Helsedirektoratet

Quality indicators in oral health care: A Nordic project

Proceedings in 2012-2018, an update

Rapport

IS-2799

Contents

Preface

The Nordic Project to define Quality Indicators of Oral Health Care was started during the Finnish presidency of the Nordic Council of Ministers in October 2007. It was one of the four health care indicator projects financed by the Nordic Council of Ministers. The Nordic countries participating in the project are Denmark, the Faroe Islands, Finland, Iceland, Sweden and Norway. At the end of 2010, the working group responsible for project implementation had agreed on 12 indicators of oral health care.

Extensive work was done to define the indicators and to ensure the quality of collected data. More quality indicators of oral health care will be needed in the future, and the working group recommends that this work continues.

It has been agreed that the country holding the presidency of the Nordic Council shall lead continual cooperation in this field. In 2017, Norway played this role and agreed to edit the revised report.

This report will summarize the progress made by the project in 2012–2018 and is a revised version of the 2012 report Quality indicators in oral health care: A Nordic project – Proceedings in 2012: https://helsedirektoratet.no/publikasjoner/quality-indicators-in-oral-health-care-a-nordic-project-proceedings-in-2012.

The success of this work is due to the excellent cooperation among the participants in the working group.

The members of the working group:

- *Denmark:* Lene Vilstrup, Health / Medicines Authority (lvi@sst.dk)
- *The Faroe Islands:* Sigrid Arge, Tórshavn municipality / Ministry of Health and Interior (sigrid@torshavn.fo)
- *Finland:* Anne Nordblad (retired 2018) / Merja-Liisa Auero, Ministry of Social Affairs and Health (merja-liisa.auero@stm.fi)
- *Iceland:* Helga Ágústsdóttir, Ministry of Health (helga.agustsdottir@hrn.is)
- *Sweden:* Andreas Cederlund (until 2017) / Mariana Näslund Blixt / David Petterson / Frida Lundgren, The National Board of Health and Welfare (mariana.blixt@socialstyrelsen.se / frida.lundgren@socialstyrelsen.se / David.Pettersson@socialstyrelsen.se)
- *Norway:* Trond Ekornrud / Othilde Skjøstad, Statistics Norway (trond.ekornrud@ssb.no / othilde.skjostad@ssb.no) / Siri Christine Rødseth, The Norwegian Directorate of Health (siri.christine.rodseth@helsedir.no)

Sincere thanks to the working group members,

Trond Ekornrud, Othilde Skjøstad and Siri Christine Rødseth

Project leaders/editors 2017–2019, Oslo, 30th April 2019

Abstract

In 2017 Norway was administrating the continuing work with Nordic cooperation and developing common Nordic quality indicators for oral health care. This report is a short summary of the work done in 2012–2018 and a revised version of the 2012 report Quality indicators in oral health care: A Nordic project.[1]

First of all, the aim of this report is to give updated data information concerning the agreed quality indicators on oral health and oral health care. Secondly, this report will give a summary of further work done by the working group from 2012–2018. This includes work in defining the indicators, ensuring the quality of collected data and work with developing potential indicators.

Basic register data can be used for comparisons by participating countries. It ia challenging to compare data and indicators between countries, since definitions and data sources may differ. While some countries may have a dental register as the data source for an indicator, another country may only have data from a survey for the same indicator.

Structural differences in dental health services across countries may also partly explain differences between the countries when it comes to some indicators. In the Nordic countries, dental services are only partly organized in the same way. The effect of these structural differences is complex and beyond the scope of this report. However, these factors must be considered when interpreting data from different countries.

Further and better data sources across the Nordic countries would make it possible to get more comparable indicators. This would facilitate benchmarking across the Nordic region in the future. However, more work is needed to develop indicators that are more accurately connected to quality of services.

The results from this report show many of the same tendencies that are found in the the working group reports from 2010 and 2012. Coverage of dental personnel seems to remain the same or improves across the Nordic countries. The indicators imply an overall improvement in oral health. There is a decrease in the proportion of individuals with caries in all reported age groups, except for 6-years olds in Sweden where caries has increased since 2011. Another positive tendency is that more children than earlier brush their teeth on a daily basis, and fewer children consume sugared soft drinks daily. However, because of the described differences in data as the basis for indicators, it is challenging to compare and interpret results across countries.

[1] https://helsedirektoratet.no/publikasjoner/quality-indicators-in-oral-health-care-a-nordic-project-proceedings-in-2012

1. Introduction

1. Introduction

1.1 Background

This publication is a revised version of the 2012 report Quality indicators in oral health care: A Nordic project.[2]

Monitoring and improving the quality of care is a priority for policy makers, administrators and health professionals. Quality of health care, including oral health care is of concern throughout the Nordic countries. Documenting and monitoring oral health and the quality of oral health services encourage transparency and enable comparisons between countries. Quality indicators are needed to improve the quality of oral health care on a well-grounded basis and to achieve continuously improving outcomes of care.

The Nordic Project of Quality Indicators for Oral Health Care was started during the Finnish presidency of the Nordic Council of Ministers in October 2007. The project was one of the four health care indicator projects financed by the Nordic Council of Ministers. The Nordic countries participating in the project were Denmark, the Faroe Islands, Finland, Iceland, Sweden and Norway.

When the Nordic Council project ended in 2010, the working group had agreed upon 12 indicators for oral health care. The results can be found in the book: «Nordisk kvalitetsmåling i sundhedsvæsenet» (in Danish).[3]

A comprehensive project report «A Nordic Project of Quality Indicators for Oral Health Care», was written in English.[4]

Since the different countries have continued to contribute it has also been possible to continue the cooperation after 2010. The motivation for this cooperation is the previous lack of common oral health indicators in the Nordic countries. Work and cooperation has been carried out with the administration mirroring the one-year presidencies of the Nordic Council of Ministers.Annual to biannual meetings have been held each year since 2010, with the exception of 2018, with no meetings. In 2017, the host country was Norway. Communicaton mostly takes place through email.

Challenges

Administrating this project across nations requires time and resources. Progress has been reduced due to lack of resources and delays in information exchange. However, the ongoing work is informative and stimulates development in the field. The established Nordic network is also important for sharing general information in the field of oral health.

[2] https://helsedirektoratet.no/publikasjoner/quality-indicators-in-oral-health-care-a-nordic-project-proceedings-in-2012
[3] http://norden.diva-portal.org/smash/get/diva2:702812/FULLTEXT01.pdf
[4] http://www.julkari.fi/bitstream/handle/10024/80108/a389b3ed-a262-44c5-bad0-b9d3eecdf089.pdf?sequence=1&isAllowed=y

1.2 Oral health care services in the Nordic Countries

This chapter will give a short updated presentation about the oral health care services in the Nordic countries. Further information is described in detail in the comprehensive report published in 2010.[5]

Denmark

Public oral health care

A. *Oral health care program for children and young people 0–17 years («børne- og ungdomstandpleje»):*

- Free of charge
- Organized by the 98 municipalities
- Can be provided by the municipalities in public clinics or by agreements with dentists in private practice.
- Oral health care covers:
  - individual and general prevention of oral disease and oral health promotion
  - regular oral clinical examination based on individual needs with diagnosis of oral disease, treatment planning and treatment of oral disease and conditions in teeth, mouth and jaws
- Orthodontic treatment according to defined criteria in the law

- The target groups are:
  - All children (0–17 years old with residence in the municipality)

B. *Special Dental Care program for vulnerable groups («omsorgstandpleje and specialtandpleje»):*

- A fixed maximum annual fee pr. year pr. person. Children free of charge
- Organized by the 98 municipalities
- Oral health care covers:
  - individual and general prevention of oral disease and oral health promotion
  - regular oral clinical examination based on individual needs with diagnosis of oral disease
  - treatment planning and treatment of oral disease and conditions in teeth, mouth and jaws
  - rthodontic treatment for children according to defined criteria in the law

- The target groups are:
  - (Omsorgstandpleje) Adults (18+) mainly the elderly who due to reduced mobility or reduced physical and psychological functional capacity are not able to utilize the general oral health service for adults in private care, and have special needs for oral health care and with residence in the municipality
  - (Specialtandpleje) Children and adults who due to mental illness, mental and physical disability are not able to utilize the general oral health service for children and adults and have special needs for oral health care and with residence in the municipality

[5] http://www.julkari.fi/handle/10024/80108

C. Specialised oral health care program for children.

- Free of charge
- Organised by the 5 regions

- Oral health care covers:
    - Specialized interdisciplinary consultation and treatment of oral disease and conditions for children < 18 years that untreated will lead to functional impairment. The programme includes examination, diagnostics, treatment planning, and specialized treatment in a interdisciplinary team (orthodontics, oral surgery, prosthodontics etc.)

- The target groups are:
    - Children under 18 years with oral disease/conditions that untreated will lead to functional impairment (e.g. dental agenesis, dental aplasia)

D. Highly specialized oral health care program for children and adults

- Free of charge
- Organised by two highly specialised dental centres of academic excellence and financed by the 5 regions

- Oral health care covers:
    - Highly specialized interdisciplinary consultation and treatment of oral disease and conditions for children and adults with rare diseases and conditions where these cause special problems in teeth, mouth and jaws. The programme includes examination, diagnostics, treatment planning, and highly specialized treatment in a interdisciplinary team (orthodontics, oral surgery, prosthodontics etc.)

- The target groups are:
    - Children under 18 years with rare diseases and conditions where these cause special problems in teeth, mouth and jaws

Private oral health care

- For adults (18 years+):
    - Provided by private dentists or dental hygienists by patients' own choice

Subsidy

- The regions give partly subsidies to oral health care for adults prioritising prevention and basic oral health care. Oral examination, scaling, individual prevention, treatment for dental caries and periodontal disease, root canal treatment, extractions and oral surgery are subsidized. The refund rates vary from 30–65 percent, depending on the patients age and the actual treatment. For some oral health care services there are fixed prices while the dentists/ dental hygienist can set their own fee for other services. Other treatments such as orthodontics, crowns and bridges and removable prosthodontics have to be paid for by the patient in full (Full out of pocket payment)

- The social security law directs the 98 municipalities to give specific subsidies to oral health care in private care for adults with low income receiving social security, pensioners, and dental trauma sufferers after an accident or epileptic seizure
- The health law directs the 5 regions to give specific subsidies to oral health care in private care for adults – in certain treatment for cancer, – with Sjogrens Syndrome, and with rare diseases

Recognized specialties

- Oral surgery (5-year curriculum) and orthodontics (3-year curriculum).
- All postgraduate specialist training is free of charge

Collecting patient data

- For children (Public sector): Annually reported from the municipalities.to the national health and medicine authority, SCOR-register (Sundhedsstyrelsens Centrale odontologiske Register)
- For adults (Private sector): Annually reported indicators of oral health in selected age groups integrated in the national health insurance register
- Surveys: Systematic national oral health questionnaire which are integrated in a national general health survey performed with 5 years interval

The Faroe Islands

Public oral health care

- For children (0–17 years)
- All treatment is free of charge, including orthodontic treatment
- Organized in three ways:
  a. Offered at a public clinic by dentists employed by the municipality.
  b. The municipality contracts a private practitioner of their own choice to treat the children.
  c. A «combined» dentist, who is part time employed by the municipality to take care of children and part time as a private practitioner treating adults. The municipalities own the clinics and the dentists rent the equipment part time.

Private oral health care

- for adults (18–22 years) examinations, at a private practitioner of their own choice is free of charge. The patient pays for any additional treatment.
- for adults (23+) dental care is provided by private dentists or dental hygienists of the patients` own choice.
- The patient pays one part of the fee to the dentist. The other part is payed through the National Health Service. The main treatments for which subsidies (45 percent) are partly given, include examinations, x-rays and diagnosis, fillings, oral surgery, periodontal and endodontic treatment.
- For most adults anesthesia, orthodontics, crowns, fixed and removable bridges and implants are paid by the patient in full (Full out of pocket payment).
- Some treatments have a fixed price, and for some treatments private dentists may set their own fees.

Subsidy

Free dental care for adults is only available if:

a) the treatment needs to be carried out in a hospital
b) some congenital deformities of the jaws and teeth, i.e. orthognatic surgery of different kinds and patients with cleft lip and palate
c) social aid is applied for to the Faroese Social Service Department

Recognized specialties

- Oral surgery (5-year curriculum) and orthodontics (3-year curriculum).
- No dentist education in the Faroe Islands, most dentists recieve their education in Denmark.

Collecting patient data

- For children (Public and private sector): Annually reported from the counties to IBM for statistical adaptation. The data are collected and compared in a report every other year. The report is written by dentists and commissioned by the Ministry of Health Affairs of the Faroe Islands.
- For adults (Public and private sector): None.
- Surveys: No systematic regular survey.

Finland

Public oral health care

- For the entire population
- Organized by the municipalities
- Children 0–17 years of age are entitled to care free of charge, including orthodontics and specialized care.
- Fees are charged for patients aged 18 years and older (in 2018 ca. 35 percent of costs).
- Any treatment that is considered odontologically necessary must be provided within a reasonable timeframe, within six months at the latest.

Private oral health care

- For the entire population
- Treatment costs are subsidised by the Social Insurance Institution (in 2018 ca. 15 percent of costs, the deductible being 85 percent).

Subsidy

- The entire population is covered by subsidised oral health care services.
- Patient fees in the public sector are regulated by the government.
- Patients under the age of 18 years are entitled to care free of charge at public oral health care services.
- All patients using private oral health care services recieve a partial reimbursement from the Social Insurance Institution with the exception of prosthetic treatment.

Recognized specialties

- Oral and Maxillofacial Surgery (6-year curriculum)
- Orthodontics (3-year curriculum)
- Clinical Dentistry (3-year curriculum, including specialist studies in Cariology and Endodontology, Periodontology, Prosthodontics, Oral Radiology, Oral Pathology, Oral Microbiology, Paediatric Dentistry)
- Diagnostics
- Public Health (3-year curriculum, no clinical training included)
- All postgraduate specialist training is free of charge.

Collecting patient data

- For children and adults (Public sector): National Institute of Health and Welfare has gathered online data from municipalities of oral health care services since 2012
- For adults (Private sector): the Social Insurance Institution of Finland gathers yearly data of reimbursed oral health care services

Iceland

Public oral health care

- Dental services are provided solely by private practitioners. There are no public dental clinics in Iceland.

Private oral health care

- Children 0–18 years receive necessary dental treatment and prophylaxis free of charge except for a low co-payment that is paid annually.
- Orthodontic treatment costs are not fully subsidized, but the Icelandic Health Insurance reimburses the cost up to 150.000 ISK.
- For adults (18 years–66 years): There is no reimbursement for dental care for healthy adults aged 18–66 years old.
- 67 years and older: Subsidy by the Icelandic Health Insurance is 50 percent for most older adults, 100 percent for people in nursing homes.
- Private dentists set their own fees for all other patients that are not covered by the contracts.
- There is no private dental insurance available in Iceland.

Subsidy

Dental care free of charge for all children from 1st January 2018.

All children under 18 years of age are entitled to free dental care under an agreement reached between Icelandic Health Insurance and the Dentists' Association of Iceland. To be eligible, children must have health insurance in Iceland and be registered with a family dentist.

