

# The Future of Telemedicine in Europe and Methods for the Evaluation of Health Services

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## ABSTRACT

*Despite the accumulation of evidence for the effects of approaches to chronic illness, methodological and analytical work is still needed to develop widely accepted evaluation methods that are scientifically sound and also practicable in routine settings. Given all the diversity and variability of disease management, a key issue for this work concerns the difficulties in establishing a useful “comparator” in settings where it is not practical or possible to execute an evaluation as a randomized controlled trial (RCT). This is indeed an important task because evaluation methods are a precondition to select efficient and effective programs, or components within a program that can address the growing burden of chronic and more in general health conditions. This is evident, in particular, when it comes to new technologies in medicine and implementation and evaluation, in the healthcare sectors, distinguishing low-income countries, on the one-hand, and those in other middle income countries.*

**Keywords:** *Chronic Illness, Health Services, Methodology for Evaluation, Randomized Controlled Trial, Telemedicine*

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## INTRODUCTION

In facing the upcoming challenges of an ageing population, the healthcare market is united when it comes to the potential of applying technological solutions to healthcare delivery processes. Despite a general level of maturity in telemedicine applications and Personal Health Systems (PHS), the market is not characterized by large scale implementation at local, national, or international level or by transfer of solutions across institutions and borders. The barriers to a wider implementation of PHS and telemedicine

services are often attributed to legal and integration issues as well as the lack of evidence of the effects. The latter is due to poor assessment methodologies and small sample sizes.

The last project sponsored by the European Community and called “RENEWING HEALTH: REgIONS of Europe WorkING to-Gether for HEALTH” focuses in particular on this. With a total sample size of 7900 patients and the use of a common model for assessment, the project will provide by the end of 2012, the missing foundation for evidence of the effects of telemedicine services and PHS across nine European regions, taking into consideration, for the first time in the literature, the stakeholders

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view on the sustainability evaluation of telemedicine services.

Today, the rapid use of Information and Communication Technologies (ICT) within healthcare organizations and differentiation of health services enables a wide variety of combination of the telemedicine applications. Moreover, every application may involve different kinds of devices: some of them allow audiovisual relationship, some just the visual one or audio and data transfer (Bergmo, 2009). These technologies can take any number of forms such as web-based applications, mobile phone and alert systems, telephone and video conferencing with patients, as well as any combination of these applications (Smith et al., 2009). As previously assessed, the technology may comprise several different functions, such as detecting problems as they arise and proposing palliative solutions. Moreover, electronic data transmission can reduce measurement detection and transmission errors in comparison with paper-based methods.

Telemonitoring has other potential advantages. Being installed in the residence of patients, it makes them more responsible in the management of their disease and it helps in the process of educating them, thorough a model of care that may contain costs (Ohinmaa et al., 2002). Improving the integration of care provided from a variety of service points, making the introduction of preventive medical practices and effective and continuous remote monitoring possible, telemedicine may also alleviate crowding in emergency rooms. Finally, tele-homecare can prevent hospitalization or even extend life, increasing the efficacy of the interventions (Paré et al., 2006).

## BACKGROUND

Among the sectors that seem indifferent towards considering sustainability as a strategy or intent, healthcare was one of the most emblematic cases, even though it is facing great challenges in its structure, organization, service delivery and operations. Within this context, the develop-

ment of new paradigms of healthcare delivery that may be sustainable over time is becoming an imperative. With this regard, technology has drawn increasing attention as one of the “emerging service delivery vehicles running on the information highway” and its application to healthcare has been denominated e-health. Despite the enthusiasm, not much is understood about how to make these changes factual and, above all, in line with the challenge of sustainable development. Specialized research provides little insight into why there is so little routine use of technologies in clinical practice: this is the reason why, in recent years, studies on the organizational sustainability have emerged.

Nevertheless, since concentrating on sustainability and technology in health care, as a whole, may turn out to be an objective out of scale, the aim of this article is also to evaluate the organizational sustainability of domiciliary assistance services through telemedicine as an application of healthcare service delivered through an e-health application. E-Health includes telemonitoring, telecare, or, more in general, telemedicine, which are terms used to describe the utilization of technologies along with local clinical protocols to remotely monitor a patient's medical condition in his own home (Smith et al., 2009). Telemedicine is generally described as the use of medical information exchanged from one site to another via electronic communications in order to improve patients' health status, as the transmission of information and communication over geographic distances enables enhanced care coordination and promotes informed, autonomous, care on the part of the patients and their family members (Chang et al., 2009). It may be defined as “distance medicine” since it uses information and communication technology (ICT) to examine, monitor, and treat patients over a distance. Different applications are employed both within and between all kind of health care institutions in order to monitor and provide support to patients living at home. Telemedicine can also be used to improve the chain of care and many experimentations of its use involve complex delivery systems that employ a mix

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