

HEALTHY FOR LIFE



TNO innovation
for life

TNO works with partners to develop, validate and implement interventions that promote the health of citizens, from the young ones to the very old.

Children in the Netherlands tend to be in good shape. However, the health of Dutch youngsters can still be improved in a number of areas like lifestyle and psychosocial problems.

Also many can be gained among adults and senior citizens in terms of boosting vitality and participation as well as improving the quality of life by encouraging healthier behaviour and creating a healthier environment.

This makes it imperative for the focus in society and (health) care to be increasingly geared to prevention and reduction of the use of medical care. Harmonisation between policy, research and practice, including industry, is therefore indispensable.

TNO's work in this innovation-area is based on two propositions: *Youth, growing up healthy* and *Adults and senior citizens, lifelong healthy and active*.



YOUTH, GROWING UP HEALTHY

If we talk about Dutch youth, then we refer to children from pre-birth until their 23rd year, a period during which many kinds of professionals including midwives, maternity assistants, GPs, teachers, sports coaches and social workers are catered to their needs. Each professional contributes to their health and safe upbringing. Demand for care and prevention changes under the influence of different behavioural patterns and fluctuating risks of disease. But what is on offer also changes as costs threaten to run out of hand at a time when the economic climate means that we have less to spend.

In the key youth profiles, moreover, disconcerting trends are evident – from perinatal mortality, overweight, alcohol consumption and chronic disease to maltreatment, behavioural disorders and multi-problem families. Currently there is a lot of attention in youth (health) care on treating such problems. However, if we want today's youth to have the future, then prevention is more effective and efficient than cure.

CHAIN COHESION

Prevention works best by creating cohesion. Hereto professionals have to collate their care both intrinsically and in terms of time and work from the same set of principles. An example: a maternity assistant who signals a risk has to be confident that a clear transfer of data to the GP or paediatrician results in continued monitoring of developments.

EVIDENCE-BASED INTERVENTIONS

TNO RESEARCHES, DEVELOPS, IMPLEMENTS AND VERIFIES INTERVENTIONS ON THE BASIS OF THREE KNOWLEDGE LINES.

1. A GOOD START

A good start should be ensured already before pregnancy and varies from general advice, such as the benefits of folic acid, quitting smoking or healthy eating, to customised advice, such as an expectant mother suffering from a certain illness or dealing with special circumstances. TNO investigates the best way of providing this care. During pregnancy itself there are all kinds of important aspects, like screening for anomalies and relieving pain. TNO takes an innovative approach to midwifery, focusing on those subjects pregnant women consider important. At the same time midwives, maternity assistants and expectant mothers are supported with scientifically substantiated information about essential topics such as breastfeeding and cot deaths.

2. A HEALTHY YOUTH

TNO strongly focuses on the scientific substantiation of the basic Youth Health Care (YHC) tasks and on subsequently implementing research results in practice by screening, signalling and monitoring. TNO also develops youth healthcare guidelines that boost the effectiveness and uniformity of treatment. Finally, within this knowledge line TNO aims to promote healthy behaviour among (chronically ill) children and youngsters, for which social media are crucial.

3. OPTIMUM DEVELOPMENT

Within this line TNO develops knowledge that enables professionals – in the preventive, education and care sectors – to promptly signal and tackle problems and circumstances where growing-up and raising of children are subject to high risk. We do this by developing and evaluating methods for early warning, preventive support during growing-up and raising, and interventions for development disorders or problems. For professionals and parents we develop knowledge that can help them in raising and supervising their children.



EXAMPLES OF OUR PROJECTS

CENTRING PREGNANCY

“CenteringPregnancy” is an inspiring new form of maternity care which integrates three extra components into maternity medical checks: self-management, knowledge development among pregnant women and group support. In CenteringPregnancy the standard 1-to-1 pregnancy checks are replaced by maternity group consultations with 8-12 expectant mothers with a comparable pregnancy duration. By offering this care to a group, more time is available for expectant mothers to discuss key issues. The care provider at the same time learns about the concerns of these women and gets to know them better. Finally, the women are given the opportunity to learn from each other. TNO is a partner of CenteringPregnancy in the USA and has brought it to the Netherlands. In cooperation with the KNOV and the LUMC the concept is being elaborated, implemented and evaluated within the maternity care field in the Netherlands, both for primary healthcare and hospitals. TNO is also developing CenteringParenting, the same care model but then applied to the YHC’s consultation office.

