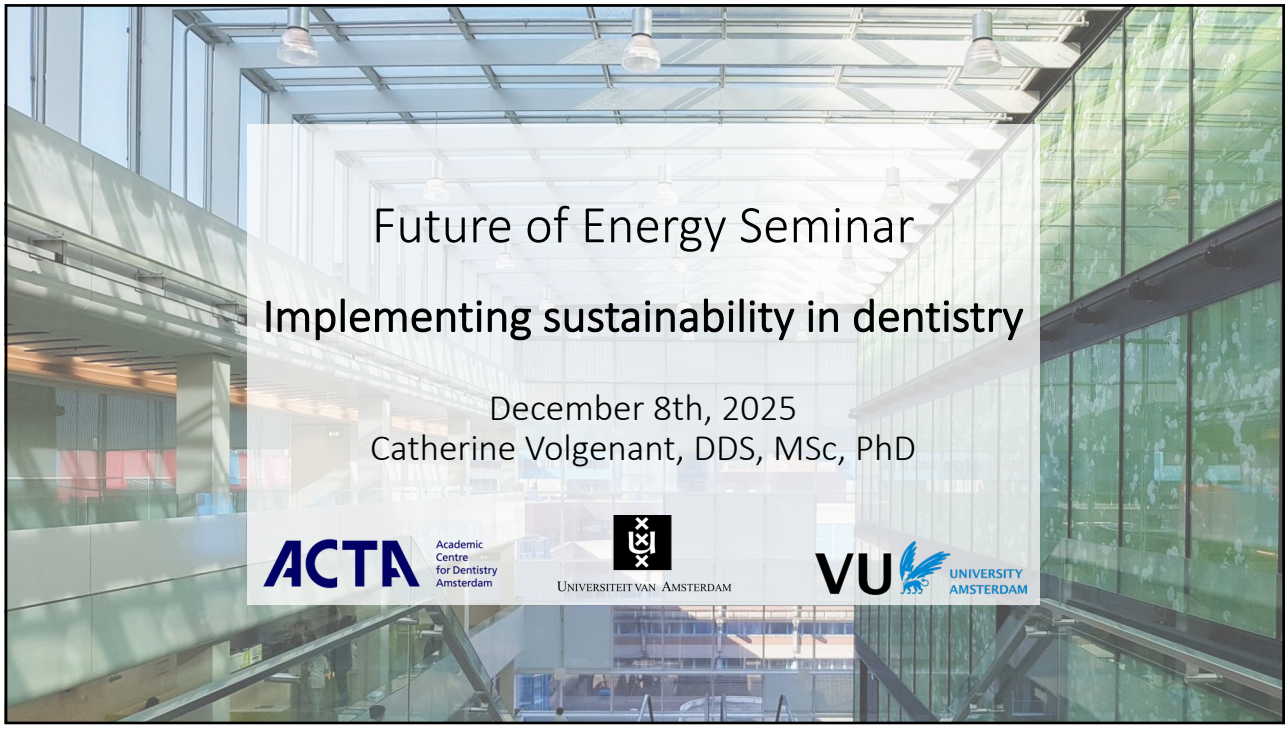


1

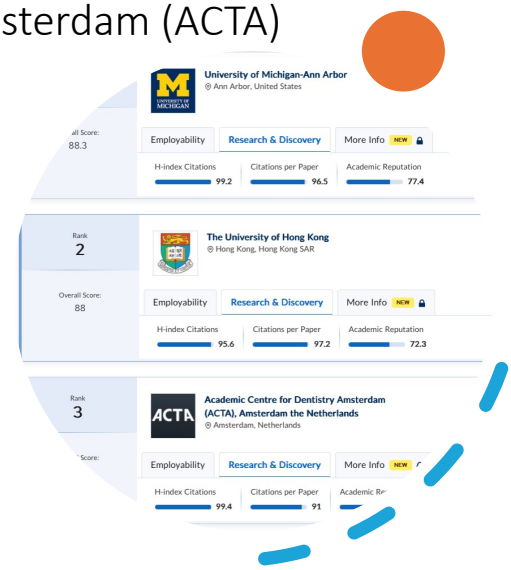
Academic Centre for Dentistry Amsterdam (ACTA)

a collaborative partnership between the two universities in Amsterdam (1985)

approx. 300 patients per day

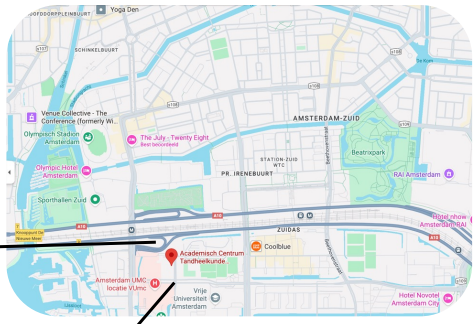
> 900 students

> 500 staff members



2

Academic Centre for Dentistry Amsterdam (ACTA)







