventable** - the risk factors and the effective measures are known
- **Expensive** - among the costliest disease groups to treat
- **Unevenly distributed** - concentrated in socially vulnerable groups

A disease that is common, irreversible, preventable and expensive is precisely the kind a health system should attack upstream.

The aim of dental public health: to improve and maintain the oral health of the population through organized community efforts.

Operational objectives:

- Reducing the prevalence and severity of oral diseases
- Reducing inequalities in oral health
- Securing equitable access to dental care
- Using limited resources rationally

Tasks

1. **Assessing** the oral health of the population
2. **Analysing** determinants and risk factors
3. **Planning** dental services according to assessed need
4. **Developing policy** and preventive programmes
5. **Promoting oral health** and health education
6. **Evaluating the effectiveness** of the interventions delivered
7. **Advocating** for oral health as a public priority

The public health cycle

Assess → Plan → Implement → Evaluate → and again

- Every step rests on data rather than impressions
- Evaluation frequently shows that a programme is not working as intended
- Programmes are therefore designed with indicators for monitoring **before** they start

This is also the logic behind most of the tasks in the practical classes.

Determinants and risk factors

Determinants of oral health

Individual: age, sex, genetic susceptibility, salivary function

Behavioural: oral hygiene, diet, tobacco, alcohol, care-seeking

Socioeconomic: income, education, employment, place of residence

System-level: access, financing, workforce distribution, health policy

The further down this list, the less the individual patient controls - and the more a population intervention can achieve.

The common risk factor approach

Oral diseases share their principal risk factors with the major chronic diseases:

- **Sugar** → caries, obesity, diabetes
- **Tobacco** → periodontitis, oral cancer, cardiovascular disease, COPD
- **Alcohol** → oral cancer, liver disease
- **Poor diet** → caries, cardiovascular disease, diabetes

Practical value: one intervention on sugar serves dental and general health at once, instead of separate campaigns for each disease. (*Sheiham and Watt, 2000*)

Inequalities in oral health

- Oral diseases follow the **social gradient**: every step down the socioeconomic ladder is associated with worse oral health
- The difference is not only between the poorest and the rest; the gradient runs the whole length of the scale
- Vulnerable groups: disadvantaged children, older people, people with disabilities, minority communities, people in remote areas

A warning: a programme that reaches mainly the informed and the motivated can **widen** the gap while improving the average.

Methods and instruments

Assessing oral health

Epidemiological surveys following WHO methodology:

- Standardized criteria, making countries and years comparable
- Index ages: 5, 12, 15, 35-44 and 65-74 years

Principal indices:

- **DMFT / dmft** - decayed, missing and filled teeth
- **CPI** - periodontal status
- Indices for oral hygiene, fluorosis and dental trauma

What an index measures

DMFT at age 12 is the main international indicator:

- It records accumulated **experience** of caries, not current activity
- It allows comparison between countries and over time
- The WHO goal is a DMFT of 3 or below at age 12

Its limits:

- It does not distinguish untreated decay from a restored tooth
- It says nothing about pain, function or quality of life

Reading the components

Two districts can share a mean DMFT of 2.0 and need entirely different programmes:

- A district where most of the score is **D** has a **treatment access** problem
- A district where most of the score is **F** has had its disease treated but not **prevented**
- A high **M** component points to extraction as the default response

The care index ($F \div DMFT$) often says more about the service than the DMFT itself.

Need and demand

Three different things:

- **Normative need** - what a professional assessment establishes
- **Felt need** - what the person recognizes and would like addressed
- **Demand** - what actually converts into someone attending

The planning trap: a service planned from its own activity data is planned around the people who already attend. Those with the greatest untreated need are the least represented in that data.

Population-level preventive measures

Fluoride:

- Fluoridated water, salt or milk; fluoride toothpaste and varnish

School and community programmes:

- Sealing permanent molars in children
- Oral hygiene instruction and supervised toothbrushing

Measures outside the dental sector:

- Limiting free sugars (WHO: below 10% of energy intake)
- Taxation and regulation; tobacco control

Organization and financing

- **The National Health Insurance Fund** - a package of dental activities, with different scope for children and adults
- **The national programme for the prevention of oral diseases in children** - sealants and preventive activities
- Direct out-of-pocket payment accounts for a substantial share of dental care
- Municipal and school initiatives; non-governmental organizations

For discussion: who pays, who decides, and who is left outside the system?

The clinician and the specialist

A different object of work

The clinical dentist:

- Works with the **individual patient**
- Diagnosis and treatment of a particular case
- The question is: “What does this patient need?”

The dental public health specialist:

- Works with **communities and populations**
- Assessment of need, planning, policy, programmes
- The question is: “What does this community need?”

Different methods and different measures of success

The clinician:

- Clinical examination, imaging, laboratory investigation
- An individual treatment plan
- Success = a healthy, comfortable and satisfied patient

The specialist:

- Epidemiological surveys, data analysis, economic evaluation
- Programmes, legislation, models of financing
- Success = an indicator that moves for the whole population

Comparison

Feature	Clinical dentist	DPH specialist
Patient	The individual person	The community
Main approach	Treatment and restoration	Prevention and promotion
Assessment	Clinical examination	Epidemiological survey
Instruments	Equipment, materials, techniques	Programmes, policy, financing
Decision	A treatment plan	Priorities and allocation of resources
Outcome	The health of the patient	Indicators for the population
Ethical emphasis	Autonomy and beneficence	Justice and aggregate benefit

Complementary, not competing

- The clinician treats the disease in the patient who is present
- The specialist works so that fewer people ever arrive with it
- An effective dental system needs both
- Dental public health sets the conditions in which every clinician practises: who has access, who pays, and who reaches the surgery at all

In short: individual care ↔ population health

Every clinician is also a public health practitioner

Even without the specialty, in your surgery you will:

- Give advice on diet, hygiene and tobacco
- Detect early signs of oral cancer at a routine examination
- Apply fluoride varnish, place sealants, take part in school programmes
- Submit the data from which national estimates are built
- Decide how much of your time goes to repairing disease and how much to preventing it

The difference is one of scale, not of values.

Conclusion

Key messages

1. Oral diseases are common, preventable and unevenly distributed
2. Dental public health treats **the community as the patient**
3. The aim is better oral health through organized community efforts
4. The tasks follow a cycle: assess → plan → implement → evaluate
5. The clinician and the specialist solve different parts of the same problem

Before the next class

- Read the syllabus, so you know where the course is going
- Check that you can reach the lecture slides in SharePoint
- Complete the registration if you have not already done so
- Work through the 15-minute reading and bring your answers to the student tasks

A question to think about: if you had a budget for one single programme for the whole country, what would you spend it on - and how would you prove that it worked?

Thank you for your attention!