ICT PSP – Health, Ageing and Inclusion Programme

Health monitoring and sOcial integration environMEnt for Supporting WidE ExTension of independent life at HOME

(Grant Agreement N° 250449)

Deliverable D3.11
Economic Impact Assessment
Version 1.0

Work Package:	WP
Version & Date:	v1.0 / 8th May 2014
Deliverable type:	Report
Distribution Status:	Public
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Approved by:	Marco d'Angelantonio
Filename:	D3.11 v1.0 Home Sweet Home Economic Impact Assessment

Abstract

This deliverable examines the economic impact of the HSH services.

Key Word List

Economic impact, indicators, workflow analysis

Executive Summary

The project has identified a number of indicators to assess the economic impact of the HOME SWEET HOME (HSH) Services.

HSH expects to find tangible and intangible benefits, but evaluating the economic impact of the latter has been excluded; the quality of life impact indicators and possible improvements are addressed in other deliverables.

The economic factors can generally be divided into three levels:

- user (savings / costs);
- organisation (public, private, profit, non-profit); and
- global (national/regional/local (municipal)).

In this study, we have focused on the user level, though we are convinced that improvements for individuals benefit global societal interests too.

In terms of economic impact:

- Since the data did not show any reduction in use of these healthcare resources by participants in the intervention group, no economic benefit from this source arose.
- Since no significant changes to workflow were identified, no economic benefit from this source arose.

However, some of the sites intend to analyse the impact of the potential changes to workflow that introducing HSH services could enable.

The results above are in sharp contrast with those obtained for DREAMING a couple of years earlier. This cannot be due to the difference in the basket of services provided because in HSH this is even more comprehensive than that deployed in DREAMING.

Therefore, the difference can only be due to the different inclusion criteria used in HSH (age and frailty) compared to DREAMING (age and chronic conditions). In other words, the results indicate that, once an older person has reached the level of “mildly frail” or “moderately frail” according to the Edmonton Frail Scale, his/her level of frailty is such that the support the technology can give is not sufficient to influence the use of health and social care resources.

The outcome of HSH suggests that, to achieve sustainability when deploying ICT-based services for older people, age and existence of chronic conditions should be used to identify people to whom the services are offered. On the other hand, moderate or higher degrees of frailty according to the Edmonton Frail Scale should be considered reasons for excluding people from the deployment. Mild frailty is probably a grey area where further analysis of data is required to determine if it is worth including these people in the deployment.

Change History

Version History:

0.1 30th April 2014
0.2 2nd May 2014
0.3 7th May 2014
1.0 8th May 2014

Version Changes

0.1 Initial draft
0.2 Initial revision of the draft
0.3 Updates following review
1.0 Version for issue

Outstanding Issues

None

Table of Contents

1. Introduction

1.1 Purpose of this document

The document provides an assessment of the economic impact of the HSH services.

The approach is based on deliverable D3.4 Economic Impact indicator list.

Economic impact is one of five aspects of the Project and services that has been assessed during the trials. The other aspects include:

- Clinical Impact: D3.8 Clinical & QoL Impact Assessment.
- Quality of Life: D3.8 Clinical & QoL Impact Assessment.
- User satisfaction: D3.12 User Satisfaction Assessment.
- Social impact: D3.10 v0.1 HSH Social Impact Assessment.

1.2 Glossary

DRG	Diagnosis Related Group
ICT	Information and communication technology
QALYs	Quality-adjusted life year

2. Approach

The approach is drawn from D3.4 Economic Impact indicator list, which enumerates all the indicators / data to be collected to evaluate the economic impact of the HSH services.

2.1 Categories of economic impact

The economic impact of the Project has been assessed in three ways:

1. Direct economic impact from savings in (mainly but not exclusively, healthcare) events.
2. Savings derived from changes to workflow.
3. Revenue from the older persons and/or their relative, addressed through an analysis of demand elasticity.

