

# Sustainable Hospitals: A Socio-Ecological Approach

*We connect two important societal concerns that are rarely addressed in combination: sustainable development and health promotion. Hospitals as central health care providers can minimize their negative side effects and improve health gain by applying a socio-ecological sustainability concept that focuses on health care – hospitals' core business – and is linked to quality management.*

Ulli Weisz, Willi Haas,  
Jürgen M. Pelikan, Hermann Schmied

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### Abstract

Although sustainable development is closely interrelated with health and health promotion, in health care systems these themes are hardly ever discussed and even more rarely implemented in combination. We see opportunities for sustainable development and health promotion, particularly in hospitals, since they play a central role in health care systems. Furthermore, hospitals have significant and growing economic, social, and environmental impacts, which in turn cause adverse effects upon health. In a transdisciplinary project involving scientists and health care practitioners we examined how sustainability can be conceptualized for hospitals in line with both a socio-ecological understanding of sustainable development and with "hospitals' reality". Our approach aims at avoiding unintended long-term and side effects of health care – hospitals' core business – by expanding quality criteria for decision making to include sustainability and health gain improvement. An example demonstrates that a hospital can thereby improve its future viability and contribute to global sustainability.

### Keywords

green hospitals, health care systems, health promoting hospitals, quality criteria, sustainable development, sustainable management

Through ecological building design, improved energy efficiency, ecological purchasing, or environmental management systems, hospitals endeavour to reduce their impact on the environment. Yet ecological criteria are still neglected when it comes to hospitals' core business: health care. Any effort made for patients' health is seen as justified, and the prevailing opinion still treats environmental protection as peripheral. At the same time, the growing health sector with its energy- and material-intensive forms of therapy contributes to environmental pollution (SDC 2008) and thereby to an intensification of environmental crises such as global warming. These crises in turn have adverse effects on health. Therefore, we put forward a sustainability concept that allows for the core business of hospitals to be observed, evaluated, and optimised by integrating quality criteria that include ecological aspects.

## Why Are Hospitals Important for Sustainable Development?

### Sustainable Development and Health Are Interdependent

*Healthy life is an outcome of sustainable development, as well as a powerful and undervalued means of achieving it. We need to see health both as a precious asset in itself, and as a means of stimulating economic growth and reducing poverty. Gro Harlem Brundtland, WHO Director General (Brundtland 2002)*

Sustainable development is a process that should ensure the future viability of our societies. It has been recognised that quality >

Contact: Mag. Ulli Weisz | Tel.: +43 1 5224000413 |  
E-Mail: ulli.weisz@aau.at

DI Willi Haas | E-Mail: willi.haas@aau.at

both: Alpen-Adria University Klagenfurt, Vienna, Graz | Institute of  
Social Ecology Vienna | Schottenfeldgasse 29 | 1070 Vienna | Austria  
Univ. Prof. Dr. Jürgen Pelikan | E-Mail: juergen.pelikan@lbihpr.lbg.ac.at

Hermann Schmied | E-Mail: hermann.schmied@lbihpr.lbg.ac.at

both: Ludwig Boltzmann Institute Health Promotion Research | Vienna |  
Austria

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of life is an important target dimension of sustainable development. Health has central importance as both a result and a precondition: on the one hand, sustainable development supports and promotes health; on the other, sustainable development is not possible in the absence of health.

Health has been presented as closely associated with sustainable development in all politically significant documents since the sustainability debate first began. Gro Harlem Brundtland summarises the *Brundtland Report* (WCED 1987) by stating that “ultimately the whole report is about health” (Brundtland 1989, p. 52). From the *Rio Declaration* (Quarrie 1992) through to the EU’s *Sustainability Strategy* (European Council 2006), health is judged to be an important prerequisite for sustainable development. This connection is also present in the debate about health. Health promotion documents show striking analogies (see box), both in terms of substance and chronological development (Pelikan et al. 2010, Weisz et al. 2009, Dooris 1999). For instance, in the *Ottawa Charter* (WHO 1986) “peace, shelter, education, food, income, a stable ecosystem, sustainable resources, social justice, and equity” are named as “fundamental conditions and resources for health” (WHO 1986, p. 1). This formulation touches on the three dimensions – social, economic, and ecological – of sustainable development.