The Children's Dental Care Agreement entered force on 15th May 2013 and has been implemented in stages. Initially it provided dental care free of charge to children 3, 15, 16 and 17 years of age. Additional ages were then added year by year until the agreement became fully implemented on 1st January 2018.

The goal of the agreement is to ensure that children under 18 years of age receive essential dental care regardless of their parents' financial situation. The dental care provided free of charge includes oral check-ups, preventive measures, fillings and other repair work considered to be essential dental care. Icelandic Health Insurance pays the entire cost of these services, with the exception of an annual appointment charge of ISK 2500.

The family dentist is responsible for calling children in for regular check-ups at least every two years.

Parents can register their children with a family dentist through Icelandic Health Insurance or through their dentist.

Dental care for older adults aged 67 years and older and people with disability

All older adults aged 67 years and older and people with disability are entitled to at least a 50 percent subsidy of their dental costs under an agreement reached between Icelandic Health Insurance and the

Dentists' Association of Iceland. To be eligible the person must have health insurance in Iceland and be registered with a dentist.

The Older Adults Dental Care Agreement entered into force on 1st September 2018.

The goal of the agreement is to ensure older adults aged 67 years and older and disabled persons receive essential dental care regardless of their financial situation. Dental care that is subsidized includes oral check-ups, preventive measures, fillings and other repair work considered to be essential dental care. Icelandic Health Insurance pays half of the cost of these services for most people but all of the cost for people in nursing homes. The aim is to increase reimbursement for most older adults up to 75 percent in the coming years.

Recognized specialties

- There are 12 authorized specialties within dentistry in Iceland: Orthodontics, Oral Surgery, Oral Radiology, Endodontics, Periodontics, Pedodontics, Gerodontics, Prosthodontics, Public Dental Health, Occlusion, Operative Dentistry and Oral Medicine.
- No specialist training is offered at the University of Iceland. Icelandic dentists seek their post-graduate training mostly in the Nordic countries and the USA.
- Specialist training is a minimum of three years including clinical and theoretical education.
- Dental and dental specialist licenses are issued by the Directorate of Health in Iceland.

Collecting patient data

- For children (Private sector): The plan is to collect data from dentists electronically in the future.
- For adults (Private sector): No data is collected automatically or systematically.
- Surveys: No systematic regular surveys are initiated by the government. The last epidemiological oral health survey on children was performed in 2005. Regular national surveys on health and lifestyle, that are performed every 2 years in general, include questions on oral health but surveys with clinical oral examinations are not frequent.

Websites

- Icelandic Health Insurance: https://www.sjukra.is/english
- Directorate of Health in Iceland: https://www.landlaeknir.is/english/
- Ministry of Health in Iceland: https://www.government.is/

Norway

Public oral health care services

- Organized and funded by the counties
- All oral health care and treatment is provided free of charge to these groups:
    a. Children and young people aged 0–18 years
    b. Mentally disabled persons both living in institutions and at home
    c. Groups of elderly and long-term care patients living in institutions or receiving care at home
    d. Youth aged 19 and 20 pay 25 percent of the public fees set by The Ministry of Health and Care Services
    e. Other groups that the county choose to prioritize (optional to each county)
- Public oral health care services can also treat patients that do not belong to a group listed above if capacity allows. These patients pay fees given by the regional public dental service.

Private oral health care services

- For adults (20 years+)
- Are provided by private dentists or dental hygienists' by patients own choice
- For most adults,treatment has to be paid in full by the patient.
- Patient fees, both in 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.

Subsidy

- The national health insurance offers partial reimbursement of the cost of some dental treatment for those over 18 years. Reimbursement is only available for dental treatment in conjunction with illness or as a consequence of illnesses, as well as necessary preventive care and treatment for priority groups specified in the Dental Health Services Act. Health Insurance renumerates according to a public fee schedule set by the state. These fees are generally lower than fees used by public and private dental practitioners, since they set their own fees.
- Reimbursement for dental care is also possible by applying for social aid to the The Norwegian Labour and Welfare Service.

Recognized specialties

- Seven dental specialties: endodontics, orthodontics, oral radiology, pediatric dentistry, periodontics, prosthodontics and oral surgery/-medicine.
- The first six are three year studies, and oral surgery/-medicine is five.
- An eighth specialty; clinical dentistry (multidisiplinær odontologi), is under evaluation at the University of Tromsø.
- All postgraduate specialist training is free of charge.

Collecting patient data

- For children (Public sector): Annually reported from the counties to Statistics Norway.
- For adults (Private sector): No data collected automatically or systematically.
- Surveys: No systematic regular survey initiated by the government. Regular health survey for adults over the age of 20 years. Approximately 8500 people are asked. See the survey in appendix.

Sweden

Public oral health care

- For all people

Private oral health care

- For all people

For children (0–23 years) (Public or private)

- All treatment is free of charge, including specialist treatment
- Up to and including 2016, dental care was free for children and young people 0 to 19 years old.
- From 2017, it has been gradually expanded and as of 2019, dental care is free for people 0 to 23 years old.

Subsidy

- The state supports dental care for people aged 24 or more:
    - Dental care voucher (a general dental care allowance, Allmänt tandvårdsbidrag, ATB): can be used as part payment for dental care at any dentist or dental hygienist. The value of the dental care voucher various for persons aged 30–64 years and for those aged 23–29 years and 65 years and older. The dental care voucher is issued every year and can be accumulated for two years.
    - Dental care voucher for patients with certain disabilities or certain long term illness (Särskilt tandvårdsbidrag, STB). The voucher can be used as part payment for preventive dental care at any dentists or dental hygienist
    - High-cost protection scheme: Reimburses different percentages when there is a high cost for oral health care. Compensation levels are based on «reference prices». Not all types of dental care are reimbursable under this support system. Based on a diagnosis made by the dental care provider or a predefined condition, certain measures qualify for dental care support.
- For specific groups of patients, for instance patients with certain disabilities and long term illnesses and elderly people living either in nursing homes or their own homes with social and nursing support, there are special arrangements for both the provision and funding of oral health care. Such patients are often identified via free outreach activities.
- Patient fees, both in the 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.

Recognized specialties

- Nine authorized specialties in dentistry: oral surgery, oral radiology, orthodontics, endodontics, periodontics, oral physiology, orofacial medicin, pedodontics and prosthodontics.
- Specialist training shall be a minimum of three years including clinical and theoretical education.
- All postgraduate specialists training are free of charge. While commissioned education might be imposed with a fee.

Collecting patient data

- For children (Public and private sector): Each county council collects patient data from public and private sector. Annually.
- For adults (Private and public sector): The National Board of Health and Welfare has a dental health register. This is a register with dental information (diagnose, treatments and dental health status that is remaining and intact teeth) for all adults who have visited public or private clinics.
- Surveys:
    - Regularly, The National Board of health and welfare use surveys to county councils for collecting information about caries and caries free children for ages 3, 6, 12 and 19.
- No regular national survey for adults. Annual national surveys on health and lifestyle include questions on oral health but surveys with clinical oral examinations are more rare.

2. The indicators

2. The indicators

2.1 Selecting Nordic quality indicators for oral health care

Between 2007 and 2010, the Nordic Project to define Quality Indicators of Oral Health Care, established 12 indicators. They were chosen in accordance with the ECHI (European Community Health Indicators) recommendations, OECD recommendations, the EGOHID work (European Global Oral Health Indicators Development-Project) as applicable to Nordic conditions. In this revised report, the working group has decided to continue with 13 indicators. The working group decided not to update the Significant caries Index (SiC), primarily due to difficulties attaining data in several countries. Also, the indicator *Number of dentists under retirement age per legitimate oral health care personell* is no longer a separate indicator. For more about guiding principles for selecting indicators, see the report from 2012.

Three indicators are new:

- Number of patients that have retrieved prescription of antibiotics for systemic use
- Amount of Defined Daily Doses (DDD) of antibiotics for systemic use
- People with unmet needs of dental examination.

Indicators regarding antibiotics were listed as potential indicators in the 2012 report and have now been included due to the present relevance concerning increasing bacterial resistence against antibiotics. The indicator regarding unmet needs was also listed as a potential indicator and has been included due to the relevance regarding social inequality and its effect on health, including oral health.

The list of indicators is divided into three groups:

1. Structure indicators
2. Process indicators
3. Outcome indicators

Structure indicators:

1. Number of licenced oral health care personnel (dentiststst and oral hygenists) under retirement age per 1000 inhabitants
2. Number of active oral health care personnel (dentiststst and oral hygenists) under retirement age per 1000 inhabitants
3. People with unmet needs for dental examination
4. Oral health care expenditures per capita

Process indicators:

5. Percentage of the population receiving oral health care within the past year
6. Frequency of tooth brushing amongst children and young people (percentage of the population brushing more than once daily)
7. Annual mean consumption of sugar-containing beverages per person amongst children and young people

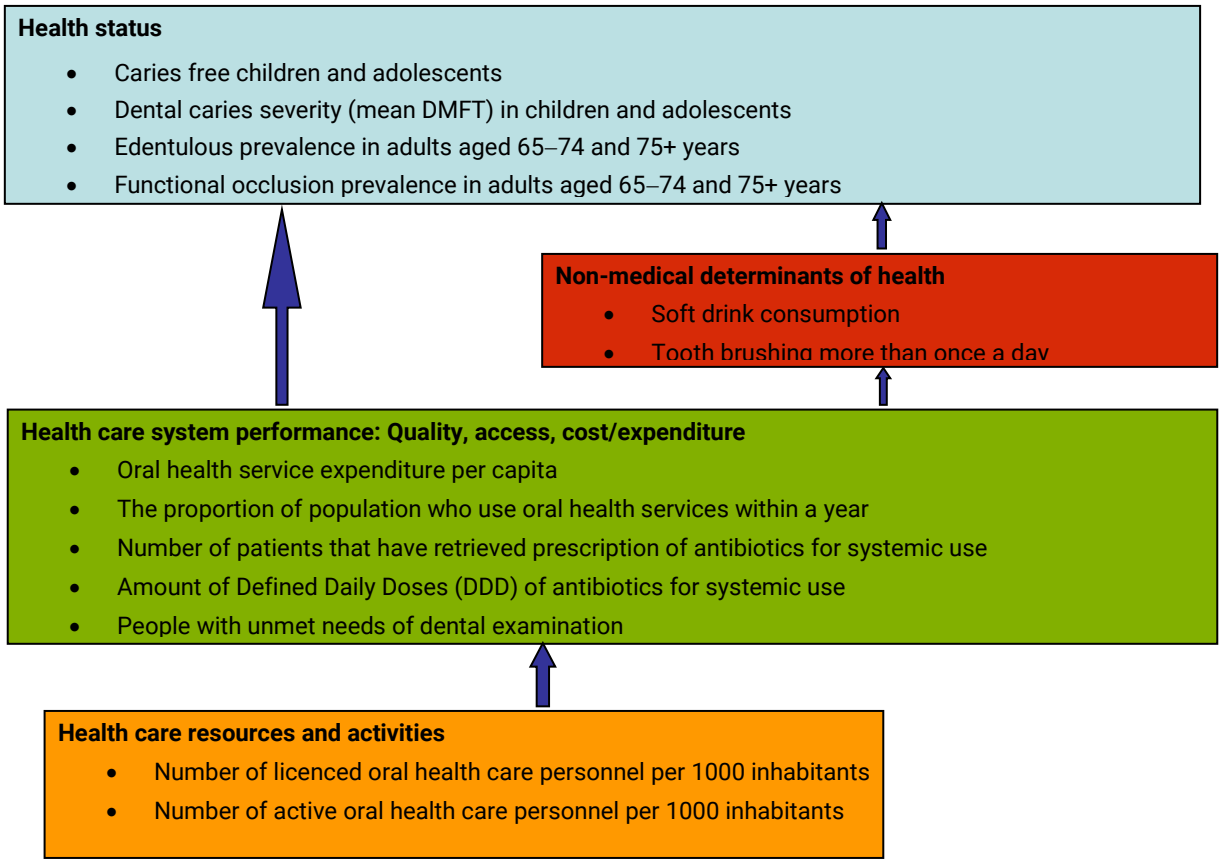
8. Number of patients that have retrieved prescription of antibiotics for systemic use prescribed by dentists
9. Amount of Defined Daily Doses (DDD) of antibiotics for systemic use prescribed by dentists

Outcome indicators:

10. Percentage of children and adolescents examined with no caries
11. Mean number of decayed, missing and filled teeth (DMFT) among children and young people examined
12. Percentage of population 65–74 years old and 75 years and older with no teeth
13. Percentage of population 65–74 years old and 75 years and older with at least 20 remaining teeth

Guiding principles in selecting the Nordic quality indicators of oral health care are described in detail in the comprehensive report published in 2010.[6]

Figure 1. An illustration of the selected indicators Nordic quality indicators for oral health and how they are coherent with the OECD conceptual framework.



[6] http://www.julkari.fi/handle/10024/80108

2.2 Results and findings

The following sections will present data on the 13 proposed quality indicators, divided into four groups as described above.

2.2.1 Structure indicators

The following table shows an overview of inhabitants and personell in the different countries:

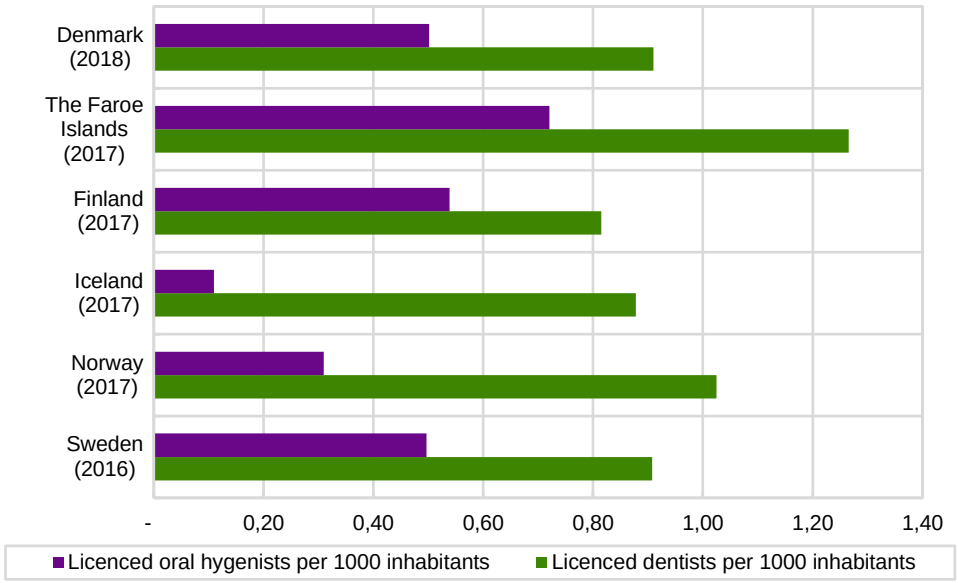
Table 1. Inhabitants and personell

	Denmark	The Faroe Islands	Finland	Iceland	Norway	Sweden
Year	**2018**	**2017**	**2017**	**2017**	**2017**	**2016**
Inhabitants	5 785 864	51 371	5 520 900	338 349	5 258 317	9 995 153
Licensed dentists	5 264	65	4 500	297	5 389	9074
Licenced oral hygenists	2 900	37	2 972	37	1 628	4966
Licensed specialists	277	-	624	43	562	1057 (2015)
Licensed orthodontists	206	2	155	14	194	-
Licensed oral surgeons	71	-	114	3	82	-
Year	**2 015**	**2 017**	**2 017**	**2 017**	**2 017**	**2 016**
Active dentists	4 781	47	4 200	248	4 891	8 063
Active oral hygienists	2 425	28	-	13	1 448	4 260
Active specialists	217	-	-	41	543	884 (2015)
Active orthodontists	157	1	-	14	182	266 (2014)
Active oral surgeons	60	-	-	3	82	145 (2014)

Scource: see appendix 1 and 2.

