The concept of sustainability and the use of outcome indicators. A case study to continue a successful health counselling intervention

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\textbf{Background.} To ensure the continuation of a successful pilot programme, the change process and the concept of sustainability need to be elaborated. So far, there are different theories on organizational change and sustainability but its practical application stay far behind.

\textbf{Objectives.} To test the practical application of a theory-based concept of sustainability and to assess the role of the change agent. A health counselling programme for high-risk cardiovascular patients, called Heartbeat 2, was used as a case study.

\textbf{Methods.} Outcome indicators were assessed based on the questions: Why should health counselling be sustained? How should this be done and by whom? How much needs to occur and by when? Data were derived from registrations, reports and focus group interviews.

\textbf{Results.} The results indicate a need for a linkage system in the final stages of change so that the programme is maintained. Limitations of the external change agent are described. The outcome indicators appeared to be an adequate operationalization to monitor sustainability. The change process leading up to sustainability appeared to be highly complex due to unpredictable and unforeseen external factors.

\textbf{Conclusions.} Our concept of sustainability appeared to be an adequate tool for the change agent to assess the extent of sustainability. An external change agent has limited influence on the management’s decision-making processes during the sustainability stage. As long as the context is changing, definite choices to sustain the innovative service of health counselling in hospitals will not be made, which inherently means an ongoing change process to sustainability.

\textbf{Keywords.} Capacity planning, change agent, institutionalization, organizational development, sustainability.

\textbf{Introduction}

Empirical knowledge about the sustainability of health behaviour change programmes in health-care settings is limited.\textsuperscript{1,2} Sustainability is a complex process\textsuperscript{3–6} that should be developed and assessed over a period of 10–15 years, involving a range of short medium and long-term programme outcomes. Sustainability has been described as the final stage of programme use in which the programme is incorporated into organizational routines so that it will be maintained once the original programme funding, adopters or programme champion are no longer present.\textsuperscript{7} So far, most theories emphasize the process of adoption and pilot implementation rather than explaining how complex organizations solve problems related to the integration of innovations into normal functioning. However, some attempts at modelling sustainability have been made. First and foremost, Shediac-Rizkallah and Bone\textsuperscript{8} describe three indicators of sustainability. The first is...
health benefits, which are at the heart of the process since interventions that yield no health benefits are not worth sustaining. The second is institutionalization factors as these are necessary to perpetuate the programme itself. The third is community capacity attributes as these attributes can influence sustainability processes at the societal level. Pluye\textsuperscript{9} claims that, at the organizational level, routines and standards (as defined in terms of memory, adaptation, values and rules) are also conducive to normal functioning in the organization.

According to diffusion of innovations theory,\textsuperscript{10} the change process is characterized by a continuous shift that starts with the initial adoption of an idea and then moves on to the implementation, maintenance and, lastly, institutionalization of the change. This process can be facilitated by a change agent, who functions as a link between the resource and the user system.\textsuperscript{10-13} The resource system is defined as the research institute that develops the innovation. The user system is the group of practitioners who makes use of the innovation. Change agents may come from either of the two systems. Since the main role of the change agent is to create a dialogue, which requires impartiality, the background should not affect the change agent’s role.\textsuperscript{10} Practice-based research networks may function as a linkage between the resource and user system.\textsuperscript{14,15}

Research on the effectiveness of both the change agent and the linkage function during the sustainability stage has not yet been reported. Therefore, this article endeavours to provide some insight on whether, and how, a linkage system and a change agent can promote sustainability of health counselling. Additionally, the practical value of monitoring the degree of sustainability by means of the three indicators mentioned above is discussed.

In this study, the Heartbeat 2 (in Dutch: Hartslag 2; 2003–2006) project is used as a case study. Heartbeat 2 evolved out of a successful project entitled Heartbeat Limburg,\textsuperscript{16} which started in 1998. The core component of Heartbeat 2 was the integration of health counselling\textsuperscript{17} into the regular medical treatment for cardiovascular patients at Maastricht University Hospital’s Cardiovascular Centre (hereafter referred to as CVC). Between 1998 and 2001, a randomized controlled trial was conducted, followed by a post-trial implementation study (2003–2001). The results on health counselling showed significant positive health effects and successful adoption and implementation of the innovation at the CVC.\textsuperscript{18-20} The next step was to make health counselling a routine within the CVC. Given that most health-care systems emphasize the treatment of disease rather than the promotion of health,\textsuperscript{21} many barriers exist with respect to the routinization of preventive health counselling in hospitals, even when a relatively successful pilot phase has been completed.