Old building:
Louwesweg

3



25.000 m^2

13 floors

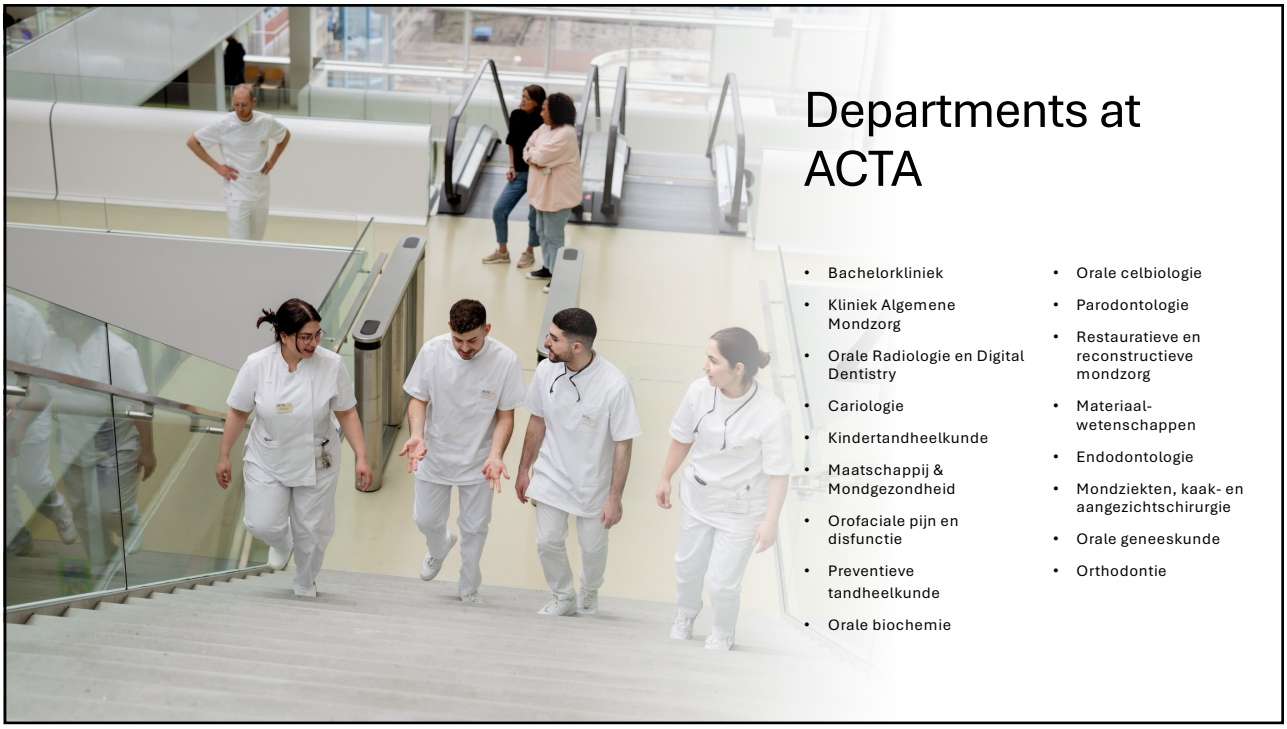
248 dental units

40 Simodont dental simulators

4



5


Departments at ACTA
Bachelorkliniek
Kliniek Algemene Mondzorg
Orale Radiologie en Digital Dentistry
Cariologie
Kindertandheelkunde
Maatschappij & Mondgezondheid
Orofaciale pijn en disfunctie
Preventieve tandheelkunde
Orale biochemie
Orale celbiologie
Parodontologie
Restauratieve en reconstructieve mondzorg
Materiaal-wetenschappen
Endodontologie
Mondziekten, kaak- en aangezichtschirurgie
Orale geneeskunde
Orthodontie

6



7

ACTA & sustainability

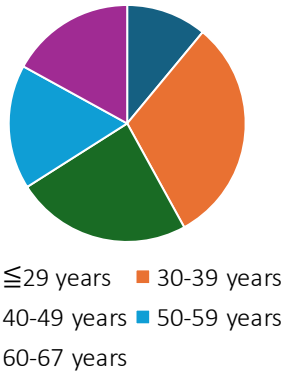
- Business management
- Research
- Education
- Care

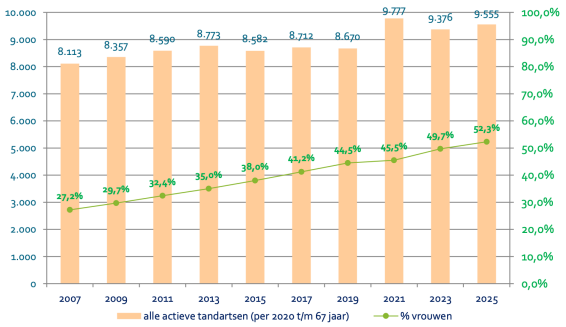


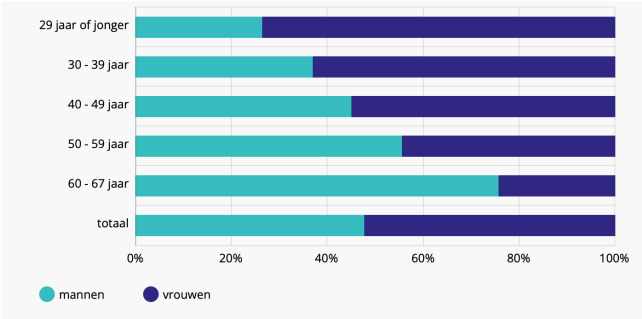
8

Dentists in the Netherlands

- January 2025: 9,555 active (<67 years old)
- January 2024: more female dentists than male



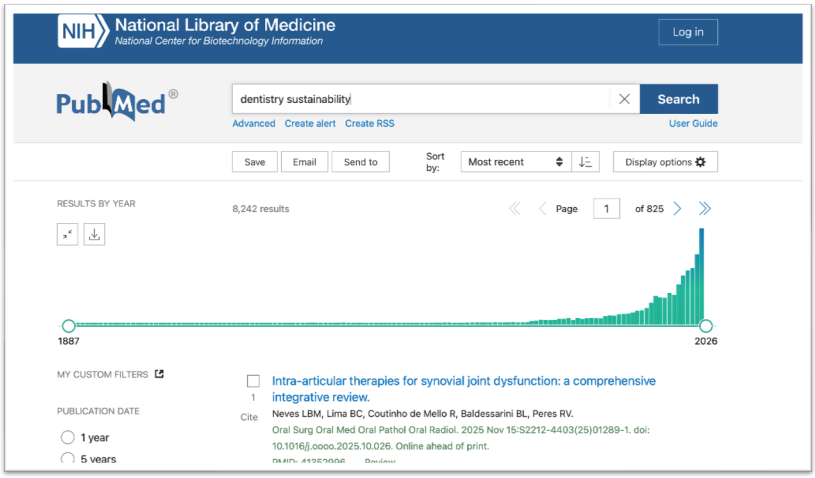




Source: Royal Dutch Dental Association (KNMT)

