

Alpine Health Tourism Action Plan

Devising Actionable Strategies for the Development
of a Nature-Based Health Tourism Ecosystem
to Improve Quality of Life and Quality of Region



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Editorial

This Action Plan's core mission is to devise actionable strategies for the development of a nature-based health tourism ecosystem to improve Quality of Life and Quality of Region in the Alpine Space. The rationale is clear: Firstly, to exploit the results of the EU Inter-reg Alpine Space project HEALPS2, which involved several key stakeholders from the health tourism, health science, and sustainable tourism industries. Secondly, to explore future opportunities for building an innovative nature-based health tourism ecosystem against the background of the manifold challenges in the tourism industry. This requires a responsible use of the natural resources of the Alpine Space in the (further) development of nature-oriented and health-promoting offers. And thirdly, to provide policymakers, regional developers, Alpine regions, SMEs, and the public access to evidence-based medical knowledge and solutions that emerge as the result of the synergy among health professionals, tourism practitioners, medical researchers, policy and strategy professionals, residents, tourists, and the public in a cohesive, integrative, and participatory way. This approach underlines the pivotal role of a sustainable and eco-medical use of Alpine natural resources for health tourism destinations and highlights the need of integrating aspects of natural resources' healing effects, a shared knowledge of Alpine assets through digital solutions, and frames strategic approaches for the long-term development of the sector.

The HEALPS2 consortium
Salzburg, October 2022

1 The Healing Power of the Alps

1.1 HEALPS2 – A Project Brief

HEALPS2 is an Interreg Alpine Space programme project that aims at favouring the positioning of the Alpine Space as a globally attractive space for Health-Promoting Tourism (HPT) which largely builds on Nature-Based Solutions (NBS) to resolve problems and tackle opportunities in a nature-based green tourism economy.

Health-Promoting Tourism which largely builds on Nature-Based Solutions is an emerging perspective on the economic activities of consumption and production of goods and services with nature at their core. Robust feedback is needed from policymakers, practitioners and academics across economics, finance, public management, and environmental science domains on the actions achieved and knowledge acquired and the needs to systemically collect recommendations arising from this shift in how we understand and engage in touristic activities of the future.



HEALPS2 is co-financed by the European Regional Development Fund (ERDF). The HEALPS2 consortium (Universities and other research and development actors, public policy makers, private enterprises, NGOs, civil society) identified key opportunities and enablers for HPT, with the common goal of building capacity to address knowledge deficits in the realm of evidence-based HPT built on natural and social resources and capitals of the Alpine region. HEALPS2 also supports a technology-oriented approach developed by researchers and experts from the private and public sectors, with the knowledge of the territory held by Alpine associations and public organisations, also aiming for promoting the future development of marginal Alpine regions. HEALPS2 also pursues the improvement in the fields of regional development and quality of life.

The main objective of HEALPS2 is to improve the framework conditions for nature-based health tourism in the Alpine Space. To this end, HEALPS2 develop scenarios for sustainable development and future growth of sustainable touristic markets benefitting from Alpine natural resources to be efficiently used for health and tourism purposes. This will allow for an implementation approach oriented towards sustainable use and preservation of Alpine natural resources. The ultimate objective of HEALPS2 is to leverage the positioning of the Alpine space as globally attractive health-promoting tourism location that cares for nature, its people and visitors in ways that safeguards the biodiversity of the tourism ecosystem. HEALPS2 promotes Nature-based Solutions to health promoting tourism as defined by the European Commission (2020) as these contribute to climate adaptation and mitigation, increase biodiversity, contribute to the improved health and wellbeing of society, and have the potential to contribute to a sustainable economy.

1.2 Key challenges

Europe is the leading tourist destination in the world (UNWTO, 2022). Tourism is at the center of a huge ecosystem of people and businesses that contribute substantially to prosperity and jobs in all Member States. This is especially true for the Alpine region (WTTC, 2022).

However, the tourism industry is currently experiencing major change caused by key challenges which threaten the wealth of the Alpine ecosystem, its nature, people, businesses, and visitors. These challenges include, among others, climate change, demographic change, loss of biodiversity, urbanization, health issues (COVID-19, civilization

diseases), regional disparities, overtourism, and non-sustainable touristic behavior on both the supply and demand side of the market.

On the upside, global trends such as a thirst for nature-based experiences and increased health consciousness hold considerable opportunities for developing innovative, sustainable and a highly valuable health-promoting tourism ecosystem in the Alpine Space, all taking care of the contextual framework in which health tourism is embedded.

On the downside, however, the health industry is facing a variety of profound and disruptive key challenges that come to greatly challenge the industry's very rationale.

Indeed, when looking to these multi-dimensional challenges, experts assign environmental change drivers such as socio-cultural factors (e.g., demographic change, urbanization, regional disparities), people's demand for better health the greatest chances for the development of an innovative health tourism economy in the Alps, supported by the ethical-ecological (e.g., sustainability) and political factors (e.g., multi-stakeholderism and multi-levelled public governance; Kooijman et al., 2021; Gowreesunkar et al., 2022; Zukunftsinstitut, 2022).

To effectively address these challenges, it is essential that tourism development is also fundamentally aligned with the Sustainable Development Goals (SDGs) (UN, 2022). Still, while health is seen as strongly contributing to higher levels of sustainability in tourism of the Alpine region (UNWTO & ETC, 2018), it is also cherished as a major business trend of a global scale (Boschetto Doorly, 2020; Zukunftsinstitut, 2020), one that the Alpine Space may much benefit from as well.

Being an emergent industry, health tourism is not a niche trend anymore but rather an upcoming hotbed of innovation for an otherwise therapy and curation-minded health industry.

In fact, above challenges substantially threaten the "healing power" of the Alps for leveraging health tourism in many ways and on many levels. However, it is well known that, with its unique mountain world, diverse climate, outstanding biodiversity and cultural heritage, the Alpine region offers numerous opportunities for healthy living. In contrast to vibrant city life, which is exposed to particulate matter and noise, outdoor recreation in natural environments is increasingly being researched and used for its positive effects on human health and well-being.



1.3 Key assets and opportunities

Building on natural, but also cultural, and built resources of the Alpine space, the region's tourism industry is well advised to unleash its grand potential, and invest into capitals, skills, and talents to leverage innovations in nature-based health services and solutions and thus wellbeing in the Alpine space.

Hence, the "healing power" of the Alps signifies a unique "healing environment", that is a high value ecosystem of nature-based and health-promoting tourism products and services at the heart of Europe. This nature ecosystem in the Alps is critical to preserving biodiversity and provide a plethora of regulating systems for the planet.

By carefully and mindfully exploiting natural resources as a new asset class, it also creates opportunities for green jobs and sustainable socio-economic development of the various Alpine regions and its health tourism enterprises and services operators at large. Considering these key resources as core values of the Alps, which are distributed over the entire Alpine region, not as a whole, but as individual, spatial characteristics, numerous opportunities arise for the creation of regional unique selling propositions (USPs) in the field of nature-based health tourism. So, it also creates opportunities for green jobs

and sustainable socio-economic development of the various Alpine regions and its health tourism enterprises and services operators at large. Ultimately, this power may act as a core engine to meet the current tourism industry crises towards creating a future-safe industry of the nature-based health tourism in the Alpine space. Indeed, with the overwhelming natural conditions, the Alps offer excellent conditions for a health-conscious lifestyle. It stands for a variety of sports activities, exercise in nature, first-class opportunities for wellness and relaxation and much more.

At the individual level, people do strongly benefit from the healing power of the Alps as well. Forests, waterfalls, medicinal plants, microbiomes on alpine pastures or thermal waters show proven health benefits for humans and lead, when applied correctly, to a strengthened immune system, higher physical fitness, better respiratory performance, and improved mental resilience (nutrition, exercise, healthy lifestyle) (Pichler, 2022). Clearly, on micro level, health benefits of human interaction with nature in the Alps are manifold. They range from acute stress relief (Niedermeier et al., 2017), reduced symptoms of specific indications such as allergies and asthma and chronic low back pain (Freidl et al., 2020; Gaisberger et al., 2012; Huber et al., 2018; Prosegger et al., 2019) to improved immune responses (Grafetstätter et al., 2017), cardiorespiratory fitness and finally the whole quality of life (Huber et al., 2022). On macro level, the overall socio-economic demand for green tourism, ethical consumption, protection of natural resources, and living close to nature is expected to increase post Covid-19 (Palazzo et al., 2022).

On the other hand, there is plenty of supply for “natural”, sustainable products and services well catered for by tourism operators who, by means of their responsibility to protect the environment, “exploit” natural resources for the social good, creating employment, improving cultural diversity, and recognizing cultural heritage values. Finally, a “win-win situation” is expected to provide for a sustainable development path in health tourism in the Alps which is built by accountable actors and their value ecosystem and consumed by responsible tourists and inhabitants.

In all, nature-based health tourism may also act as core engine to meet the challenges of the current tourism industry crises towards creating a future-safe industry in the Alpine space, while grabbing the full range of opportunities for a sustainable development of a nature-based health tourism industry in the Alps. Therefore, nature-based health tourism could become one of the leading tourism sectors for a sustainable development of the Alpine region in the future.

1.4 Purpose

The main purpose of this Action Plan is fivefold:

- 1 To present a synoptic overview of natural Alpine resources and their possible health impacts.
- 2 To scientifically explain key issues of a nature-based health tourism by presenting key elements of a generic Alpine Health Tourism Effects Model.
- 3 To highlight the major challenges as confronted by the tourism industry in the Alpine Space and how key players may mitigate these challenges through using natural resources and human capabilities for leveraging their potential in favor of developing a Sustainable Health Tourism Development Path.
- 4 To devise Actionable Strategies for a nature-based, sustainable health tourism Development Path on a regional level, following insights gained from the analytical considerations.
- 5 To propose Policy Recommendations for policymakers and regional development authorities in the process of determining a most effective path of policy innovation in the field of nature-based health tourism.



2 Alpine Natural Health Resources

Various natural resources such as forests, waterfalls, medicinal plants, microbiomes on alpine pastures or thermal waters show measurable health benefits for humans. These health resources lead, among other things, to a strengthened immune system, higher physical fitness, better respiratory performance, and improved mental resilience (nutrition, exercise, healthy lifestyle).

In what follows, some key Alpine natural resources shall be presented and – supported by scientific evidence within medical studies – their value for health tourism stressed.

Air Ions

Background

Ions are formed from originally neutral particles that have been positively or negatively charged by ionization. These charged particles are very small, have high mobility and can be spread quickly by the wind. Due to their electrical charge, these particles tend to form clusters and combine with larger particles and aerosols in the air. The cleaner the ambient air, the longer the ions are present as small ions, floating in the air to be deeply inhaled by breathing. High levels of air pollution lead to the formation of larger ions with less positive health effects, as they sink to the ground more quickly and can also be inhaled less deeply. Light air ions, which usually consist of negatively charged oxygen molecules and have a beneficial effect in particularly high concentrations, are thus particularly healthy for humans. Because plants are important producers of negative ions, the concentration of negative air ions in cities is significantly lower, at 100 to 800 ions/cm³, compared to green areas and forests where the concentration is around 700 to 2,000 ions/cm³. The ions are formed during photosynthesis: the more intense the light source, the more negative air ions are formed. The number of negatively charged particles therefore increases with increasing altitude, as the solar radiation becomes more intense. The concentration of negative air ions is highest in natural environments that host a water source, such as a river or a waterfall. The air ions are created by the unbridled force of flowing water, breaking waves or especially by the force of falling water, as is the case with waterfalls, the main producers of negative ions.



Studies

- Indication: respiratory function (Alexander, Bailey, Perez, Mitchell & Su, 2013): evidence level Ib
- Indication: anxiety, mood, relaxation, sleep; depression (Perez, Alexander & Bailey, 2012): evidence level Ia

Conclusion

A range of single studies suggests that negative air ions have multiple health benefits on humans. They have a clear influence on human health and well-being. Negatively charged air ions seem to have a positive health effect regarding immunological, physiological, and psychological aspects. However, some of these results need to be further verified in high quality studies. In combination with water aerosol from e.g., waterfalls they are likely to induce an immune-modulatory effect (see also Waterfalls).

Health tourism value

- Examine possible distinction formats (e.g., climatic spas, climatic health resorts).
- Linking of tourist offers with plenty of exercise in the open air (note altitude and existing water sources).

Balneotherapy in Alpine Healing Waters



Background

Balneotherapy is defined as the use of baths containing thermal mineral waters from natural springs at a temperature of at least 20°C and with a mineral content of at least 1 g per liter. The temperature of the thermal water is usually around 20 degrees. Balneotherapy has been used since ancient times in the treatment of various diseases and is still in use today.