In order to assess the economic impact of the HSH service only direct (tangible) costs and benefits resulting from the social and health care have been taken into account.

Intangible costs (indirect costs) and benefits are excluded from assessment due to the difficulty of calculating them and their uncertain results. This is discussed further in section 2.3 below.

2.2 Data collection

The indicators / data collected fall into two categories:

- Indicators / data generated by the project trials.
- Data external to the project, but which none-the-less impact on the economic assessment of the services.

2.3 Intangible costs & benefits

Regarding the intangible costs and benefits, the different methods to evaluate them are, on the one hand, through the human capital method, along with its recent variations, the frictional costs and QALYs, and on the other hand through the contingent valuation.

- The main idea of the human capital theory in the healthcare system is to invest in people's health to improve their future productivity. In the case of the HSH project, which is aimed in general at the elderly, who cannot improve their productivity because they are already retired, this method is not applicable.
- Regarding the frictional costs theory, this is related to the costs of replacing one worker by another in case of illness. Again, this is not applicable to the HSH target users.

- QALYs are measured according to the loss of time, also called temporary costs (transfers and waiting time before consultation) and the costs of training by the substitution of a worker.
- The intention of the contingent valuation consists of knowing how the agent evaluates his/her own health conditions.

To sum up, intangible costs and benefits are difficult to assess because they are strongly related to the citizen costs, while HSH intended to demonstrate social and healthcare savings and benefits. It would be an interesting philosophical and ethical discussion to ensure consistency and contrast between health and economical goals, which falls outside this discourse, but HSH started from the idea that prevention is more interesting and probably cheaper than care or cure.

3. Direct economic impact

This section describes the economic indicators selected. Some of data is collected by the project, very often as part of the clinical indictors; the remainder (e.g. DRG or tariff costs used within each country) is available from the relevant health service.

Where appropriate, the significance of the indicators is discussed.

Where there are particular issues for a country, this is noted.

Indicators are set out in two groups:

- The first group includes all the indicators to be captured for both intervention group and control group.
- The second includes indicators applicable to the intervention group only.

3.1 Economic indicators for both intervention and control groups

3.1.1 Costs of hospital admissions

These are defined as those costs of staying in a hospital bed, as defined within the particular health system. In Spain, for example, the minimum stay is 24 hours, for others it can be less.

In order to calculate these costs, the Project will capture the number of bed-days used, and then apply the tariff, established by a Health Financial Institution (public or private sector).

One of the important goals of HSH was to reduce the cost of social and health care to older people through better targeting of interventions and early detection of situations of risk and deterioration of health conditions. In this context, by monitoring the elderly in their homes, it was expected to reduce the number of hospital bed-days, both through reducing the average length of stay of telemonitored patients, and by decreasing the number of their admissions. Therefore, this economic indicator was expected to be more favourable to the intervention group than to the control group.

3.1.2 Cost of consultations with GPs, specialists and nurses

Under this heading, we include those costs resulting from outpatient consultations carried out in a consultation room of a hospital or healthcare centre for diagnosis, treatment and/or follow-up.

The most appropriate methodology to calculate these costs is applying the tariff established by a Health Financial Institution or healthcare insurance company. The Project has captured the number of the different types of consultation carried out.

Regarding these consultations, there are two important facts to consider:

- According to the initial hypothesis, improving accessibility of the telemonitored group to the service can cause an increased demand with a direct impact to the number of consultations requested by the patients themselves.
- On the other hand, the security provided by the telemonitoring service should act as a diminishing factor on demand of care and cure.

Therefore, the security of the telemonitoring service could compensate for the demand produced by improving accessibility. Hence the importance of monitoring the number of consultations carried out.

3.1.3 Costs of Accesses to Emergency Rooms

These costs are the result of all services given to all patients treated and registered at the emergency department of a hospital, healthcare centre or ambulance. Emergency cases of admitted patients are excluded from this definition as they are already considered hospital admissions. One important emergency to consider is the so-called non-admission emergency, that refers to all emergency treatments and registrations with referral notes signed by practitioners of primary care that do not require any admission.