9

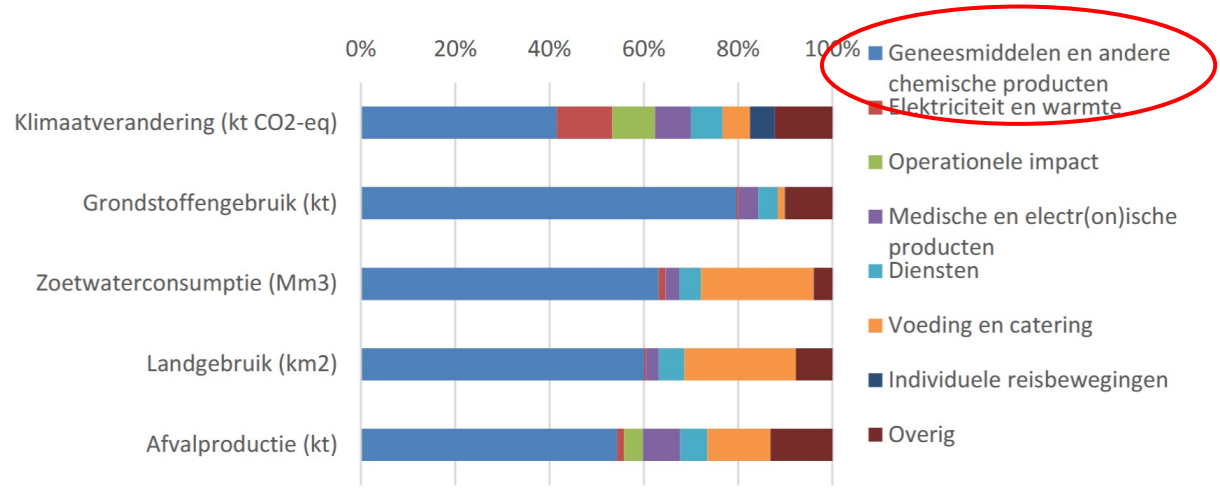
Disclaimer



Pubmed December 7th, 2025

10

Environmental footprint of the Dutch healthcare sector



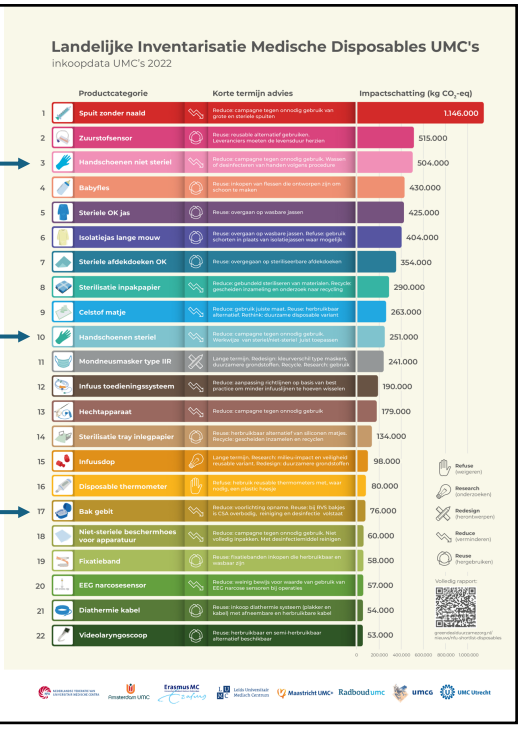
Source: RIVM 2022-0127

11

Medical disposables

- Personal protective equipment
- Sterilisation and surgical instruments
- Denture tray





Nederlandse Federatie Universitair medische centra

12

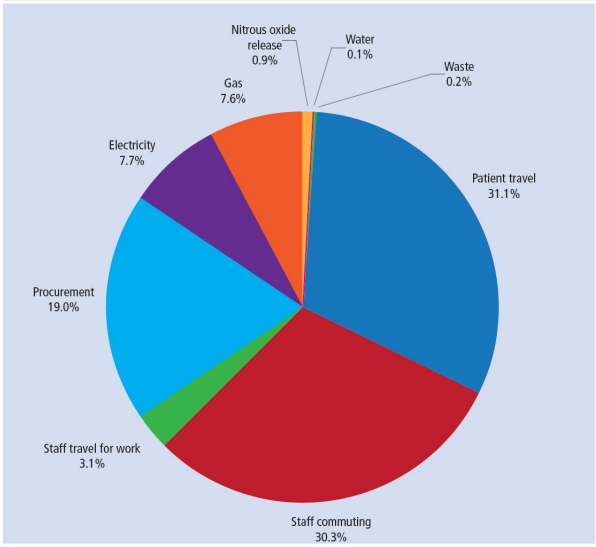
An estimated carbon footprint of NHS primary dental care within England. How can dentistry be more environmentally sustainable?

B. Duane,*[1] M. Berners Lee,[2] S. White,[3] R. Stancliffe[4] and I. Steinbach[5]

In brief

Encourages readers to consider sustainability as part of their overall dental practice.	Helps readers understand their obligations to consider sustainability along with their other societal obligations.	Provides readers with a summary and description of carbon emissions originating from dentistry, with discussion on how these could be reduced.

Duane et al., 2017



13

Sustainability?!





Damien Hirst - 'Waste'

14

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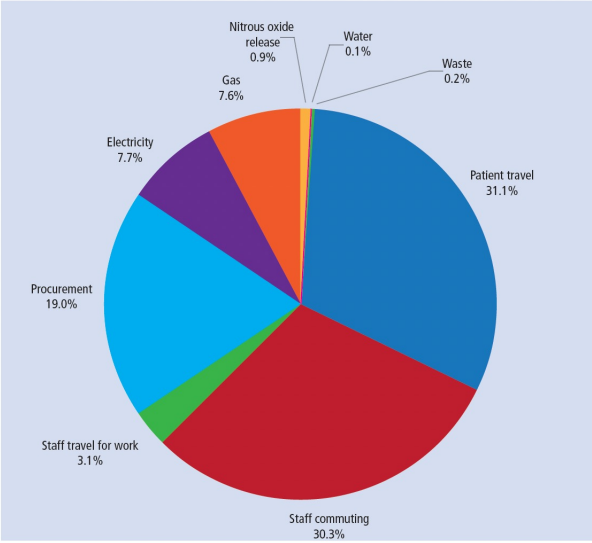
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Helps readers understand their obligations to consider sustainability along with their other societal obligations.

Provides readers with a summary and description of carbon emissions originating from dentistry, with discussion on how these could be reduced.

Duane et al., 2017

Total travel footprint: 64.5%

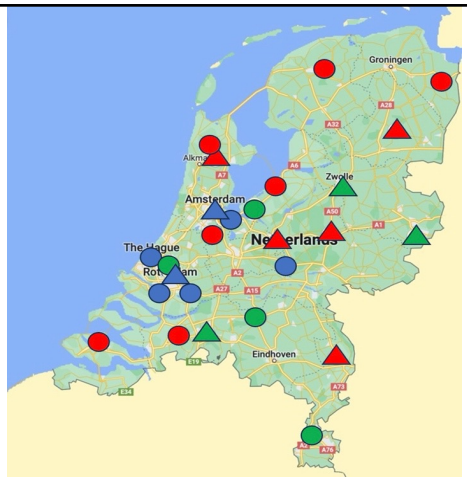


15

What about travel in the Netherlands?

Pilot study at ACTA

- Patients (n = 960)
- Staff (n = 269)



: rural (n=12)

: moderately urban (n=7)