There is no international definition of balneotherapy in a broader sense and the treatment methods included. It may involve mineral baths, sulfur baths, brine baths, radon-carbon dioxide baths or Dead Sea salts. As an adjunct to balneotherapy, spa therapy employs various modalities such as physiotherapy; a change in environment and lifestyle per se may contribute to the changes seen in patient outcomes, i.e., the therapeutic result may not be due to the balneotherapy alone. As the composition of the mineral waters differs in its content in terms of cations and anions, it is difficult to assess the specific therapeutic component.

Studies

- Resource: mountain hiking + iodine-sulphur-Na-Cl-water / brine baths / Na-Ca-Cl-SO₄-water. Indication: prevention of falls; healthy aging: stamina and strength (Prosegger et al., 2019): evidence level Ib.
- Resource: mountain hiking + Mg-Ca-SO₄-water. Indication: non-specific chronic pain in the lower back area (Huber et al., 2019): evidence level Ib.
- Resource: balneotherapy. Indication: rheumatoid arthritis and chronic pain in the lower back area (Morer et al., 2017): evidence level Ib.
- Resource: balneotherapy. Indication: stress (Antonelli & Donelli, 2018): evidence level Ib.

Conclusion

The available data suggest that balneotherapy is associated with healing of several rheumatological diseases. However, existing research is still limited. The use of Alpine balneotherapy in health tourism would require the examination of each Alpine healing water regarding its effects on specific indications, taking into account experiences drawn from successful product development.

Health tourism value

- Identification of existing natural healing springs.
- Development of tourism offers with therapeutic services in cooperation with experts and institutions (health hotels, spa resorts, Kneipp associations, therapists, etc.).
- Making natural springs accessible to the public.

Alpine Water – Blue Spaces

Background

Water is one of the most important physical and aesthetic landscape elements. Humans have always been attracted by rivers, lakes, and the ocean. What impact do aquatic environments have on people's health? While the health benefits of green spaces are quite well explored, little analysis has been made of “blue spaces” and even less of “Alpine” blue spaces. Blue spaces have occasionally featured in public debate as far as the risks are concerned, e.g., drowning, or microbial contamination. However, a stay in a blue space environment can promote health and well-being. The evidence is still insufficient as far as the underlying mechanisms are concerned.

Studies

- Indication: public health (Grellier et al., 2017): evidence level IV
- Indication: well-being; combating stress (Franco et al., 2017): evidence level IV
- Indication: well-being; mental health (Gascon et al., 2017): evidence level IV
- Indication: well-being (de Bell et al., 2017): evidence level IV

Conclusion

The water resources of the mountains are of vital importance to both society and the ecosystem. The increasing demand for water and the effects of climate change are leading more and more to water use conflicts. Overcoming these conflicts while at the same time maintaining the ecosystem are major challenges. Alpine destinations can use their various forms of blue space to develop evidence-based health tourism products and integrate these into economic value chains. The healing potential and the resulting health tourism potential are still underestimated and should be the focus of further research.

Health tourism value

- Take account of existing blue spaces for hiking tours, excursion destinations, etc.
- Make blue spaces accessible while also checking possibilities for people of limited mobility.



Alpine Streams for Kneipp Hydrotherapy

Background

Kneipp water applications are among therapies commonly used in the field of naturopathy. The list of indications for Kneipp hydrotherapy is long, yet the scientific evidence is hardly explored by clinical studies. In many cases its application is based upon experiential judgment. Core elements of Kneipp's hydrotherapeutic treatments are treading water, hot and cold half-baths, full baths, contrasting baths, steam treatments, wraps and compresses and, most importantly, cold gushing water briefly applied to various parts of the body. Moderately intensive daily physical activities also form part of Kneipp hydrotherapy.



Scientific evidence

There is insufficient evidence from clinical studies on the efficacy of Kneipp hydrotherapy treatments. But, as a therapeutic add-on option for different diseases, hydrotherapy according to the Kneipp method has become more and more a topic of scientific research. Treatment successes have for example been found for Kneipp hydrotherapy as an add-on in the concomitant treatment of dementia. There is sound evidence that cold water applied locally to the face and neck region is able to provoke significant improvement in cognitive abilities or in cases of chronic obstructive pulmonary disease. Hydrotherapy in general shows therapeutic benefits concerning balance, increasing mobility and quality of life for people with movement disorders.

Studies

- Indication: movement disorders in cases of Parkinson's disease (Rocha et al., 2015): evidence level Ia
- Resource: Alpine cold water (Doering et al., 2001): evidence level Ib
- Indication: health prevention measures; awareness of individual health resources (Eckert & Anheyer, 2018): evidence level IV
- Indication: quality of life; treatment of side effects of breast cancer treatment (Hack et al., 2015): evidence level IV

Conclusion

There are indications that Kneipp hydrotherapy can be a useful add-on treatment for people with different disease patterns. However, clinical trials are required that compare e.g., therapies of varying duration and frequency to clarify the associated risks and benefits for each indication

Health tourism value

- Develop seasonal concepts with Alpine streams at the centre always bearing in mind regional conditions and compatibility with prevailing values.
- Establish appropriate partnerships.
- Offer health experiences that revolve around cold water.
- Reactivate of existing Kneipp facilities or opening of new facilities.

Waterfalls

Background

European mountain regions host numerous Alpine waterfalls that produce inhalable, negatively charged nano-water particles known as “Lenard ions” (see also air ions). Negative air ions close by waterfalls, the so called “ionosols”, are generated by aerosolization of water droplets on an obstacle, an aqueous surface or by aerodynamic breakup during free fall. After break-up, these smaller fragments are negatively charged and remain in the air, carried by the air stream for some time. The lifetime of ionosols is long enough for them to be inhaled. The remaining larger fragments are positive and precipitate to the ground. This airborne nano-aerosol is assumed to trigger a variety of biological effects, e.g., mild activation of the immune system, stabilizing of the autonomous nervous system and improvement in blood flow. The specific environment of a waterfall provides beneficial effects for prophylactic or therapeutic stress management when combined with high-altitude climate therapy and physical activity (mountain hiking). Staying nearby a specific Alpine waterfall, the “Krimml Waterfalls”, has proven beneficial effects for the treatment of allergic asthma and is even listed as an approved natural remedy. It is important to note that each alpine waterfall has a specific physicochemical signature and can act on different medical indications.

Studies

- Indication: Allergic asthma and Allergic Rhinitis (Gaisberger et al., 2012): evidence level Ib
- Resource: mountain hiking and waterfall. Indication: moderate to high stress levels; prevention of burnout and strengthening the mucosal immune system (Grafetstätter et al., 2017): evidence level Ib

Conclusion

Ancient traditions and folk wisdom from many regions of the world ascribe numerous curative and healing effects to waterfalls. There is evidence for an added health benefit due to exposure to a waterfall environment in combination with mountain hiking and a stay at moderate altitude. Alpine waterfalls represent a simple to implement and cost-effective health tourism product base for the treatment of stress-related symptoms, allergies, and diseases of the airways.



Health tourism value

- Cross-check on studies of diseases on which existing waterfalls have a positive effect and develop offers that include professional support.
- Combine offers with accommodation (farmstay holidays, allergy-friendly accommodation, etc.), therapies (physiotherapy, nutrition, inhalation therapy, etc.) and complementary elements (guided hikes, recommendations for post-holiday period, etc.).

Alpine Mountain Hiking



Background

The main reasons for hiking are experiencing nature, fresh air, the beauty of nature and landscape, fauna and flora. Health comes as another increasingly important aspect for hiking holidays, supported by scientific evidence of the positive effects of hiking on health and well-being now constantly growing. One of the first approaches to investigating the health effects of Alpine mountain hiking was represented by the “Austrian Moderate Altitude Studies” (AMAS) conducted in Austria. AMAS I (2000) focused on the indication of the metabolic syndrome, a combination of overweight, disturbed blood sugar and blood fat metabolism, as well as high blood pressure, whereas AMAS II (2006) focused on persons with high stress levels. The studies proved that an active sojourn (a combination of hiking and active/passive regeneration) at moderate Alpine altitudes (1,500 – 2,500 meters) under the guidance of professional coaches has positive effects on persons with metabolic syndrome as well as on clients suffering from stress.

Mountain hiking and healthy ageing

Healthy aging and physical activity go hand in hand: the longest possible healthy life is therefore directly dependent on an active lifestyle, while efficient interventions are

needed to preserve functional abilities so as to prolonging disability-free life expectancy. Mountain hiking is a very popular pastime among elderly people. More than 6 million people over 60 years of age undertake mountain activities in the Alps every year, but mountaineering demands a relatively high level of physical fitness. Ageing is typically associated with declining fitness, but this decline is not solely the result of ageing; it is mostly the price to be paid for physical inactivity. When mountain hiking, people are often confronted with rapidly changing environmental conditions such as path gradients, stony or narrower passages, altitude, weather conditions, or ascending and descending sections. These constantly changing conditions require continual proprioceptive feedback, thus promoting the diversification of gait patterns and balance responses. Mountain hiking could therefore be an effective form of training for older people, addressing aerobic capacity, strength, and balance.

Studies

- Resource: mountain hiking at medium (1,700 m) and low (200 m) altitudes. Indication: metabolic syndrome (Neumayr et al., 2014): evidence level Ib
- Resource: mountain hiking and balneotherapy. Indication: osteoporosis prevention (Winklmayr et al., 2015): evidence level Ib
- Indication: stress (Niedermeier, Grafetstätter, Hartl & Kopp, 2017): evidence level Ib
- Indication: mood – emotional reactions (Niedermeier, Einwanger, Hartl & Kopp, 2017): evidence level Ib
- Resource: mountain hiking + waterfall. Indication: medium to high stress levels; burn-out prevention (Grafetstätter et al., 2017): evidence level Ib
- Resource: mountain hiking + iodine-sulphur-Na-Cl-water / brine baths / Na-Ca-Cl-SO₄-water. Indication: prevention of falls; healthy aging: stamina and strength (Prosegger et al., 2019): evidence level Ib
- Resource: mountain hiking + Mg-Ca-SO₄ thermal water. Indication: non-specific chronic pain in the lower back area (Huber et al., 2019): evidence level I

Health tourism value

- Develop offers in combination with other natural resources (e.g., balneotherapy, waterfalls, etc.).
- Develop target-group specific products (e.g., hiking trails with different characteristics for specific indications such as cardiorespiratory fitness, chronic back pain, etc.) with reference to increasing levels of lifestyle diseases.

Rock climbing / Outdoor bouldering

Background

Rock climbing is a popular pastime for all age groups. Several disciplines can be distinguished, including traditional climbing, sports climbing and bouldering. The Alps offer an infinite number of climbing and bouldering routes of varying skills levels. In addition, many indoor climbing facilities and climbing parks are on offer. Therapeutic climbing is a new approach adapted from artificial rock-climbing movements. It does not necessarily involve climbing entire routes as in traditional climbing but may only involve specific exercises performed on a climbing wall. Therapeutic climbing is currently used for treating orthopedic, neurological, and psychological diseases. A meta-analysis from 2010 states that the evidence for the effectiveness of therapeutic climbing is limited and involves a high risk of bias: the effects of therapeutic climbing are therefore still unclear.



Studies

Climbing as a preventive health intervention

- Indication: trunk muscles and mobility (Heitkamp, Wörner & Horstmann, 2005; Muehlbauer, Stuerchler & Granacher, 2012): evidence level IIa

Therapeutic climbing

- Indication: cerebral palsy (Böhm, Rammelmayer & Döderlein, 2015; Schram Christensen, Jensen, Voigt, Nielsen & Lorentzen, 2017): evidence level Ib
- Indication: multiple sclerosis (Velkonja, Curić, Ozura & Jazbec, 2010): evidence level Ib
- Indication: chronic back pain (S.-H. Kim & Seo, 2015; Schinhan et al., 2016): evidence level IIa
- Indication: depression (Stelzer et al., 2018): evidence level Ib

Conclusion

Further research is required for the indications described. Only long-term interventions were examined in the existing studies, which limits implementation in health tourism. Furthermore, highly trained staff are needed, while no evidence exists concerning short-term interventions (e.g., 1-2 weeks).

Health tourism value

- Well-trained staff (climbing instructors, therapists, psychologists) are required for climbing therapy.
- Create a wide range of climbing courses (from beginner to expert).
- Creation/designation of new tours in cooperation with local climbing clubs and mountain guides.
- Indoor offers for days when the weather is bad.

