

On a mission to shape the future

Oral healthcare professionals in the Netherlands join forces in [ORANGEHealth.nl](https://www.orangehealth.nl) in a mission to shape the future of health and healthcare



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ORANGEHealth.nl aims to become the Dutch Public Private Partnership which unites all knowledge in the field of oral health. It is built on a partnership of knowledge institutions, oral healthcare professionals, private companies, patient associations, insurance companies and public health bodies. They collaborate in a multi-year program to capitalize on the unique oral healthcare system to address mutually linked oral and general health challenges, while establishing a more integrated role of the healthcare professional in the broader Dutch Healthcare system.

Oral healthcare professionals in the Netherlands join forces in ORANGEHealth.nl in a mission to shape the future of health and healthcare: making a leap forward in prevention, providing the right care in the right place. ORANGEHealth.nl contributes in this way to realizing the missions as defined in the Dutch Knowledge and Innovation agenda 'Health and Care'.

People commonly seek medical help when they feel ill. The current healthcare system is organized to cure patients once disease symptoms become apparent. All future health strategies will focus on prevention and care. In oral health, professionals have already a longstanding tradition of early signaling and prevention of dental diseases. However, this proven approach

is no common practice in general healthcare. Therefore, ORANGEHealth will integrate oral healthcare into the general healthcare system in close collaboration with other primary and public healthcare providers. This allows for wider preventive action, increases the quality of life for individuals and reduces healthcare costs on the short and longer term.

Oral health has a history in care and prevention

A large percentage of the Dutch population (80%) regularly visits an oral healthcare professional. Oral healthcare professionals have shown success in moving from treatment to prevention of oral diseases and monitoring oral health: the prevalence of complete tooth loss of the total population has been reduced by approximately 50% since 2000: from 15,7% to 8% in 2018. (www.staatvandemondzorg.nl)

The teeth, tongue, saliva and surrounding tissues form an easy access route to non-invasively survey oral and –potentially- general health. Oral health care professionals are in the unique position to play a new role in the monitoring and early detection of oral and general health issues.

Many parties will benefit from ORANGEHealth. Data Science will feed future health strategies with regard to oral and general health. "Oral health is a key indicator of overall health, well-being and quality of life. Most oral diseases and conditions share modifiable risk factors with the leading NCDs (cardiovascular diseases,

cancer, chronic respiratory diseases and diabetes). These risk factors include tobacco use, alcohol consumption and unhealthy diets high in free sugars, all of which are increasing at the global level. There is a proven relationship between oral and general health" (<https://www.who.int/news-room/fact-sheets/detail/oral-health>).

A collaborative approach to join oral health and general health

Oral health is an integral part of general health. Many associations between oral and systemic disease have been described, and common risk factors identified. This joint research approach will build on this relationship to develop effective and cost-effective diagnostic, prevention and treatment tools.

Innovative tools for monitoring and early detection at the chairside and at home will not only benefit consumers but will also provide valuable input for future research and innovation.

ORANGEHealth expects important steps forward in oral and general health of citizens and specific groups such as children, older people, the chronically ill and socio-economically disadvantaged groups.

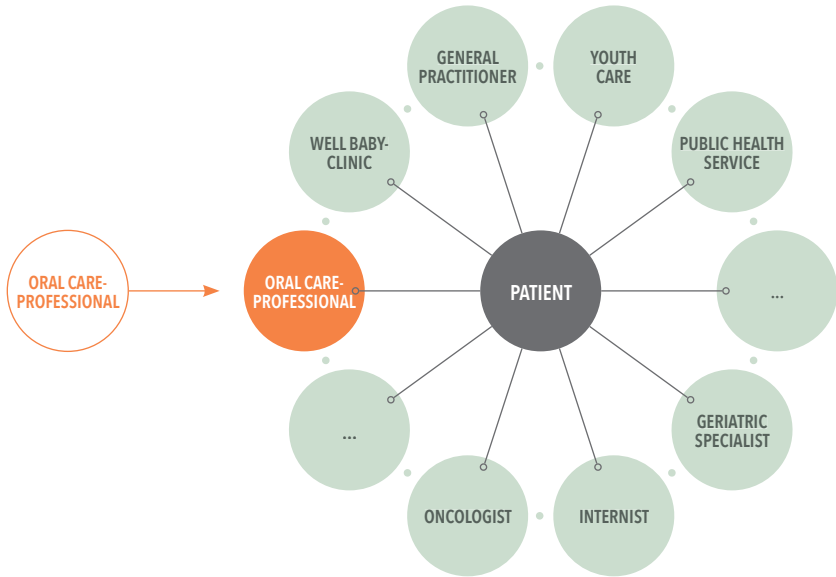


Fig 1. Oral healthcare professionals at this moment are not fully integrated into the health care system, and rarely viewed as essential primary healthcare providers. The current program aims to position the oral health professional as an essential piece of the integral healthcare system.