2.2.1.1 The ratio between the number of licensed dentists and oral hygienists per 1000 inhabitants

Figure 2. Number of licensed dentists under retirement age/1000 inhabitants and number of licensed oral hygienists under retirement age/1000 inhabitants.



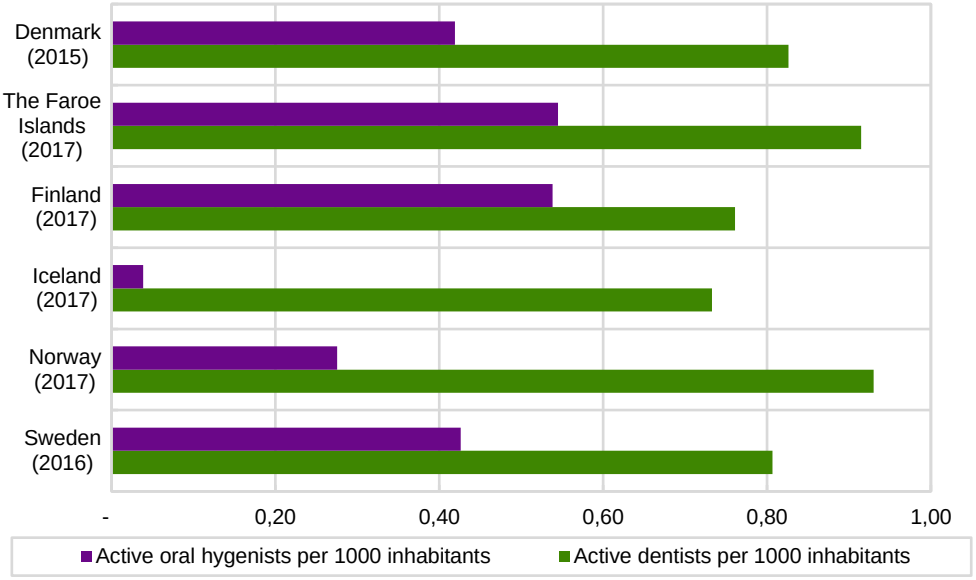
Scource: see appendix 1.

Findings: Figure 2 shows that Finland and Iceland have the lowest number of licensed dentists under retirement age/1000 inhabitants, with numbers at 0,82 and 0,88. The Faroe Islands has the highest number at 1,3. Iceland also has the lowest number of licensed oral hygienists under retirement age/1000 inhabitants at 0,11, while the Faroe Islands has the highest at 0,72.

Figures show that the situation regarding the numbers of licensed dentists has remained fairly stable in the Nordic countries since the last report was published in 2012. The only exemption is the Faroe Islands where the number of dentists has increassed up per 1000 inhabitatants. However, considering the low population in the Faroes Islands, the actual increase in numbers is not significant.

2.2.1.2 The ratio between the number of active dentists and oral hygienists per 1000 inhabitants

Figure 3. Number of active dentists and oral hygienists under retirement age/1000 inhabitants



Scource: see appendix 2.

Findings: Figure 3 shows that Iceland has the lowest number of active dentists under retirement age/1000 inhabitants at 0,73, while Norway has the highest at 0,93. Since the last report was published in 2012, Iceland has had a relative decrease in the number of active dentists under retirement age/1000 inhabitants. The remaining countries have quite stable figures.

Information about the licensed oral health workforce is available from registers, but there is a need for more information about the active workforce in some countries. For example, numbers for Finland for oral hygienists are identical for figures 2 and 3. One would expect a higher number of licensed workers than active oral health workers.

Indicators regarding health personell in this report have only included persons under retirement age in the region. Retirement age varies slightly across the Nordic region. The present trend is that people retire at an older age than previously and that retirement age has become more flexible. The quality indicator work group may in future consider publishing data on active personell regardless of retirement age, to get a more accurate picture of the working force in oral health.

The number of active dentists and oral hygienists per 1000 inhabitants does not take part-time work into account. Oral health personell cover appears to be high and stable in the Nordic region, but if a significant percentage work part time, the figures above would mask that health personell cover may not be as good as it seems. The quality indicator work group may in future consider using different data, such as the number of Full-time equivalent (FTEs) for dentists and oral hygienists. There are large differences in the ratio of active dentists per active oral hygienist; in Iceland it was over 18 and in Sweden 2.1.

The long-term trend in oral health services over the decades in the Nordic region has gone from focusing on restorative treatment to oral health promotion and diease prevention. Oral health in the region has steadily improved over time. Largely due to this development, several countries have aimed to increase the ratio of oral hygienists to dentists. The intention of this policy is to deliver services at a correct and optimal level (in accordance with the LEON principle) and to increase focus on preventive measures on both individual and population level. Iceland and Norway have so far experienced the least success of the Nordic contries at increasing the number of oral hygienists.

2.2.1.3 People with unmet needs for dental examination

The EU-SILC indicator may be used to measure the unmet need for dental examinations in the adult population when self-payment is included in the calculation. The indicator is called, «People with unmet needs for dental examination by sex, age, reason and income quintile (%)». More information about the EU-SILC indicator can be found through the link: http://epp.eurostat.ec.europa.eu/

Unmet needs for dental examination in the Nordic countries – EU-SILC

The need to see a dentist may have multiple reasons. The need may arise, for example as a result of specific dental problems such as toothache or dental disease, or it may come from a more general desire to prevent future dental problems. Although these two examples are different when it comes to how acutely they are assessed, the need for a dental visit could be equally important. (Ekornrud and Jensen 2010).

EU Survey on Income and Living Conditions (EU-SILC)

The EU Survey on Income and Living Conditions is an annual European sample survey. The study is coordinated by the EU's statistical office Eurostat. The Survey, among other things, mapS finance, labour and health in most recent calendar years. Denmark, Finland, Iceland, Norway and Sweden all conduct the survey. For more information about EU-SILC, see Sandvik and Holseter 2018[7] and the Eurostat webpage.[8]

EU Survey on Income and Living Conditions annually maps people's unmet need for dental examination within the last 12 months and the reasons they did not vistit a dentist.

EU-SILC shows that unmet needs for dental examination varies among Nordic countries, and it also varies according to age, sex, income and activity status. It also indicates that from 2005 to 2015, there has been a reduction in the amount of unmet needs in the population. But still, in some Nordic countries, a large percentage of the adult population have reported having unmet needs for dental examination.

[7] https://www.ssb.no/sosiale-forhold-og-kriminalitet/artikler-og-publikasjoner/_attachment/339726?_ts=161758d25c0
[8] http://epp.eurostat.ec.europa.eu/

Access to dental care when you need it is important. The indicator from EU- SILC «unmet needs for dental examination» can help the Nordic countries monitor development and trends on this area. It can also help countries determine the main characteristics among people with unmet needs. For instance it would be interesting to note if people with unmet needs for dental examinations vary according to background categories such as income, activity status, age and sex.

It is also important to discover the main reasons why people who need dental examinations still fail to visit a dentist. Is it due to cost, time constraints, waiting lists or fear of the dentist? The results from the EU-SILC survey will hopefully provide answers to many of these questions.

Analysis of Self-rated reasons for unmet needs for dental examination in EU and the Nordic countries

Table 2. People with unmet needs for dental examinations in Nordic countries. 16 years and over. 2010 and 2015, and percent change between 2010 and 2015.

	2010	2015	Percent change 2010–2015
Denmark	3,8	6,3	66
Finland	5,8	6,1	5
Iceland	12,1	12,6	4
Norway	8,6	7,3	- 15
Sweden	9,4	6,8	- 28

Source: EU-SILC, Eurostat. See appendix 3 for more details.

Among the Nordic countries in 2015, Iceland had the highest proportion of people with unmet needs (12.6 percent), while Finland the lowest, with 6.1 percent. During the period 2010–2015, there was a decrease of the EU-SILC score in Sweden and Norway, while an increase in Finland, Denmark and Iceland. The biggest increase in unmet needs between 2010 and 2015 was in Denmark with 66 percent.

Main reasons why people report unmet needs for dental examinations in EU and the Nordic countries

Table 3 shows that economy is the most important reason for unmet needs for dental examination. In the EU, 65 percent of people state cost as their main reason for having unmet needs. 10 percent state «Fear of dentist, hospital, examination or treatment» as their reason, and 6 percent claim to have no time for the purpose, while 5 percent are put off by waiting lists.

Table 3. Main Reasons why people have not been to the dentist during the last 12 months despite need in the EU total and Scandinavia. 2015. Percentage of people with unmet needs for dental exminations.

	Denmark	Finland	Iceland	Norway	Sweden
Too expensive	62	5	82	53	52
No time	6	2	1	11	10
Too far to travel	0	0	1	1	1
Didn't know any good doctor or specialist	0	0	0	1	1
Waiting list	2	79	0	3	3
Fear of dentist, hospital, examination or treatment	11	2	3	15	10
Wanted to wait and see if problem got better on its own	6	2	1	5	10
Other reasons	13	11	12	11	12

Source: EU-SILC, Eurostat. See appendix 3 for more details.

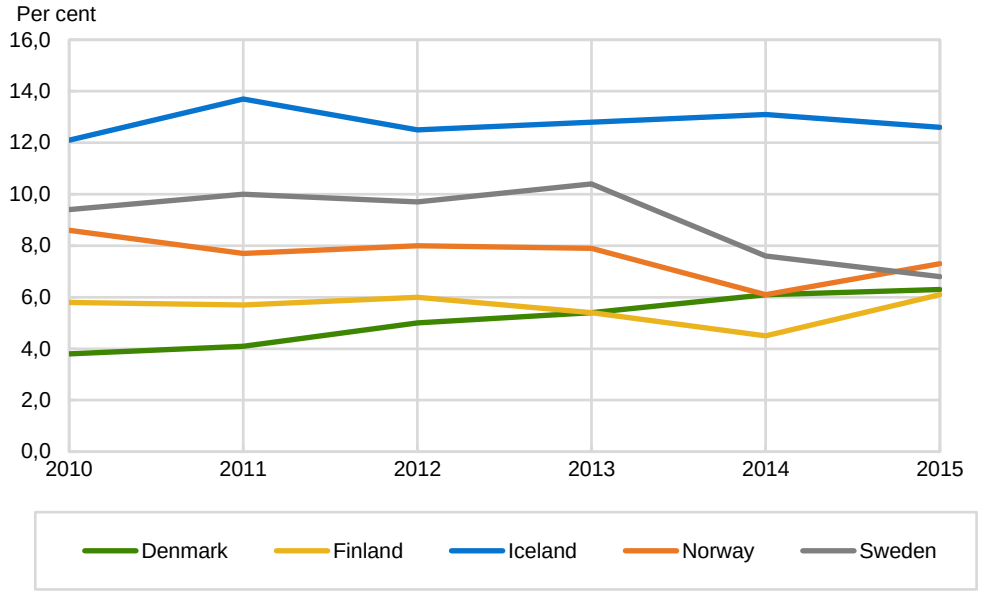
Expense is the main reason for unmet need for dental examinations in both EU and the Nordic countries. The exception is Finland. In 2015, 82 percent of the population who reported an unmet need for dental examinations in Iceland stated expense as the main reason, while in Finland only 5 percent reported the same. Cost is the main reason for unmet needs for dental examinations during the whole period 2010–2015, in most EU countries including all the Nordic countries, except Finland.

Finland is the only Nordic country where people report waiting lists as the main reason for an unmet need for dental examinations. While 79 percent of people with unmet needs reported waiting list as the main reason in Finland, 0 percent reported the same in Iceland. In other Nordic countries, 2 percent reported waiting lists as the main reason in Denmark and 3 percent in Sweden and Norway. Waiting lists could become a major reason for unmet needs for dental examinations, due to structural differences in dental health care services between the countries.

Fear of the dentist varies among the Nordic countries as the main reason for unmet needs for dental examinations. Over 10 percent report fear of dentist as the main reason in three of the Nordic countries (Norway, Sweden and Denmark). While 15 percent of people with unmet needs reported fear of the dentist as the main reason in Norway, only 2 percent reported the same in Finland.

Unmet needs for dental examinations in the Nordic countries – development over time

Figure 5. People with unmet needs for dental examinations during the past twelve months despite a need in the Nordic countries. 16 years and over. 2010–2015.



Source: EU-SILC, Eurostat. See appendix 3 for more details.

Findings: Figure 5 shows that during the period 2010–2015, there have been variations in the Nordic countries when it comes to the proportion of the population with unmet needs for dental examination. While two of the Nordic countries had a decrease of unmet needs for dental examinations during the period, three countries had an increase.

In 2015, Iceland reported the highest proportion of people with unmet needs for dental examination with 12.6 percent. In Norway, it was 7.3 percent, in Sweden 6.8 percent, in Denmark 6.3 percent, while it was lowest in Finland (6.1 percent).

In total during this period, the percentage of reported unmet needs for dental examination has decreased in two Nordic countries, while it has increased in three countries. The highest decrease was in Sweden with 28 percent, while the highest increase was in Denmark with 65 percent.

Differences between the Nordic countries in unmet needs by activity status

Activity status in EU-SILC – some definitions

The results of the EU-SILC survey about unmet needs for dental services is partly distributed and presented by the population's activity status. Definitions of employment and unemployment are similar to Eurostat's common definitions.

The following section is prevailing in the EU-SILC:

Population – includes the whole population, in this case, everyone involved in the survey is 16 years and over.

Employed persons – includes all persons aged 15–74 years who performed work with an income that lasted at least one hour in a given reference week. It also includes people who have such work, but who were temporarily absent because of illness, vacation, leave of absence or salary: Persons who are in the initial military or civil service, are also considered employed.

People in employment with pay from an employer are also classified as employed, as opposed to people in for example job training, who only receive an allowance.

Unemployed persons – includes all persons without income related work who attemted to aquire work during the last four weeks, and who could have taken such work during the reference week or the two subsequent weeks.

Retired persons – includes all persons who have retired with a pension, or receive other forms of social support such as disability pensions, social assistance, rehabilitation benefits, etc.

Other inactive persons – includes all persons not included in any of the other categories.

For more about the activity status of the EU-SILC:

http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/EN/hlth_care_silc_esms.htm

Table 4. People with unmet needs for dental examinations within the last 12 months by activity status. 2015. Percentage of people with unmet needs for dental exminations in the population 16 years and over within each group.

	Employed persons	Unemplyed persons	Retired persons	Other inactive persons
Denmark	6,1	20,9	3,5	7,7
Finland	5,9	11	5,4	6,1
Iceland	6,3	18,1	4,6	9,3
Norway	11,4	27	5,5	18,2
Sweden	6,2	23,7	3,1	13,3

Source: EU-SILC, Eurostat. See appendix 3 for more details.