Forest Therapy

Background

In recent years there has been considerable and increasing attention paid to using the forest environment as a place for recreation and health promotion. This trend comes from Japan, where it is called “shinrin-yoku”, a term that means “taking in the forest atmosphere through all of our senses” or, more simply, “forest bathing”. Alpine forests represent a distinguishing element of the Alpine region. Forests are an important area for recreational activities and play a key role in tourism as they are a defining feature of the landscape, while numerous hiking trails run through Alpine forests. Given the emerging global trend of forest therapy and the wide occurrence of forests in the Alpine area, forests and their postulated health effects make a good base for the development of Alpine health tourism products. However, a closer look to the scientific literature on forest therapy reveals several gaps and shortcomings, especially regarding the research methodology and transferability of results.

Scientific evidence

The lack of high-quality studies means that there is no convincing evidence for the benefits of forest therapy. Besides the lack of methodological quality, there are further limitations on the transferability of study results to Alpine forests:

- Research suggests that many of the health effects measured can be attributed to phytoncides, a generalized term for natural chemicals released by plants into the environment. It is theorized that these chemicals could influence stress physiology and immunology through inhalation. Most forest therapy studies were conducted in tropical primeval forests (mostly Japanese, Korean and Chinese) with a high degree of biodiversity. These forests are totally different from typical Alpine forests: almost all Alpine forests are semi-natural as defined by ‘Forest Europe’, with a significant presence of large trees and deadwood. There are almost no truly primary forests and plantations. Thus, their phytoncide composition is different and the effects measured cannot be transferred to Alpine forests.
- In most studies, the control group lived in Asian megacities like Tokyo with high air and noise pollution. The health benefits measured could therefore also be attributed to the absence of such factors. Furthermore, these cities are not comparable to typical European/Alpine cities.



Studies

To date only the following three randomized controlled clinical trials have been conducted in Europe:

- Indication: higher stress levels (Dolling et al., 2017): evidence level Ib
- Indication: exhaustion (Sonntag-Öström et al., 2015): evidence level Ib
- Indication: exhaustion (Stigsdotter et al., 2017): evidence level IIa

Conclusion

Strong evidence of the benefits of the forest environment in terms of health and wellbeing has yet to be found. The findings of previous research support the premise that exposure to forest environments may provide health benefits. The evidence is however insufficient owing to methodological limitations. Future investigation is necessary to validate forest specific health effects, especially for Alpine forests.

Health tourism value

Considering the wide occurrence of forests in the Alpine region and the emerging trend towards nature-based recreation, forests may be considered an important resource with a high health tourism potential. However, based on current data, no scientifically grounded statement can be made about specific health effects of Alpine forests. Therefore, there is a strong need for future research with high-quality studies.



Protected areas and biodiversity

Background

The Alps are among the richest regions in Europe regarding landscape, plant, and animal species variety. As the loss or destruction of habitats is the most direct threat to biodiversity, protected areas are crucial in countering the continuing loss of ecosystems and species. All in all, more than 1,000 large Alpine protected areas are listed, covering some 25% of the Alpine region. The Alps are thus one of the world's most important ecoregions in terms of conserving global biodiversity. Closely linked to biodiversity is the environmental microbial diversity that influences the human microbiome, i.e., the collection of microorganisms including bacteria, archaea and fungi living in and on the human body. This is an emerging research field in medical science and holds significant health tourism potential as an Alpine-specific resource.

Scientific evidence

The best-researched aspect of the direct link between protected areas and human health relates to effects on psychosocial wellbeing. Protected areas have a strong restorative capacity and have been shown to aid recovery from mental fatigue, reducing stress levels, assisting cognitive functioning and improving the overall psychological state. Some studies show that these psychological benefits are higher in areas of greater biodiversity. Furthermore, research indicates a potential beneficial and protective influence on respiratory systems of residential areas with high biodiversity. No intervention study could be identified that explicitly links Alpine-specific protected areas to direct health outcomes. However, based on the indirect links of protected areas and biodiversity to human health and well-being, there is a high probability for the existence of a huge potential for health tourism. Protected areas also play a key role in the conservation of other Alpine natural resources with medically and scientifically proven effects, such as waterfalls, and can therefore be seen as “meta health resources”.

Health tourism value

- A balance must be found between offers to untouched nature and diverse nature.
- Visitor guidance measures are required to conserve and protect biodiversity and nature.
- Include such indicators as “Nature connectedness / Nature relatedness”, “Recovery from stress and fatigue”, “Health related quality of life / Well-being” and “Promotion of physical activity” when developing and promoting tourism offers.

Alpine Farming and Alpine Pastures – Environmental Microbes

Background

The accumulating evidence indicates that the environmental microbiome plays a significant role in asthma development. The very low prevalence of asthma in populations highly exposed to the microbiome indicates its potential for disease prevention. These protective effects are most likely related to the specific microbial diversity in farming environments, especially those that practice animal husbandry. The human microbiome is defined as the collection of all microorganisms including bacteria, archaea and fungi living in and on the human body. The microbiome seems to affect virtually every bodily function. Depending on its composition, it can produce thousands of different biologically active substances, including neurotransmitters such as dopamine, serotonin and nor-epinephrine. According to the current state of science, the diversity of the microbiome seems to play the biggest role in human health. It is becoming increasingly apparent that the composition of the intestinal microbiome beginning in utero has long-term consequences for human health and well-being. Studies show for example that those living in densely populated areas are less susceptible to microbial diversity than those in rural neighborhoods, which also reduces the diversity of the human microbiome. There is emerging evidence that biodiversity loss in the wider environment may lead to reduced diversity in human microbiota and such modifications are associated with a dramatic increase in the incidence of immune-related diseases including metabolic, allergic and inflammatory diseases and, most likely, neurodegenerative and psychiatric disorders as well.

Medical evidence

Asthma and allergies are today the most common chronic diseases in children. A large body of literature shows that children raised on farms have much lower rates of allergies and asthma. The timing of the exposure to environmental microbes found on farms seems to be crucial. The strongest effects are observed for exposure that occurs in utero and during the first years of life. This implies a variety of options for future preventive strategies in terms of health tourism.

Scientific evidence

- Resource: agricultural environment with increased exposure to bacterial components in stables as well as livestock. Indication: hay fever, asthma and eczema (Von Ehrenstein et al., 2000): evidence level III



- Resource: microbial agents in stables and farms. Indication: hay fever, asthma and other common allergies. (Riedler, Eder, Obergeld & Schreuer, 2000): evidence level III
- Resource: diversity of microbial exposure. Indication: asthma and atopy (Ege et al., 2011): evidence level III
- Resource: agricultural environment. Indication: asthma and other atopic illnesses (Alfvén et al., 2006): evidence level III
- Resource: agricultural environment. Indication: allergies (Horak et al., 2002): evidence level IIb • Resource: agricultural environment. Indication: allergies and asthma (Schulze, Strien, Praml, Nowak & Radon, 2007): evidence level III
- Resource: agricultural environment, visiting stables. Indication: asthma, allergies and other atopic diseases. (Radon, Ehrenstein, Praml & Nowak, 2004): evidence level III
- Resource: agricultural environment, exposure to stables holding livestock. Indication: asthma, allergies and other atopic diseases (Riedler et al., 2001): evidence level III
- Resource: farmstays for pregnant women. Indication: asthma, allergies (Ege et al., 2006): evidence level III

Health tourism value

- Cooperation between farmers and hosts in the region.
- Focus on farmstay holidays to work in stables and with animals. Holiday offers for pregnant women and/or for families with children in the first year of life for the prevention of allergies and asthma.



High Altitude (2,500+ Meters)

Background

Altitude training is a popular strategy among athletes to improve sea-level performance. Altitude training is today a standard training routine in many endurance sports to increase physical capacity.

Studies

- Resource: altitude training. Indication: stamina and performance (Ploszczyca, Langfort & Czuba, 2018; Lundby & Robach, 2016): evidence level Ib

Conclusion

Although altitude training is widely used to improve exercise capacity, clear scientific proof for its effectiveness is still lacking. Further research is needed to explore the effects of altitude training in detail.

Health tourism value

- Cooperate with medical institutions.
- Physiotherapeutic offers especially in combination for training camps at high altitudes for competitive athletes.

Medium Altitude (1,000 – 2,500 Meters)

Background

In contrast to UV radiation, which increases with altitude and is associated with vitamin D synthesis, fine dust pollution reduces as the altitude increases. Furthermore, shorter flowering phases and more extreme weather conditions lead to a change in vegetation at higher altitudes, which in turn significantly reduces allergen concentrations compared to lower-lying natural habitats. The “thinner” air or lower air viscosity facilitates breathing, while stays at medium altitudes induce relaxation and lower stress levels. A one-week stay at 1,700 meters above sea level leads to significant improvements in sugar metabolism and cardiovascular parameters such as pulse and blood pressure. Climate therapy at medium to high altitudes is also well-known as a successful alternative medical treatment for respiratory and allergic illnesses such as bronchial asthma, atopic dermatitis, psoriasis, and eczema.



Scientific evidence

- Resource: mountain hiking for one week. Indication: prevention of cardiovascular diseases (Theiss et al., 2008): evidence level III
- Indication: allergic bronchial asthma (Massimo et al., 2014): evidence level IIa
- Resource: mountain hiking for one week. Indication: cardiopulmonary and metabolic effects of physical activity for older people (Burtscher et al., 2001): evidence level Ib
- Resource: mountain hiking. Indication: metabolic syndrome (Neumayr et al., 2014): evidence level Ib
- Indication: airway inflammation, allergy and asthma (Rijssenbeek-nouwens & Bel, 2011): evidence level Ib • Indication: “allergy and inflammation” (Engst & Vocks, 2000): evidence level Ib

Conclusion

There is considerable scientific evidence that describes the benefits and positive health effects of medium altitude stays. This is limited by the fact that very few studies solely address a stay at medium altitude. In most studies, a stay at medium altitude is combined with an additional intervention such as physical activity. In addition, the participants involved in the studies are mostly not in good health but rather have a specific indication, making it difficult to draw general conclusions about particular health benefits.

Health tourism value

Development of packages for one to two-week stays in close cooperation with hosts and mountain guides with:

- Mountain hikes
- Plenty of exercise in the fresh air
- Wellness offers

Apitherapy



Background

Apitherapy is the medical use of honey products such as honey itself, propolis, royal-jelly, beeswax or bee venom to treat various diseases in complementary medicine. Honey has been used since ancient times for medicinal purposes such as healing wounds, tissue regeneration, alleviating gastrointestinal disorders, gingivitis and various other pathologies. Beekeeping and apitherapy have a long tradition in European folk medicine.

Scientific evidence

Honey is the most ancient biomaterial used for wound dressing and the effectiveness of honey in the treatment of wounds has been confirmed by many studies. It is believed that honey may be used as a suitable alternative with most infected wounds owing to its antibacterial and healing effects.

Studies

- Indication: treatment of wounds (Oryan, Alemzadeh & Moshiri, 2018): evidence level Ia

Bee venom therapy

Bee venom therapy (BVT) uses bee venom for medicinal purposes. The various therapeutic applications of BVT include various musculoskeletal conditions (e.g., arthritis, rheumatism) and immune-related diseases.

Studies

- Indication: unwanted side effects during treatment with BVT (Park, Yim, Lee, Lee & Kim, 2015): evidence level Ia
- Indication: rheumatic arthritis (A. Lee et al., 2014): evidence level Ib
- Resource: bee venom acupuncture. Indication: chronic lower back pain (Se, Han, Kwon, Jo & Lee, 2017): evidence level Ib

Conclusion

The greatest evidence for apitherapy is centered on wound treatment. It is not easy to treat wounds in health tourism as this requires highly trained medical personal and appropriate facilities.

Health tourism value

- Development of cross-sectoral innovations with local apiarists.
- Workshops with local beekeepers where participants learn how to make simple wound dressings.

Honey

Background

Honey is a highly nutritional food with a low glycaemic index. Honey consumption reduces blood sugar levels and prevents excessive weight gain. It also improves lipid metabolism by reducing total cholesterol, triglycerides and low-density lipoprotein while increasing high-density lipoprotein, decreasing the risk of atherogenesis. In addition, honey enhances insulin sensitivity that further stabilizes blood glucose levels and protects the pancreas from overstimulation brought on by insulin resistance. There is therefore a strong potential for honey supplementation to be integrated into the management of metabolic syndrome, both as preventive as well as supplementary therapeutic agents. Metabolic syndrome is a cluster of diseases consisting of obesity, diabetes mellitus, dyslipidaemia and hypertension.