**Methods**

The most appropriate approach to answer our research questions seemed to be a case study. According to Yin,\textsuperscript{22} case studies are a preferred strategy when questions of ‘how’ or ‘why’ are being posed, when the investigator has little control over events and when the focus is on a contemporary phenomenon within a complex real-life context.

A linkage system between the CVC (the user system) and the Public Health Service (the resource system, PHS) was built. The project leader of the PHS was appointed as an external change agent. The change agent built the linkage system by organizing a steering committee with members from PHS and CVC.

The change agent was primarily concerned with determining the main outcome indicators for success, by providing answers to the following questions: (i) Why should the health counselling programme be sustained?; (ii) How can this be done?; (iii) By whom should this be done?; (iv) How much has to be done?; and (v) By when should sustainability be achieved?\textsuperscript{8,23} The first question served as a prerequisite for the latter questions.

The strategies applied by the change agent included: linking the resource and user system through the steering committee (see Table 1, point 1a), measuring the health benefits experienced by new patients (Table 1, points 2a and 2b), discussing the possibilities of making health counselling a routine part of the disease management programmes (Table 1, points 3a and 3b), compiling an inventory of capacity requirements (Table 1, points 4a, 4b and 4c) and communicating to attain CVC staff commitment for an ongoing health counselling programme within the disease management programmes beyond 2006 (Table 1, points 5a, 5b and 5c).

To study the effectiveness of change agent’s strategies and the linkage system to promote sustainability, we measured the outcome indicators of the ‘why’, ‘how’, ‘by whom’, ‘how much’ and ‘by when’ questions.

Data were derived from documents, minutes, progress reports, interns’ reports, health advisors’ patient records, CVC Board statements and focus group interviews. In 2006, five focus group interviews were conducted with a total of 23 CVC managers, specialists and nurses who were randomly selected from the total CVC team (n = 151). Every group was led by the same moderator who made use of a predetermined format. All interviews were tape-recorded and transcribed in the code system of QRS NVivo.

**Results**

**Linkage system**

The steering committee met 21 times with a mean participation of 5.4 out of the 6 members. The
atmosphere was positive. The change agent initiated 22 bilateral consultations about related topics. A total of nine columns were published in the hospital magazine. Six national conference contributions as well as seven local presentations were made. These contributions were made in order to link internal and external hospital staff to propagate preventive health counselling in hospitals.

**Sustainability: health benefits**

The pre-test and two post-test comparisons indicated a short-term decrease in fat consumption (2003: \( P < 0.001 \); 2004: \( P < 0.001 \)) which did not sustain at the long term. However, both a short-term and a long-term increase in physical activity was noted (2003 and 2004: \( P < 0.001 \)). The results also indicated that, in 2004, patients experienced both a short-term (\( P < 0.001 \)) and a long-term (\( P < 0.05 \)) reduction in stress. However, this was not the case in 2003. Smoking cessation did not sustain.24 Two-thirds of the patients (69%) reported benefits from health counselling, while 22% were neutral and 9% reported no benefits. Health counselling topics that were perceived as either important or very important were in successive order: aftercare and adherence to medication (73%), physical activity (65%), food and fat consumption (62%), stress (57%) and smoking (52%). Approximately half of the patients reported many difficulties with respect to initiating and maintaining lifestyle changes. Health counselling service was rated at 7.5 on a 10-point scale.24 The results on smoking (negative), fat consumption (small) and physical activity (positive) were consistent with the initial trial.18

**Sustainability of programme activities: how and by whom**

Budget cuts had a considerable impact on the development of the disease management programmes. Instead of the intended 13 programmes, only five were realized, and only four of the six cardiovascular nurses were actually appointed. The cardiovascular nurses who carried out the diagnostic screening were supposed to refer new patients to the health counselling, since specialists had high rates of non-compliance. The change agent actively endeavoured to have a referral and follow-up procedure implemented. However, this aspect was not formally assessed by the management. Finally, neither cardiovascular nurses nor specialists referred faithfully and systematically.

For a special group of patients (stable patients with coronary disease), a proposal was made to have the referral procedure connected to the concept of task substitution. Cardiovascular nurses were expected to record changes in biomedical risk factors and to inform the cardiologist about these risk factors. Two tasks were added to this, namely to make inventories of lifestyle risk factors and to offer health counselling to patients. The health counselling was thus integrated into the function of cardiovascular nurse. This reinvented health counselling was then embedded in the disease management programmes for stable coronary disease patients.