## *A socio-ecological sustainability concept moves environmental and social issues into the core business of hospitals, i. e., into decisions on health care and health promotion.*

Since the 1990s, the consideration of health in the wider context of sustainable development has been regularly discussed and called for within public health or health promotion literature (e. g., McMichael 2006, Brown et al. 2005, Dooris 1999, Hancock 1996, Labonté 1991). Of the 21 goals defined in a framework concept of the World Health Organization (WHO), “a healthy and safe physical environment” and “multisectoral responsibility for health” (WHO 1999, pp. 75 ff., 104 ff.) are related to central concerns of sustainable development.

Questions that address the reciprocal relations between health and sustainability, particularly in the context of climate change and its adverse impact on health, are attracting increasing attention within the health community. These are taken up in politics (e. g., WHO 2003, 2009) and research, often focusing on health co-benefits of climate mitigation (e. g., Kickbusch 2010, see also the series *Health and Climate Change* published in the *Lancet* in 2009<sup>1</sup>). Meanwhile, health care systems are being asked to address this issue (McMichael et al. 2009, NHS 2009). However, health has so far rarely been systematically connected, let alone implemented, together with sustainable development.

### **The Role of Organizations**

Although sustainability problems are global in character, the causes and most of the actors who are required to find an appropri-

ate response are anchored within local contexts. Late modern society is characterised as a society of organizations (Robbins 2004, Perrow 1991). Since the 1990s, organizations – or, in the terminology of health promotion, settings – have been gaining importance and attention as a key decision making and operational level for sustainable development. For the implementation of sustainability strategies, it is therefore beneficial to take an approach based not only on activities at the macroscale of society or the microscale of individuals but also on the mesoscale of organizations.

The international literature on sustainable business management, often referred to as “corporate social responsibility”, contains widely varying and often vague definitions of sustainable development for organizations. In Europe, corporate social responsibility denotes a business concept whereby companies integrate social and environmental concerns in their business operations and interactions with stakeholders on a voluntary basis (European Commission 2006). Integrated approaches to sustainability that attempt to give equal consideration to all three sustainability dimensions are underrepresented (e. g., Stubbs and Cocklin 2008). This allows one-sided, short-term measures to be subsumed under the concept of sustainability, since in almost every case one or the other dimension of sustainability is addressed (cf.

von Hauff and Kleine 2009, Ott 2009). This pragmatic approach fails to adequately take into account possible problematic side effects of and interactions between single measures.

Both the anticipated synergies between sustainable development and health promotion and the importance of organizations as key actors in the implementation of sustainability strategies were crucial to our decision to focus our research on hospitals.

### **Sustainability Problems of Hospitals**

Through their high material and energy use, hospitals have a significant negative impact on the environment. The total CO<sub>2</sub> emissions of the National Health Service (NHS) England for 2004, estimated to be 18.6 megatonnes CO<sub>2</sub>, were equal to 2.6 percent of total UK consumption emissions<sup>2</sup> (SDC 2008). Our estimates show that Austria’s hospitals emit 2.4 megatonnes CO<sub>2</sub> per year (own calculations, based on Statistik Austria 2004 and Eurostat 2001), representing 4.5 percent of national CO<sub>2</sub> emissions<sup>3</sup>.

1 [www.thelancet.com/series/health-and-climate-change](http://www.thelancet.com/series/health-and-climate-change)

2 Estimated on a consumption basis including import-related emissions (for details see SDC 2008).

3 Emissions include those resulting from preliminary services. According to our estimates, Austrian hospitals’ national share of other emissions like NO<sub>x</sub> and toxic waste is of the same order (four to seven percent).