Studies

- Indication: metabolic syndrome (Ramli et al., 2018): evidence level Ib
- Indication: diabetes mellitus (Meo et al., 2017): evidence level Ib

Health tourism value

Development of offers in close cooperation with beekeepers and hosts., e.g.:

- Sale of local honey in hotels
- Guided tours and honey tastings
- Restaurant menus that feature dishes containing honey



Alpine Milk & Dairy Products

Background

Plant growth diminishes with altitude and with it the yield, but as the intensity of sunshine increases, Alpine plants process greater amounts of energy, in turn leading to a higher protein and fat content. Animals react in a similar manner: because of the demands placed on their bodies by living in the Alps, animals are slower to fatten than during the same period spent in the valley, while milk output at higher altitudes is much lower than in the valley. It is however creamier when produced higher up: even today it will contain between 15% and 30% more fat than down in the valley. What is more, Alpine products were considered tastier and healthier because of the herbs found only up there that contain high percentages of ethereal oils. Dairy production therefore has a long tradition in the Alpine region and was early on associated with beneficial health outcomes. It plays a key role in the protection of Alpine flora and fauna as well as in the preservation of regionally typical landscapes. It is also integral to the ecological structure and cultural identity of the Alpine region and can therefore serve as a valuable product component in Alpine health tourism.

Scientific evidence

Milk and its derivatives are useful foods throughout all life periods, particularly during childhood and adolescence, as their contents of calcium, protein, phosphorus and other micronutrients can promote skeletal, muscular and neurological development. Alpine milk and Alpine dairy products seem to have a health promoting nutritional value owing to their composition. Generally, milk from grass-fed livestock is more beneficial than that of cornfed animals. Some studies also show that milk consumption might have a protective effect on the development of allergies and asthma.

Scientific evidence

- Resource: exposure to farmhouse milk. Indication: childhood allergies and asthma (Lluis et al., 2014): evidence level IIa
- Resource: consumption of farmhouse milk. Indication: childhood allergies and asthma (Brick et al., 2016) evidence level IIa

Conclusion

Studies indicate that milk consumption including that of unpasteurized milk might explain the protective effect of farming on atopy (hypersensitivity to otherwise harmless natural and artificial environmental substances). However, most studies are cross-sectional in

nature and further investigation to identify specific protective agents or mechanisms is required. The consumption of unpasteurized milk is not without hazards: it is important to understand which components and mechanisms underlie both the protective effect observed and the risks so as ultimately to be able to utilize milk as a means of primary prevention. Until then the consumption of raw milk cannot be safely recommended.

Health tourism value

- Integrate Alpine dairy products as product components in health tourism value chains.
- Farmstay holidays for families with children in the first year of their life for the prevention of allergies and asthma (needs further investigation, as most studies are cross-sectional)



Plants / Phytotherapy

Background

Alpine herbs and plants are an essential part of traditional European folk medicine. Knowledge of herbs was deeply rooted in the rural population, as medical care was difficult to obtain. Indigenous plants and herbs were therefore used for medical purposes. Today, Alpine herbs are witnessing a revival as public interest in the region's natural treasures grows.



Scientific evidence

- Resource: arnica. Indication: aching muscles after sport (Adkison et al., 2010; Pampa et al., 2014; Iannitti, Morales-Medina, Bellavite, Rottigni & Palmieri, 2016): evidence level Ib
- Resource: St John's wort. Indication: depression (Ng et al., 2017): evidence level Ia
- Resource: St John's wort. Indication: psoriasis (Mansouri et al., 2017): evidence level IIa

Health tourism value

- Create publicly accessible herb gardens (with or without admission fee).
- Offer herb walks in combination with cookery courses.
- Offer courses for applications using herbs.
- Provide for cross-sectoral cooperation of tourist businesses with herbalists (themed trails including menus featuring dishes with locally occurring herbs).

Winter / Snow-Based Activities

Exercise in the snow

Nowadays, “lifestyle diseases” such as cardiovascular diseases, type 2 diabetes, obesity, high blood pressure, allergies or psychological diseases such as depression and anxiety disorders are on the rise. On the one hand, this is due to sedentary lifestyles (on average we generally exercise too little) combined with an unbalanced diet and high stress potential due to urban crowding effects, such as over-stimulus, noise, competitive pressure, etc. On the other hand, we spend too much time in enclosed spaces (>90%!) and, when we go outside, the environment and air quality play an important role. Besides the proven positive psychological effect of untouched nature on humans, nature also offers a higher concentration of negative air ions and reduced fine dust pollution. Particularly in winter, when the air is even more polluted by loose chippings, heating, etc., outdoor physical exercise in the fresh air is recommended. Physical activity significantly improves cardiorespiratory fitness and increases our capacity to absorb oxygen. This improves our performance and blood circulation, so that every cell in our body is optimally supplied with oxygen. Movement also releases more endorphins in the brain, which has a mood-enhancing and activating effect on us. Regular exercise also has an influence on our immune systems and produces anti-inflammatory effects: People with a sedentary lifestyle who are overweight usually suffer from mild, chronic inflammation. Regular, moderate physical activity supports our immune systems in many ways and counteracts numerous diseases. Physical exercise has been shown to reduce the inflammatory capacity of leukocytes, increase the number of neutrophils (part of the leukocytes whose main task is defence against pathogens) in the blood and promote phagocytosis activity (the body’s own defence mechanism against foreign or malignant cells). Regular physical exercise reduces the resting pulse and sympathicotonus, strengthens our muscles, including the heart muscle, and increases heart rate variability. Exercise reduces both cholesterol and blood sugar levels, thus significantly reducing the risk of cardiovascular disease or type 2 diabetes. Even age-related hypertension can be counteracted via physical activity. Regularly covering a distance of 50 km/week will halve our mortality rates. Regular physical activity strengthens our immune system, reduces susceptibility to infection and has a protective effect against the most common lifestyle diseases.

Scientific evidence

- Indication: stamina/strength/power/balance in older people (Muller et al., 2011): evidence level Ib



- Indication: cardiovascular risk factors in older people (Niederseer et al., 2011): evidence level Ib
- Indication: cardiovascular and metabolic behaviour (T. L. Stoggl et al., 2017): evidence level IIb
- Indication: cardiovascular fitness and metabolic behaviour (Stoggl et al., 2016): evidence level IIb
- Indication: health status (BMI, fitness, physical activity, depression, smoking and alcohol consumption) (Anderson et al., 2017): evidence level III
- Indication: cardiovascular diseases (M. Faulhaber et al., 2007): evidence level III

Health tourism value

- Offer guided winter hikes with and without sports equipment.
- Create and maintain infrastructure such as toboggan runs, cross-country ski trails and winter hiking trails.
- Develop hiking routes and offers in close cooperation with tourist facilities and enterprises with hiking guides.

Winter / Non-Snow-based Activities

Winter hiking

Winter hiking is possible on all hiking trails that are walkable in winter. Calorie consumption per hour of winter hiking is around 250 kilocalories. Exercise in the sun and fresh air releases serotonin, the “happiness hormone”, which counteracts both physical stress reactions and the “winter blues”, thus lifting the mood. Winter hiking is particularly suitable for overweight people and those affected by metabolic syndrome (high blood pressure, abdominal obesity, fat metabolism disorders and increased blood sugar levels). Winter hiking reduces physiological parameters such as blood pressure and heart rate, aids weight loss and improves cholesterol and sugar metabolism.

Scientific evidence

- Indication: respiratory function; allergic rhinitis and/or asthma (Prosegger, Huber, Grafetstätter, Pichler, Braunschmid et al., 2019): evidence level Ib
- Indication: metabolic syndrome (Neumayr et al., 2014): evidence level Ib



Ice skating

Whether on a lake or on prepared rinks in the city, ice skating is a popular winter sport. It is not only fun and easy to learn, but also very healthy. Ice skating is a form of moderate endurance training and an ideal aid in losing weight. Gliding over the ice is therefore beneficial for the cardiovascular system, also improving coordination, balance, and body control when skating. It trains many muscle groups, especially the thighs and the back, but also the buttocks and the arms as they swing. Like outdoor running, ice skating stimulates the blood circulation and helps the body to cope better with temperature fluctuations. Additionally, the fresh air strengthens the immune system.

Scientific evidence

There is considerable medical evidence concerning ice skating and its effects on the human body, but only as regards elite athletes. Evidence of the medicinal impact of ice skating in the amateur sector is lacking.

Conclusion

The Alpine region offers a wide range of physical activities from which numerous tourist leisure activities can be derived. These activities are generally healthy and beneficial to the body, even if medical evidence is lacking for some of the activities mentioned as regards the amateur or leisure areas. One possible variation for non-snow-based activities is represented by themed walks. In the health tourism sector, there is still a need for research in this area to determine actual health effects.

Health tourism value

- Themed hikes.
- Creation and maintenance of infrastructures such as skating rinks or winter hiking trails.
- Development of offers in close cooperation with tourist facilities and enterprises with hiking guides.



Radon

Background

Radon therapy has been used in central Europe since the beginning of the 20th century. It uses radon, a chemically inert, naturally radioactive gas for treating various diseases. Its main application is as a non-pharmacological treatment option for various inflammatory rheumatic diseases. For treatment purposes, radon is commonly applied by bathing for about 20 minutes in water with a radon concentration of 0.3–3 kBq/l or remaining for about one hour in caves or galleries with a natural radon concentration of about 30–160 kBq/m³.

Scientific evidence

- Resource: radon cure therapy. Indication: rheumatoid arthritis (Falkenbach, Kovacs, Franke, Jörgens & Ammer, 2005; Franke, Reiner & Resch, 2007; Franke & Franke, 2013): evidence level Ib
- Resource: low-dose radon hyperthermia therapy. Indication: osteoporosis (Winkelmayr et al., 2015): evidence level Ib
- Resource: low-dose radon hyperthermia therapy. Indication: secondary osteoporosis (Lange et al., 2016): evidence level IIa
- Resource: low-dose radon cure therapy. Indication: pains and high blood pressure (Rühle et al., 2019): evidence level Ib

Speleotherapy

Background

Speleotherapy is a special kind of climate therapy that uses the specific microclimate of mines and caves to treat respiratory and skin related diseases in particular. Speleotherapy is relatively widespread in Europe. Speleotherapy facilities vary in their environmental conditions, including as regards radiation levels, temperature, and humidity. Patients are advised to rest while spending time in most caves. Physical or breathing exercises, including salt aerosols, are recommended for some caves.

Scientific evidence

- Indication: asthma (Beamon, Falkenbach, Fainburg & Linde, 2001): evidence level Ia
- Indication: childhood asthma (Gaus & Weber, 2010): evidence level Ib
- Indication United Airway Disease = Allergic Rhinitis and Allergic Asthma (Freidl et. al. 2020): evidence level Ib
- Rheumatic Diseases (Falkenbach et. al. 2005): evidence level Ia

Conclusion

Medium scientific evidence is available for speleotherapy. Caves and mines vary in their specific conditions: further research is therefore needed to evaluate the specific health effects of speleotherapy.



3 The Alpine Health Tourism Effects Model

Given the health industry’s current profound challenges, the diversity of needs of all stakeholders involved, and the enormous potential of the Alpine region’s natural resources with a view to further developing a nature-based and health-promoting tourism ecosystem products and services, a generic Alpine Health Tourism Effects Model (AHEM) can be schematized as follows (Fig. 1):

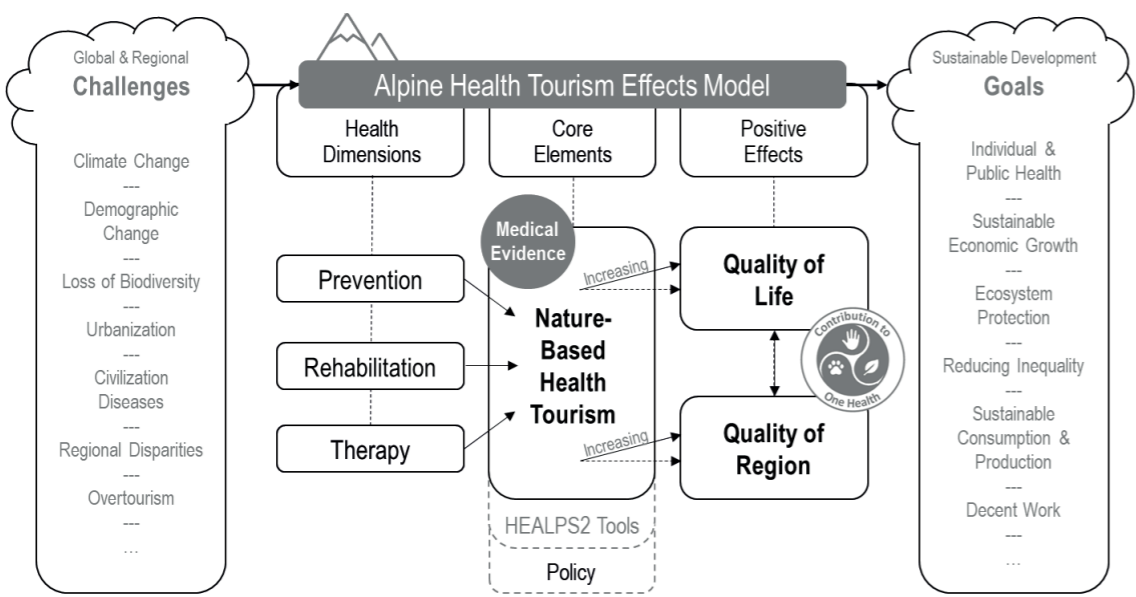


Fig. 1: Alpine Health Tourism Effects Model (Source: The authors)

3.1 Key elements

Principally, the model represents impact relations between antecedent challenges of tourism in the Alps (i.e., global and regional), people’s needs-based health dimensions to trigger health interventions in tourism (i.e., prevention, rehabilitation, therapy), the model’s constitutive core elements (i.e. evidence-based medical health tourism solutions), and potential effects of these nature-based health tourism offers on various aspects the Quality of Life/Quality of Region in the Alpine Space, as a result of which SDGs are addressed as outcome.