ORANGEHealth.nl envisages to include all players of the health network

ORANGEHealth will apply data science to extract hitherto hidden information from existing data on oral and general health from primary care practices, data repositories and health cohorts. The partnership will develop innovative tools for early diagnosis and prevention of oral and systemic diseases and we will implement the results nationwide.

ORANGEHealth will create action around, and contribute to National themes (Dutch Research Agenda) and focus on specific oral care roadmaps (Kennisagenda Mondgezondheid) and other scientific studies. This will lead to a better understanding of diseases, prevention and effect measurements.

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The program has three key focus areas

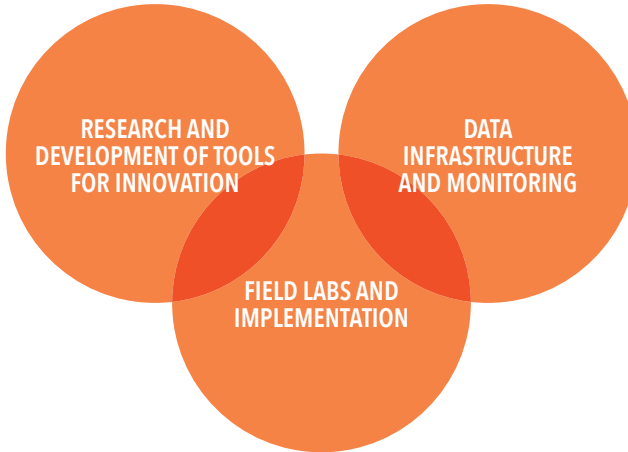


Fig 2. The key focus areas of the consortium

The strategy to achieve the goals consists of three key focus areas simultaneously interacting with each other.

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Research and Development of tools for innovation

This part of the program focuses on three themes:

- 1 Identifying/discovering biomarkers in the mouth in order to create a fundamental understanding of most common oral disease processes (i.e. caries and periodontitis) and using the mouth for general health indications
- 2 Developing innovative tooling (sensors) to support healthcare professionals and/or people at home to search for/detect relevant markers and in that way monitoring oral and general health status and signaling abnormalities indicating disease
- 3 Providing a course of action for both healthcare professionals and patients to intervene as early as possible to tackle and/or manage the (oral or other) disease and/or stop the further spread of the disease

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In a next stage we will also work on the development and validation of model systems for pre-clinical investigation of positive or negative effects of biomaterials, food ingredients and oral care products on hard and soft tissues in the oral cavity. This will reduce the need of performing experiments with animals for pre-clinical testing.

Data Infrastructure and Monitoring

The data infrastructure will allow for i) monitoring of oral and general health of the population, ii) identifying risk groups, and iii) evaluation of the effectiveness of existing and newly developed preventive health programs and treatment strategies. Data mining, text mining and new tools within the context of artificial intelligence will be used to this end.

Field labs are living labs and form the testing ground for novel approaches

Health economic analyses forms a strong fundament of this key focus area to identify cost-effective and equitable routes of action and needs-based planning.

Tailored care for citizens by implementing early preventive measures and timely referral to other healthcare professionals in the health chain will be targeted outputs.

Big data from national health cohorts, disease cohorts and primary care providers will be analyzed in relation to disease relationships and risk indicators. Using data science tools distinct clusters of subjects will be identified with differential risks and progression of prevalent chronic diseases.

Field labs and Implementation

The third area of the program focuses on the actual implementation and evaluation of preventive interventions and tools that have yielded positive results in initial research. Available scientific knowledge from oral health experts on how to improve general and oral health is ready for implementation and could provide a quick start for innovation in field labs.

Field labs are living labs and form the testing ground for novel approaches. If new measures work, they may be adopted instantly and implemented on a

larger scale. Through co-design and co-development new concepts will be tested and best practices adopted that will improve ‘the way we work’ in a systematic way. Active involvement of citizens will be a key success factor, but also policy makers, public organizations, health professionals should contribute to the program to make this a success.

Implementation includes involvement of and initiatives from and for individuals, education programs, and workshops.

A long-term commitment is needed

The ORANGEHealth.nl consortium is established to provide a stable environment for realizing these goals over the next 10 years. Endorsed by Health Holland, the consortium will make a running start in 2020 and continue with

the projects that have been awarded earlier. The first major kick-off project is scheduled in March 2021. As the consortium grows, new funding will be attracted and new projects will start. It is estimated that the entire project will have a duration of at least ten years.

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The founding partners are the Dutch institutions for higher education in oral healthcare: ACTA and Inholland (Amsterdam), UMCG & Hanze Hogeschool (Groningen), Radboudumc and HAN (Nijmegen), HU (Utrecht). They will sign a letter of intent establishing the consortium.

ORANGEHealth.nl is open to additional partners on a project level and at a consortium level.

Interested to improve Oral and General Health? Please join us

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ORANGE Health.nl

ORANGEHealth.nl stands for ORal AND GEneral