Global sustainability problems such as climate change and the energy crisis, together with shortages of physical resources, are growing and will increasingly impact negatively on the health care system and hospitals in a double sense. As environmental problems intensify, this will on the one hand lead to stricter environmental guidelines, regulatory measures, and price increases. On the other hand, the consequences of environmental problems such as climate change have adverse effects on health, the extent of which is as yet difficult to establish (cf. IPCC 2007, WHO 2003). Hospitals will be confronted with both of these aspects. In recognition of this situation, WHO called on hospitals to play an active role in the fight against climate change (WHO and HCWH 2009).

Hospitals also endanger the health of their workers and even that of their patients. The workplace risk factors in hospitals in regard to psychological and physical health are higher than those in other occupational fields (e.g., Iseringhausen 2010). Patient health is endangered by unwanted side effects of treatment, such as medical error (IOM 2000), nosocomial (i.e., hospital-acquired) infections (Amato-Gauci and Ammon 2007), or hospitalism<sup>4</sup>.

A central problem for hospitals concerns the demand for ever more efficient delivery of services. Since the mid-1980s, health care spending has increased disproportionately compared to economic growth in all developed countries, with the greatest increase generally in the hospital sector. Thus hospitals are central to the public debate about “sustainable” financing of the health care system (McKee and Healy 2002). How do hospitals address these problems?

### New Approaches in Hospital Practice

Since the mid-1990s, a rapidly increasing number of initiatives have come into being world-wide that can be subsumed under the concept of the “green hospital”. Examples include the international network *Health Care Without Harm*<sup>5</sup> or the *Canadian Coalition for Green Health Care*<sup>6</sup>. Our research results show that in connection with sustainability in hospitals, narrow ecological approaches predominate. These tend to neglect the social dimension and are generally not considered when decisions on health care are taken. Sustainability is mostly confined to “eco-friendliness” of the supporting services of hospitals and to cost savings.

The *Health Promoting Hospital (HPH)* represents another movement for reform (see box). It seeks a reorientation of hospitals that goes beyond traditional clinical and curative service provision. Hospitals are expected to take on additional and specific primary, preventive, and health promoting functions, and to follow health promotion principles such as empowerment and participation. Only recently, increased interest for sustainable development has arisen within the *International HPH Network* and the *International Union for Health Promotion and Education*.<sup>7</sup>

Probably the most significant change undergone by hospitals concerns the radical transformation of publicly administered organizations into modern market-oriented enterprises, a shift that is not least driven by a political desire to cover costs. Within this context, quality management systems have been introduced to

#### BOX:

### Health Promotion and Health Promoting Hospitals

The *Ottawa Charter for Health Promotion* (WHO 1986) defined health promotion as “the process of enabling people to increase control over, and to improve their health”, and as one strategy to implement health promotion “to reorient health services”. A *Health Promoting Hospital (HPH)*, therefore, “does not only provide high quality comprehensive medical and nursing services, but also develops a corporate identity that embraces the aims of health promotion, develops a health promoting organizational structure and culture, (...) develops itself into a health promoting physical environment and actively cooperates with its community” (WHO 1998). The *HPH* thus combines empowering individuals to promote health with fostering physical and social environments to be more health promoting. To reach this goal, WHO/Europe initiated the *International Network of Health Promoting Hospitals and Health Services* (or *HPH Network*)<sup>a</sup> in 1990. It now consists of 39 networks in 26 countries spread over five continents, with more than 840 member hospitals.

a [www.hphnet.org](http://www.hphnet.org)

control, among other things, the cost efficiency of services. However, spiralling costs cannot be reined in solely by means of improved efficiency since both the supply of services, driven by advances in medicine and technology, and the demand for services, for example as a result of rising chronic degenerative diseases, continue to grow considerably. Thus, although important strategies exist in the hospital setting for dealing with single aspects of sustainability, these one-dimensional solutions have so far not been promulgated systematically and are rarely connected with one another.