The model argues that tourism in the Alpine Space may derive exponential benefits from leveraging global trends such as an increasing thirst for nature-based experiences and increased health consciousness to hold considerable opportunities for developing an innovative, sustainable and highly valuable health-promoting tourism ecosystem. Nature-based health tourism, which substantially improves the Quality of Life and the Quality of Region in the Alpine Space, taking care of the sustainability framework in which health tourism has to be embedded.

Notably, the potential of nature-based health tourism offerings is medically proven with valid and reliable clinical research results. Evidence-based effects research and analysis is AHEM’s DNA. Nature-based health tourism offerings are expected to have positive effects (e.g., individual health, economic growth, nature protection) at both individual and regional level. These effects can be both short-term (quick wins) and medium- to long-term in nature.

As a corollary, nature-based and health-promoting tourism can therefore contribute to the achievement of the SDGs to a greater extent than other forms of tourism and can thereby also be seen as a concrete contribution to the implementation of the One Health Concept (One Health High-Level Expert Panel (OHHLEP); Adisasmito et al., 2022; Macenzie & Jeggo, 2019).

Two main effects dimensions come to evaluate the model’s outcome: “Quality of Life” and “Quality of Region”. In what follows, these are explained in more detail.

3.2 Effects on enhanced Quality of Life

The term “health tourism” describes any tourist trips that either serve to prevent physical, as well as mental illnesses (prevention) or have the regeneration and healing of body and mind as their goal (rehabilitation and therapy).

For many years now, demand in the field of health tourism has been clearly shifting away from the traditional spa stay towards nature-based and health-promoting tourism strongly characterized by the main activities of exercise and nutrition.

These “vacations with health benefits” offer multidimensional opportunities due to the natural uniqueness of the Alpine region within Europe, which meet both guests with the

desire to optimize their well-being and travelers with indication-specific health requirements.

The growing social importance of health tourism is reflected in the increasing appreciation of personal health. For many people, the desire to do something for health continuously grows, with patients no longer considered as passive users of healthcare providers but instead becoming active shapers of their own health.

Health is seen as a component of a conscious lifestyle, in that central topics of health maintenance such as nutrition, exercise and lifestyle for the prevention of diseases take on an increasingly important role in life and on vacation.

The healthcare market in the EU is of increasing importance for the overall development of national economies. The key economic indicators of the healthcare industry show above-average growth rates compared to the overall economy. Historically, health tourism in Europe was primarily determined by curative stays in spas and health resorts. The withdrawal of the social insurance carriers from state-financed cure-focused offers creates a more open market structure and a new orientation towards innovative and target group-specific forms of offers and distribution channels. The range of offers in health tourism is becoming larger and more specific, and the valorization of alpine assets through themes such as hiking, biking, mountain and nature experiences offer great potential for innovation. Nature-based and health-promoting Alpine tourism aims at optimally linking prevention, rehabilitation, and therapy with touristic structures of the Alpine region. This dialogue of tourism with medicine based on scientific evidence not only creates maximum “vacation success” and individual improvement of health and well-being but is also highly economically valuable due to its low cost-effectiveness threshold.

In the following, the Alp’s potential for improving health-related Quality of Life will be explained, based on three prototypical European traveler target groups: (1) the Generation 65plus; (2) children and adolescents, and (3) the working population:

The omnipresent demographic change influences the development of health tourism offers and the shift in age structures makes structural accessibility and basic medical therapeutic care at the vacation destination necessary.

Generation 65plus

Elderly people are the richest and the only growing population group in Europe. In the 21st century, seniors are fitter, more mobile and more energetic and take significantly more vacation trips than in past decades. Despite increasing age or illness, people do not want to miss out on vacations. Health tourism offers of secondary prevention and tertiary prevention therefore increase. The 65–85-year-olds deal more intensively with health topics than younger generations. Thus, older people are an attractive target group for a nature-based and health-promoting vacation in the Alps.

Not only best-agers can benefit from a health-promoting and nature-based vacation stay in the Alps: Driven by the exponential urbanization of Europe in the last hundred years, many more children and young people live in urban agglomerations that negatively affect the younger generation through changing lifestyles, screen-oriented low-power activities, and nature deprivation.

Children and Adolescents

A recent report from the World Health Organization indicates that the number of obese adolescents in many countries in Europe continues to rise and is a persistent health problem. One in three adolescents in Europe is overweight or obese with the Covid crisis leading to more screen time and reduced time for general exercise and sports. 4 out of 5 obese adolescents continue to suffer from weight problems as adults and are at higher risk for stigma, discrimination, and many chronic medical conditions. Obese and overweight children and adolescents are more likely to suffer from type 2 diabetes, asthma and sleep disorders, as well as musculoskeletal and cardiovascular diseases. They are more likely to be absent from school, more likely to have psychological problems, and often experience social isolation. Also, in relation to this young urban target group, the Alpine region has a variety of health-promoting specific factors of action, such as the movement in the three-dimensional space and the altitude of the Alps, as well as the rich and immune system-promoting microbiome of the alpine pastures and Alpine cultural landscapes. Both contrast with the urban living environment of children and adolescents and corresponding tourist and club offers can be considered as important building blocks in primary prevention during vacations.

The working population

As for the working population, city life is associated with a whole range of stressful living: noise, light pollution and crowding in combination with high levels of particulate matter promote stress and increase the risk of mortality. A whole range of diseases and conditions such as cardiovascular disease, metabolic syndrome, overweight, obesity, cancer,

infectious diseases, inflammatory bowel disease, bronchial asthma, cognitive performance, migraine/headaches, sexual function, and mental disorders are stress associated. Evidence-based health tourism offerings in the Alpine region that have been shown to reduce stress can effectively address the working population primarily affected by chronic stress, and quality of life and resilience can be achieved in the Alpine vacation format.

The core elements of a health tourism stay in the Alpine region are the improvement of health and well-being of the traveler. The guest should experience a noticeable and, in the optimal case, even measurable improvement of his mental and/or physical health status by taking advantage of a nature-based and health-promoting vacation. In this respect, the improvement of quality of life has become an important and accepted success criterion of health-related measures in medicine and psychology. Health-related quality of life is a subjective psychological construct that estimates health status from the perspective of the individual (Patient Reported Outcome).

Health-related Quality of Life (QoL) is a multidimensional construct consisting of physical psychological and social dimensions. Health describes only one aspect of the general quality of life and stands alongside influencing factors such as wealth, freedom, politics, education, culture, and religion.

In the health tourism context, however, the improvement of health-related QoL represents a central outcome parameter and measurable main effect. Health-related quality of life is derived from WHO's definition of health and includes physical health, psychological well-being, and social integration. Nature-based and health-promoting alpine vacations have a positive influence on all 3 entities, as recent research data from the Alpine region can show.

Measuring health-related QoL in a vacation context can be used to assess whether the health benefits of an Alpine health-promoting vacation are present for specific target groups and whether a guest's well-being and health have improved.

A great advantage in the use of health-related QoL as a measure of the health success of a vacation stay is that the measurement instruments measure health and well-being generically and across diseases. These generic quality-of-life measurement instruments, such as the SF-36 and its short form SF-12 or WHO-5, can be used in any health tourism context: whether the guest's health expectation is in the area of prevention and health maintenance or even in the rehabilitative or therapeutic area.

Unlike other instruments, this specific health-related QoL allows for cross-disease com-

parisons of health tourism interventions measurable (i.e., comparisons of interventions for different diseases or health desires). For simple and low-threshold - but medically and psychologically valid - use in Alpine health tourism, specific QoL tools such as the online intercultural Quality of Life Comic (iQoLC) have already been developed, validated and successfully used to measure personal health outcomes in nature-based and health-promoting vacation formats. As recent tourism surveys show, the measurable health success visualized to the guest before and after the vacation is one of the most relevant booking success factors in target group-specific alpine health tourism: In this regard, measurement tools such as the intercultural Quality of Life Comic should also be used intensively as a quality management tool for guest loyalty and health communication.

The rich resource bundle of the alpine region also enables indication-specific health tourism offers and services, for example waterfalls against allergy and asthma or mountain hiking and therapeutic bathing against chronic back pain. Not only for the two mentioned examples of highly widespread civilization diseases but for almost every disease or health desire in the physical and mental area there are specific instruments of QoL measurement which can be used parallel to generic measurement instruments as a quality management measure in medical tourism offers.

An immense advantage of using quality-of-life measurement tools in Alpine health tourism is to compare low-threshold and simple health interventions in terms of improving health and well-being with classic rehabilitative and therapeutic formats of government primary care. This enormously important health-economic component of Alpine health tourism has so far only been selectively elaborated and shows, with regard to allergic asthma, a clear cost advantage of a nature-based therapeutic vacation stay at the Krimml Waterfalls compared to standard classical asthma therapy. Further studies should follow and open up an economic and health economic dimension of alpine health tourism.

3.3 Effects on improved Quality of Region

The individual Quality of Life is shaped by numerous factors that depend both on the individual and the environment, and, naturally, their interaction. Thus, major parts of both physical and mental health are the result of a complex interaction of a person's behavior and the conditions under which s/he lives. These conditions are determined, among other things, by geographic location, cultural context, economic situation, and politics. This applies primarily to the inhabitants of a region but can also be transferred to visitors.

These gather experiences during their touristic stay and later adopt them to their own living environment. Following the concept of sustainability, these framework conditions can be summarized by the three dimensions socio-culture, ecology, and economy, whereby these three dimensions must always be considered as being mutually interdependent (Mensah, 2019).

Depending on the specific components of this interaction structure, the individual has varying degrees of influence, which can be of both a direct and indirect nature. For example, social interaction with other people can be seen as a factor that can be influenced directly, whereas the available natural resources or the general economic situation are factors that can be influenced more indirectly.

These considerations show that the individual Quality of Life must always be considered in the context of several factors that also go beyond the individual self. This context is given above all by the conditions in the living space of the individual, thus it can be spatially delimited (Staats, 2022).

To be able to capture the positive effects of nature-based and health-promoting tourism beyond individual health effects, the Quality of Region dimension should be considered in addition to the Quality-of-Life dimension. Because positive effects of nature-based health offers can also have an impact on the Quality of Regions themselves and thus lead, for example, to healthier social, ecological, and economic conditions. These regional effects should therefore also be recorded in the context of the development and implementation of nature-based and health-promoting offers.

The spatial delimitation of a specific region can be done in different ways. In general, a region is a spatial unit that can be delimited from other regions or higher-level areas according to certain criteria. Regions can be based on different factors: historical, cultural, social, natural, economic, legal, political, or administrative decisions. The delimitation of a region can therefore result from a single characteristic of natural features (e.g., geology, climate, fauna), anthropological factors (e.g., language, culture, economy) or, alternatively, political-administrative units (e.g., states, provinces, Interreg program areas). On the other hand, regions can also be defined by the integration of several of these factors, hence represent a set of different characteristics (e.g., Alpine region, Ruhr area, Europe) (Bätzing, 2001).