**Sustainability of capacity: how much and by when**

We planned to offer 1250 patients health counselling between 2003 and 2006. Of this expected number, 923 (74%) were actually offered health counselling. In order to increase this number, it was necessary to obtain insight on referral and counselling procedures for each professional in the chain of care, an estimation of the time needed to carry out the tasks and a calculation of total capacity based on number of patients. The steering committee decided to initiate a training programme on health counselling in order to increase total capacity. The change agent provided a budget for the years beyond 2006 whereby cardiovascular nurses could be trained in health counselling techniques.

The Board further determined that highly complex patients should be offered health counselling in the CVC university hospital, moderately complex patients should be offered counselling in the CVC medical

### Table 1  Number of strategies applied by change agent

<table>
<thead>
<tr>
<th>The number of applied strategies</th>
<th>2004</th>
<th>2005</th>
<th>June 2006</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a. Formal meetings steering committee</td>
<td>8</td>
<td>8</td>
<td>5</td>
<td>21</td>
</tr>
<tr>
<td>2a. Discussions about surveillance with Risk Consult®</td>
<td>7</td>
<td>8</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>2b. Discussions about monitoring long-term effects on lifestyle</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>3a. Discussions about where to incorporate health counselling in the disease management programmes</td>
<td>4</td>
<td>7</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>3b. Discussions about how to improve patient referral</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>4a. Discussions about capacity and task division</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>4b. Discussions about sustaining health counselling as part of the disease management programmes</td>
<td>1</td>
<td>5</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>4c. Discussions about the number of counselled patients (&gt;500 a year)</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>5a. Communication activities to attain commitment from a broad audience</td>
<td>10</td>
<td>10</td>
<td>3</td>
<td>23</td>
</tr>
<tr>
<td>5b. Bilateral meetings</td>
<td>12</td>
<td>6</td>
<td>4</td>
<td>22</td>
</tr>
<tr>
<td>5c. Discussions about resources to maintain Heartbeat</td>
<td>13</td>
<td>6</td>
<td>8</td>
<td>27</td>
</tr>
</tbody>
</table>
centre where stable patients are monitored and patients with low complexity should be offered counseling by nurses in general practice. The Board further contended that the investments should be divided according to this differentiation of patient categories.

Commitment
The results of the focus group interviews indicated that 39% of the CVC members were acquainted with Heartbeat, 39% had heard about Heartbeat but knew very little about it and 22% had not heard of Heartbeat. CVC members unanimously agreed that health counselling should be provided to cardiovascular patients. However, there were mixed opinions about who should provide it. Opinions on whether the CVC, PHS or another organization should provide the health counselling service were dependent on one’s vision with respect to the core services and financial responsibilities of the above-mentioned organizations. As a general rule, the cardiovascular specialist is primary responsible for informing the patient about the disease and advising the patient to make lifestyle changes. CVC members all agreed that this task could be transferred to nurses.

Practical strategies initiated by the change agent, such as role-model stories and conference contributions, had only a modest impact on commitment given that publications and conference contributions tend to reach external research groups others than the target population of practitioners within the CVC.

CVC members criticized the fact that no supervisor was formally assigned responsibility for health counseling activities. Installing a supervisor somewhere between the cardiovascular nurses and the vice-director could have strengthened managerial support. In essence, CVC members saw the Heartbeat project as mainly supported by an external change agent with expert and informational power but without legitimate power related to the CVC.

Financial constraints were perceived as unchangeable and it forced the CVC to focus on its core business, namely treating diseases. The research period in this study coincided with Dutch health-care reforms that aimed to introduce market principles into the health-care system. Negotiations with health-care providers by health insurance companies were required to deliver the highest quality services at the lowest price. This, in turn, made it rather inconvenient for CVC staff to decide on whether health counselling should be incorporated in the new disease management programmes, especially since the provision of health counselling could make cardiovascular treatment more expensive than elsewhere.

Discussion and conclusion
The linkage system was indispensable for agenda setting reasons. It not only helped to maintain the ongoing discussion but also helped to develop a shared vision and to create dialogue between the change agent and various levels of organization in the hospital. It is likely that the ongoing discussions contributed to a broader acceptance of the need for health counseling. We thus conclude that our findings confirm the importance of a linkage system during the stage of attaining sustainability as emphasized by the theory.