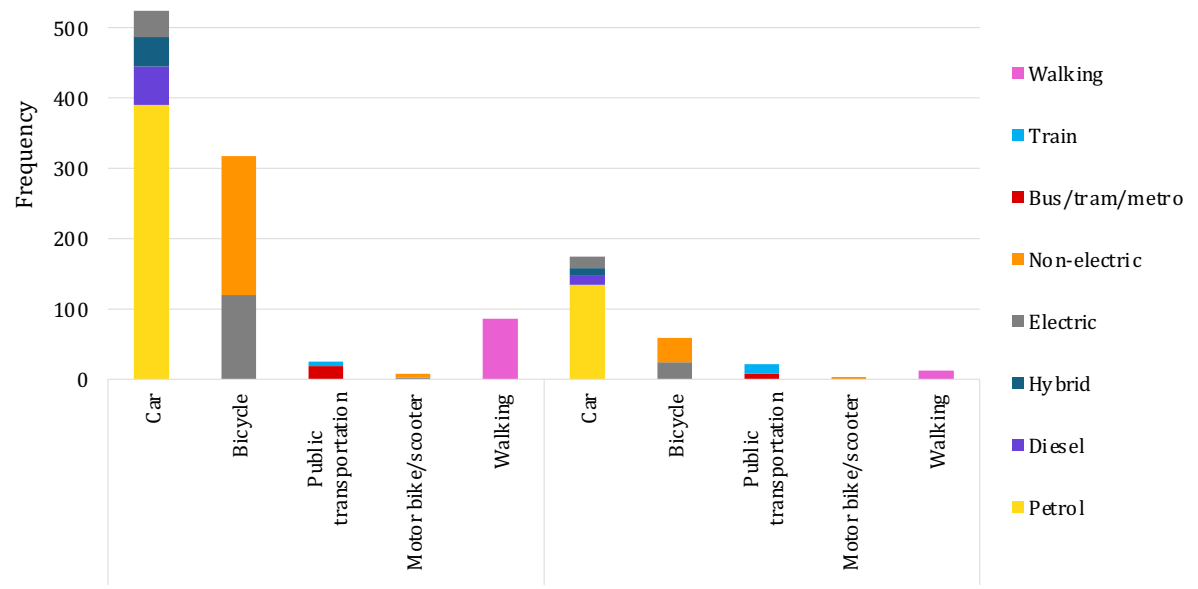
: urban (n=7)

: large (n=16)

: small (n=10)

Student thesis Pien Tamboer, ACTA

16

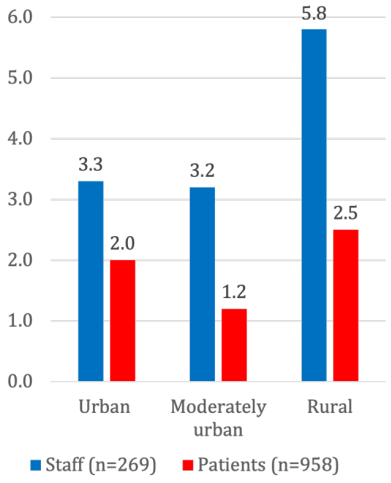


Student thesis Pien Tamboer, ACTA

17

More traveling in rural areas

- No significant difference for staff nor for patients between small and large practices
- Higher emissions for staff and patients: more CO_2 emission in the rural group



Student thesis Pien Tamboer, ACTA

18

RESEARCH

What is the environmental footprint of a dental practice? A life cycle analysis (Part 1)

Brett Duane*[1] and Ingeborg Steinbach[2]

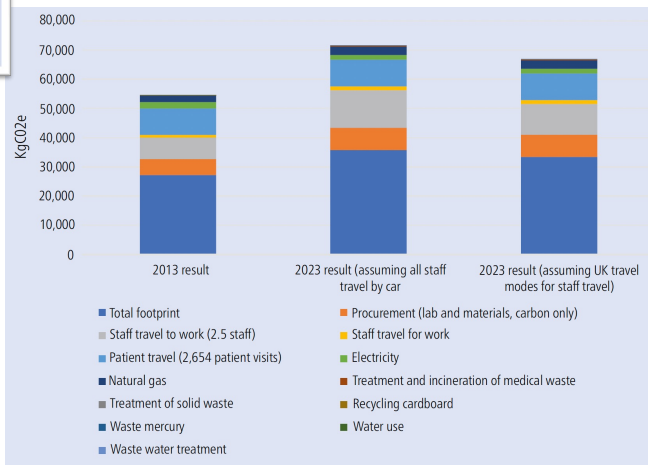
Key Points

The overall carbon footprint of dental practices has increased, rising from 27 tonnes to 35 tonnes, with notable shifts in different components such as increased waste and staff travel, despite a decrease in electricity-related emissions.

The carbon footprint of incinerating mixed dental waste is estimated at 1,552 kg carbon emissions per tonne, emphasising the significant environmental impact associated with waste management in dental practices and the need for sustainable waste disposal strategies

The carbon emissions related to water use have decreased from 39 kg to around 13 kg, indicating a change in methodology.

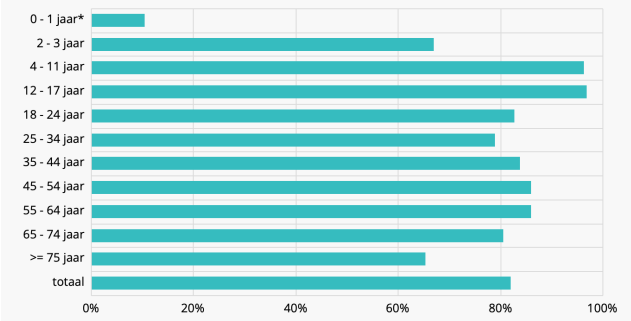
Duane & Steinbach, 2024



19

Who is travelling?

2024: 82% of the Dutch inhabitants went to the dentist at least once (7.3% has a full denture)



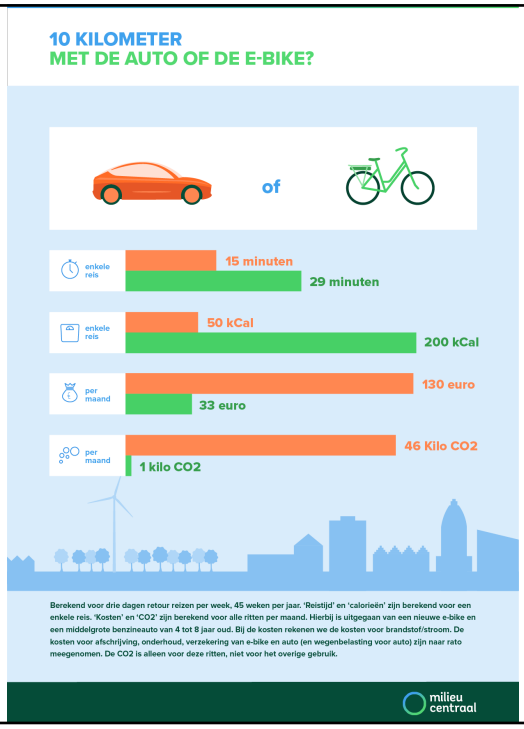
Average number of visits: 4.2 (?)

Nearly all of us go to the dentist

Source: CBS Gezondheidsenquete

20

Main sustainability tip in dentistry: go by bike!