Findings: Table 4 shows that the percentage of reported unmet needs for dental examinations is highest among unemployed people in Nordic countries in 2015. It is highest in Norway (27 percent) and lowest in Finland (11 percent). However, during the period from 2010 to 2015, this percentage has decreased in the Nordic countries.

Unemployed persons in the Nordic countries, except Finland, report expense as the main reason for their unmet needs for dental examinations. Finland is the exception where Finnish unemployed and employed people both report waiting lists as the main reason.

There are no clear differences between unmet needs for men and women for dental examinations in Nordic countries. However, there are significant gender differences amongst the unemployed. In 2015 in Iceland, Sweden and Norway unemployed men reported a higher percentage of unmet needs than unemployed women.

Differences between the Nordic countries in unmet needs by income

Table 5 shows persons 18 years and older, who have not been to the dentist within the last twelve months despite need, by different income quintile.

Income quintile in the EU-SILC survey

The results of the EU-SILC survey unmet needs for dental services is distributed and presented by the household to each individual person's income, the so-called income quintile. If one ranks all of the household incomes in ascending order, and divides them into five equal groups (quintile), then the first quintile comprises the fifth of the population with the lowest income, while the fifth quintile will comprise the fifth of the population with the highest incomes. When income groups are defined as quintiles, the income limits for each quintile changes from year to year, as income distribution and income changes.

Income quintile is computed on the basis of the total equalised disposable income of the year (N-1), i.e. total disposable household income divided by the household equalised size using the so-called modified OECD equivalence scale. This scale gives a weight of 1.0 to the first adult, 0.5 to any other household member aged 14 and over and 0.3 to each child below age 14.

For more on income quintile in the EU-SILC:

http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/EN/hlth_care_silc_esms.htm

Table 5. People with unmet needs for dental examinations within the last 12 months, by income quintile. 2015. Percentage of people with unmet needs for dental exminations in the population 16 years and over within each group.

	First quintile	Second quintile	Third quintile	Fourth quintile	Fifth quintile
Denmark	9,7	8,7	6,9	4,3	2,2
Finland	7,5	6,6	6,4	6	4,3
Iceland	22,5	14,3	13,2	8,8	5,7
Norway	16,8	8,2	6,1	3,3	2,7
Sweden	13,3	7,2	6,6	3,8	3,2

Source: EU-SILC, Eurostat. See appendix 3 for more details.

Findings: Table 5 shows that people with unmet needs for dental examinations unambiguously decreases with rising income. This applies to all Nordic countries. Iceland has the highest proportion of unmet needs in all five quintiles.

The greatest difference in unmet needs between the high and low income groups, is in Iceland and Norway, and it is smallest in Finland. Available data shows that waiting lists are the main reason for unmet needs in Finland across all income groups.

In Nordic countries, there is no common pattern to the distribution of unmet needs for dental examination either in general or with respect to gender. As for the occurrence of unmet needs in different income quintiles regarding gender, in the first income quintile, men have the highest proportion in all Nordic countries except for Iceland. In other income groups the variation in unmet needs between the Nordic countries regarding gender seems to be insignificant.

2.2.1.4 Oral health care expenditures per capita

A System of Health Accounts

A System of Health Accounts (OECD, 2000) is designed to provide a model for uniform reporting for countries with different ways of organising their national health system, and to meet the needs of analysts of health care systems and policy makers.

The set of tables is based on common concepts, definitions, classifications and accounting rules in order to ensure comparability over time and across countries.

Total health expenditure measures the final consumption of health care goods and services (i.e. current health expenditure) in addition to capital investment in health care infrastructure.

The health accounts provide a comprehensive accounting framework for the entire field of health care activities. The system presents health expenditure by function of care, by source of funding and by provider industry. The objective of health accounts is to constitute a system of comprehensive, internally consistent and internationally comparable accounts, which should also be compatible with other aggregated economic and social statistics as far as possible.

The System of Health Accounts is organised around a tri-axial system of recording the health expenditure. The expenditure is grouped into the three following categories:

- Health care by function (HC)
- Health care service provider industries (HP)
- Sources of funding (HF)

Dental care is measured by the function HC 1.3.2 Out-patient dental care

For more see: http://www.oecd.org/

Table 6. Dental expenditures per capita. Constant purchasing power parity with base year 2010 (US$). 2006–2016.

		2006	2008	2010	2012	2014	2016
Total dental health expenditures	Denmark	189	188	203	210	198	207
	Finland	167	186	192	197	199	181
	Iceland	222	220	208	213	239	252
	Norway	251	269	271	273	293	307
	Sweden	261	269	266	263	265	270
Government/ Compulsory schemes	Denmark	36	36	40	40	35	41
	Finland	76	86	83	85	82	54
	Iceland	43	38	31	31	50	58
	Norway	58	70	71	79	87	87
	Sweden	99	106	105	103	103	105
Voluntary schemes/household out-of-pocket payments	Denmark	153	152	163	170	163	166
	Finland	91	100	109	112	117	127
	Iceland	179	182	177	182	189	194
	Norway	193	199	200	194	206	220
	Sweden	162	163	161	160	162	165

Source: OECD, System of a health account. Function «HC 1.3.2 Out-patient dental care».

Findings: Table 6 shows figures from OECD's a System of Health Account. The figures are reported annually from all member states to the OECD, based on $USD spent on dental care (HC 1.3.2). All countries have an increase in total expenditures per capita, government schemes per capita and on voluntary schemes per capita in the period 2006-2016. The exception is Finland, where the expenditure on government schemes has decreased by 28 percent from 2006 to 2016.

Figure 6. Dental expenditures per capita. Constant purchasing power parity with base year 2010 (US$). 2016.

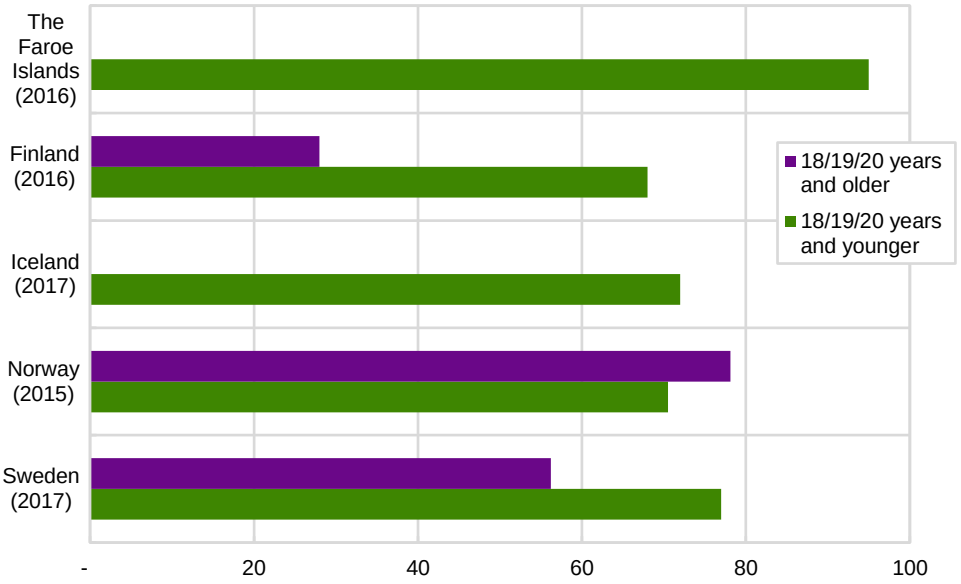
Source: OECD, System of a health account. Function «HC 1.3.2 Out-patient dental care».

Findings: Figure 6 shows that Norway spent the most in total per capita with USD 307 $USD, while Finland spent least with USD 181. Furthermore, the figure shows that Sweden spent the most per capita with 105 $USD on government schemes in 2016, while Denmark spent the least with 41 $USD. On the other hand, Norway spent the most per capita on voluntary schemes with 220 $USD per capita in 2016, while Finland spent the least amount with 127 $USD.

2.2.2 Process indicators

2.2.2.1 The percentage of the population receiving oral health care within the past year

Figure 7. The proportion of the population under 18/19/20 years-old and the proportion of adults aged 18/19/20 years and older separately who used oral health services within a year.[9]



Scource: see appendix 5.

Findings: Five countries (Finland, Iceland, Sweden, the Faroe Islands and Norway) are able to report the proportion of the population under 18/19/20 year-olds who used oral health services within a year. Norway (2015) and Finland (2016) had the lowest proportion at 68 and 71 percent. Sweden (2017) and the Faroe Islands (2016) had the highest at 77 and 95 percent.

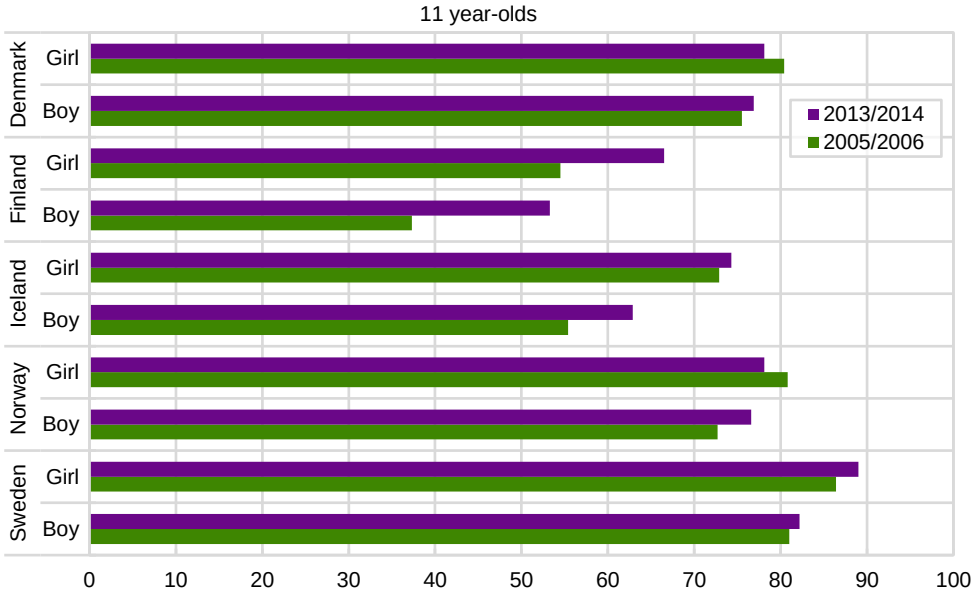
For the adult populations data was available from only three countries (Sweden, Norway and Finland). Finland had the lowest proportion at 28 percent while Norway had the highest proportion at 78 percent.

[9] Age cut offs differs between countries. See Appendix 5 for more.

2.2.2.2 The frequency of tooth brushing (percentage of the population brushing more than once daily)

This indicator is based on a WHO study called «Health behaviour in school-aged children (HBSC)». It is conducted every four years. The following figures show the results from the HBSC surveys in 2005/2006 and 2013/2014 on the percentage of school-aged children (11-and 15-year-olds) brushing their teeth more than once daily.[10] The Faroe Islands are not included in the study. For further information about the indicator, see appendix 6.

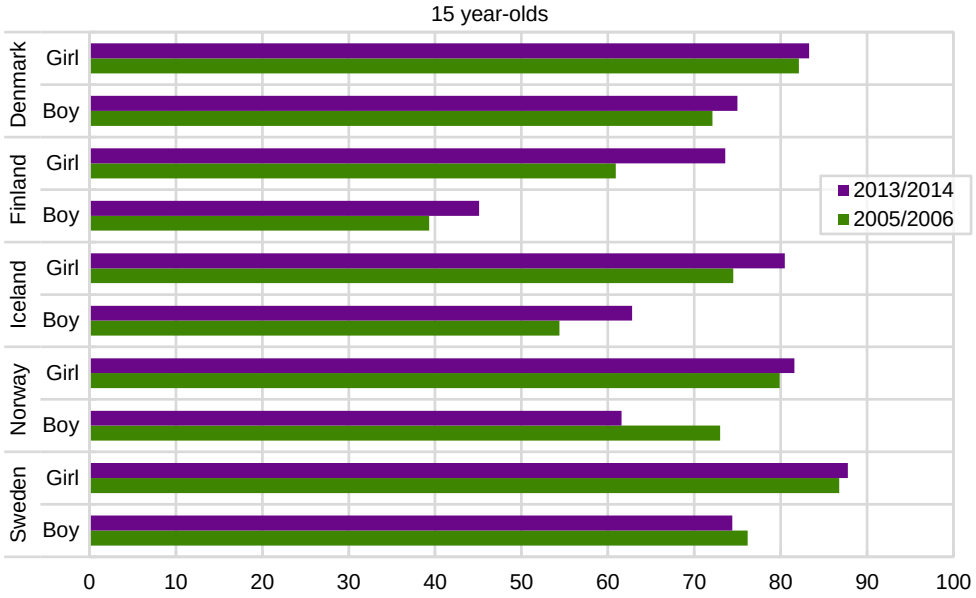
Figure 8. 11-year-olds. Daily tooth brushing (more than once a day). Percentage of 11 year-olds asin the study. 2005/2006 and 2013/2014.



Source: HBSC. See appendix 6 for more details.

[10] For more information about the last study in 2013/2014, see the report from WHO: http://www.euro.who.int/__data/assets/pdf_file/0003/303438/HSBC-No.7-Growing-up-unequal-Full-Report.pdf

Figure 9. 15-year olds. Daily tooth brushing (more than once a day). Percentage of 15 year-olds asked in the study. 2005/2006 and 2013/2014.



Source: HBSC. See appendix 6 for more details.

Findings: In summary, figure 8 and 9 indicate that for 11 and 15 year-olds, a greater percentage of girls brush their teeth more than once a day compared to boys in Nordic countries. The figures also show that there has been an increase in the proportion of boys and girls who brush their teeth daily in 2013/2014 compared to 2005/2006. At the same time, there are fairly large differences in the proportion brushing their teeth more than once daily between some Nordic countries. The figures also show that the proportion brushing their teeth more than once a day is quite similar between 11 and 15-year-olds in the different Nordic countries in 2013/2014.

There has been an increase in the proportion brushing their teeth more than once a day among 11-year-olds between 2005/2006 and 2013/2014, for both girls and boys in Nordic countries. The exceptions are Norway and Denmark, where the percentage of 11-year-olds girls who brush their teeth daily has somewhat descreased. Among 11 year-old boys in 2013/2014, the proportion who brush their teeth more than once a day is highest in Sweden (82 percent) and lowest in Finland (52 percent). Among girls, the proportion is also highest in Sweden (89 percent) and lowest in Finland (66 percent).