In order to assess these costs, again the Project will use the Tariff, and capture the number of visits to emergency rooms.

By receiving the telemonitoring services, it was expected that patients in the intervention group would go to the hospital emergency department only when in need of receiving emergency services. Here, the Contact Centre acts as a filter as it evaluates the emergency for the intervention group, while the control group will keep using the emergency services as usual. The accesses to emergency rooms were expected to be higher in the control group because patients and relatives are not able to evaluate the emergency due to their lack of medical knowledge.

Italy

In the Italian National Health Service, accesses to ER is free for the patient at point of care. Note that ER belongs to the Hospital Trust, which actually is unable to determine the cost of each access. The evaluation is thus underway even it this has become rather academic considering that there are no significant changes in the number of accesses to the ER between the intervention and the control group.

Spain

In order to assess these costs, we have used the tariff and captured the number of visits to emergency rooms.

3.1.4 Costs of temporary or permanent stays in elderly or nursing homes for respite care

These costs are defined as those costs of staying in an elderly home during a certain period of time either permanently or for respite care.

To calculate these costs, the Project has chosen to use the tariff established by the Health Financial Institution or healthcare insurance company, and has captured the number of days spent in elderly or nursing homes for respite care.

According to the initial hypothesis, thanks to the technological and communication tools used by the telemonitored patients, the number of transfers to elderly or nursing homes should be reduced, enabling elderly to stay longer in their homes. The economic indicator should therefore be more positive for the telemonitored patients (intervention group) than for the control group.

Italy

The cost of each day is fixed by each nursing home. Rates, depending on the complexity of the care, range from 65 to 120 €/day (paid by the user, with a possible contribution by the social services). Thus, in the trial the costs for the stay should be easily and precisely calculated.

3.1.5 Costs of visits of social assistants and home nurses

These costs are identified as the costs of total hours spent by social assistants and/or home nurses to visit the patients in their homes to check their living conditions.

Originally, the intention was to calculate the price of each hour according to the tariff established by the Health Financial Institution or healthcare insurance company. The number of visits, and hours spent, by social assistants and/or home nurses was also going to be captured. However, when it became clear that no changes were going to occur in the workflow, calculating the hourly cost of staff become irrelevant because there were, by definition, no differences between the time spent by professional for following the older people in the intervention group compared to those in the control group.

3.2 Economic indicators only for intervention group

3.2.1 Costs of equipment

All costs of technological and medical devices used in the HOME SWEET HOME project.

The methodology used to calculate these costs is the real and fixed costs per kit for each pathology.

3.2.2 Costs of equipment installation and maintenance

Cost of all charges resulting from the equipment installation and maintenance.

Italy

Costs have been fixed on the basis of costs of subcontracting.

3.2.3 Costs of training for the trials

Cost of total hours used to train all staff involved in the project (physicians, nurses, etc.) as well as patients and relatives to the correct use of the HOME SWEET HOME services. At the beginning of the trial, all patients received training on how to use the medical devices, videoconference and the personal tracker Mambo2.

3.2.4 Costs of alarm services

Cost of time that the Call Centre employs for each patient in alarms of type I and type II.

It is important to take into account the two different costs assessments according to the following Contact Centres used by the pilot sites:

- Shared Call Centre: Staff involved in HOME SWEET HOME respond not only to the alarms generated by the HSH monitoring and alarm system but they also work in other healthcare services. Therefore, only the costs for HOME SWEET HOME alarms have been considered.
- Exclusive Call Centre: Staff working exclusively for the alarms of HOME SWEET HOME.

4. Changes to workflow

The Project has analysed the workflow of a sample of processes in each trial site at the start of validation, and at the end. The objective was to identify any changes in workflow that have taken place as a result of the Project, and analyse the economic consequences.