## A Sustainability Concept for Hospitals

### A Transdisciplinary Project

Concerning sustainability concepts for hospitals, we were unable in a review process to find any satisfactory approaches for organizations to integrate all three sustainability dimensions. Therefore, in a transdisciplinary project (table 1, p. 194) we developed a comprehensive approach for hospitals based upon a socio-ecological paradigm for global sustainable development. Our aim was to develop a scientifically consistent concept acceptable for involved key actors by promising them sufficient benefits and by considering “hospitals’ reality”, i.e., the actual challenges facing hospitals. It had to provide opportunities for new solutions and at the same time to accept and expand strategies that had already been introduced successfully. From the beginning we closely collaborated with practitioners from hospitals (table 1). >

4 Adverse mental and physical health effects resulting from long hospital stays.

5 [www.noharm.org](http://www.noharm.org)

6 [www.greenhealthcare.ca](http://www.greenhealthcare.ca)

7 See *HPH Conferences 2007 to 2010* ([www.hphconferences.org](http://www.hphconferences.org)) and *IUHPE Conference 2010* ([www.iuhpeconference.net](http://www.iuhpeconference.net)).

**TABLE 1:** The transdisciplinary project *Testing the Sustainable Hospital* aimed at developing a sustainability concept and applying it within three testing areas.

|                                    |  |
|------------------------------------|--|
| <b>key areas of testing</b>        | <ul style="list-style-type: none"> <li>■ sustainable business management: creating orientation</li> <li>■ sustainable provision planning: innovative planning</li> <li>■ sustainable service provision: making sustainability work in day-to-day business</li> </ul>   |
| <b>timeline</b>                    | 2006 to 2008 with subsequent follow-up projects  |
| <b>funded by</b>                   | Austrian Federal Ministry for Transport, Innovation and Technology (BMVIT) within the transdisciplinary program <i>Factory of Tomorrow</i> ( <a href="http://www.fabrikderzukunft.at">www.fabrikderzukunft.at</a> ), and Austrian Research Promotion Agency (FFG)  |
| <b>team</b>                        | <ul style="list-style-type: none"> <li>■ <i>science partners</i>: interdisciplinary team of researchers from the Institute of Social Ecology, Vienna (project coordinator), Ludwig Boltzmann Institute Health Promotion Research, and ARECon GmbH</li> <li>■ <i>hospital partners</i>: Otto Wagner Hospital, Vienna (pilot hospital), Vienna Hospital Association, and Immanuel Diakonie Group, Berlin (consulting observers)</li> </ul> |
| <b>resources for practitioners</b> | <i>Sustainable Hospital Instruction</i> , available at <a href="http://www.das-nachhaltige-krankenhaus.at">www.das-nachhaltige-krankenhaus.at</a> (with project summaries in English)  |

### The Socio-Ecological Sustainability Concept

Global society can only continue to function in the long run if it does not destroy the natural conditions that support human life. Accordingly, societal development must be compatible with the preservation of natural systems, or nature. “Sustainability, therefore, is an anthropocentric notion: it means that human-induced changes in ecosystems must not threaten the exchange processes between society and its natural environment in ways that affect society’s survival or well-being” (Haberl et al. 2004, p. 200). Similarly, political documents demand that the environment, or nature, should be treated in such a way that it will still be available to ensure the well-being of future generations (cf. Brundtland definition).

Accordingly, key distinctions in the concept of sustainability concern the relationship between a system and its environment (society – nature) and the relationship between the current and future generations (present – future). Maintaining society-nature interaction over the long term is jeopardised when societal problems are externalised<sup>8</sup>, whether spatially, factually, or temporally, producing undesirable side effects and long-term consequences as a result. This is a concise formulation of the key message of the socio-ecological approach of sustainability. Through its concepts of social metabolism and colonisation of natural systems (Fischer-Kowalski et al. 1997), it facilitates the analysis of globally observable crisis phenomena.