21






November 6, 2025

Dutch Association for Dentists

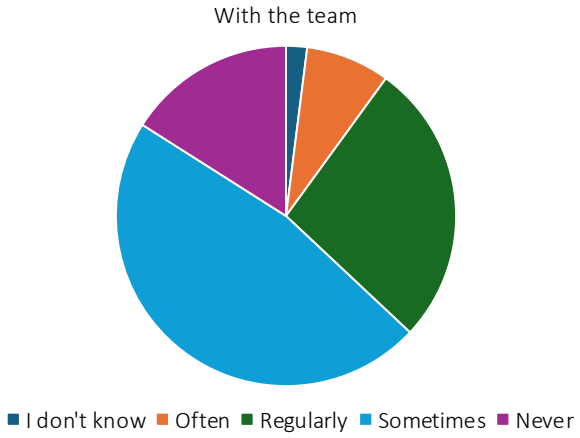
Koninklijke Nederlandse Maatschappij tot Bevordering der Tandheelkunde: KNMT

KNMT

Royal Dutch Dental Association

22

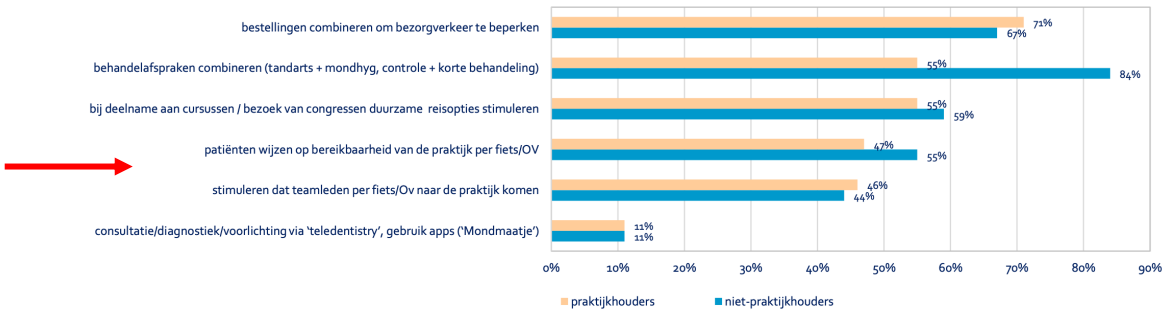
Is sustainability a topic of conversation?



KNMT-research, September 2024

23

Actions taken regarding travel movements



KNMT-research, September 2024

24

An estimated carbon footprint of NHS primary dental care within England. How can dentistry be more environmentally sustainable?

B. Duane,*[1] M. Berners Lee,[2] S. White,[3] R. Stancliffe[4] and I. Steinbach[5]

In brief

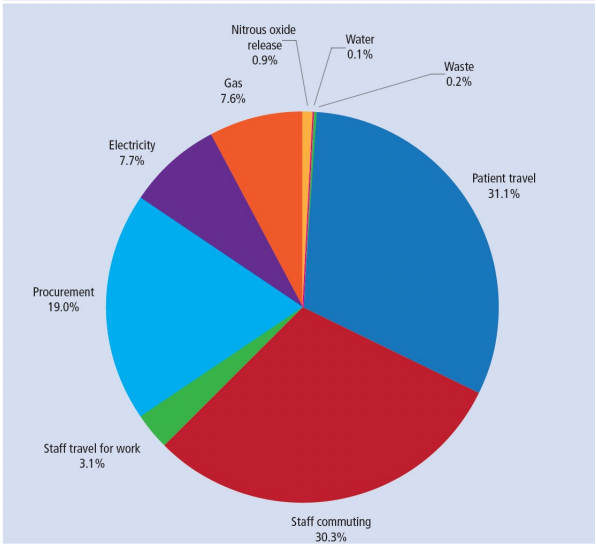
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Helps readers understand their obligations to consider sustainability along with their other societal obligations.

Provides readers with a summary and description of carbon emissions originating from dentistry, with discussion on how these could be reduced.

Duane et al., 2017

Procurement: 19.0%
Waste: 0.2%



25

A comparative life cycle assessment of dental restorative materials

Lucy Smith[a,b,c], *Mustafa Ali*[b,c,d,*], *Manon Agrissais*[e], *Steven Mulligan*[f,g], *Lenny Koh*[b,c,d,g], *Nicolas Martin*[c,f,g]



- Dental amalgam shows the highest overall environmental impact across most assessed categories.
- Resin-based composite has the highest Global Warming Potential among the three materials.
- Main sources of environmental impact differs per material
  - Amalgam: Primarily from material use.
  - Composite: Mainly from energy use during processing of both material and packaging.
  - Glass polyalkenoate cement (GIC): From material and energy use for packaging.

26

New guideline for handhygiene before surgery: only washing OR disinfecting

Gloves

- 1 glove = 26 gram CO_2
  x 19.3 milion gloves = 504.000 kg CO_2
- 20 sec washing hands = 9 gram CO_2
- 3 ml hand sanitiser = 0,9 gram CO_2



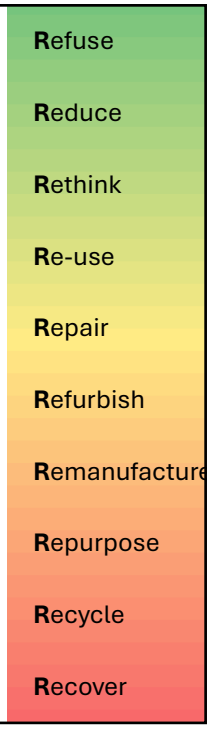
- $75 per 1000 kg CO_2 emission
  1 glove = 0,2 dollarcent
  1 box of 100 pieces of $5 with 20 cent mission allowances

27

Disposables

Health care: 13% use of commodities in NL

So:
- Use less disposables
- Use less commodities
- Different commodities (bioplastics / recyclate)
- Use of products that are easier to recycle
- Production location
- Reusable instead of disposable
- Important to pay attention to the procurement policy



28

Action on procurement

		£		
Buy less. It's often that easy		£		
Avoid where appropriate single use device		££		
Choose the chemicals you use carefully				
Use social media and online tools to communicate with your patients		£		
Choose where appropriate, recyclable, reusable, products especially in your stationary items		£		
Consider fairtrade type items for your grocery items		££		
Choose 2-3 of your most used products and get your supplier to complete a sustainability/ethical questionnaire		£		
Choose suppliers who use minimal/ environmental friendly packaging		£		
Manage your stock to reduce purchasing products you don't need and may waste		£		
Implementation: Easy ... Less easy				
Investment costs: low £ ... high £££				
Financial return on investment (ROI) Low ... High				
Environmental benefit: Small ... Large				

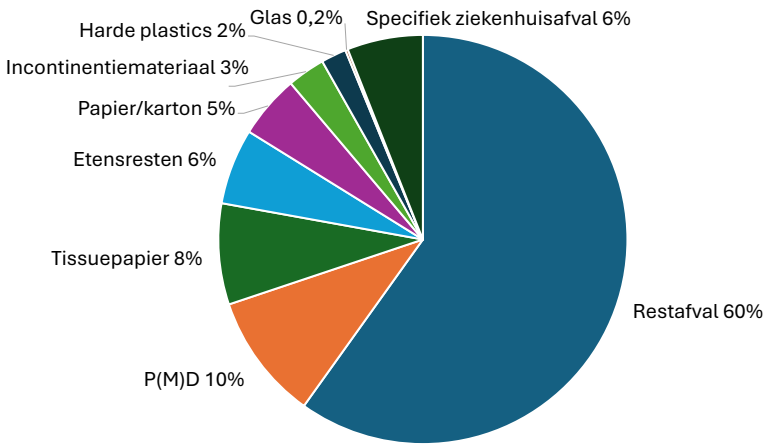
29

Dutch health care: 4% of our waste



30

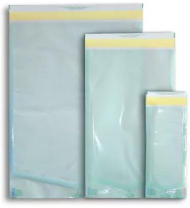
Dental practice waste often disposed of as residual waste