D-SCREENING

The D(evelopmental)-screening enables early warning of children with a mental handicap. Often these children are registered for help late on while their parents would benefit greatly from early warning. Research by TNO revealed that scores on the normal YHC development survey (the Van Wiechen Survey) can be merged to form a single yardstick: the Developmental-score (D-score). This D-score is remarkably aligned to a mental handicap at a later age (5-10 years old). On the basis of this survey TNO developed a standardised aid to enable paediatricians to determine the necessity of subsequent action: the D-screening tool.

PROMOTING HEALTH AT SCHOOLS

Schools do not only foresee in cognitive learning goals of children and youngsters, but also fulfil educative and care tasks in order to prepare pupils to participate as fully-fledged citizens in society, both now and in the future. In doing so the school can use health education, early warning of

and catering to individual pupils with health risks as well as offering a safe learning environment at school (both physically and socially). TNO helps schools and establishments that support schools to do this.

Two examples:

- *Long Live Love:* TNO contributes to the development of lesson methodology (incl. “Long Live Love” that encourages pupils to use contraceptives to prevent sexually transmitted diseases and teenage pregnancy.
- *Transfer-enhancing learning:* TNO has revealed that effective education on certain lifestyle themes (like safe sex) can simultaneously have a preventive impact on other lifestyle themes (like healthy diets and excessive alcohol consumption), without explicit teaching of these themes. TNO has started a project together with the Trimbos Institute to adopt these learning principles in the broad-ranging curriculum The Healthy School and Stimulants.



Youth, Growing up Healthy

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ADULTS AND SENIOR CITIZENS, LIFELONG HEALTHY AND ACTIVE

Good health enables citizens to participate in society for as long as possible. Healthy behaviour and a healthy environment – at home, in the neighbourhood, at work, in sport – are essential and can help to prevent or restrict disorders and their consequences. Together with employers and employees, local authorities, entrepreneurs, prevention and care institutions and professionals, TNO works on innovations in these areas, enabling citizens to extend their working lives and live longer at home – and that is of great societal and economic importance.

CHAIN COHESION

Prevention works best by creating cohesion, so TNO focuses not only on the citizen but also on the environment and people that may influence the health of risk groups, such as policymakers of local authorities, professionals and practice and sector organisations. TNO initiates and facilitates the developed interventions to be implemented in policy and practice in those environments and chains where they are most effective and have the most sustainable impact.

TNO RESEARCHES, DEVELOPS, IMPLEMENTS – WITH PARTNERS - AND VERIFIES INTERVENTIONS ON THE BASIS OF THREE KNOWLEDGE LINES.

1. PHYSICALLY ACTIVE CITIZENS

More sport and physical activity boosts the health and vitality of the Dutch population. Employees that exercise properly are healthier, are less likely to become overweight and tend to be absent from work much less often, which means that they can be employed more usefully and for longer. TNO studies (cost-)effective health, physical activity and lifestyle programmes at and around work intended to boost the vitality of employees, with subsequent customised recommendations that may help bring about sustainable

employability of personnel and answer research questions from policy and practice.

Any adverse effects of sport in the form of injuries must be prevented as much as possible or be appropriately treated, for both recreational and elite sport. TNO therefore also works on optimising sports health, developing insights into the causes of injuries and the preventive measures that can be taken to stop injuries from happening.

2. ACTIVE ENVIRONMENT

It is not only the citizen but also the environment that is key to good health. The environment has to 'entice' citizens to behave in a healthy way and to participate responsibly and active in society. To achieve this TNO studies (cost-) effective strategies, supports local authorities and industry with knowledge about the development of a healthy environment and works on comprehensive solutions that make a difference to vitality.

3. PARTICIPATION

Ageing in good health is a great gift and a proof of success of economic and social development of recent centuries. The growing group of senior citizens wants to enjoy a pleasant and worthwhile life for as long as they can. But old people are often faced by several situations that make them more vulnerable. Major life events such as the loss of a partner, a fall, surgical intervention or a series of smaller incidents can drastically – and even irreversibly – alter their capacity to cope independently. In various partnerships TNO develops, validates and implements tools and interventions that can provide early detection of functional decline, prevent deterioration and boost vitality. Older people learn to deal efficiently with restrictions and incidents in their immediate surroundings so that their lives remain pleasant and worthwhile, even at a very advanced age.