### Developing a Sustainability Concept for Hospitals

How can these socio-ecological principles, which were developed for the global level, be transferred to organizations and – in our case – to hospitals? If the aim is long-term maintenance of the interrelationships between society and nature on a global scale, an analogous formulation for the mesoscale could be: The prerequisite for the long-term functioning of organizations is their capability of maintaining their relationships with their environments over the long term. In contrast to a global perspective, most organizations have fewer direct relationships with nature but more relationships with actors or stakeholders in social environments. In the case of hospitals, the latter range from patients and staff, as so-called internal environments of hospitals, to the state, economy, and civil society as external environments (Pelikan and

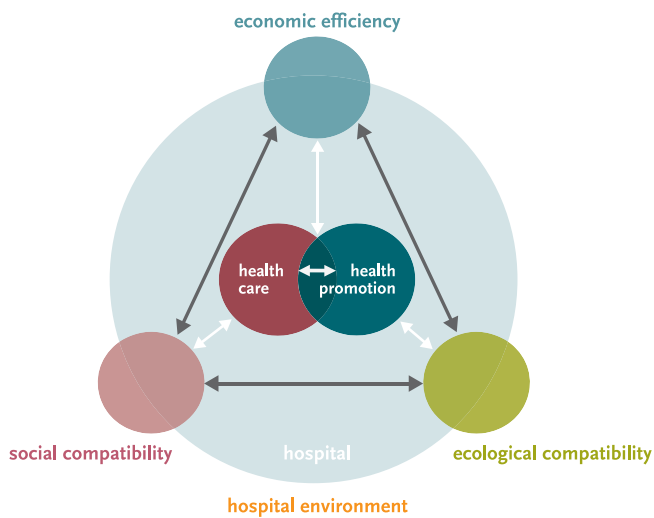
Halbmayer 1999, pp. 25–27). According to the above-mentioned principles, a hospital acts sustainably when it does not defer or externalise problems to its social and natural environments. A broad perspective should be employed, therefore, when evaluating the consequences of an organization’s (systemic) functioning for itself and its environments.

A concrete example may provide a more vivid understanding of problem externalisation by hospitals: If patients are sent home from hospital too early or without adequate preparation, problems in the broader treatment of illness are externalised from the hospital to its patients, their relatives, and eventually to other health care service providers. Sometimes the problems caused are so severe that patients have to be readmitted to a hospital as inpatients. These unsustainable practices of hospitals not only lead to unnecessary costs that finally impact on the wider economy, and to avoidable material and energy consumption, but also place an unnecessary strain on patients and often upon their relatives too.

Following on from the preliminary theoretical considerations, we may take as a basis the political concept of sustainable development, which offers insights by considering increasing ecological problems and social inequality together with economic growth. We argue that this concept, particularly as represented in the form of the sustainability triangle, is transferable to organizations. For this reason, we have adapted the “global” sustainability triangle (based on Fischer-Kowalski 2002) for hospitals (figure 1), focusing upon the dynamics within the system and upon its relationships with social and natural environments.

Health care, i. e., hospitals’ core business (including related support services), and health promotion as a newly emerging service, are at the centre of the triangle. Both services overlap to some extent and have effects on and are affected by the three dimensions of sustainability for internal and external hospital environments, which also mutually influence each other. Therefore, sustainable development at the level of individual hospitals concerns the optimisation of different quality criteria: provision of

<sup>8</sup> A current example: the enormous CO<sub>2</sub> emissions from fossil fuel combustion, which are now – with a long temporal delay – causing global warming.



**FIGURE 1:** Suggested sustainability triangle for hospitals. Health care – hospitals' core business – and health promotion are at the centre of the triangle and should be considered in their dynamic interrelations with the objectives: social and ecological compatibility and economic efficiency.

services must take into account not only generic health care and health promotion quality but also aspects of economic efficiency as well as social and environmental compatibility.

These criteria are already being considered – albeit to varying degrees – by a certain proportion of hospitals. So what is innovative about the socio-ecological sustainability concept for hospitals?

### Moving Sustainability into the Core Business

The primary criteria that are decisive for hospitals' core business are standards of clinical treatment, which are mainly determined by what is clinically and technically possible. Alongside these are the business considerations of hospital management, owners, and funders, which focus on cost efficiency, funding options, and, particularly in the case of private hospitals, cost-revenue relations. In the "sustainable hospital", additional criteria should be introduced:

- contribution to the preservation of nature by limiting resource use and other environmental pressures,
- reduction of costs to the national economy, and
- minimisation of social burdens within and outside the hospital.