31

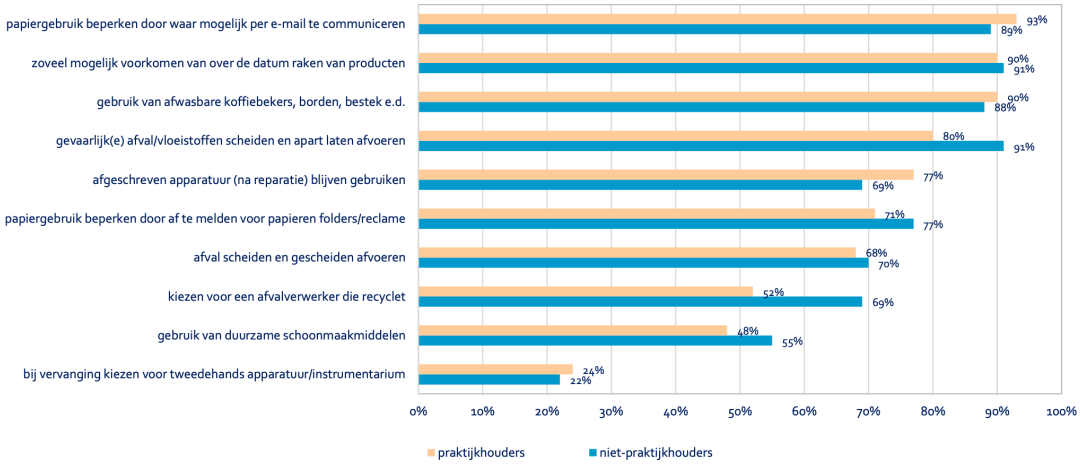
Waste analysis





32

Actions taken regarding circulairity



KNMT-research, September 2024

33

An estimated carbon footprint of NHS primary dental care within England. How can dentistry be more environmentally sustainable?

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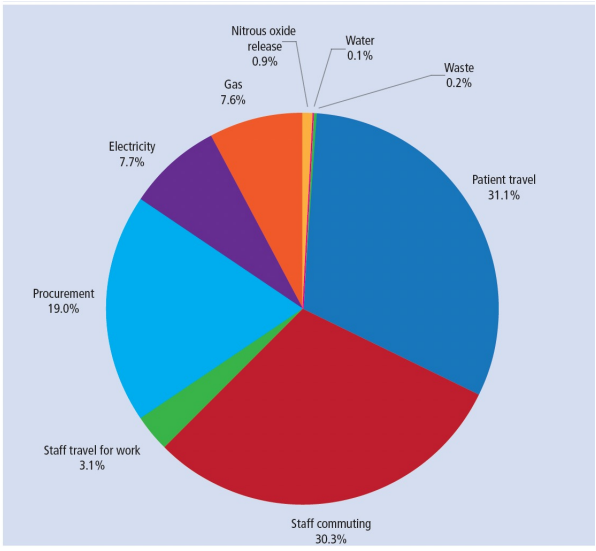
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Duane et al., 2017

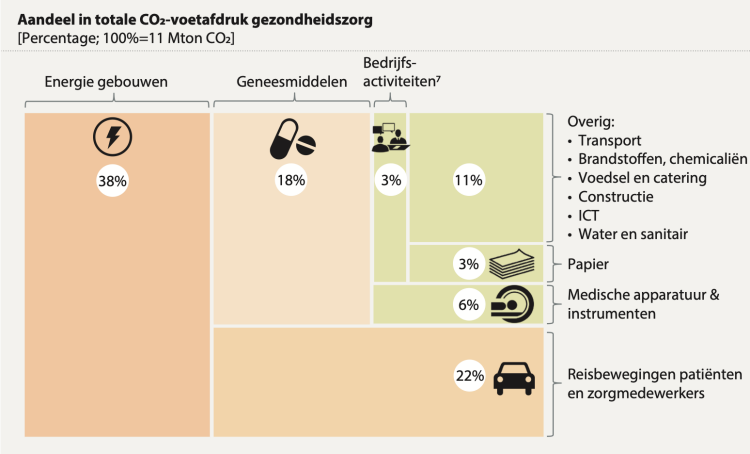
Electricity & gas 15.3%

and the Netherlands?....



34

CO_2 footprint Dutch Health care



Gupta Strategists, 2019

35

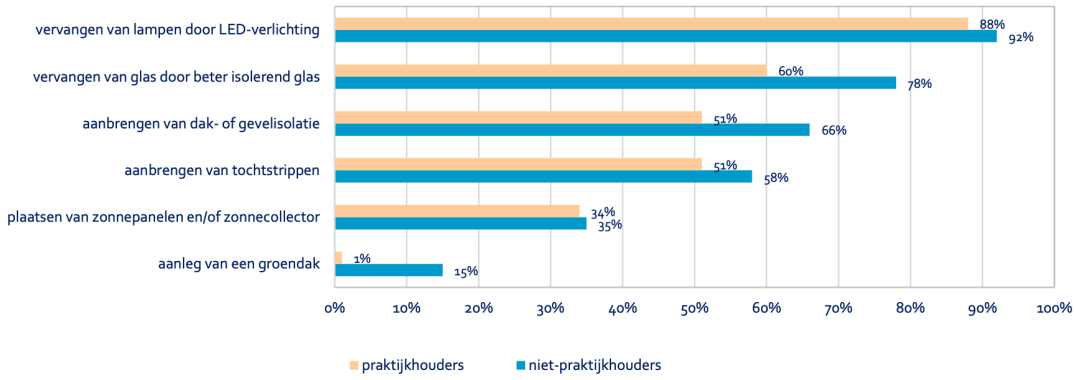
Dental practices in the Netherlands

- The total number of dental practices in the Netherlands is approx. 4,300 (early 2024)
- The average dental practice has 3.3 treatment chairs
- Last decades, number of practices is decreasing, and the size of practices grows:
  - more dental units, more staff, and more patients per practice