In the context of alpine health tourism, spatial delimitation in the form of individual destinations, meaning individual places such as Krimml in Austria, Vichy in France, or Murska

Sobota in Slovenia, appears to be purposeful. This is particularly due to the manifold characteristics of such areas and the increase in potential influencing factors associated with the size of the region, larger regions, e.g., higher-level tourist units such as Bavaria (Germany) or Piedmont (Italy), are less suitable. Here, the exact determination of the effects of nature-based and health-promoting offers due to the higher number of influencing factors and potential synergy effects is, however, more difficult.

However, accurately measuring the effects of nature-based and health-promoting offerings in a region is not easy. Tourism as a regional development factor is rather under-represented in the theoretical frameworks to date. This is because its influence is underestimated or because the manufacturing industry, service industries or topics of urban development come to the fore.

As a result, tourism is mainly studied empirically in the literature or simply described as a regional development factor without providing a concrete theoretical framework for its regional implementation (Calero & Turner, 2020). Looking at the nature of regional tourism development in detail, it becomes apparent that this lack of a framework may also be caused by the fact that it is extremely difficult to cover the manifold (spatial) differences between individual regions. Thus, there are plainly too many small-scale variables for tourism to be squeezed into a rigid regional development framework.

3.4 Integration of SDGs

One approach to addressing this challenge is to take an overarching approach that integrates all aspects of action, the concept of sustainability. Here, there are already some concrete approaches for implementation that make the regional impacts of tourism recordable and assessable and thus provide a good orientation framework for regional stakeholder (Smetana et al., 2015). The basic ideas of these approaches can also be transferred to nature-based health tourism. Thus, different indicators can be collected at the regional level for the three dimensions of sustainability – socio-culture, ecology, and economy. This will later allow drawing the full picture when aiming to assess regional levels of sustainability alongside these dimensions in a comparative way.

The most widely used approach for the measurement of sustainability is a set of indicators (GRI Standards) developed by the Global Reporting Initiative to assess the sustainability performance of organizations of various types (e.g., companies, NGOs, associations), whereby these standards for assessing sustainability are primarily used by business en-

terprises (GRI 2022). The set of indicators currently consists of 38 overarching categories (e.g., emissions, supplier social assessment, public policy) and a total of more than 120 individual indicators but is being continuously developed to create more and more transparency (GRI, 2022). This type of assessment is particularly suitable for all companies in the region that are directly or indirectly involved in nature-based and health-promoting offerings. In this way, at least part of the effects can be recorded and made measurable. In principle, however, the use of this approach can also be transferred to other areas or organizations in a region.

In addition, there are also approaches that specifically consider success factors for sustainable regional development (of rural regions). Examples for this in the Central European context are, among others, the work of Margarian (2016) as well as the Success Factor Model of Probst and Tokarski (2019) which identifies, for example, common goals and strategies for the development of the region, the commitment to cooperation or inputs and impulses from external parties as potential success factors. On the one hand, the success factor model offers a good extension of the sustainability approach described above, but on the other hand, it also makes clear that each region needs individual development goals and correspondingly specific actions, and thus different development paths can result or make sense for each region (Bätzing, 2015; Probst & Tokarski, 2019).

Margarian (2016) also states that some important factors of regional development are either not generalizable or cannot be directly influenced (e.g., individuals as drivers, networks). An enabling administration can be seen as a possible solution, which has free resources and the necessary management skills to clarify the appropriate development path for the region as well as the relevant indicators – together with all stakeholders – and to intervene in a coordinating way, without claiming to steer economic developments (Margarian, 2016).

Due to the complexity of the assessment, which is caused partly by different systems and approaches, but mainly by the regional specifics, an independent regional coordinating body or habitat management is highly recommended. The main aim is to actively address the regional development through nature-based and health promoting offers, to initiate innovations in a targeted manner and to measure and assess the activities. In this way, the development paths worked out together with all stakeholders in the region could be taken up and coordinated taking into account the overarching SDGs (UN, 2022) and the regional success factors (Probst and Tokarski, 2019) or, more specifically, with the help of prioritizing GRI indicators that are also well suited at the regional level (e.g., on Biodiver-

sity, Environmental Compliance, Local Communities, Diversity and Equal Opportunities). Finally, all sustainable activities for the entire region could be compiled and analyzed in comparison with other regions or over time and used for further development.

The fact that this is a medium- to long-term process should definitely be taken into account when initiating and implementing such a project. And, following the Alpine Health Tourism Effects Model, the three health dimensions of prevention, rehabilitation and therapy can in principle also be applied to regional development. Based on an analysis of the current situation, actions can be defined that either address future challenges in a preventive way or rehabilitate or treat undesirable developments of the past.

In line with the SDGs, the following regional impacts, for example, could be targeted through nature-based and health-promoting offerings (Bischof, 2022).

SDG 3

Ensure healthy lives and promote well-being for all at all ages:

- Creation of new, nature-based health offers that, in addition to classic vacation motives such as recreation or adventure, also offer socially relevant added value in the form of health (prevention, therapy, rehabilitation) for guests and locals alike.
- Creation of health-oriented innovations through a new perspective on the topics of health and vacation. Health moves to the center, nature experience and outdoor activities receive a new, concrete value through measurable health effects.

SDG 8

Promote sustained, inclusive, and sustainable economic growth, full and productive employment and decent work for all:

- Creation of new or protection of existing jobs in the cross-sectional field of tourism and health and, associated with this, an increase of the attractiveness as a place to live and work for the regions.
- Expansion of existing or creation of new, regionally anchored value chains in the field of health.
- Increasing the quality of the offer as well as further differentiation of the offer through innovative approaches in the field of health.

SDG 15

Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss:

- Raising awareness of the value of nature by creating a new value for natural resources that can be measured both individually and economically through nature-based and health-promoting offerings.
- Creation of steering instruments for visitor guidance in the natural area by embedding nature use/activities in fixed value chains.

Overall, several levels of regional development can be addressed on the basis of natural resources and added value can also be created at several levels.



4 The Nature-based Health Tourism Development Path

Building an effective nature-based Health Tourism Development Path is not an easy task. For this purpose, HEALPS2 developed, among other things, a “Nature-based Health Tourism Development Path” (NBHTDP) toolkit, that is a collaborative, end-to-end product development tool for key stakeholders (e.g., regional tourism destination managers) which plan to embark on building up nature-based health tourism offers in their region. This toolkit covers numerous activities on multiple levels and uses for this purpose e.g., explanatory videos, presentations, MIRO board content, further links, scientific and non-scientific texts, short tips, the support tools developed within the framework of HEALPS2 as well as specially created workshop concepts including the necessary materials. Therefore, from the user perspective, it makes sense to first create a general overview of all process steps.

Generally, the key purpose of The Path serves as a knowledge and visibility toolkit throughout every phase of the nature-based health tourism development project, so that regional managers can make better decisions regarding nature-based health tourism solutions. Methodically, it follows a procedural logic and guides the applicant through a multi-step development design process, whereby managers are led by guiding questions and further advice in how effectively develop a path according to their needs and preferences.

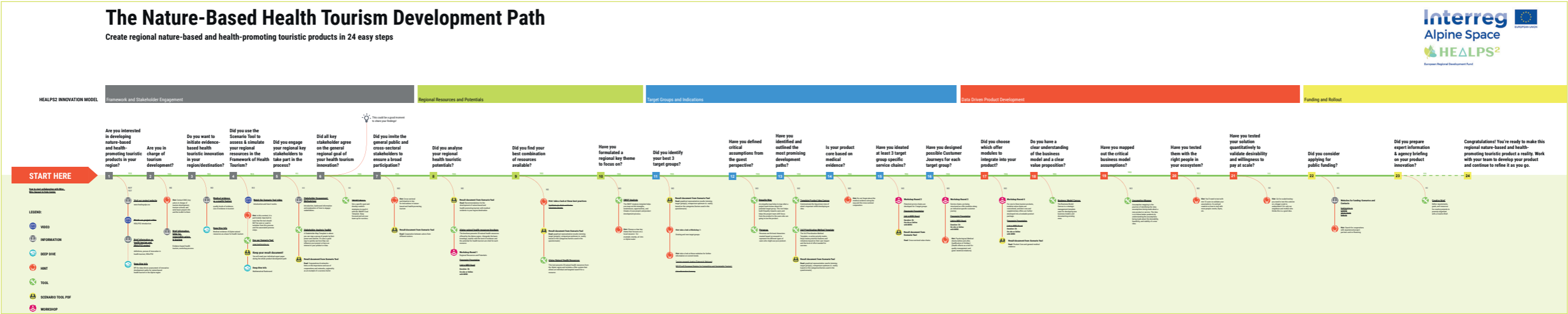
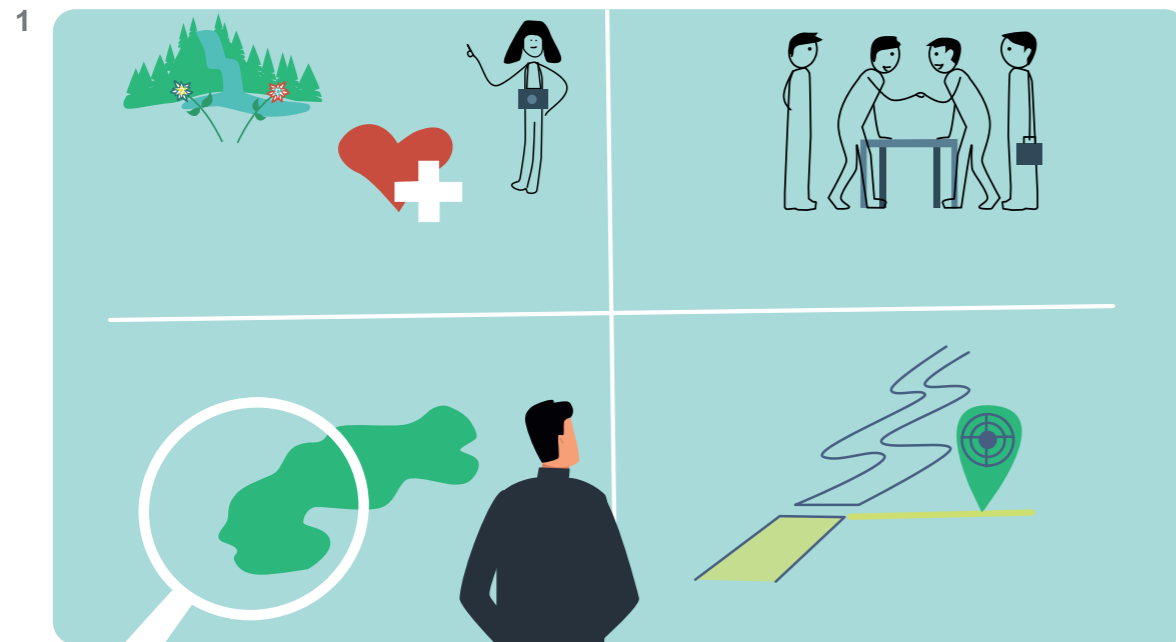


Fig. 2: The Nature-based Health Tourism Development Path (Source: The authors)

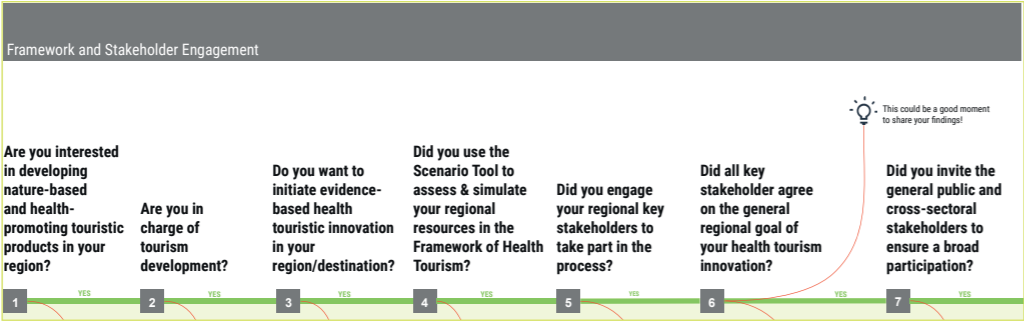
4.1 Key process elements and steps

Conceptualized within the HEALPS2 project, the Development Path consists of five main “activity categories” that build on each other and can either be run through sequentially or, depending on a region’s development stage, be started at other entry points within the Path. The five main activity categories (as indicated in different colors in Fig. 2 above) are:

- 1 Framework and Stakeholder Engagement
- 2 Regional Resources and Potentials
- 3 Target Groups and Indications
- 4 Data Driven Product Development
- 5 Funding and Rollout



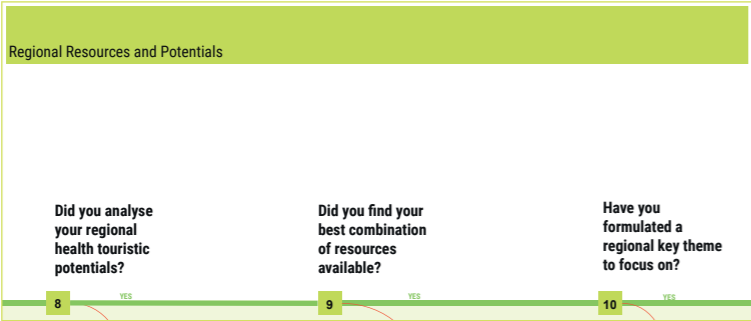
The guiding questions of the five main steps are presented in more detail below. Details on methods used is offered on www.healing-alps.eu.



