
Executive summary

Request for advice

For many people, nature is a place to relax and recover from the stresses of day-to-day life. The hectic pace of modern society means that people are turning more and more to nature for relaxation and recreation. However, in an increasingly populated and urbanised society, nature is no longer an inevitable component of the immediate living environment. To find nature, we have to travel greater and greater distances, by car, train or plane.

Nature policy recognises the increasing demand for ‘nature for people’, particularly in and around towns and cities. In health-policy circles, there is currently little interest in the possible benefits of nature in terms of health. However, more and more initiatives are emerging in the healthcare sector that indicate a renewed appreciation for nature as a ‘curative’ phenomenon. For example, more and more care institutions have ‘healing gardens’ and ‘green’ activities. There is a greater emphasis during the construction of new hospitals on ‘healing environments’. The number of ‘care farms’ catering to individuals suffering from burn-out, for example, is also rising.

What knowledge on a possibly beneficial influence of nature on our health and well-being has so far been obtained through scientific research? This is the central question in this advisory report. First, a link between nature and health can be established directly, through indicators for health and well-being. The limited amount of direct evidence is therefore the starting point in this report. Second, a connection between health and nature can be established indirectly, by looking at how nature influences actions or

mechanisms which in turn influence health. The much more extensive scientific knowledge on these intermediary mechanisms is also discussed.

The following intermediary mechanisms have been chosen: 1) recovery from stress and attention fatigue, 2) encouragement of exercise, 3) facilitating social contact, 4) stimulation of development in children and 5) stimulation of personal development and a sense of purpose. An overview is given of the current level of knowledge on these mechanisms, as well as an assessment of the gaps in that knowledge and recommendations for research to extend current knowledge.

Link between nature and health

Is there scientific evidence for a positive link between nature and health and, if so, how strong is this evidence? The influence of nature in the living environment on health has been investigated by two large-scale epidemiological studies: a cross-sectional study of the Dutch population as a whole and a Japanese longitudinal study among elderly inhabitants of Tokyo. The Committee thinks the results need careful consideration. However, their quality is such that they can be seen as a first direct indication of a positive link between nature and (generic) health indicators.

The other studies have involved small, specific study populations. One study, Ulrich's oft-quoted, hospital-file study, shows that a view of nature from a hospital window accelerates physical recovery after surgery. The Committee has reservations about the methodology used in this study. There are also a limited number of studies of the influence of a view of nature from the workplace (including plants in the workplace itself) on the physical health and productivity of workers. The unsatisfactory methodological quality of these studies meant that they failed to convince the Committee.

Knowledge about the link between nature and health from therapeutic practice is anecdotal and fragmentary. Hardly any systematic research has been done into the efficacy of garden therapies or of stays at 'care farms' in terms of improving well-being or other therapeutic goals.

With the exception of the two large epidemiological studies, there has therefore been no methodologically sound, empirical research into the link between nature and (generic) health indicators. More research is required to provide stronger scientific proof. Subsequent research will have to concentrate on testing specific hypotheses about: 1) the effects of different types of greenery (greenery in the day-to-day living environment as compared to 'recreational' greenery), 2) the effects on specific health outcomes, such as the development of cardiovascular disease or other disorders related to stress and a lack of exercise and 3) the health effects in sub-groups of the Dutch population (the elderly, children, lower-income groups and the working population).

In addition, post-operative patients in hospitals provide opportunities for prospective trials. Such trials would focus on whether these patients have a view of nature from their window, and the effect of this on their health.

Recovery from stress and attention fatigue

A first way to look into an indirect influence on health is to establish whether exposure to nature is instrumental in recovering from stress and attention fatigue. If so, this is of great importance. Chronic stress plays an important role in the aetiology and course of severe, common physical and mental illnesses and health problems. Stress-related mental problems such as anxiety disorders and depression are common. They are major causes of absenteeism and work disability.

A large number of studies, all using sound methodology, have produced strong evidence of the positive effect of nature on recovery from stress and attention fatigue. Exposure to nature has proved to have a positive effect on mood, for example, as well as on concentration, self-discipline and physiological stress. The studies were conducted both in the laboratory and under field conditions. The beneficial effects occur even after brief exposure to a view of nature.

There is no data on the duration or frequency of exposure to nature that is required to prevent stress-related illness in the long-term. There has not been any research involving individuals with chronically high stress levels or those who are ill. Little is also known about the effect of different types of nature.

The Committee believes that well-controlled follow-up research is needed in order to establish greater clarity about the significance of the observed recuperative effects of nature in terms of the aetiology of stress-related illness. Further research is also needed to determine which types of nature are most relaxing and what the differences are between nature in the immediate living environment and nature further away. A greater understanding of the influence of agricultural nature is particularly relevant to the Dutch situation.

Encouragement to exercise

A second way in which nature can indirectly improve health is by encouraging exercise. This mechanism is important, since a minority of the Dutch population (45 percent) meet the standard for exercise (at least five days a week 30 minutes exercise of moderate intensity), while 12 per cent of the Dutch do not even manage 30 minutes exercise a day of any intensity. Exercise has a positive effect on numerous health determinants, including overweight. It also reduces the risk of cardiovascular disease and diabetes mellitus (type II), for example. If the policy remains unchanged, lack of exercise will become

more common, with major implications for the state of public health. The encouragement of recreational and daily exercise is therefore an important intervention strategy. Until now, many intervention strategies have concentrated on general education and awareness-raising. An important question is whether a 'green' living and working environment encourages people to exercise more on a daily basis.