EXAMPLES OF OUR PROJECTS

LET MORE SENIOR CITIZENS PROFIT FROM FUNCTIONAL TRAINING

Functional training is an exercise programme that trains senior citizens in the Netherlands in day-to-day activities like walking up stairs, doing groceries, going outside, getting out of a chair or bed, etc. This kind of training boosts their ability to cope independently and their quality of life. Customised, varied, complex and, above all, intensive training enables senior citizens to manage even in adverse circumstances. The reserves accumulated in the training help them manage difficult situations and gives them more self-confidence, enabling them to orchestrate their own lives and participate in society to the best of their ability and demands. TNO wants to enable more senior citizens to benefit from functional training and undertakes different projects to get functional training into the care and various other sectors, working with partners on the implementation. For instance, a study has revealed the pros and cons of a home-based individual functional training programme given by a physiotherapist to senior citizens aged 75 and above threatened by no longer being able to cope independently and the pros and cons of a specific functional training programme for senior citizens who have to undergo a major surgical operation and run the risk of complications.

INTERSECTORAL COOPERATION

Healthy and liveable neighbourhoods are seen as important means of sustainably promoting the health, participation and quality of life of citizens. In terms of physical and social changes in the neighbourhood, it is essential to promote and establish cooperation among sectors such as spatial planning, health and welfare, sports clubs, schools and employers. A key question in this matter is how this inter-sector cooperation can be optimised. Inter-sector cooperation can be defined here as intra and extra-sector cooperation that is often formalised or organised and strives for a common goal. TNO investigates the (priority) factors that promote inter-sector cooperation for a healthy and liveable neighbourhood. One such available innovation is the 'Inter-sector Cooperation' checklist.

EXTENDING AND EXPANDING THE PHYSICAL ACTIVITY AND HEALTH MONITOR TO INCLUDE VITALITY

TNO constantly measures the physical activity of the Dutch population, reporting on this in a Physical Activity and Health Trend Report that appears once every two years. It considers questions like: 'How many people exercise enough?', 'What are the physical activity trends in the population?' and 'What do we need to make progress in this area?'. In addition to internet questionnaires, TNO also develops objective methods to quantify physical activity patterns in target groups in order to gain better insight into how, when and how many people are physically active. On top of this, TNO develops and validates the National Vitality Monitor, a broader monitor co-developed by RIVM to follow the vitality of the population in the run-up to the Olympic Games of 2028, when we want optimum vitality in the Netherlands.



Lifelong Healthy and Active

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TNO HEALTHY FOR LIFE

A NUMBER OF FOCAL AREAS COME WITHIN BOTH THEMES.

DENTAL HYGIENE

Teeth are essential for chewing, biting, speaking, facial expression and quality of life; dental hygiene is therefore vital. Within the dental field in the Netherlands TNO is unique in the large-scale epidemiological research it undertakes into the prevalence, incidence and passage of dental diseases among the population, identifying the effects of systematic changes and providing early warning of new emerging threats to dental health such as enamel erosion. Knowledge of the aspects that influence dental health are translated into interventions. For instance, how effective is an information film offered by health centre assistants on dental care for children? In this way TNO helps to enhance dental hygiene and reduce the costs of dental care.



SUCCESSFUL INNOVATION

Introducing an innovation or preventive intervention in healthcare stands or falls by systematic implementation. To be successful, at every stage of the introduction process insight is necessary into the factors that may help or hinder that introduction. TNO investigates these factors, the effectiveness of introduction strategies and the degree of distribution, adoption, implementation and continuation as well as advises on the introduction strategy, supervising and evaluating the introduction process. TNO offers organisations customised solutions by combining research, evidence based advice and training.

SUCCESSFUL COOPERATION

Solving major societal problems in prevention and care requires a cooperative approach among partners from the fields of policy, research and practice (both public and private). In many cases this cooperation fails to materialise by itself and in other cases ends once their subsidies run dry. So TNO is looking into the factors that can influence the creation and retention of successful cooperation and into the competencies the policy, research and practice parties must have to be able to cooperate successfully.



HOW CAN YOU BENEFIT FROM TNO?

TNO is the largest independent research organisation in the Netherlands in the field of preventive care. TNO has a proven track record in multidisciplinary research, with in-house expertise ranging from medical and behavioural sciences, health promotion, epidemiology and health economy to development psychology, human movement sciences and dental hygiene. TNO is embedded in the field and cooperates with the academic world and strategic partners like the LUMC and AMC, University of Maastricht, Applied Universities, the Netherlands Youth Institute, the National Institute for Sport and Physical Activity and the RIVM.

TNO.NL

HEALTHY LIVING

TNO initiates technological and social innovation to promote healthy lives and a healthy society.

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