Step 1: Framework and Stakeholder Engagement

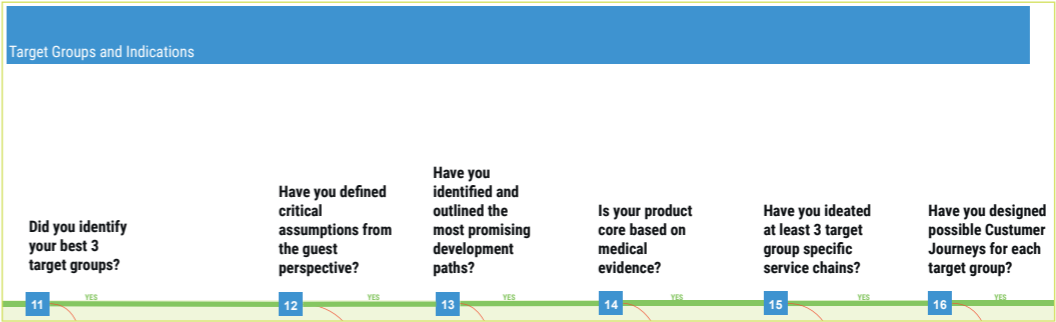
The process starts with Path applicants queried about the extent the which they have already acquired knowledge about nature-based and health-promoting tourism in their region and, basically, what goals they would wish to pursue when embarking on a development in this field.

Accordingly, this process is assisted by medical evidence for nature-based interventions which would help their decision-making. Further, stakeholder engagement methodology and stakeholder analysis are provided to assist this part of the process, accompanied by knowledge built upon the HEALPS2 Scenario Tool (to be explained in more detail below).



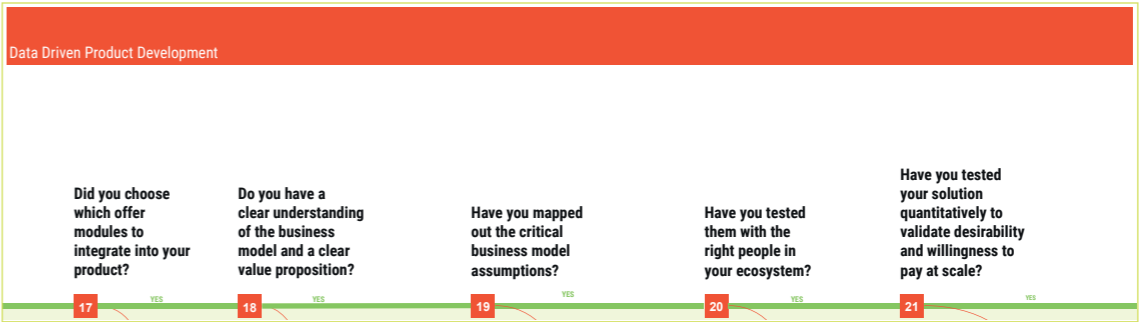
Step 2: Regional Resources and Potential Analysis

In step 2, the potential analysis of the region is being conducted. Here, workshop tools and a SWOT analysis is to inform about regional key themes and potentials.



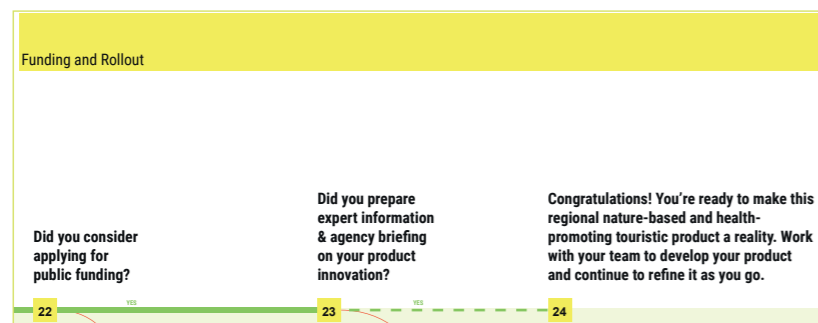
Step 3: Target Group Analysis and Indications

In step 3, representative target groups are identified in a stakeholder workshop, again using the results of the Scenario Tool, focusing more particularly on individual travelers' health motives. Next, the socio-demographic structure as well as expectations of the potential guests are examined. The target group's attractiveness level are then judged correspondingly. Then, possible cross-sectoral value chains and potential customer journeys are developed for priority target groups. Suitable workshop templates are again provided for both process steps.



Step 4: Data-Driven Product Development

In step 4, potential nature-based health tourism market solutions are then valorized by data-driven tool which are further discussed in value chain workshops. Following this, results are used to develop and analyze a suitable business model. Finally, the developed offerings are tested both qualitatively and quantitatively by means of data collected from end-users/travelers on their behavioral preferences and WTP.



Step 5: Funding and Rollout

In step 5, different funding opportunities are shown, and rollout plans shaped that are suitable for this sector of regional development.

4.2 HEALPS2 Scenario Tool as data-based background app

As mentioned above, the Scenario Tool developed as part of HEALPS2 is used to support this development process. This digital tool and its results, calculated individually for a region, can support the development process at various points.

The Scenario Tool is based on the idea of using current scientific knowledge about the health effects of natural resources (evidence) as the main target parameters for the development of appropriate health offers. While there is still a great need for research on this type of evidence, but for some indications there is sufficient good evidence to develop high-quality tourism services. Currently, the following seven indications are part of the Scenario Tool:

- 1 Allergies
- 2 Overweight
- 3 Lack of Fitness
- 4 Back pain
- 5 Respiratory diseases
- 6 Cardiovascular diseases
- 7 Stress and Burnout

Based on these indications, the Development paths best suited to the region in terms of nature-based and health-promoting tourism (regional potential) are output as the result of the Scenario Tool. In order to be able to calculate this potential of a region, the Scenario

Tool uses a set of indicators to evaluate and analyze the current state of a region in a data-driven and evidence-based way.

For this purpose, a semantic reasoning mechanism was computed. This represents a knowledge database (ontology), where real data from a region are analyzed using a pre-defined logic, which in turn is based on the current knowledge of the evidence of natural resources and on selected success factors of regional development.

The indicators can be divided into five categories, whereby two categories play a central role in the analysis. These are natural resources on the one hand and health-oriented services (economic resources) on the other. In addition, the Scenario Tool also processes basic tourism key figures, information on regional characteristics, the image and tourist attractions as well as on cooperations and networks within the region. The medical evidence finds its way into the digital tool via the assignment to the natural resources as well as to the health-oriented services. In addition to this supply-side analysis, the Scenario Tool also considers information on the needs and expectations of the demand side, namely the guest perspective. This is done through a continuous guest survey in the Alpine region, which results form the basis for concrete recommendations for the creation of offers for the most suitable target groups of a region. These data are updated annually within the Scenario Tool.

However, the implementation of the shown possibilities should not only be up to the actors in the regions, but also to the policy, which should further improve and develop the framework conditions in the field of nature-based health tourism. An own analysis of the current EU funding programs on regional (micro-level policy practices), cross-border (meso-level) and transnational level (macro-level) shows in which areas which steps are necessary to further improve the framework conditions for nature-based health tourism, especially in the Alpine region.

5 Actionable Strategies and Policy Recommendations

An undisputed strength of the Alps is their unique natural and cultivated landscapes – waterfalls, dense forests, pure mountain air, meadows full of flowers and herbs, and much more besides. Promoting the beauty of these is a strategy – while recognizing their healing power and thus developing health tourism offers is a successful strategy.

With its unique mountain world, diverse climate, outstanding biodiversity and cultural heritage, the Alpine region offers numerous opportunities for empowering and enabling people to make life choices that benefit their health.

Overall, the following conclusions can be drawn:

Firstly, there is a myriad of challenges to up-scaling and out-scaling of health-promoting tourism solutions in practice. The analysis has looked to some of the most important challenges it is facing regarding maintaining an effective aggregate transnational policy universe that keeps up to its promise of promoting a sustainable tourism ecosystem within the Alpine Space. Although there is a growing body of research in EU tourism policy, critical analyses into the structures, processes, efficacies and controversies of tourism policy formulation, implementation and practice are sparse. This report tried to address this void.

Certainly, this is a daunting task given the changing nature of current environmental challenges on the tourism industry at large. Nonetheless, research on these challenges and how they affect the efficacy of policy instruments applied has become ever more important should the “European project” survive its institutional crisis and overcome the general atmosphere of disillusionment on many levels.

Critically, on the level of principles, interventionist schemes of EU tourism policy are under pressure as government protection and support is a controversial means to regulate markets and seem to have in-built biases towards failure. Indeed, a combination of complexity, uncertainty and volatility is characteristic and explains a lot of what is unique about today’s tourism practice and therefore why policy is distinctively challenging.

In fact, international policymakers have lately been successful in embedding sustainability into policies to address climate change and biodiversity loss and the EU has invested con-

siderable resources in largescale demonstrations of the benefits of nature-based market economies across Europe. In the interim, the climate and biodiversity crisis won’t wait.

Therefore, secondly, we advocate for sustained public sector investment in nature-based health tourism in the short term, accompanied by longer term transformative change measures in systems and processes to instigate the necessary shift towards a nature-based economy at large. Investment in health-promoting tourism should be accompanied by measures to ensure such investment leads to direct economic benefits in terms of increased innovation, enterprise and job creation in the private sector supplying sustainable tourism. Policy support programmes shall further be inspired by gaining insights on “actionable knowledge” from health tourism practice. This enhances “implementable validity” and “instrumental impact” by discussing critical challenges enterprises face in the process determining most effective paths of organizational innovation. We also wish to promote further research efforts on the health effects of nature-based health tourism products and services and help disseminate the research findings.

Thirdly, we propose lowering entry barriers of accessing funding opportunities at all levels of nature-based health tourism. In our view, this is necessary and shall help stimulating the establishment of networks of expertise on issues of health tourism in the Alps. Knowingly, these networks encompass a wide range of people which would all contribute to a better dissemination of knowledge across the board: local and regional administrations that have a legal competence for spatial planning and territorial development, chambers of commerce, industry or agriculture, labor market agencies, trade unions, employers’ associations, private and public transport organizations, universities and education institutions, agencies for tourism promotion, institutions managing natural resources and environmental organizations, cultural organizations at regional and local level, small businesses, SMEs, and more. The targeted funding of regional coordinating bodies that manage the selected regional development paths in the form of a mediator for the various stakeholders, considering the three dimensions of sustainability, can also represent an important step forward in funding. Finally, more information for the Alpine regions themselves on how to use these EU programs for an innovative development of health tourism should be part of the future politics.

Ultimately, arguments for and against public intervention into health tourism markets need to be based on resolving conflicting issues about the effects of political measures that promote it. This means that public policy activity on the tourism market must first be evaluated based on the extent to which the measures are suitable for strengthening eco-

nomically disadvantaged actors for competition, preventing concentration processes that restrict competition, and booting economic opportunity in markets which lack financial resources.

In fact, it is necessary to examine whether public policy intervention contributes to ensuring market diversity while promoting ecological standards and meeting SDGs (particularly SDG3 to focus on health and wellbeing) while supporting health tourism activities.

Certainly, effective governance plans through means of direct subsidies for supporting a whole industry will first have to identify the big picture when aiming to resolve problems of an ailing or otherwise to be supported post-COVID tourism industry, all the way from setting clear and realistic objectives to measuring the effects of subsidy-impacted industry performance and output. This is not an easy task, as SDGs greatly challenge touristic performance as measured by appropriate value frameworks. As a corollary, this implies this requires the establishment of a strategic policy, budget, and monitoring/controlling framework for effective health-promoting tourism investments in the Alpine Space.