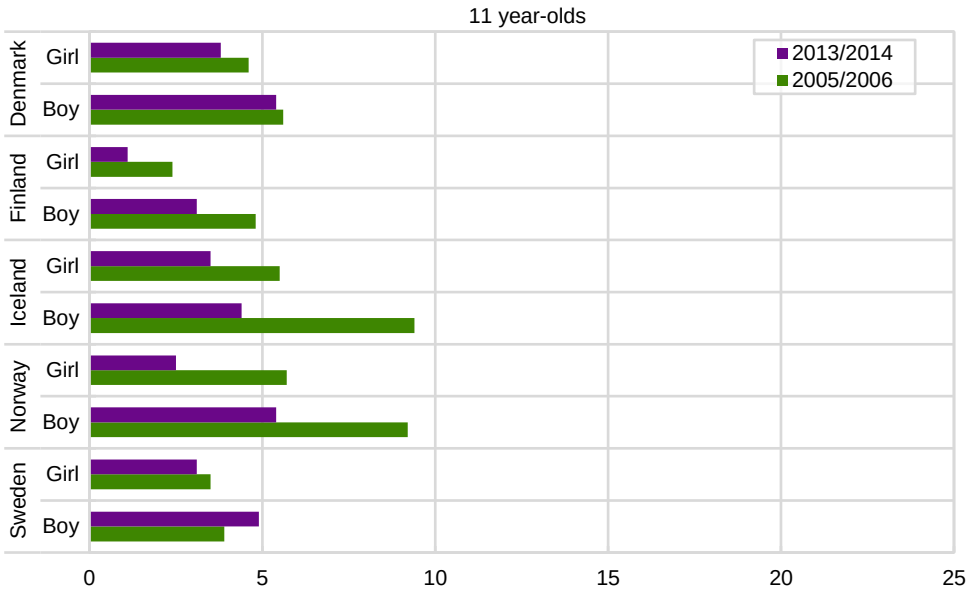
There has been an increase in the proportion brushing their teeth more than once a day from 2005/2006 to 2013/2014 for 15-year olds in Nordic countries. The exceptions are boys in Norway and Sweden where there has been a small decrease. Among 15 year old boys in 2013/2014, the proportion who brush their teeth more than once a day was highest in Denmark (75 percent) and lowest in Finland (45 percent). Among girls, the proportion was highest in Sweden (88 percent) and lowest in Finland (74 percent).

2.2.2.3 The annual mean consumption of sugar-containing beverages per person

This indicator is based on a WHO study called «Health behaviour in school-aged children (HBSC)». It is conducted every four years. The following tables show the results from the HBSC surveys in 2005/2006

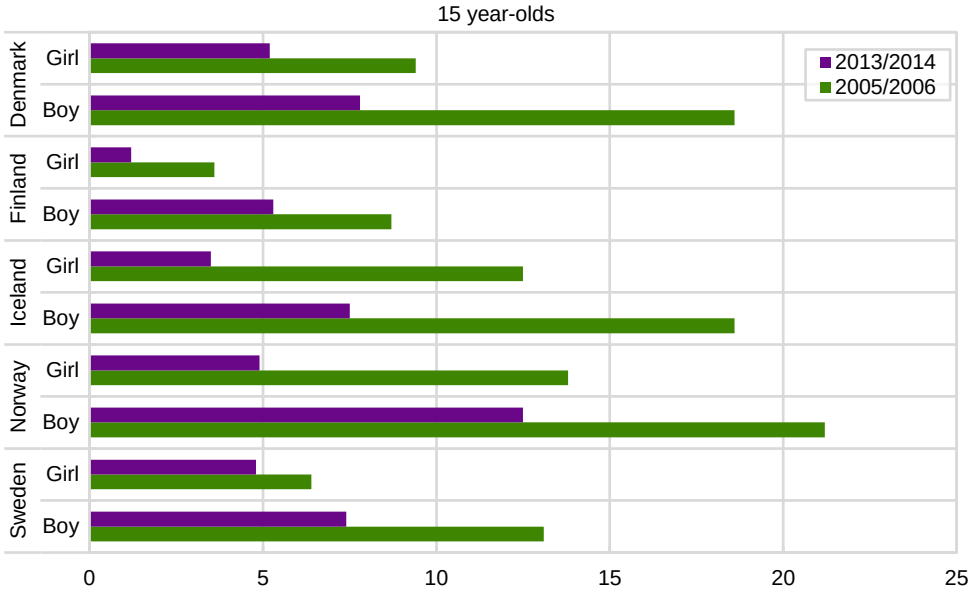
and 2013/2014 on the percentage of school-aged children (11-, 13- and 15-year-olds) who drink soft drinks daily. The indicator show the consumption of sugar-sweetened beverages, including soft drinks.[11]

Figure 10. 11-year-olds who drink sugared soft drinks daily or more than daily. Percentage of 11 year-olds asked in the study. 2005/2006 and 2013/2014.



Source: HBSC. See appendix 7 for more details.

Figure 11. 15-year-olds who drink sugared soft drinks daily or more than daily. Percentage of 15 year-olds asked in the study. 2005/2006 and 2013/2014.



Source: HBSC. See appendix 7 for more details.

[11] For more information about the last study in 2013/2014, see the report from WHO: http://www.euro.who.int/__data/assets/pdf_file/0006/167424/E96444_part2_4.pdf

Findings: In summary, figure 10 and 11 indicate that the proportion of 11 year-olds and 15 year-olds in the Nordic countries who drink sugared soft drinks daily decreased between 2005/2006 and 2013/2014. This applies to both boys and girls in both age groups for all Nordic countries. Boys drink more sugared soft drinks than girls in all Nordic countries. The figures also show that the proportion who drink sugary drinks on a daily basis was higher among 15-year-olds than 11-year-olds.

There has been a decrease in the proportion 11 year-old boys and girls who drink sugared drinks daily between 2005/2006 and 2013/2014. The only exception is 11 year-old boys in Sweden, where the proportion of 11 year-old boys increased from almost 4 percent in 2005/2006 to almost 5 percent in 2013/2014. In 2013/2014, Denmark and Norway had the highest proportion of 11 year-old boys who drink sugared soft drinks with 5.5 percent, while Finland has the lowest with 3.1 percent. Among 11 year-old girls, Denmark has the highest proportion with 3.8 percent, while Finland has the lowest with 1.1 percent.

There has been a decrease in the proportion 15 year-old boys and girls who drink sugared drinks daily between 2005/2006 and 2013/2014. In 2013/2014, Norway has the highest proportion of boys who drinks sugared soft drinks with 12.5 percent, while Finland has got the lowest with 5.5 percent. Among 15 year-old girls, Denmark has the highest proportion with 5.5 percent, while Finland has the lowest with 1 percent.

2.2.2.4 Antibiotics prescribed by dentists

Resistence to antibiotics has become one of the greatest threats to health and it is on the increase globally. Without efficient antibiotics, health services would be without treatment options for ordinary infections, such as tuberculosis or pneumonia, and many surgical interventions can not be carried out without treatment with antibiotics in the postoperative phase. It is vital that health personell are educated in the correct use of antibiotics and that usage is reduced.

The working group has earlier developed two potential indicators for the prescription of systemic antibiotics, and revised versions have been included as indicators in this revised report:

1. Number of patients per thousand inhabitants that have retrieved prescription of antibiotics for systemic use (ATC code J01 and P01AB01), prescribed by dentists.
2. Number of Defined Daily Dose (DDD) per thousand patients who have retrieved prescriptions of antibiotics for systemic use (ATC code J01 and P01AB01), prescribed by dentists.

Indicator 1 above (table 7) presents rate per 1000 of population receiving prescription of systemic antibiotics by dentists in the different Nordic countries. A higher figure may indicate dentists prescribing more antibiotics than recommended and/or it may indicate a higher prevalence of oral infections in the population.

Indicator 2 above (table 8) presents figures for the average amount of antibiotics assumed consumed (received) by patients that have retrieved a prescription for antibiotics per year. Higher figures may

indicate that higher doses of antibiotics tend to be prescribed in a given country or that patients receive more than one prescription.

Consumption of drugs is measured through DDD, as recommended by the WHO Collaborating Center for Drug Statistics. WHO definition of DDD is: *«The DDD is the assumed average maintenance dose per day for a drug used for its main indication in adults.»*[12]

A DDD will only be assigned for drugs that already have an ATC code. Denmark, Iceland, Sweden, the Faroe Islands, Finland and Norway all have available data on DDD. DDD figures represent a less accurate estimate of use of antibiotics, which may differ considerably from its actual usage.

The following tables present the two quality indicators concerning systemic antibiotics prescribed by dentists and dental specialists (ATC code J01 and P01AB01) from 2007 to 2017.

Table 7. Number of patients per thousand inhabitants that have retrieved prescription of antibiotics for systemic use (ATC code J01 and P01AB01), prescribed by dentists. 2007–2017.

	Denmark	The Faroe Islands	Finland	Iceland	Norway	Sweden
2007	20,3	-	38,1	36,8	23,3	26,7
2009	23,1	38,0	39,5	37,1	24,8	23,7
2011	25,8	38,6	40,6	37,5	26,0	22,6
2013	27,8	37,9	43,4	38,3	26,3	19,8
2015	28,8	40,9	43,9	39,5	25,3	17,1
2017	21,5	35,8	37,6	39,9	22,1	15,7

Scource: see appendix 8.

Findings: Table 7 shows that an increased proportion of the population had retrieved prescription of antibiotics by dentists in the period 2007 to 2015 across all Nordic countries, except for Sweden which shows a decrease throughout the period 2007-2017. Between 2015 and 2017 the proportions decreases, starting in Norway in 2013. Iceland had the highest proportion in 2017 with 39,9 per thousand, while Sweden had the lowest number of individuals that had retrieved prescriptions of antibiotics with 15,7 per thousand inhabitants. Figures now appear to move in the right direction, as figures from 2017 are down to the level of 2007. There has been increased attention and information about the health risks related to resistence against antibiotics and National authorities in the Nordic region have aimed to inform the pubic and health personell about correct use of antibiotics.

[12] The WHO Collaborating Centre for Drug Statistics Methodology in Oslo, Norway (WHO CC, Oslo),http://www.whocc.no/ddd/definition_and_general_considera/

Table 8. Number of Defined Daily Dose (DDD) per patient who have retrieved prescriptions of antibiotics for systemic use (ATC code J01 and P01AB01), prescribed by dentists, 2007–2017.

	Denmark	The Faroe Islands	Finland	Iceland	Norway	Sweden
2007	9,8	-	9,4	12,8	11,6	15,6
2009	10,3	9,0	9,6	12,6	11,8	15,5
2011	10,7	9,3	9,3	11,6	11,9	15,4
2013	11,2	9,4	9,5	12,0	11,9	16,0
2015	11,8	10,1	9,6	11,9	12,3	16,7
2017	11,3	10,0	9,3	11,3	12,5	17,2

Scource: see appendix 9.

Findings: Table 8 shows that Iceland had a decrease in the amount of Defined Daily Doses (DDD) per patient which had been prescribed by dentists in the period 2007–2017, while Denmark, Norway and Sweden had an increase. Finland had stable figures in this period, and the lowest figure at 9,3 in 2017. Sweden had the highest number of Defined Daily Dose (DDD) per patient in 2017 at 17,2.

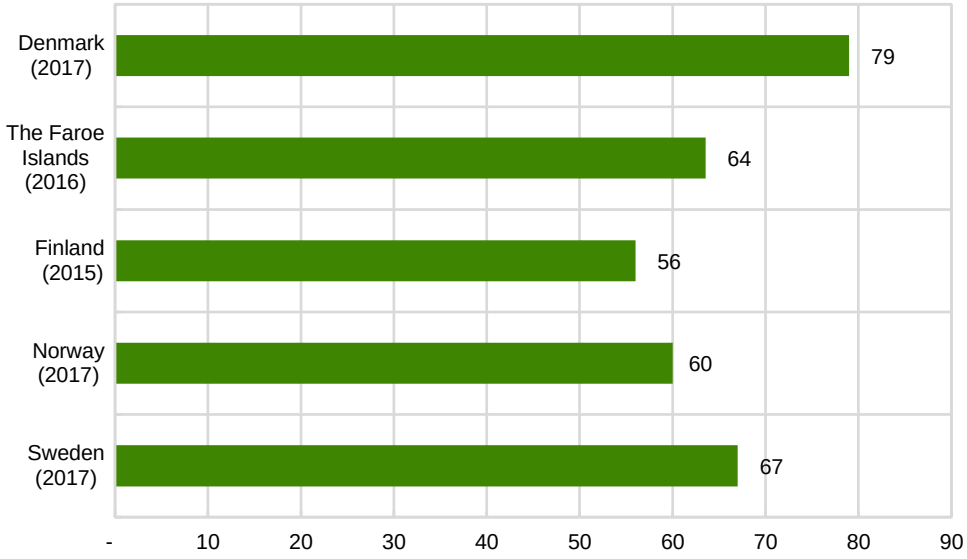
This indicator gives an estimate of size of dose (assumed consumed) per antibiotic treated patient. If patients retrieve more than one prescription per year, this will contribute to higher figures. Variations in figures between countries may be partly due to different practices of prescription between countries. Higher figures may also indicate patients need higher doses due to more severe infections.

2.2.3 Outcome indicators

2.2.3.1 The percentage of children and adolescents examined who had no caries

No obvious decay experience means: (D3MFT=0/d3mft=0). No obvious decay means: No decay in dentine.

Figure 12. Proportion of 12-year-old children with no obvious decay (no dentine caries). Percentage



Scource: see appendix 10.

Findings: The percentage of children with no obvious decay (previously known as caries-free children) has increased in all Nordic countries between 2005–2017. Among 12-year olds, it varied from 56 percent in Finland (2015) to 79 percent in Denmark (2017) (Figure 12). The latest data from Iceland are from 2005, and are not included in the figure.

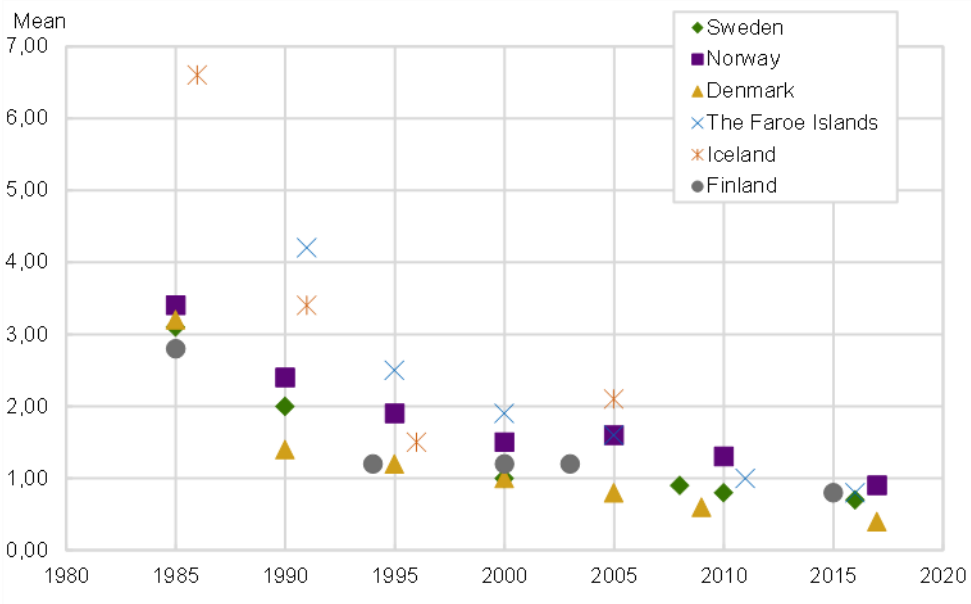
The proportion of 12-year-olds with no obvious decay has increased in all Nordic countries since the last report was published in 2012.

It should be mentioned that there is an under representation of caries-free in the figures, and this may vary between countries. Children with caries tend to be examined more often and are therefore over-represented compared to caries-free children, who are called for examination more rarely. There are however drop-outs and how their status would affect the figures is unknown.