36

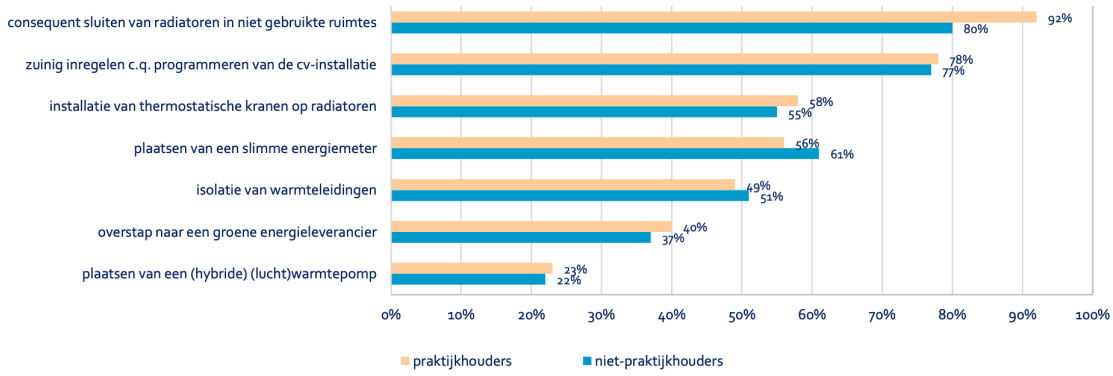
Actions taken regarding the building



KNMT-research, September 2024

37

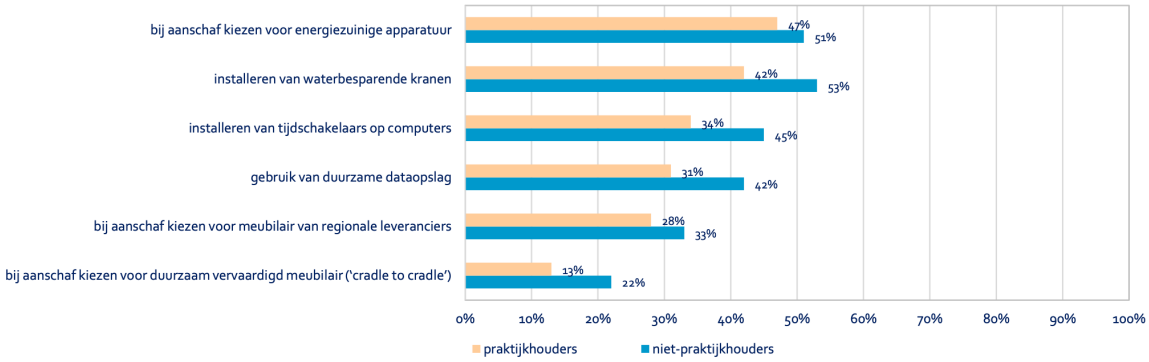
Actions taken regarding the heating of the building



KNMT-research, September 2024

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Sustainability measures taken with regard to the layout of the building and equipment



KNMT-research, September 2024

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INTERNATIONAL DENTAL JOURNAL 72 (2022) 847–852

Scientific Research Report

Facilitators and Barriers to Implementing Sustainability in Oral Health Care

Catherine Minke Charlotte Volgenant [a,b], *Sierou Bras* [a,c], *Ilona Francisca Persoon* [a*]

Qualitative research
- semi-structured interviews
- 14 stakeholders
    - 6 dentists
    - 2 oral hygienists
    - 3 assistents
    - product-manager dentistry
    - quality manager dentistry
    - senior salesman
- results within a conceptual framework

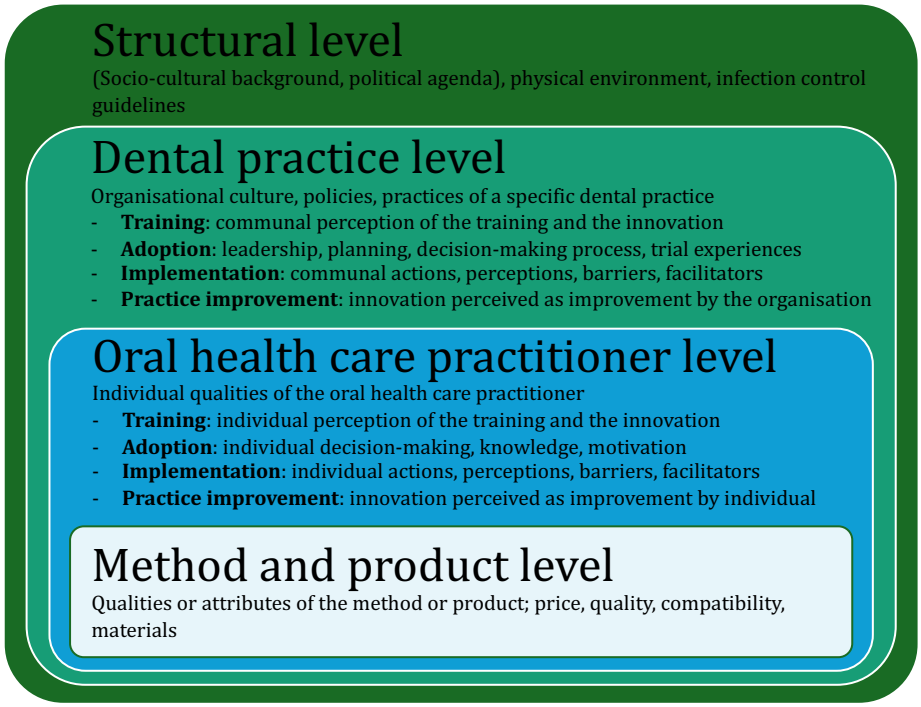
41

"It's like the story of the chicken and the egg. If there is no demand, it will not be produced and if it's not produced, there will be no demand. So, at some point someone will have to take the first step."

Participant 11



42



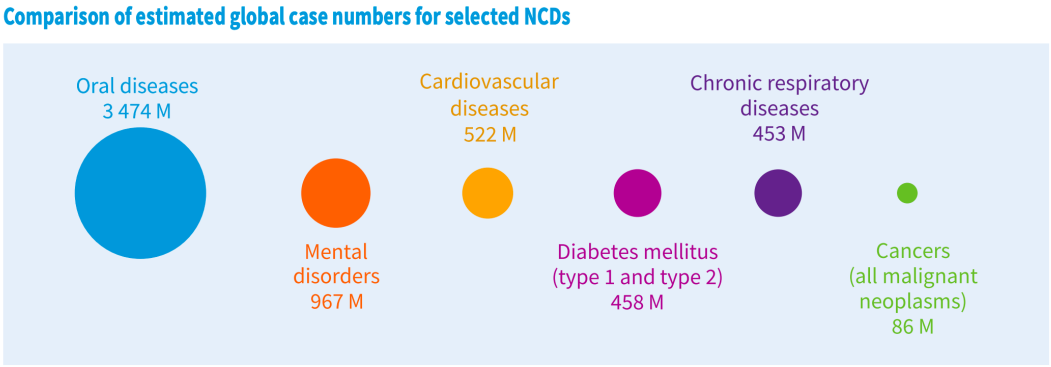
43

Awareness is there, the challenge is turning it into action

- Barriers
  - Limited knowledge about the main sources of environmental impact
  - Lack of information and availability of sustainable products and methods
- Facilitators
  - Growing awareness, especially among women and young people
- Recommendations
  - Use knowledge about barriers and facilitators
  - Collaboration needed among all stakeholders