In all, actions in favor of nature-based health tourism are not just about achieving better health outcomes for tourists. Instead, the governance rationale, design, measures and instruments, procedures, and ensuing impacts shall benefit the whole health tourism ecosystem and all its players involved. Only this integrative approach will improve the accountability of policymakers for health impacts at all levels of policymaking. It includes an emphasis on the consequences of public policies on health systems, determinants of health, and social well-being at large. It also contributes to sustainable development and the implementation of new strategies and practices for further strengthening Health-in-all Policies (HiAP) in the EU. Based on this rationale, we suggest a range of further concrete actions required to improve alignment across EC policies in support of nature-based health tourism market stimulation.

Certainly, effective governance plans through means of direct subsidies for supporting a whole industry will first have to identify the big picture when aiming to resolve problems of an ailing or otherwise to be supported post-COVID tourism industry, all the way from setting clear and realistic objectives to measuring the effects of subsidy-impacted industry performance and output. This is not an easy task, as SDGs greatly challenge touristic performance as measured by appropriate value frameworks. As a corollary, this implies this requires the establishment of a strategic policy, budget, and monitoring/controlling framework for effective health-promoting tourism investments in the Alpine Space.

Policies to stimulate demand and uptake of nature-based health-based tourism offerings in the Alpine Space are currently emerging. As it stands, to offer nature-based health products and services would perfectly complement a preventive public health system. Policymakers are thus advised to include more substantive measures to instigate transformative change towards sustainable tourism. All these now need to be addressed quickly, should the many systemic challenges in the tourism industry in the region be properly met.

- EUSALP, the EU Strategy for the Alpine Region, takes the uniqueness of the Alpine region as a key starting point.
- The Alpine area is composed of territories with contrasted demographic, social and economic trends, and a great cultural and linguistic diversity. This diversity goes along with a great variety of governance systems and traditions. Both the common specificities of the Alpine area and its variety and diversity call for cooperation. An Alpine macro-regional strategy would provide an opportunity to improve cooperation in the Alpine States as well as identifying common goals and implementing them more effectively through transnational collaboration.
- EUSALP constitutes a strategic agenda that should guide relevant policy instruments at EU, national and regional level, by closely aligning and mutually reinforcing them.
- However, albeit its huge potential, the Alpine Space is currently facing major challenges.
- To confront these challenges, EUSALP has been launched in 2015 and provides an opportunity to improve cross-border cooperation among and between seven European countries: Austria, France, Germany, Italy, Liechtenstein, Slovenia, and Switzerland.
- EUSALP identifies common goals and effectively implements them through transnational collaboration. Better cooperation between the regions and countries is, however, needed to tackle those challenges.
- The EUSALP strategy is realized by the above-mentioned seven countries and their 48 regions. Main priority areas of EUSALP are (1) economic growth and innovation, (2) mobility and connectivity, and (3) environment and energy. Nine Action Groups (AGs) work on the implementation of these priority areas.

The nine Action Groups of EUSALP started their work in 2016. Up until 2020, they have elaborated 14 strategic implementation initiatives and numerous other concrete activities. Action Group 2 aims both at identifying key Alpine economic sectors which would benefit from action at macro-regional level and implementing concrete measures to improve

their economic and social environment. The added value comprises a better use of Alpine specific resources and potentials in the identified strategic sectors, focusing on the improvement of framework conditions and opportunities for SMEs.

EUSALP has the ambition to make a substantial contribution to the European Green Deal through promoting an “Alpine Green Deal”. An important element in this respect is the inauguration of the “Innovation Hub for Green Business Models”.

This Hub has identified the following list of key issues: Circular economy, bioeconomy, innovation platforms for industrial development, innovation for green infrastructure-based business models (hydrogen), cluster-building for green innovation, innovative Alpine value-chains, and new skills for green jobs.

Hence, the key focus of EUSALP’s Action Group 2 is on the following topics, which are transversal and interrelated. Action Group 2 shall:

- Accelerate the transition of Alpine tourism towards an ecological and all-season model, by supporting its actors and encouraging them to cooperate at both local and European levels
- Promote sustainable agriculture, pastoralism, and mountain forestry
- Support the SMEs transition for competitive and resilient value chains
- Unleash the potential of the data economy to reach the Alpine and EU strategic objectives

The Action Plan on Alpine Health Tourism is not only a central output of the Alpine Space Project HEALPS2 but will also be a central working document for supporting the achievement of the goals of tourism transformation in the Alpine region. It will also integrate the core issues of climate change, mobility, and the enhancement of natural and cultural heritage. This shall safeguard year-round jobs in Alpine tourism.

Moreover, it promotes action for the implementation of innovative (publicly) funded projects in the context of the further development of sustainable tourism in the Alps.



References

- Bätzing**, W., 2015. Die Alpen: Geschichte und Zukunft einer europäischen Kulturlandschaft, 4., völlig überarbeitete und erweiterte Auflage. ed. Verlag C.H. Beck, München.
- Bätzing**, W., 2001. Zum Begriff und zur Konzeptuion von "Region" aus Sicht der Geographie, in: Sturm, R. (Ed.), Die Region in Europa Verstehen - Konzepte Und Ideen in Der Wissenschaftlichen Debatte. pp. 33–38.
- Bischof**, M. & Hartl, A., 2022. KPI for data-driven assessment and benchmarking of potential development paths for nature-based health tourism in the Alpine region. In D. Spoladore, E. Pessot, & M. Sacco (eds.), Digital and Strategic Innovation for Alpine Health Tourism Natural Resources, Digital Tools and Innovation Practices from HEALPS 2 Project. Switzerland: Springer Cham:
- Boschetto Doorly**, V., 2020. Megatrends Defining the Future of Tourism: A Journey Within the Journey in 12 Universal Truths, Anticipation Science. Springer International Publishing, Cham. <https://doi.org/10.1007/978-3-030-48626-6>
- Calero**, C., Turner, L.W., 2020. Regional economic development and tourism: A literature review to highlight future directions for regional tourism research. *Tourism Economics* 26, 3–26. <https://doi.org/10.1177/1354816619881244>
- Freidl**, J., Huber, D., Braunschmid, H., Romodow, C., Pichler, C., Weisböck-Erdheim, R., Mayr, M., Hartl, A., 2020. Winter Exercise and Speleotherapy for Allergy and Asthma: A Randomized Controlled Clinical Trial. *J Clin Med* 9. <https://doi.org/10/ghg8hq>
- Gaisberger**, M., Šanović, R., Dobias, H., Kolarž, P., Moder, A., Thalhamer, J., Selimović, A., Huttegger, I., Ritter, M., Hartl, A., 2012. Effects of ionized waterfall aerosol on pediatric allergic asthma. *J Asthma* 49, 830–838. <https://doi.org/10/gc3khp>
- Gowreesunkar**, V., & Maingi, S., 2022. Management of Tourism Ecosystem Services in a Post Pandemic Context. *Global Perspectives*. New York: Routledge.
- GRI** – Global Reporting Initiative, 2022. GRI Standards [WWW Document]. GRI. URL <https://www.globalreporting.org> (accessed 3.10.22).
- Grafetstätter**, C., Gaisberger, M., Prossegger, J., Ritter, M., Kolarž, P., Pichler, C., Thalhamer, J., Hartl, A., 2017. Does waterfall aerosol influence mucosal immunity and chronic stress? A randomized controlled clinical trial. *J Physiol Anthropol* 36, 10. <https://doi.org/10/gc5vqp>
- Huber**, D., Grafetstätter, C., Prossegger, J., Pichler, C., Wöll, E., Fischer, M., Dürl, M., Geiersperger, K., Höcketstaller, M., Frischhut, S., Ritter, M., Hartl, A., 2018. Green exercise and Mg-Ca-SO₄ thermal balneotherapy for the treatment of non-specific chronic low back pain: a randomized controlled clinical trial. *International Journal of Environmental Research and Public Health* (in press).
- Huber**, D., Mayr, M., Hartl, A., Sittenthaler, S., Traut-Mattausch, E., Weisböck-Erdheim, R., Freidl, J., 2022. Sustainability of Hiking in Combination with Coaching in Cardiorespiratory Fitness and Quality of Life. *International Journal of Environmental Research and Public Health* 19, 3848. <https://doi.org/10.3390/ijerph19073848>
- Mackenzie**, J.S. Jeggo, M., 2019. The One Health Approach-Why Is It So Important? *Trop Med Infect Dis*. 2019 May 31;4(2):88. doi: 10.3390/tropicalmed4020088. PMID: 31159338; PMCID: PMC6630404.
- Margarian**, A., 2016. Grenzen der Gestaltbarkeit: Gibt es Erfolgsfaktoren der regionalen Wirtschaftsentwicklung? In: J. Lange (Ed.), Erfolgsfaktoren der Regionalentwicklung jenseits der großen Städte. pp. 19–35.
- Mensah**, J., 2019. Sustainable development: Meaning, history, principles, pillars, and implications for human action: Literature review. *Cogent Social Sciences* 5, 1653531. <https://doi.org/10.1080/23311886.2019.1653531>
- Niedermeier**, M., Grafetstätter, C., Hartl, A., Kopp, M., 2017. A Randomized Crossover Trial on Acute Stress-Related Physiological Responses to Mountain Hiking. *Int J Environ Res Public Health* 14. <https://doi.org/10/gbv8kt>
- One Health High-Level Expert Panel (OHHLEP)**, Adisasmito, W.B., Almuhairi, S., Behraves, C. B. Bilivogui, P, Bukachi, S.A., et al., 2022. One Health: A new definition for a sustainable and healthy future. *PLoS Pathog* 18(6): e1010537. <https://doi.org/10.1371/journal.ppat.1010537>
- Palazzo**, M., Gigauri, I., Panait, M.C., Apostu, S. A., Siano, A., 2022. Sustainable Tourism Issues in European Countries during the Global Pandemic Crisis. *Sustainability*, 14, 3844. <https://doi.org/10.3390/su14073844>
- Pichler**, C., Hartl, A., Weisböck-Erdheim, R., Bischof, M. 2022. Medical evidence of Alpine natural resources as a base for health tourism. In D. Spoladore, E. Pessot, M. Sacco (eds.), Digital and Strategic Innovation for Alpine Health Tourism Natural Resources, Digital Tools and Innovation Practices from HEALPS 2 Project. Switzerland: Springer Cham:
- Probst**, T., Tokarski, K.O., 2019. Erfolgsfaktoren für die nachhaltige Entwicklung von Regionen im ländlichen Raum: Erkenntnisse aus etablierten Regionen in der Schweiz, Österreich und Deutschland, in: Tokarski, K.O., Schellinger, J., Berchtold, P. (Eds.), Nachhaltige Unternehmensführung. Springer Fachmedien Wiesbaden, Wiesbaden, pp. 443–461. https://doi.org/10.1007/978-3-658-22101-0_18

Prosegger, J., Huber, D., Grafetstätter, C., Pichler, C., Braunschmid, H., Weisböck-Erdheim, R., Hartl, A., 2019. Winter Exercise Reduces Allergic Airway Inflammation: A Randomized Controlled Study. *Int J Environ Res Public Health* 16. <https://doi.org/10.3390/ijerph16112040>

Smetana, S., Tamásy, C., Mathys, A., Heinz, V., 2015. Sustainability and regions: sustainability assessment in regional perspective: Sustainability and regions. *Regional Science Policy & Practice* 7, 163–186. <https://doi.org/10.1111/rsp3.12068>

Staats, M. (Ed.), 2022. *Lebensqualität: ein Metathema*, 1. Auflage. ed. Beltz Juventa, Weinheim Basel.

United Nations (UN), 2022. Sustainable Development Goals [WWW Document]. URL <https://sdgs.un.org/goals#goals>

World Tourism Organization (UNWTO), 2022. Global and regional tourism performance [WWW Document]. UNWTO Tourism Dashboard. URL <https://www.unwto.org/tourism-data/global-and-regional-tourism-performance> (accessed 3.10.22).

World Tourism Organization (UNWTO), European Travel Commission (ETC) (Eds.), 2018. *Exploring Health Tourism – Executive Summary*. World Tourism Organization (UNWTO). <https://doi.org/10.18111/9789284420308>

World Travel and Tourism Council (WTTC), 2022. Economic Impact Reports [WWW Document]. URL <https://wttc.org/research/economic-impact#:~:text=WTTC's%20latest%20annual%20research%20shows,the%20global%20economy%20in%202020>. (accessed 3.10.22).

Zukunftsinstitut, 2022. Megatrend Gesundheit. <https://www.zukunftsinstitut.de/dossier/megatrend-gesundheit/> (accessed 3.9.22).



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