The Project did not have the resources to analyse all the processes associated with the health and social care of the participating user population. Instead the following processes have been selected as being those most likely to demonstrate workflow changes leading to economic savings:

- The home care service delivery process.
- Home-based rehabilitation service process.
- And optionally, the multi-disciplinary service needs assessment process.

The selected processes have been analysed at the start of validation (ex-ante) and at the end (ex-post).

5. Indicators & information collected

5.1 Healthcare events

The following healthcare events were captured during the project:

- Number of hospital admissions for both intervention and control group participants.
- Number of consultations with GPs, specialists and nurses for both intervention and control group participants.
- Number of accesses to emergency rooms for both intervention and control group participants.
- Number of stays in elderly or nursing homes for respite care for both intervention and control group participants.
- Number of visits of social assistants and home nurses for both intervention and control group participants.

An analysis of this data did not show any reduction in use of these healthcare resources by participants in the intervention group.

5.2 Changes to Workflow

Sites carried out an ex-ante and ex-post analysis of workflows.

Perhaps due to the small number of participants in the intervention groups, no significant changes to workflow were identified.

5.3 Organisational questionnaire

In addition to the above indicators collected, an organisation questionnaire was prepared and circulated to all pilot sites. The questionnaire is included in Appendix A.

The results are summarised below. For details, please see the Excel file in Annex 1.

General information:

Country	Ireland	Italy	Belgium	Spain
Region	Louth	Latina	Antwerp	Badalona
Partner(s)	Dkit	ASL Latina	Zorgbedrijf and CMA	Badalona Serveis Assistencias
Number of inhabitants of the region	122.897	5.732.000	500.000	219.708

Country	Ireland	Italy	Belgium	Spain
Number of users PAS personal alarming system in the region		30	5.600 ZB 2.151 CMA	3.251
1. Which home automation appliances:				
Do you already provide?	Classic alarm		1) Classic alarm 2) 24H Care - add on to PAS 3) Fire, CO, Fall detec 4) mobile alarm	1) Personal alarm system 2) LOPE (Personal monitoring service)
At what cost for the user?	5 €		15 /10 €	12 / 6 €
Do you have lower rates for certain groups of users?	General reduction		Yes	Yes
Please give an estimate (%) of the extent to which the purchase or installation of (all) the appliances and services you provide are financed from public subsidies.	100%		11/35%	100%

Other comments:

- Ireland offers a classic Pendant Alarm, linked to landline and monitored by an alarm call centre; these are grant aided at full equipment cost. End users pay 5 Euro/month. Ireland and Spain have 100% subsidies from the government for purchase and installation.
- Belgium offers a similar system as Ireland, but the government contribution is lower (11% to 35%). The end user pays 15 €/month + installation costs, + cost for interventions (Zorgbedrijf).
- In Spain the taxes that the person must pay depend on their income (from 0 to 12,42 €, as a maximum). Only 4% of the people pays the maximum. 76% pay 6,30 €.

2. Which other HSH home automation appliances are you:

a) willing to provide? See Annex 1.

b) at what price?

Spain: From our point of view, probably we would promote the whole platform, implementing roughly applications according to the frailty of the persons and their needs. Therefore we would speak of a global price that should not be more than 40 €/month, with lower rates for certain groups of users.

c) What would be the maximum contribution you would charge the user for a given product and the accompanying service? ('regardless' of the cost): see previous point: 40 €/month, with lower rates for certain groups of users.

d) Will you have lower rates for certain groups of users?

"YES" for Belgium and Spain, but Ireland does it better in the way of public support, and has a lower rate for all user.

3. Open question:

By equal social policies:

a) How do you estimate the use of HSH applications in your country?

Spain: Low, due to the economic cost of the service and devices.

Ireland: Based on the current cost structure I would be inclined to imply that the take up of HSH applications will be very poor in Ireland. Future deployments would be dependent on State support for the costs and updating the hardware to cheaper models.