44

Oral diseases are a global public health challenge and among the most prevalent diseases worldwide



World Health Organization

Oral Health Neglect:
the overlooked crisis affecting 3.5 billion people

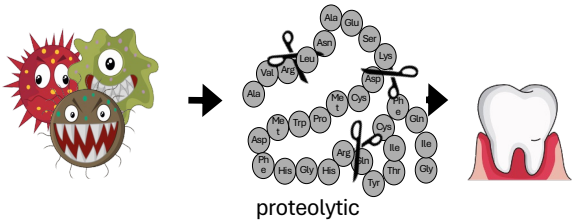
45

Most oral diseases can be prevented

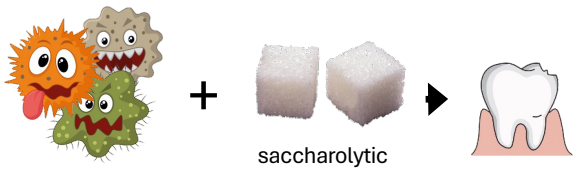
- Healthy mouth



- Gingivitis (gum disease)



- Caries (cavities)



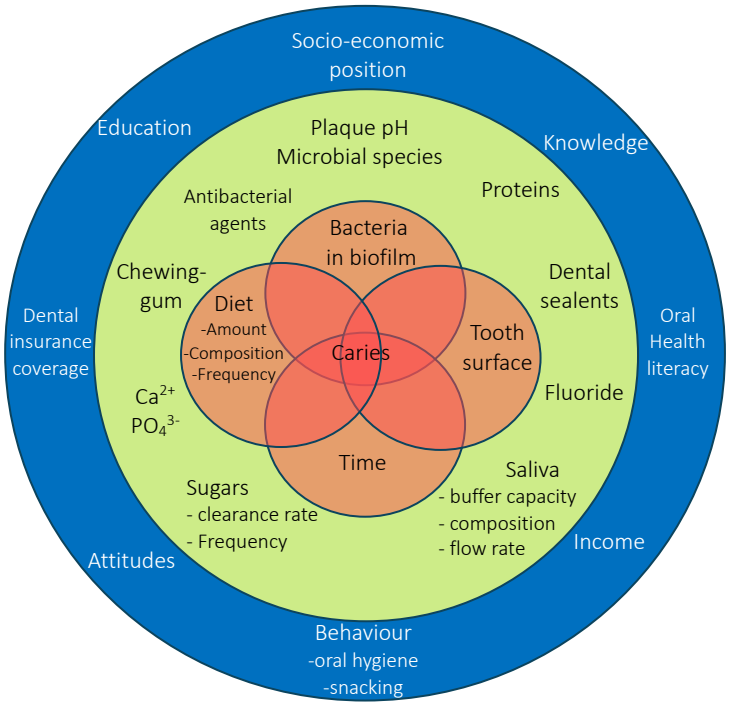
46

Etiology Caries

Factors that directly contribute to caries development

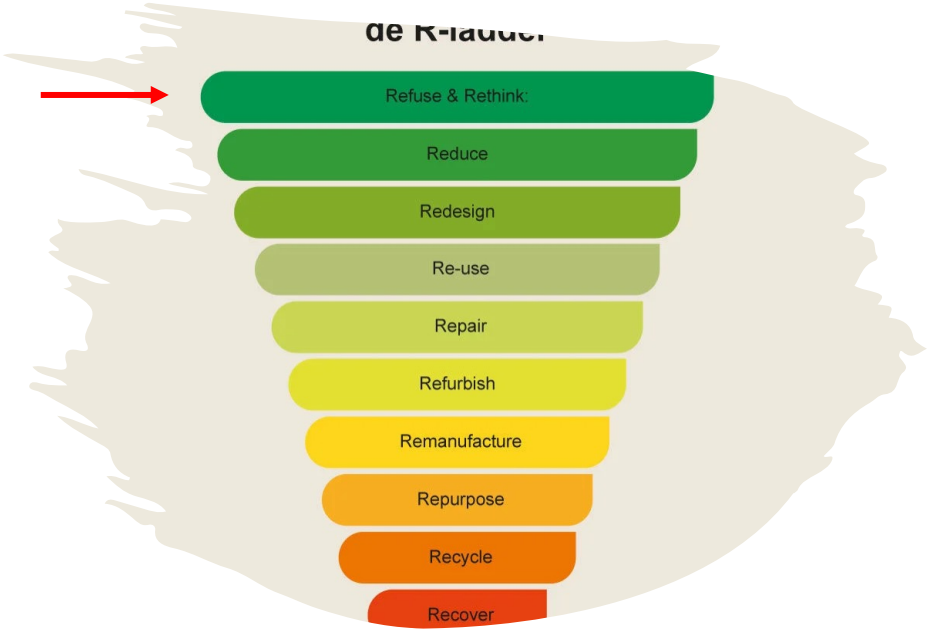
Oral environmental factors

Personal factors



Selwitz et al, The Lancet 2007

47

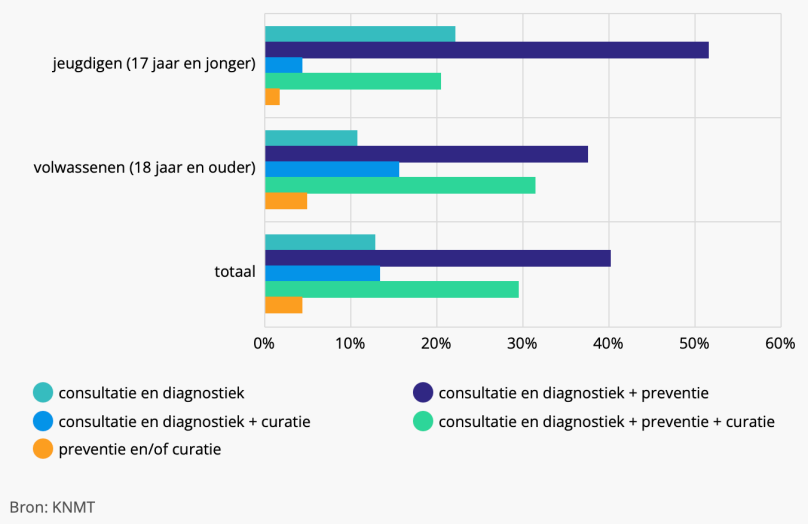


48

Type of care performed in 2024

Prevention!

You also go to the dentist when you do not have a specific complaint



Bron: KNMT

49

Sustainable dentistry?!



c.volgenant@acta.nl

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