None of the Nordic countries report or register systematically enamel caries. Enamel caries has a higher chance of requiring operative dental treatment in the future and indicates a need for non-operative treatment (fluoride brushing, fissure sealant etc). Collecting data also on enamel caries (D1-2) would give a more accurate picture of national oral health status and should be considered in future for Nordic countries.

2.2.3.2 Mean number of decayed, missing and filled teeth (DMFT) among the children and adolescents examined

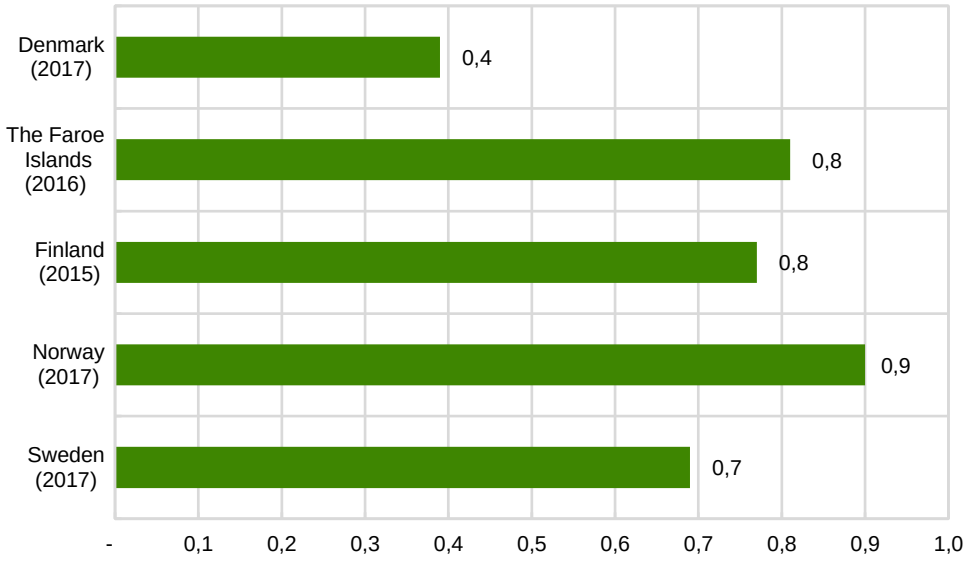
Figure 13. Average number of decayed, missing or filled teeth, 12-year-old children in Nordic countries.1985–2010.



Scource: see appendix 11.

Findings: Figure 13 shows a substantial decrease in average DMFT for 12-year-olds in all Nordic countries between 1985 and 2016. Over the past four decades, oral health of children in the Nordic countries has shown a large improvement. It is nonetheless important to remember that these are average numbers, and there are subgroups with much higher DMFT figures.

Figure 14. Average number of decayed, missing or filled teeth, 12-year-old children.



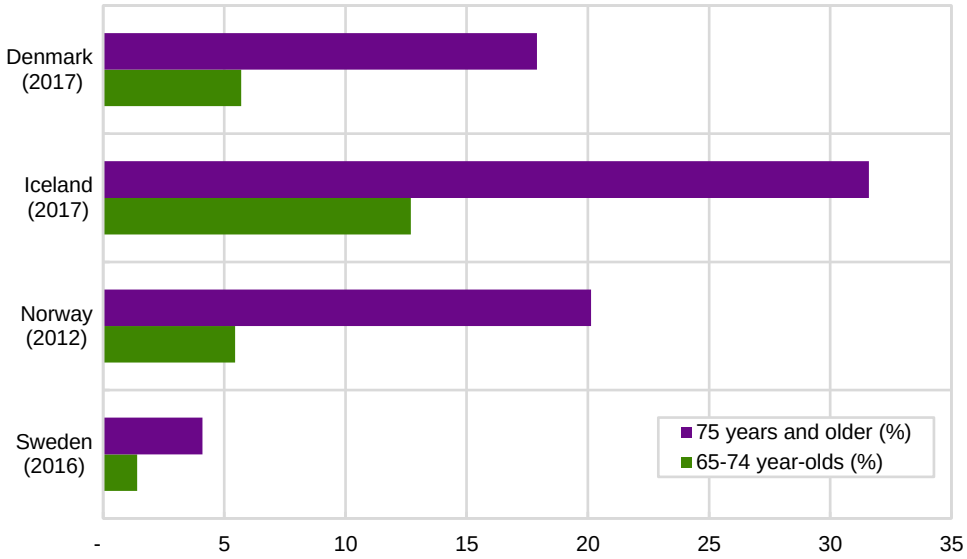
Source: see appendix 11.

Findings: Figure 14 shows the average number of decayed, missing or filled teeth among 12-year olds. The mean national D3MFT scores for 12-year olds are low in all Nordic countries. There are, however, some differences between the Nordic countries; the lowest D3MFT (0.4) was in Denmark (2017) and highest in Norway (0.9 in 2017). The World Health Organization set a target for Europe of not exceeding 1.5 D3MFT by the year 2020 for 12-year olds (WHO, 1999) and this goal has already been reached by all Nordic countries with the excemption of Iceland. The latest data from Iceland are from 2005, and are not included in the figure.

Average DMFT figures have decreased in all Nordic countries since 2012, when the previous report was published. We have no knowledge of the development in Iceland due to lack of data.

2.2.3.3 The percentage of the population 65–74 years old and 75 years and older with no teeth

Figure 15. Proportion of edentulous (no teeth) in age group 65–74 and 75 years and older in the Nordic countries. Percentage.[13]



Scource: see appendix 12.

Findings: Figure 15 shows that the percentage of people from 65 to 74 years old with no teeth varied from 1 percent in Sweden (2016) to 13 percent in Iceland (2017). The figure also shows that that the percentage of edentulous people in the age group 75+ is higher and it varies from 4 percent in Sweden (2017) to 32 percent in Iceland (2017).

Finland could deliver data on the year groups listed in table 9 below.

Table 9: Proportion of edentulous (no teeth) in age group 70-79 years, 80+ years and 70+ age standardized, in Finland (FinHealth 2017, National Institute for Health and Welfare, Finland):

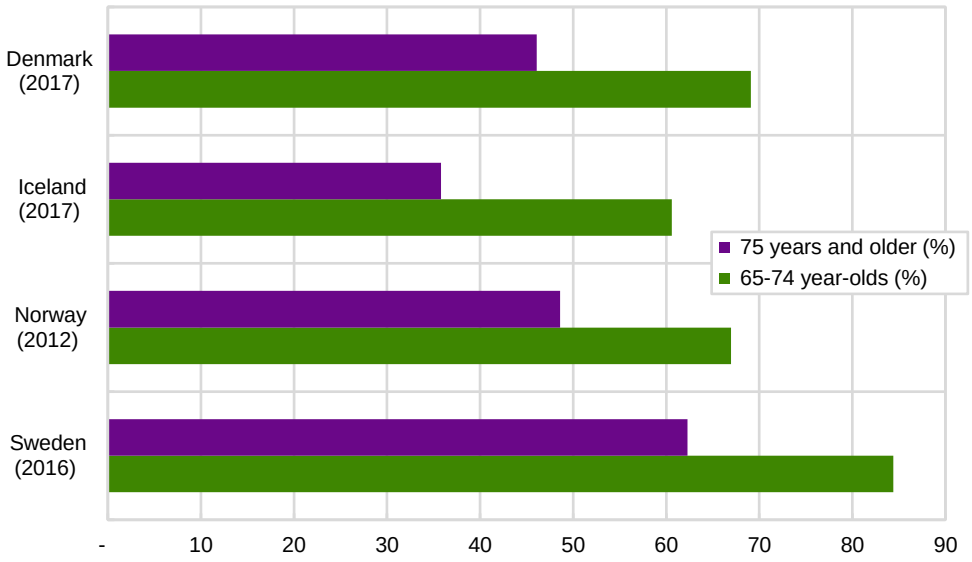
Age group	Percentage of age group with no teeth	Percentage of male age group with no teeth	Percentage of female age group with no teeth
70 – 79 years	24,8 %	23,0 %	26,5 %
80+	38,9 %	38,9 %	44,9 %
70+, age standardized	29,0 %	26,1 %	31,9 %

[13] No available data from The Faroe Islands.

Figures show that the number of people with no teeth is decreasing rapidly in all Nordic countries. But it is important to note that some countries have not included people living in institutions for the aged and disabled in their statistics. For more information about this indicator see appendix 12.

2.2.3.4 The percentage of the population 65–74 years old and 75 years and older who have at least 20 remaining teeth

Figure 16. Proportion of adults aged 65–74 years and 75 years and older with 20 or more natural teeth. Percentage.



Scource: see appendix 13.

Findings: Figure 16 shows the distribution of 65 to 74 year olds and 75-years and older having 20 or more natural teeth. While this was 84 percent in Sweden for 65 to 74 year olds in 2016, it was 61 percent in Iceland in 2017. In the age group 75 years and older, 36 percent in Iceland (2017) had 20 or more teeth, while the highest percentage for this age group was in Sweden at 62 percent (2016). Variation between countries is slightly larger for the older age group. As expected, the proportion with 20 or more teeth is lower amongst the oldest age groups in all countries,

Finland delivered the following data: The FinnHealth 2011 study showed that in the age group of 65 years or older, 46% of females and 48% of males had at least 20 functional teeth. There were more female than male participants in that age group, so the mean figure would be closer to 46 than 48.

Different years of reporting the data make it challenging to compare across the Nordic countries. There is reason to believe that the proportion of people with 20 or more natural teeth will increase in the years to come in all Nordic countries. It is also important to emphasize that the figures for some countries do not include people living in institutions for aged and disabled. For more information about this indicator, see appendix 1.

2.3 Potential new quality indicators

The working group has tried to extend the number of quality indicators beyond the original 12 currently in use. In 2010, the following criteria were agreed as potential quality indicators:

- The percentage of the population receiving oral health care regularly
- Self-rated oral health
- Self-rated chewing ability

These are described in the comprehensive report published in 2010:
http://www.julkari.fi/handle/10024/80108

In 2012, the working group considered several potential indicators related to following areas:

- Erosion
- Antibiotics
- Self-rated reasons for unmet needs for dental examinations

Quality indicators have been developed in the last two areas listed and are included in this report.

The next section describes the potential quality indicators that the working group proposed in 2010.

2.3.1 Erosion

According to the literature, one third of children and adolescents have dental erosion. Dental erosion ceases from progression at any stage as soon as the causal factors are is removed. It is therefore important to diagnose the condition at an early stage in order to initiate appropriate preventive measures and to avoid further tissue loss. There is no consensus in academia on which index system should be used to register and quantify dental erosion in patients. Nonetheless, the use of an erosive tooth wear index represents a benchmark that allows direct comparison between clinical data from different centres or from different time points.

A first step towards an indicator for dental erosion in national surveys could be to register in a patient journal whether the patient has erosion and if dentin is exposed.

3. Conclusion

3. Conclusion

This report is a short summary of the work done by the working group for The Nordic Project of Quality Indicators for Oral Health Care in 2018 and an update of the previous report published in 2012. As the working group previously has conducted extensive work in defining the indicators and ensuring the quality of collected data, it is important that data on the selected indicators are published on a regular basis.

This report gives updated information on quality indicators regarding oral health and oral health care. Nordic health care personnel and health authorities may use the report to assess and compare the quality of oral health services and oral health status in the Nordic countries. In the period 2012–2018, work has also been done in analysing some of the indicators. The working group has carried out work on developing new quality indicators, and as a result three new indicators are included in this report:

- Number of patients that have retrieved prescription of antibiotics for systemic use
- amount of Defined Daily Doses (DDD) of antibiotics for systemic use
- people with unmet needs for dental examinations.

The results presented in the report suggest that oral health status is steadily improving in the population in the Nordic region. This assumption is based on indicators regarding proportion of 12-year-olds with no caries and mean number of decayed, missing or filled teeth in the same age group. Figures on proportion of persons with no teeth in certain age groups support the picture of an overall improving oral health status. Data from a WHO study indicates that health behavior with importance for oral health amongst children and young people in the region has improved over a 10-year period (2005/06-2013/14).

The report also implies that there is an unmet need for oral health care in the adult population in all Nordic countries. There is a clear socio-economic difference in access to oral care; The proportion of people with unmet needs for dental examinations are highest among people with low education, low income and unemployed in all Nordic countries.

The report also gives interesting comparisons between countries regarding numbers of oral health care personnel and ratios between dentists and oral hygienists. There is a fairly stable situation regarding oral health care personnel across the region, but ratios between the two different groups of personnel varies significantly. The prescription of antibiotics by dentists seems in 2017 to have reverted to 2007 levels, after an increase between 2007-2015. This overall trend is similar across the region, with some variations between countries.

For the future, the working group recommends that the cooperative work continues and more joint quality indicators regarding oral health are developed. Further work is needed to develop indicators more accurately connected to quality and the working group regards it as important that the Nordic countries strive to collect comparable data. Better and more extensive data regarding the adult population across the region could and should be achieved. Another future goal is to publish comparable data and quality indicators in oral health care for the Nordic countries on a joint digital platform, such as Nowbase (the shared website for the Nordic Medico-Statistical Committee (NOMESCO)). Such publishing would ease both cooperation and updating.

4. Appendix

Appendix 1

Indicator number 1: Number of licenced oral health care personnel under retirement age per 1000 inhabitants
Date: January 2019

Written by: Norwegian Directorate of Health

Definition:	a: Number of licenced dentists under retirement age/1000 inhabitants b: Number of licenced oral hygienist under retirement age/1000 inhabitants
Unit of measurement:	Number of oral health care personell
Purpose of the indicator:	The structure of health care systems is considered as key element of effective management and essential for attainment of health system goals: improving health, responding to the legitimate expectation of the population and fairness of the contribution. It is important to have regulatory systems to ensure that the oral health workforce of the future is prepared to meet the changes that may take place in health care delivery. The indicator gives an picture of the situation for the inhabitants in each country regarding access to oral health care personnel. The overall aim is providing the adequate number of personnel with appropriate competence to meet the needs of the population.
Interpretation:	A higher number of licenced oral health care personnel under retirement age indicates better access to oral health care care service. The indicators reflect the ratio between the different educational skills in dentistry.
Target:	No known consensus of a target level.
Type of indicator:	Structure indicator
Technical description:	*Numerator:* licenced oral health care personnel under retirement age *Denominator:* 1000 inhabitants
Sources:	**Sweden:** The National Board of Health and Welfare and Statistics Sweden. Inclusion of active/employment rate: Active personnel. The employment rate is unknown. **Denmark:** The National Board of Health and Statistics Denmark. Inclusion of active/employment rate: Number of legitimate, not active. Includes people under 70 years of age. **The Faroe Islands:** The Faroese Dental Association and the Faroese Oral Hygenists Association's register of active and licenced members

	Finland: Statistics Finland and Valvira (National Supervisory Authority for Welfare and Health). Inclusion of active/employment rate**:** Number of legitimate, not active. Includes people under 64 years of age. **Iceland:** The Directorate of Health and Statistics Iceland. **Norway:** Statistics Norway (SSB) and different administrative registers in Norway. Inclusion of active/employment rate: Active personnel under 67 years.
Sources of error:	Possible bias: • Different type of data sources (see above) • Different year of collecting the data • Different retirement ages in each country • Different inclusion criteria: Some countries do not have a retirement age or the overview of this. • Different geographical structure. These differences make it challenging to compare between countries.
Geographical level of publishing:	Each country publishes data for the whole country.
Quality area:	Care within reasonable time.