"Sustainable decisions" should take all these dimensions into account together by evaluating different options also in terms of their side effects and long-term consequences. Accordingly, a (more) sustainable development in the hospital setting is one in which services are improved in relation to the status quo for at least one of the dimensions without impacting negatively upon the other ones. In an ideal situation, solutions are sought that improve all dimensions. By making problem externalisation to different environments or stakeholders more visible, this approach allows unintended side-effects to be mitigated. This requires both

monitoring of the relevant environments and consideration of appreciable long-term and side effects of hospitals' services. Introducing this form of monitoring and integration is primarily the task of hospital management, but it also requires monitoring and analysis on higher levels, e.g., hospital associations or health care systems. In summary, sustainability in the hospital setting can be seen as an extension of established quality criteria to include social, ecological, and economic aspects, with particular attention being given to long-term effects and to impacts upon a hospital's environments. In principle, this can be achieved by using and developing systems and methods of quality management.

Thus a socio-ecological sustainability concept enables hospitals to move the environmental agenda into their core business, i.e., into decision making regarding health care and health promotion measures.

### Example: Improving Respiratory Care

We can gain an idea of how this might be implemented by looking at an example from our project (table 1). The example relates to respiratory care and deals with provision planning for long-term ventilated patients (Weisz et al. 2009).

At one of the internal departments of the pilot hospital, patients with chronic lung disease who are dependent on artificial respiration are treated in two successively connected intensive care wards (two-step model). Of these, the intensive care unit (ICU) is charged with the acute care of those with life-threatening disease, often involving organ replacement and using mechanical ventilation. The respiratory care unit (RCU)<sup>9</sup>, unique in Austria, specialises in the weaning of artificially ventilated patients with prolonged dependency on ventilation following acute illness.<sup>10</sup> Patients with chronic respiratory problems are prepared for ventilation at home: they and their relatives are trained to achieve the appropriate safety and quality of ventilation. These patients are readmitted at regular intervals to the RCU for check-ups and further care. In cases involving acute problems, doctors from the ward continue to function as contact partners.


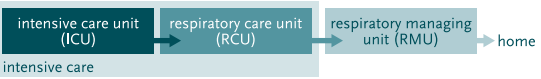
Experience over 15 years shows that transmural<sup>11</sup> case management, training, remobilisation, and check-ups could take place outside the RCU under better conditions. For these patients, the resource use of intensive care wards in terms of apparatus and staff is not only unnecessary but is actually a hindrance. Patients and relatives frequently find the direct transposition from the intensive care ward to the home overwhelming, and this often leads to unplanned readmissions and frequent contact with the ward. Moreover the intensive care setting endangers patients by exposing them to nosocomial infections and other health risks. >

9 Intensive care units fall within the highest intensive care category (class 3), while the respiratory care unit is categorized as class 1–2.

10 This represents nine percent of all ventilated patients and 30 percent of patients with underlying chronic obstructive pulmonary disease (COPD).

11 "Transmural" refers to the hospital-home interface.

**TABLE 2:** Long-term ventilation of patients with internal or surgical diagnosis: comparison of the conventional two-step model and a suggested improved three-step model. If hospitals' core business planning considers sustainable development and health promotion criteria in addition to quality criteria of clinical treatment, health gains are accompanied by cost savings and reduced material use.

|  | two-step model   |       | three-step model  |       |       |
|--|--|-------|---|-------|-------|
| ward   |   |       |       |       |       |
| length of stay in ward (patient days)                                | 21,534   | 2,522 | 18,628  | 2,389 | 3,039 |
| costs for patient group (million EUR/y)                              | 46.3   |       | 42.6 (i. e., reduction of 3.7 million EUR or 8%)  |       |       |
| cost-revenue relation  | the three-step model shows a marginal improvement (using conservative assumptions, e. g., not considering additional revenue through reallocation of beds)   |       |   |       |       |
| material use (t/y): ■ gross weight (incl. packaging)<br>■ net weight | 4,056<br>687   |       | 3,739 (i. e., reduction of 318 t/y or 7.8%)<br>625 (i. e., reduction of 62 t/y or 9.0%) |       |       |
| health gain  | empowerment of patients (RMU); reduction of health risks such as infections (because in the three-step model less time is spent in intensive wards [ICUs and RCU] and more time is allocated for training) |       |   |       |       |