Belgium: See Ireland.

b) For your organization? Please explain.

Spain: We thought that this is an opportunity for the implementation of telemedicine in our organization, but the use will depend on the support by government resources

c) Any suggestions?

Spain: We think that advances in technology will lower the global price of the platform and make it more affordable for installation at home.

Ireland: A further study in Willingness to Pay by participants and Healthcare service providers would help understand the threshold that either the State or individuals would be willing to pay for this service. With that knowledge further development innovations and reduced cost hardware could be incorporated into the solution to make it a more viable commercial proposition

6. Economic impact results

6.1 Impact of healthcare events

Since the data did not show any reduction in the use of the health and social care resources by participants in the intervention group, no economic benefit could be demonstrated.

The conclusion above is in sharp contrast with that obtained for DREAMING a couple of years earlier. This cannot be due to the difference in the basket of services provided in HSH, because this is even more comprehensive than that deployed in DREAMING.

Therefore, the difference can only be due to the different inclusion criteria used in HSH (age and frailty) compared to DREAMING (age and chronic conditions). In other words, the results indicate that, once an older person has received the level of “mildly frail” or “moderately frail” in the Edmonton Frail Scale, his/her level of frailty is such that the support the technology can give is not sufficient to influence the use of health and social care resources.

The outcome of HSH suggests that, to achieve sustainability when deploying ICT-based services for older people, age and existence of chronic conditions should be used to identify people to whom the services are offered. On the other hand, moderate or higher degrees of frailty according to the Edmonton Frail Scale should be considered reasons for excluding people from the deployment. Mild frailty is probably a grey area where further analysis of data is required to determine if it is worth including these people in the deployment.

6.2 Impact of workflow changes

Since no significant changes to workflow were identified, no economic benefit from this source could be demonstrated.

The size of the sample of older people recruited for the trials, although sufficient to reach statistically significant results, turned out not to be sufficient to change the care workflow, because they remained a negligible percentage of the total population assisted.

However, some of the sites intend to analyse the impact of the potential changes to workflow that introducing HSH services could enable.

Moreover, new EU funded projects managed by the same Management Team, and especially SmartCare which started in March 2013 and can count a user population of over 8.000 older people, should allow services to reach the critical mass which enables care providers to radically change the care workflow.

Results from SmartCare will be in the public domain and will benefit the HSH partners too, even without considering the continuity element represented by the Management Team.

Appendix A: Economic Questionnaire for Organisations

This is the questionnaire that was circulated to gather the information in Annex 1.

Purpose of the survey

With this survey, we will investigate the actual use of home automation appliances as well as the price end-users are willing to pay for making use of / purchasing new appliances.

We hypothesize that home automation appliances will be purchased or rented by users only if social entrepreneurs or the Government take charge of a substantial part of the purchase price and installation and maintenance costs, a theorem that can also apply to social organizations who offer home automation appliances now already.

Contents of the questionnaire: (See Excel File)

We would like to ask the HSH partners the following information, which will be put together in a single database.

General information:

Partner:

Country:

Region:

Number of inhabitants of the region:

Number of users PAS personal alarming system in the region:

1. Which home automation appliances do you:

a) already provide ?

b) at what cost for the user?

c) Which fees do you charge for your actual applications and/or services?

d) Do you have lower rates for certain groups of users?

e) Please give an estimate (%) of the extent to which the purchase or installation of (all) the appliances and services you provide are financed from public subsidies.

2. Which other HSH home automation appliances are you

a) willing to provide?

b) at what price?

c) What would be the maximum contribution you would charge the user for a given product and the accompanying service? (‘regardless’ of the cost)

d) Will you have lower rates for certain groups of users?

3. Open question:

By equal social policies:

a) How do you estimate the use of HSH applications in your country?
b) For your organisation? Please explain.
c) Any suggestions?