The impact of the external change agent shows mixed results. Roger’s theory emphasizes that the position of the change agent should be in both the resource and user system. It appears that, in our study, attaining this double position was very time consuming and whether we were successful in doing this remains unclear. A change agent from the resource system had been operating since 1998 and had been successful in realizing adoption and pilot implementation. The external change agent that functioned between 2003 and 2006 had been partly successful. Commitment increased but financial constraints were counterproductive. In our opinion, the absence of an internal supervisor combined with the external change agent’s lack of legitimate power hampered the formalization of procedures that were essential to embed health counselling into the routines of disease management programmes. This finding suggests that an external change agent may need a counterpart from the user system during the sustainability phase, especially when it comes to influencing the management’s decision-making processes. Additionally, we contend that the preference and effectiveness of an internal or external change agent during the sustainability phase needs to be investigated further.

Our case study reveals that the method used to monitor levels of sustainability, namely the use of medium and long-term outcomes based on why, how, by whom, how much and by when questions, appears to be an adequate tool for unravelling the complexity of a change process. The answers to these questions provided sufficient information on the level of sustainability. In terms of Pluye’s four degrees of sustainability, namely absent, precarious, weak and routinized, Heartbeat can be characterized as a weakly sustained innovation. This means that, although the programme is officially sustained, the activities were not routinized and may thus be subject to radical changes in the short term.

Our case study also reveals that practice-based research provides a model for building a synergy among hospital staff and the change agent to support sustainable improvements. Knowledge production was supported by monitoring the change process in practice. Decisions on the institutionalization of a programme will be influenced by arguments other than those for temporarily pilot implementation. Roger’s theory predicts that innovations that cause more ‘irreversible changes’ are less likely to be adopted. The adoption
of a continuous disease management programme could have been perceived as an irreversible change. Whether this kind of change is interpreted as a threat or an opportunity obviously impacts the decision to adopt. Because the disease management programmes for cardiovascular patients still had to be developed and a clear vision on it was lacking, the CVC was unwilling to make definitive choices with respect to the health counselling service. In contrast, the responsible specialist for the disease management programme for stable coronary patients had a clear vision on task substitution. Health counselling was seen as an opportunity to realize this task substitution and thus generated a dynamic decision to incorporate health counselling.

Our findings also reveal the influence of unpredictable and unforeseen external factors, such as budgetary cuts and a national increase in attention to task substitution. This finding corresponds with the organizational theory of contingency which postulates that substitution. This finding corresponds with the organizational theory of contingency which postulates that organizational design reflects the degree of complexity of the environment in which an organization operates. The research period for the sustainability study coincided with Dutch health-care reform which was not the case for the randomized controlled trials and post-trial implementation studies. This resulted in a high degree of financial uncertainty. As a result, health insurance companies were not yet prepared to finance health promotion activities within curative health-care settings. Nonetheless, despite the widespread dissemination of guidelines on cardiovascular risk management and self-management of chronic illness, the CVC has yet to fully integrate these guidelines in practice. We found, in contrast to Pluye’s theory, that the availability of an institutional standard did not sufficiently convince the CVC to sustain health counselling. In this study, compliance with guidelines or standards was thus unsatisfactory.

We initially considered sustainability to be the final phase in the innovation process. However, in accordance with the Scheirer findings, our case reveals that parts of the original health counselling were sustained while other parts were reinvented. The social environment in hospitals is constantly changing. Health policy and the structure of the hospitals are thus constantly in reform. We may conclude that sustainability is not simply the last phase of a change process but rather a much more ongoing, cyclic evolvement that functions through a social process of human interactions.

The study covers only one descriptive case. Consequently, the extent to which the results can be generalized is limited. In this case study, questions of how and why were posed, the investigator had little control over events and the focus was placed on a contemporary phenomenon in a real-life context. As a result, the findings of our study may only allow for tentative conclusions. We conclude that the contribution of the linkage system and the change agent may be essential but unfortunately lacked a counterpart from the user side, which seems relevant when it comes to influencing the management’s decision-making processes. Furthermore, the monitoring of medium and long-term outcomes based on the why, how, by whom, how much and by when questions appeared to be an effective instrument for determining the extent and complexity of sustainability and for assessing the degree of sustainability. Evidently, our study has shown that sustainability is not easily obtained. The meaning of the innovation is constructed over time to better correspond with the changing context. This continuous adaptation fits to the debate over whether institutionalization is the proper end point of changes in health care. It may be a comforting thought that continuous developments of preventive health-care innovations reflect continuous attempts to improve patient care.

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Conflicts of interest: None.

References

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