The RCU management therefore suggested to introduce an additional ward outside the intensive care area, namely, a respiratory managing unit (RMU) undertaking all tasks associated with preparing for ventilation at home. This represents an extension of the two-step model to a three-step model (table 2).

We compared both models with regard to the criteria of sustainable development and health promotion. This included an estimation of the potential savings in terms of patient days spent in the intensive care area (ICUs and RCU), as well as potential savings of costs and material use.<sup>12</sup> A prospective needs survey<sup>13</sup> of ICUs within the Vienna Hospital Association, carried out in 2007, showed that 13.5 percent of the patient days spent in ICUs by ventilated patients<sup>14</sup> could have been transferred to the RCU or RMU. The beds were thus misallocated<sup>15</sup> for that time. Moreover, 56 percent of patient days spent in the RCU at the pilot hospital could have been transferred outside the intensive care area (figure 2). This represents a total of 3,039 patient days that were spent unnecessarily on intensive care wards.

Table 2 shows that both costs and gross material use for the patient group in question could have been reduced by about eight percent through employing the three-step model instead of the two-step model. Furthermore, the results show that health gain can also be increased by reducing the patient time spent on intensive wards and establishing a RMU ward outside the intensive care area. Thus a three-step care model for patients receiving long-term ventilation would lead to an improved care situation and to better conditions for health promotion measures. The investments required to implement a three-step model are justifiable given the estimated cost savings.

The three-step model shows the advantages gained if hospitals' core business planning takes into account sustainable development and health promotion criteria in addition to quality criteria of clinical treatment: significant improvements in economic and social respects can simultaneously produce savings in physical resources. In the case of provision planning, applying the concept is especially beneficial as decisions on provisions determine the future use of physical and financial resources as well as

the social burden in the long term. Since misallocation involves considerable consequences for both hospitals' future viability and their contribution to societal sustainability, we recommend misallocation as an adequate sustainability indicator for hospitals.

## Conclusions

As a result of climate change and its potential adverse impact upon health, the close connections between sustainable development, health, and health promotion receive increasing attention by public health actors in the areas of politics and research. It is argued that a common approach to tackling these issues will produce synergies. Hospitals both cause and are affected by sustainability problems due to the interrelationship between sustainable development and health. Because of their dual role, developing a socio-ecological sustainability concept for hospitals is particularly worthwhile.

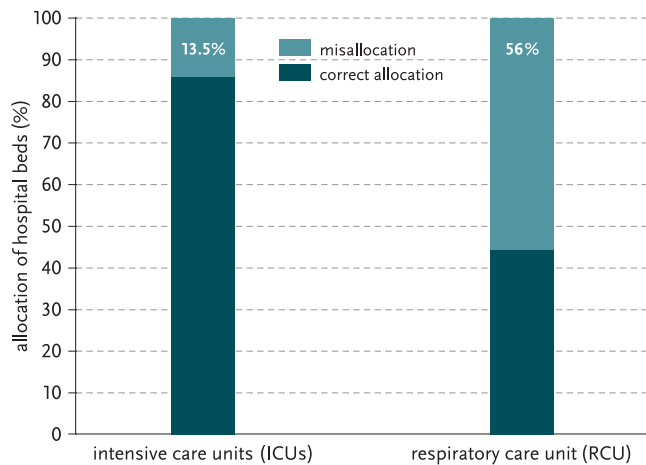
Analogous to a socio-ecological approach to sustainability at the global level, our understanding of sustainable development in hospitals requires reducing the externalisation of sustainability problems in the course of conducting hospitals' core business. This mainly implies mitigating unwanted social and ecological long-term and side effects. In order to assess the sustainability of an organization, the relationship between the services it provides (e. g., health care, health promotion, and related supporting services) and their environmental impacts must be monitored and

12 To estimate material use, we recorded the gross and net weight of 80 percent of the most expensive consumer goods (investment goods as well as pharmaceuticals, infusions, and blood transfusions were not taken into account). For methodological details see Weisz et al. (2009).