There are indications in a large number of studies that the environment is an important determinant of exercise. However, it is much less clear whether the environment must be 'green' to encourage people, even though the limited amount of available research does suggest this. Evaluations of a few existing programmes for encouraging exercise indicate that an attractive, green environment close to home and work provides the best opportunities to encourage daily exercise in the form of walking and cycling. It has also emerged that people keep exercising for longer in natural surroundings.

New research should concentrate mainly on the type of nature and the distance to the living and working environment. Relevant research issues are: How can green facilities in the immediate living and working environment be made as inviting as possible? Are there adequate opportunities for walking and cycling in green surroundings in, or close to, our main cities and close to businesses and offices? And what is the significance of this green environment for the health and productivity of people whose work involves little exercise?

Facilitating social contact

Can nature facilitate social contact? If so, this would also establish a positive link between nature and health. People with many social contacts feel healthier, have a lower risk of cardiovascular disease and live longer. Among older people, more social contacts are linked to a longer life and reductions in the prevalence of depression and cognitive impairment. Social contact not only prevents loneliness, it also results in more social support and concrete assistance in difficult situations and encourages healthy behaviour. Individualisation in society is making social contact more difficult.

Three closely-related studies have been conducted into the contribution of nature and green facilities to the social quality of a living environment. These studies, all three of which were conducted in an underprivileged area of Chicago, provide indications of a positive correlation between green public facilities and social integration, particularly for people living in conditions of poverty. However, other factors cannot be completely excluded. The Committee doubts whether the results also apply to Dutch neighbourhoods. The amount of green space in the area studied was minimal. Other types of green facilities, for example allotment gardens and collective gardens, and green activities linked to clubs or groups, are also thought to encourage social contacts and social cohe-

sion in neighbourhoods or groups. There is hardly any systematic research on this subject.

The Committee recommends research into the link between public green facilities and social integration or social capital in underprivileged urban areas in the Netherlands. A more extensive classification and survey is required of urban green facilities. In addition, research could be conducted into the social significance of typical Dutch group-based green activities (allotment gardens, shared gardens, volunteer work in landscape and nature maintenance).

Encouraging optimal development in children

The healthy development of children contains many keys to the physical, psychological and social well-being of adults. To what extent does exposure to nature contribute to a healthy development in children, resulting in better health later in life? Opportunities to play and learn are important for the cognitive, socio-emotional and motor development of children. The elimination of natural environments from the immediate living environment and a reduction in the freedom of movement are depleting the opportunities for contact with nature. It is possible that children cannot recover from stress as quickly when there are not enough green spaces in their surroundings, and stressful experiences early in life can have a long-term effect on their behaviour and health.

There is little systematic empirical research into the influence of contact with the natural environment on the development of children. The available empirical research is generally qualitative and descriptive. On the basis of this limited knowledge and existing theories, the Committee believes that it is plausible that the cognitive, motor and socio-emotional development of children can benefit from varied, regular and direct contact with nature. Relatively familiar natural locations as close as possible to the home ('the jungle around the corner') provide opportunities for free exploration and motor development. They encourage sensorial experiences and experiences that contribute to personal development. The Committee is aware that, in the times in which we live, there are dangers associated with locations of this kind.

Otherwise, one study indicates that the presence of green facilities in the immediate living environment of children in an underprivileged area is linked to better concentration and self-discipline. Another study even found an enhanced capacity to deal with stressful events.

The Committee does not think that the evidence from empirical research into the favourable effect of nature on the development of children is convincing. Given the importance of healthy development in children, it recommends more extensive empirical research. Long-term research is also required into the knock-on impact of this favourable effect on healthy behaviour and health later in life. For example, what is the

significance of contact with nature in the formative years in terms of later behaviour involving nature and benefiting recuperation?

Providing opportunities for personal development and a sense of purpose

Finally, the question is whether scientific research demonstrates that contact with nature can contribute to personal development and a sense of purpose. Many adults run up against issues relating to the meaning of life. Interest in new sources of a sense of purpose and the possible significance of nature in that respect are on the increase. A sense of purpose provides opportunities for the integration of personal goals and for dealing with fear of old age, illness and death. This means that a sense of purpose is very important for physical, psychological and social well-being.

Studies of leisure time spent in natural surroundings have indicated that nature creates the conditions for a sense of purpose; stimulating feelings of relaxation, autonomy and competence makes people more open to reflection. In addition, because of its symbolic significance, nature can contribute to a sense of purpose. Natural elements and locations can refer symbolically to convictions and values that give meaning to life.

However, the available research suffers from methodological limitations. The Committee therefore recommends further systematic research in order to acquire a better understanding of the influence of nature on personal development and a sense of purpose. The focus here should not be solely on relatively untamed environments far removed from living environments but also on nature in the vicinity.

In conclusion

The Committee notes that follow-up research is required in order to provide further support for the indications from existing theoretical and empirical research into the beneficial effect of nature on health. Most evidence from empirical research relates to the effect on recovery from stress and attention fatigue. Much less is known about the other mechanisms (encouragement to exercise, facilitating social contact and influence on development of children). In other cases, the evidence is weak, due to the methodological limitations of the research (influence on personal development and a sense of purpose). However, existing research already provides consistent clues for assuming a positive link between nature and health. If further research confirms these results, this will underline more attention in decision making for green strategies that many people already perceive as good for health.