Appendix 2

Indicator number 2: Number of active oral health care personnel under retirement age per 1000 inhabitants

Date: January 2019

Written by: Norwegian Directorate of Health

Definition:	a: Number of active dentists under retirement age/1000 inhabitants b: Number of active oral hygenists under retirement age/1000 inhabitants
Unit of measurement:	Number of personnel
Purpose of the indicator:	The structure of health care systems is considered as key element of effective management and essential for attainment of health system goals: improving health, responding to the legitimate expectation of the population and fairness of the contribution. Especially the numbers of active workforce need to be monitored. It is important to have regulatory systems to ensure that the oral health workforce of the future is prepared to meet the changes that may take place in health care delivery. By monitoring the number of active personnel, not just the number of legitimate, one can get information on how many that is actually working. For some countries, there is a big difference between the ratios of licensed personnel and active personnel.
Interpretation:	A higher number of active oral health care personnel under retirement age indicates better access to the oral health care service. The indicators reflect the ratio between the different educational skills in dentistry.
Target:	No known consensus of a target level.
Type of indicator:	Structure indicator
Technical description:	*Numerator:* Number of active dentists and oral hygienist under retirement age *Denominator:* 1000 inhabitants
Sources:	**Denmark:** The National Board of Health and Statistics Denmark. Inclusion of active/employment rate: Number of legitimate, not active. Includes people under 70 years of age. **The Faroe Islands:** The Faroese Dental Association and the Faroese Oral Hygenists Association's register of active and licenced members **Finland:** Statistics Finland and Valvira (National Supervisory Authority for Welfare and Health). Inclusion of active/employment rate**:** Number of legitimate, active. Includes people under 64 years of age.

	Iceland: Directorate of Health Iceland, Statistics Iceland and Icelandic Health Insurance. Inclusion of active/employment rate**:** Number of active. Includes people under 67 years of age. **Norway:** Source: Statistics Norway (SSB) and different administrative registers in Norway. Inclusion of active/employment rate: Active personnel under 67 years. **Sweden:** Source: The National Board of Health and Welfare and Statistics Sweden. Inclusion of active/employment rate: Active personnel. The employment rate is unknown.
Sources of error:	Possible bias: • Different type of data sources (see above) • Different year of collecting the data • Different retirement ages in each country • Different inclusion criteria: Some countries do not have a retirement age or the overview of this. • The number of recognized specialties varies from two in Denmark to eight in Sweden. This may affect the ratio of population per specialist. • Different geographical structure. These differences make it problematic/challenging to compare between countries.
Geographical level of publishing:	Each country publishes data for the whole country.
Quality area:	Care within reasonable time.

Appendix 3

Indicator number 3: People with unmet needs for dental examination by age, sex and main reason
Date: January 2019

Written by: Norwegian Directorate of Health

Definition:	People with unmet needs for dental examinations within the last 12 months and reasons why they didn't go to the dentist, by age, sex, income, educational level and activity status
Unit of measurement:	People 16 years and over
Purpose of the indicator:	Measure the self reported unmet need for dental examinations in the adult population and the main reason why. It is also an aim to highlight any social inequalities in the adult population.
Interpretation:	Shows the proportion of people with unmet needs for dental examinations within the last 12 months and reasons why they didn't go to the dentist, by age, sex, income and activity status. A large proportion with unmet needs suggests that the dental service is not available to the target group to which it is to provide services.
Target:	Show the proportion of people with unmet needs for dental examinations within the last 12 months and reasons why they didn't go to the dentist, by age, sex, income, educational level and activity status. It is also an aim to highlight any social inequalities in the adult population.
Type of indicator:	Structure indicator
Technical description:	*Numerator:* People 16 years and over with unmet needs for dental examinations within the last 12 months *Denominator:* People 16 years and over
Sources:	EU- SILC (EU Survey on living and income conditions)
Sources of error:	EU SILC is an output harmonized survey which can result in challenges comparing figures between all countries.
Geographical level of publishing:	Country
Accounting groups:	Adult population 16 years and over
Quality area:	Access to dental care services in the adult population. If there is a large unmet need for dental examinations in different groups of the adult population, the government should consider measures to make the service more accessible to those respective groups.

Appendix 4

Indicator number 4: Dental expenditures per capita. Constant purchasing power parity with base year 2010 (US$).
Date: 25th of January 2019

Written by: Norwegian Directorate of Health

Definition:	Dental expenditures per capita in total and for the public and private sector. Constant purchasing power parity with base year 2010 (US$).
Unit of measurement:	Number of US dollars ($) per capita (Constant purchasing power parity with base year 2010 (US$))
Purpose of the indicator:	Shows the total spending on oral health services per capita and also divided by private and public spending.
Interpretation:	Low cost can indicate an effective oral health care system, but it can also indicate low political or personal priority on oral health.
Target:	Containing costs within reasonable limits
Type of indicator:	Structure indicator
Technical description:	Numerator: Amount in US dollars. Constant purchasing power parity with base year 2010 (US$). Denominator*:* Total number of inhabitants at any given time point.
Sources:	A System of Health Accounts (OECD, 2019) It is designed to provide a model for uniform reporting for countries with different ways of organising their national health system, and to meet the needs of analysts of health care systems and policy makers. The set of tables is based on common concepts, definitions, classifications and accounting rules in order to ensure comparability over time and across countries. Total health expenditure measures the final consumption of health care goods and services (i.e. current health expenditure) in addition to capital investment in health care infrastructure. The health accounts provide a comprehensive accounting framework for the entire field of health care activities. The system presents health expenditure by function of care, by source of funding and by provider industry. The objective of the health accounts is to constitute a system of comprehensive, internally consistent and internationally comparable accounts, which should also be compatible with other aggregate economic and social statistics as far as possible. Dental care is measured by the function HC 1.3.2 Out-patient dental care and are divided Government/compulsory schemes costs and Voluntary schemes/household out-of-pocket payment. For more see: http://www.oecd.org/
Sources of error:	In some countries, the data sources for the costs in the private sector (Voluntary schemes/household out-of-pocket payment) may be somewhat uncertain.
Geographical level of publishing:	Data reported on national level
Accounting groups:	All age groups

Quality area:	With the other indicators it may give some indication of how effectively the resources are used.

Appendix 5

Indicator number 5: Percentage of the population receiving oral health care within the past year
Date: February 2019

Written by: Norwegian Directorate of Health

Definition:	Percentage of the population receiving oral health care within the past year
Unit of measurement:	18/19/20 years and younger, and 18/19/20 years and older, but the age cut offs differs slightly between countries (see sources).
Purpose of the indicator:	Regular visits to oral health care service ensures good oral health. The indicator gives a picture of the populations access to the oral health care service.
Interpretation:	The indicator shows the percentage of the population receiving oral health care and also possible dropouts from regular dental service. A high number is desirable, as it shows that a higher percentage of the population has received oral health care.
Target:	The population as a whole.
Type of indicator:	Process indicator
Technical description:	Numerator: Number of people in the different age groups who used the oral health service within the past year Denominator: The population as a whole in the same age group
Sources:	Finland: National Institute for Health and Welfare for the public services and Social Insurance Institution for the private services The Faroe Islands: National SCOR system for the age 0-18. No data for the age groups older than 18. Denmark: no data Sweden: Children and young adults: Population survey. The National Board of Health and Welfare and Statistics Sweden. Regular survey. The indicators show mean value of 3, 6, 9, 12 and 19 year olds Adults, 22 years and older: Register data. The National Board of Health and Welfare and Statistics Sweden Norway: Children and young adults: Statistics Norway Adults: Figures are based on a questionnaire survey; the health interview survey ««Levekårsundersøkelsen 2012» from Statistics Norway (SSB). The health interview survey is a country representative questionnaire and interview survey. Iceland: The Icelandic Health Insurance.
Sources of error:	• Different data sources • Comparison of different age groups, i.e some countries have free dental care until the age of 18, others to the age of 19 etc.
Geographical level of publishing:	National level.
Accounting groups:	The population of 18/19/20 years and younger, and 18/19/20 years and older, but the age cut offs differs slightly between countries.
Quality area:	With the other indicators it may give some indication of how many people received dental care.

Appendix 6

Indicator number 6: Daily tooth brushing in school-aged children
Date: November 2018

Written by: Statistics Norway

Definition:	Daily tooth brushing (more than once a day) in 11-and 15-year-old girls and boys. Young people were asked how often they brushed their teeth. Response options ranged from «never» to «more than once a day».
Unit of measurement:	Percent (%) – The findings presented are the proportions who reported brushing their teeth more than once a day.
Purpose of the indicator:	Tooth brushing is considered to be an important method for maintaining gum health and controlling plaque formation[14]. The indicator expresses health behavior in school-aged children (11- and 15-year-old girls and boys). Those who brush their teeth more than once a day by 12 years of age are more likely to continue to do so throughout their teenage years and into adulthood[15]. Low-frequency tooth brushing tends to be accompanied by smoking, unhealthy eating patterns and low levels of physical activity.[16]
Interpretation:	The higher percentage, the better chance for good oral health.
Target:	100 %, as the universally recommended frequency for tooth brushing is twice a day[17].
Type of indicator:	Process indicator
Technical description:	*Numerator:* Number of 11- and 15-year-old girls and boys who brushed their teeth «more than once a day». *Denominator:* Number of 11-and 15-year-old girls and boys asked.
Sources:	WHO Health behavior in school-aged children studies (HBSC)[18]
Sources of error:	Lack of coverage for responses to the survey.
Geographical level of publishing:	Each country publish data for the whole country.
Accounting groups:	11 and 15-year-old girls/boys.
Quality area:	Prevention effort, HBSC findings highlight oral health inequalities, indicating that policy-making should focus on initiatives that target boys and low-affluence groups.

[14] Löe H (2000). Oral hygiene in the prevention of caries and periodontal disease. International Dentistry Journal: 50:129-39.
[15] Koivusilta L et al (2003). Toothbrushing as part of the adolescent lifestyle predicts education level. Journal of Dental Research, 2003, 82(5):361–366.
[16] Honkala S et al (2011). Toothbrushing and smoking among adolescents – aggregation of health damaging behaviours. Journal of Clinical Periodontology, 2011, 38(5):442–448.
[17] Löe H (2000). Oral hygiene in the prevention of caries and periodontal disease. International Dentistry Journal: 50:129-39.
[18] http://www.hbsc.org

Appendix 7

Indicator number 7: Consumption of non-diet soft drinks
Date: November 2018

Written by: Statistics Norway

Definition:	Intake of non-diet (sugared) soft drinks among 11- and 15-year-old girls and boys. Young people were asked how often they drink sugared soft drinks. Responses ranged from «never» to «more than once a day».
Unit of measurement:	Percentage (%) of children with daily intake of sugared soft drinks.
Purpose of the indicator:	Consumption of non-diet soft drinks is an indicator of less-healthy food intake, primarily in the context of the increasing prevalence of overweight and obesity. Soft drinks are generally considered as «empty calories» that inhibit the intake of more nutritious foods, posing serious challenges to adolescent compliance with current dietary guidelines. Consumption of soft drinks and other sugars has been associated with an elevated risk of poor oral health in adolescence, particularly caries and dental erosion, and this relationship is cumulative.
Interpretation:	A lower percentage is considered better for maintaining good oral health.
Target:	No known consensus of a target level.
Type of indicator:	Process indicator
Technical description:	*Numerator:* Number of 11- and 15-year-old girls and boys with a daily or more than daily intake of non-diet soft drinks. *Denominator:* Number of 11-and 15-year-old girls and boys asked.
Sources:	WHO Health behavior in school-aged children studies (HBSC)[19].
Sources of error:	Lack of coverage for responses to the survey.
Geographical level of publishing:	Each country publishes data for the whole country.
Accounting groups:	11 and 15-year-old girls/boys.
Quality area:	Prevention effort, HBSC findings highlight oral health inequalities, indicating that policy-making should focus on initiatives that target boys and low-affluence groups.

[19] http://www.hbsc.org

Appendix 8

Indicator number 8: Number of patients who retrieved prescription of antibiotics for systemic use
Date: 1st February 2019

Written by: Norwegian Directorate of Health

Definition:	Number of patients that have retrieved prescriptions of antibiotics for systemic use (ATC code J01 and P01AB01), prescribed by dentists.
Unit of measurement:	Patients per 1000 inhabitants.
Purpose of the indicator:	Resistance against antibiotics has become one of the great threats to health and it is increasing globally. Without efficient antibiotics, health services would be without treatment options for ordinary infections, such as tuberculosis or pneumonia, and many surgical interventions can not be carried out without treatment with antibiotics in the postoperative phase. It is vital that health care personell are educated in the correct use of antibiotics and that usage is reduced.
Interpretation:	A lower number is regarded better as it indicates a lower rate of dentists' prescriptions of antibiotics
Target:	No known consensus of a target level.
Type of indicator:	Process indicator
Technical description:	*Numerator:* Number of patients that have retrieved prescription of antibiotics for systemic use (ATC code J01 and P01AB01), prescribed by dentists. *Denominator*: Population at year-end.
Sources:	**Norway:** National register for prescriptions: «Reseptregisteret», Norwegian Institute of Public Health, in 2018. **Sweden:** National register for prescriptions: «Läkemedelsregistret», The National Board of Health and Welfare. **Finland:** Prescription Register, Social Insurance Institution of Finland (Kela). **Denmark:** National Health Data Authority **Iceland:** Directorate of Health, national data base of prescription drugs. Iceland. **Faroe Islands:** Apoteksverk Føroya (the National Pharmacy of the Faroe Islands)
Sources of error:	Different type of data sources
Geographical level of publishing:	National
Accounting groups:	Whole population
Quality area:	Drug use, administration of antibiotics within oral health care, reducing use of antiobiotics.

Appendix 9

Indicator number 9: Amount of Defined Daily Doses (DDD) of antibiotics for systemic use
Date:1st February 2019

Written by: Norwegian Directorate of Health

Definition:	Amount of Defined Daily Doses (DDD) of antibiotics for systemic use (ATC code J01 and P01AB01), prescribed by dentists and retrieved by patients.
Unit of measurement:	DDD per 1000 patients
Purpose of the indicator:	Resistance against antibiotics has become one of the great threats to health and it is on the increase globally. Without efficient antibiotics, health services would be without treatment options for ordinary infections, such as tuberculosis or pneumonia, and many surgical interventions can not be carried out without treatment with antibiotics in the postoperative phase. It is vital that health personell are educated in the correct use of antibiotics and that usage is reduced.
Interpretation:	A high number indicates a high daily dosage of antibiotics per patient
Target:	No known consensus of a target level.
Type of indicator:	Process indicator
Technical description:	*Numerator*: Amount of Defined Daily Doses (DDD) of antibiotics for systemic use (ATC code J01 and P01AB01), prescribed by dentists and retrieved by patients. *Denominator:* Number of patients that have retrieved prescription of antibiotics for systemic use (ATC code J01 and P01AB01), prescribed by dentists.
Sources:	**Norway:** National register for prescriptions: «Reseptregisteret», Norwegian Institute of Public Health, in 2018. **Sweden:** National register for prescriptions: «Läkemedelsregistret», The National Board of Health and Welfare. **Finland:** Prescription Register, Social Insurance Institution of Finland (Kela). **Denmark:** National Health Data Authority **Iceland:** Directorate of Health, national data base of prescription drugs. **Faroe Islands:** Apoteksverk Føroya (the National Pharmacy of the Faroe Islands)
Sources of error:	Different type of data sources
Geographical level of publishing:	National
Accounting groups:	Whole population
Quality area:	Drug use, administration of antibiotics within oral health care, reducing use of antiobiotics.