13 Survey on the incidence of prolonged weaning phases and the length of stay due to this problem at a certain level of ICU care, studied in five representative ICUs. For methodological details, see Funk et al. (2010).

14 Long-term ventilated patients with internal or surgical diagnosis.

15 "Misallocation" refers here to situations in which patients are placed in a setting that is not optimal for their treatment needs.



**FIGURE 2:** Long-term ventilated patients with internal or surgical diagnosis: misallocation of hospital beds (misallocated patient days as percentage of total patient days) within the Vienna Hospital Association in 2007. 13.5 percent of the patient days in intensive care units (ICUs) were unnecessarily spent at such an intensive level of care. 56 percent of patient days in the respiratory care unit (RCU) at the pilot hospital were unnecessarily spent in the intensive care area. Misallocation can be used as a sustainability indicator for hospitals.

evaluated. Sustainable development therefore is an optimisation task for hospitals: to deliver their core and support services not only according to health care and health promotion quality criteria but also according to criteria of economic efficiency as well as social and ecological compatibility.

Using respiratory medicine as an example, we were able to show that hospitals can considerably reduce their environmental impacts if they include ecological criteria in their central planning decisions relating to their core business. These ecological improvements are achievable in addition to any benefits of traditional environmental management. Precisely where the health of patients is concerned, it makes sense for hospitals to jointly address environmental, social, and economic issues related to patient care instead of treating “ecological compatibility” separately as an isolated and marginal issue. This also proved a key motivation for our hospital partners to continue addressing sustainability in hospital practice beyond the end of the pilot project.

Integrated treatment of the three sustainability dimensions makes more easily comprehensible through what kind of measures hospitals could potentially contribute to global sustainable development. In this way, we address still unresolved questions regarding the contributions of organizations to a societal transition towards sustainable development.

The growing health sector with its environmental impacts as well as its inequalities constitutes a rewarding field for sustainability initiatives. A multi-dimensional optimisation effort promises health gains for individuals and a transition from a largely repair oriented to a more health promotion oriented health care system with increased affordability as well as material and energy efficiency. This approach to sustainability is in the interest of health policy, health promotion, and citizens, and should therefore receive a positive response from all quarters.

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#### Ulli Weisz

Born 1962 in Villach, Austria. Studies in ecology, with focus on socioeconomics, University of Vienna. Ten years of work experience as a qualified nurse. Since 2004 research fellow at the Institute of Social Ecology of the Alpen-Adria University Klagenfurt, Vienna, Graz.

Since 2009 PhD project in social and human ecology on approaches to sustainable development and health.



#### Willi Haas

Born 1959 in Vienna. Studies in mechanical engineering and ergonomics at Vienna University of Technology. 1985 to 1995 co-founder and director of the Institute of Applied Ecology in Vienna. 1995 to 1997 acting director of the Environmental Monitoring Group, Cape Town.

Since 1998 research fellow at the Institute of Social Ecology, Vienna. Responsible for the research area Sustainability Transitions.



#### Jürgen M. Pelikan

Born 1940 in Breslau, then Germany. Professor emeritus of sociology, University of Vienna. Key researcher at the Ludwig Boltzmann Institute Health Promotion Research, Vienna. Director of the WHO Collaborating Centre for Health Promotion in Hospitals and Health Care, Vienna.



#### Hermann Schmied

Born 1963 in Vienna. Studies in psychology, University of Vienna. Twelve years of work experience in the field of health promotion in health care settings. Since 2008 researcher at the Ludwig Boltzmann Institute Health Promotion Research, Vienna.



## Nachhaltigkeit

# A-Z



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