Appendix 10

Indicator number 10: Percentage of children and adolescents examined with no caries

Date: 12th of February 2013

Written by: Ministry of Welfare, Iceland

Definition:	Proportion of children and adolescents who have no obvious decay experience.
Unit of measurement:	Percentage
Purpose of the indicator:	To evaluate the effectiveness of oral health programs, self-care and oral health care services in maintaining oral health and controlling dental caries sufficiently for it to remain in the early stage of decay.
Interpretation:	High proportion indicates good oral health in the population in terms of dental caries.
Target:	The aim is that the majority of the population will have no obvious decay experience.
Type of indicator:	Outcome indicator
Technical description:	*Numerator:* Number of children of certain age, 5–7 years (age group varies among the countries), 12 years, 15 years and 17/18/19 years old (with no obvious decay experience, $D_3MFT=0$ and $d_3mft=0$ (age groups varies among the countries) Denominator*:* Number of children same age in the population surveyed.
Sources:	**Sweden:** Population survey. The National Board of Health and Welfare and Statistics Sweden. Regular survey. Deviation from the inclusion criteria: Sweden does not register missing teeth (M). The indicators show 3, 6, 9, 12 and 19 year olds. **Denmark:** Oral Health Register (SCOR), National Health Data Authority **The Faroe Islands:** Oral Health Register (SCOR), National Board of Health Denmark. **Finland:** National Institute for Health and Welfare for the public services. **Iceland:** Population survey. Ministry of Health, University of Iceland. **Norway:** Source: Statistics Norway (SSB). Reported annually from each municipality to the SSB. 5, 12 and 18 year olds examined in the past year in the public dental service.
Sources of error:	The countries use different type of data sources: Some sources are surveys, others are registers. Sweden does not register missing teeth (M). This makes it problematic/challenging to compare between countries.
Geographical level of publishing:	Each country publishes data for the whole country.
Accounting groups:	The countries collect data for different age groups. That is why we use the severeal age groups: 5–7-,12-, 15- and 17–19-year-old children.

Quality area:	Prevention effort, highlight oral health inequalities, indicating the need for treatments in the future. Evaluating effectiveness of oral health programs, self-care and oral health care services in maintaining oral health and controlling dental caries sufficiently for it to remain in the early stage of decay.

Appendix 11

Indicator number 11: Mean number of decayed, missing and filled teeth (DMFT) among children and young people examined
Date: 1st February 2019

Written by: Norwegian Directorate of Health

Definition:	Dental caries severity mean dmft/DMFT in children and adolecents
Unit of measurement:	Average number of decayed, missing or filled teeth (dmft/DMFT)
Purpose of the indicator:	To evaluate the effectiveness of oral health programs, self-care and oral health care services in maintaining oral health and controlling dental caries sufficiently.
Interpretation:	Low figures indicate a low average level of caries in the population
Target:	WHO target for Europe 2020: not exceeding mean 1,5 DMFT for 12-year-olds
Type of indicator:	Outcome indicator
Technical description:	Mean number of decayed, missing and filled teeth (DMFT) in specific age groups; 5-,6-,12-,15-,17- and 18-year-olds.
Sources:	**Sweden:** Population survey. The National Board of Health and Welfare and Statistics Sweden. Regular survey. Deviation from the inclusion criteria: Sweden does not register missing teeth (M). **Denmark:** Oral Health Register (SCOR), National Health Data Register **The Faroe Islands:** Oral Health Register (SCOR), National Board of Health Denmark. **Finland:** National Institute for Health and Welfare for the public services. **Iceland:** Population survey. Ministry of Health, University of Iceland. **Norway:** Statistics Norway (SSB). Reported annually from each municipality to the SSB. 12 year olds examined in the past year in the public dental service.
Sources of error:	The countries use different type of data sources: Some sources are surveys, others are registers. Sweden does not register missing teeth (M). This makes it problematic/challenging to compare between countries. Also, children examined by dentist at specified ages may vary between countries. This also makes it challenging to compare between countries.
Geographical level of publishing:	Each country publishes data for the whole country.
Accounting groups:	The countries collect data for different age groups. This explains why several age groups are used.
Quality area:	Prevention effort, highlight oral health inequalities, indicating the need for treatments in the future. Evaluating effectiveness of oral health programs, self-care and oral health care services in maintaining oral health and controlling dental caries sufficiently.

Appendix 12

Indicator number 12: Edentulous prevalence in adults aged 65–74 years and 75 years and older
Date: August 2012

Written by: Swedish National Board of Health and Welfare

Definition:	Proportion of 65–74 yearolds and 75 years and older adults who have lost all their natural teeth.
Unit of measurement:	Percentage of age groups 65–74 and 75 years and older
Purpose of the indicator:	Better oral hygiene, access to care, technical advances in oral health care and socioeconomic factors have resulted in more people retaining their natural teeth in later life. Loss of all natural teeth can contribute to psychological, social and physical impairment. Edentulous prevalence is a measure of past disease and an indicator of oral health. The edentulous prevalence index is recommended by the WHO (WHO, 1997) and reducing the prevalence rate of complete loss of natural teethis one of the WHO global goals for oral health for the year 2020. The use of age group 65–74 is recommended by the WHO. The age group 75+ has also been included in the indicator as the older age goups in the Nordic region are increasing in numbers.
Interpretation:	The lower percentage of edentulous people in the population indicate better oral health and better oral function.
Target:	Reducing tooth loss is one of the WHO global goals for oral health for the year 2020.
Type of indicator:	Outcome indicator.
Technical description:	*Numerator:* Number of 65–74 yearolds and 75 years and older adults who have lost all their natural teeth (edentulous). *Denominator:* Number of 65–74 year olds and 75 years and older adults in the population *Edentulous:* A condition characterised by not having any natural teeth. *Natural teeth:* Includes teeth which have erupted into the mouth and excludes artificial teeth, implants and dentures.
Sources:	**Denmark**: The National Institute of Public Health, SUSY a national health interview survey, 2017. **Finland**: Health 2017 survey, National Institute for Health and Welfare for the public services **Iceland**: Numbers from a Health Survey 2017, conducted by the The Directorate of Health in Iceland. Using both e-mail and web questionnaires. The Public Health Institute of Iceland. **Norway**: The figures are based on questionnaire survey; the health interview survey «Levekårsundersøkelsen 2012» from Statistics Norway (SSB). The health interview survey is a country representative questionnaire and interview survey. Note: • Only individuals in households answer the survey, not individuals in institutions such as nursing homes.

	• There is a drop in numbers in the oldest age groups in the survey, especially in the age group 67 years and older. Question: «Approximately how many of your own teeth do you have left? (Adults have 28 teeth + 4 wisdom teeth.)». 4 alternatives were given: 1: 20 or more, 2: 10–19, 3: 1–9, 4: 0. **Sweden**: Register data. Source: The National Board of Health and Welfare.
Sources of error:	Countries use different type of data sources: Some sources are surveys, others are registers.
Geographical level of publishing:	Each country publish data for the whole country.
Accounting groups:	Individuals ages 65–74 year olds and 75 years and older
Quality area:	Prevention effort, highlight oral health inequalities

Appendix 13

Indicator number 13: Functional occlusion prevalence in adults aged 65-74 years and 75 years and older
Date: 12th of February 2013

Written by: Ministry of Welfare, Iceland

Definition:	Proportion of adults aged 65–74 year olds and 75 years and older who have at least 20 natural teeth remaining.
Unit of measurement:	Percentage of age groups 65–74 and 75 years and older
Purpose of the indicator:	To establish the proportion of the population aged 65–74 years and 75 years and older who have the minimum amount of natural teeth to have a satisfactory functional occlusion according to international standards and recommendations by the WHO. One of the WHO global goals for oral health for the year 2020 is to increase this percentage. The age group 65–74 is recommended by the WHO for this indicator. Most of the countries have data on remaining teeth, few know if the remaining teeth are in occlusion or not. This data does still tell something about the oral health.
Interpretation:	Higher proportion indicates better oral health
Target:	To increase the proportion of the population aged 65––74 years old and 75 years and older who have at least 20 natural teeth remaining.
Type of indicator:	Outcome indicator
Technical description:	*Numerator:* Number of adults aged 65––74 years and 75 years and older with at least 20 natural* teeth remaining **Natural teeth:* Includes teeth which have erupted into the mouth and excludes artificial teeth, implants and dentures *Denominator:* Number of 65–74 year-olds and 75 years and older in the population surveyed.
Sources:	**Denmark**: The National Institute of Public Health, SUSY a national health interview survey, 2017. **Finland**: Health 2017 survey, National Institute for Health and Welfare for the public services. **Iceland**: Numbers from a Health Survey 2017, conducted by the The Directorate of Health in Iceland. Using both e-mail and web questionnaires. The Public Health Institute of Iceland. **Norway**: The figures are based on a questionnaire survey; the health interview survey ««Levekårsundersøkelsen 2012» from Statistics Norway (SSB). The health interview survey is a country representative questionnaire and interview survey. It is important to emphasize: • Only individuals in households are included in the survey, not individuals in institutions such as nursing homes.

	• There is a drop in numbers in the oldest age groups in the survey, especially in the age group 67 years and older. The question people answered to: «Approximately how many of your own teeth do you have left?». 4 alternatives were given: 1: 20 or more, 2: 10–19, 3: 1–9, 4: none. **Sweden**: Register data. Source: The National Board of Health and Welfare.
Sources of error:	The countries use different type of data sources: Some sources are surveys, others are registers. This makes it challenging to compare between countries. Different years of reporting the data makes it problematic to compare across the Nordic countries. The figures for some countries include people living in institutions for aged and disabled and others do not. Most of the countries have data on remaining teeth, few know if the remaining teeth are in occlusion or not.
Geographical level of publishing:	Each country publishes data on a national level.
Accounting groups:	65–74 year-olds and 75 years and older.
Quality area:	Prevention effort, highlights oral health inequalities.

Appendix 14

SURVEYS IN THE NORDIC COUNTRIES

DENMARK:

The National Institute of Public Health, SUSY a national health interview survey, 2005.
15 165 people over the age of 18 were asked.

Spørsmål 1:

Antall tenner igjen:
Tandløs
1–9 tænder tilbage
10–19 tænder tilbage
20 eller flere tænder tilbage
Alle tænder tilbage
Ved ikke/ uoplyst

THE FAROE ISLANDS:

«Endnu har Færøene ingen tandhelsespørgsmål med i landsomfattende undersøgelser, men dett kan nok etableres fremover, hvis de nordiske lande bliver enige om et fælles spørgeskema».

FINLAND:

Oral health related questions in FinnHealth 2017 study (National Institute for Health and Welfare, Finland)

Sample size 9345 (age group 30 years or older) of whom 6545 participated at least in one of the data collection procedures (health check, interview, questionnaire). For participants 70 years or older (regarding question on edentulous persons), the sample size was 1662. The sample was selected so that it was representative of the Finnish population. Population estimates (%) were calculated by multiplying age-group prevalence (number of persons) by the size of the age group in the whole population.

1. In your opinion, is the condition of your teeth and your oral health
   a) good
   b) fairly good
   c) average (not good, not bad)
   d) relatively poor
   e) poor

2. How often do you brush your teeth?
   a) more than twice a day
   b) twice a day
   c) once a day
   d) less than once a day
   e) never

3. How often you use dental floss or interdental brush?
   a) daily
   b) weekly
   c) less than weekly
   d) never

4. Have you had dry mouth during the past month (30 days)?
   a) daily
   b) less than daily
   c) never

5. Have you had toothache or other tooth or denture related problems during the past 12 months?
   a) no
   b) yes

6. Have you had bad breath during the past month (30 days)?
   a) no
   b) b) yes

7. Do you usually visit a dentist?
    a) regularly, to have an examination
    b) only when you feel pain or have other (oral health) related problems
    c) never

8. When was your latest visit to a dentist?
    a) less than 1 year ago
    b) 1 – 2 years ago
    c) 3 – 5 years ago
    d) more than 5 years ago
    e) I have never visited a dentist

9. Have the following issues prevented you from visiting a dentist?
    a) long waiting list, no/yes
    b) difficult to travel to the clinic, no/yes
    c) too high costs, no/yes

10. How many times have you visited during the past 12 months (answer in numbers)
    a) a dentist in a public health clinic
    b) a private dentist
    c) some other dentist (in the army, at an university, in a hospital or other)
    d) a dental technician
    e) a dental therapist or a dental nurse at a public health clinic
    f) a private dental therapist or dental nurse
    g) other professional to have dental treatment

Extra questions for those who are 70 years or older

11. Do you use dentures?
    a) full dentures (no own teeth or dental roots)
    b) partial dentures, have some own teeth
    c) no dentures, have some teeth
    d) no dentures, no teeth

12. How often do you clean your dentures? (question only for those who use dentures)
    a) more than two times a day
    b) two times a day
    c) once a day
    d) less than once a day
    e) never

ICELAND:

The Public Health Institute of Iceland sent a questionnaire, the National Health Survey by mail in 2007 and a follow-up in 2009 and 2017.

Questions about the number of teeth:

We ask about the number of your own teeth. Please count your teeth in upper and lower jaw in front of a mirror, mark the existing teeth in the appropriate boxes. Do not count prosthesis or dental implants (implants are fake teeth that are implanted into the jaw bone). If you have a full prosthesis you mark «no tooth». The maximum amount of teeth is 32 if the 4 third molars are included, 16 in each jaw.

How many teeth do you have in the upper jaw?

None, 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 teeth

How many teeth do you have in the lower jaw?

None, 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 teeth

NORWAY

From «Levekårsundersøkelsen 2012» in 2012:

Spørsmål 1:

Hvordan vurderer du din tannhelse?

Svaralternativ:

O Meget god O God O Verken god eller dårlig O Dårlig O Meget dårlig

Spørsmål 2:

Omtrent hvor mange av dine egne tenner har du igjen?

Svaralternativ:

O 20 eller flere O 10–19 O 1–9 O Ingen

Spørsmål 3:

Når var du sist hos tannlege?

Svaralternativ:

O 6 mnd. eller mindre O 7–12 mnd. siden O 1–2 år siden

O Mer enn to, men mindre enn fem år siden O Mer enn fem år siden

Spørsmål 4:

Har du noen gang i løpet av de siste 12 mnd. hatt behov for å gå til tannlege uten å gjøre det?

Svaralternativ:

O Ja O Nei

Quality indicators in oral health care: **A Nordic project**

Utgitt
30th of April 2019
Bestillingsnummer
IS-2799

Utgitt av
Helsedirektoratet
Postadresse
Pb. 220 Skøyen, 0213 Oslo
Besøksadresse
Vitaminveien 4, 0483 Oslo

Telefon 810 20 050
Faks 24 16 30 01

Design
Itera as

www.helsedirektoratet.no