REal-time data monitoring for **S**hared, **A**daptive, **M**ulti-domain and **P**ersonalised prediction and decision making for **L**ong-term Pulmonary care **E**cosystems

D7.1: SROI Methodology and first Quick Scan SROI ratio

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Abstract

When it comes to the implementation of eHealth, it is important to include all the relevant stakeholders in the research. Furthermore, to ensure sustainable implementation it is important that all stakeholders are aware of their own added values as well as other stakeholders' added values related to the innovative eHealth solutions.

It is difficult to compare and weigh all the inputs and outputs stakeholder provide. The social return on investment (SROI) methodology can provide insight to the added value for every stakeholder on every level (micro, meso, and macro) to convince all stakeholders of the value of the innovative eHealth solution and to improve implementation. In task 7.4 (Evaluation of social impact) of the RE-SAMPLE project, we will investigate the social impact of the foreseen RE-SAMPLE innovation by means of the SROI methodology. The objective of this deliverable is to describe the SROI methodology and estimate a first forecast SROI ratio of our foreseen RE-SAMPLE innovation.

The general aim of the SROI methodology is to demonstrate the sustainability and the social value added by intervention and organizations through the understanding, managing, and communication of their impact in economic, social and environmental terms (Maier et al., 2015). The SROI approach defines seven principles and six process steps. Every SROI starts with establishing the Impact map (also called Theory of Change (ToC)) for the relevant stakeholder. When this Impact map is ready, all inputs and outcomes need to be monetized. Before the SROI ratio can be calculated, it is necessary to consider impact, by means of deadweight and attribution. The final step is to report the SROI ratio.

In literature, there are no examples of SROI of innovative eHealth solutions, like the RE-SAMPLE innovation. There is however a recent paper of Talboom et al., 2021 which aims to assess the public value of the self-management program for those who suffer from Chronic Obstructive Pulmonary Disease (COPD). Their analysis of the self-management program showed that each euro invested translated to social return of 4.90 euros per patient per year (measured over 5 years). This SROI ratio was mainly the result of an increase in quality of life (QoL) and a decrease in healthcare costs.

The ToC of the RE-SAMPLE innovation is still under discussion and it is therefore difficult to determine the foreseen in- and outputs per stakeholder (Impact map). However, given our experiences and the available SROI in literature, we foresee a positive SROI ratio between 3.00 and 4.00 for the RE-SAMPLE innovation. Task 7.4 (Evaluation of social impact) of the RE-SAMPLE project is a returning task and there are three three-month periods when SROI work will be performed. Over these two upcoming periods the RE-SAMPLE SROI will mature and the SROI ratio will become more and more precise. The outcomes of this process will be presented in D7.6 (Final SROI ratio for three hospital sites [M45]).

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Symbols, definitions, abbreviations, and acronyms

Citizen science	A participatory research model in which non-professionals are actively involved in scientific research
CCC	Complex Chronic Condition
COPD	Chronic Obstructive Pulmonary Disease
D	Deliverable
GOLD	Global Initiative for Chronic Obstructive Lung Disease
GP	General Practitioner
M	Month
REDF	Roberts Enterprise Development Fund
RIVM	Dutch National Institute for Public Health and the Environment
RWD	Real World Data
SROI	Social return on investment
ToC	Theory of Change
QALY	Quality Adjusted Life Years
WP	Work Package

1. Introduction

Sustainable implementation is the aim of every innovative idea or concept introduced to the healthcare sector. However, not every implementation is sustainable. Most pilot studies end before the outcomes related to clinical-, and cost-effectiveness are available and published. This also relates to innovations supported by technology, such as eHealth. However, research during the last 10 years has shown that even when the outcomes on clinical-, and/or cost-effectiveness are available and extremely positive, the implementation of an innovative eHealth solution into the healthcare sector can be difficult or fail. There are various reasons why sustainable implementation is difficult and not achieved in most cases.

When it comes to the implementation of eHealth it is important to include all relevant stakeholders in the research. In addition to the end-user, other (direct and indirect) stakeholders, such as technology providers and insurance companies should be addressed. For sustainable implementation it is important that all stakeholders are aware of their added value of an innovative eHealth solutions and also aware of the added value of the other stakeholders. This added value differs between stakeholders. For a patient the added value of an innovative eHealth solution could be the better access to healthcare, for a physician it could be extra patient data made available by the solutions. For decision- and policy-makers the added value could be higher work efficiency and lower cost. Overall, it is difficult to compare and weigh all these various added values of the stakeholders and to decide which one is more important.

Which one is decisive? In our opinion, the social return on investment (SROI) methodology can provide insight to the added value for every stakeholder on every level (micro, meso, and macro) to convince all stakeholders of the value of the innovative eHealth solution and to improve the changes of sustainable implementation. Therefore, in task 7.4 (Evaluation of social impact) of the RE-SAMPLE project, we will investigate the social impact by means of the SROI methodology. During the length of the project, the outcomes of this task will be presented in two deliverables:

> ➢ D7.1: SROI Methodology and first Quick Scan SROI ratio [M8]
> ➢ D7.6: Final SROI ratio for three hospital sites [M45]

2.   Objectives

The objectives of this deliverable are to describe the SROI methodology and to estimate the first forecast SROI of our foreseen RE-SAMPLE innovation (or the personalised companionship programme). This first forecast SROI will focus on the Dutch health system and society.

Chapter 3 of this deliverable describes the SROI methodology and the various principles and steps related to this methodology. The chapter will also present the activities related to task 7.4. The outcome of the first forecast SROI will be presented in chapter 4 addressing the various parts of a SROI analysis (theory of change, stakeholders, input, output and SROI ratio). This deliverable will end with a discussion on the SROI methodology and the next steps within task 7.4.

3. Method

3.1 The Social Return on Investment methodologies

The general aim of the SROI methodology is to demonstrate the sustainability and the social value added by interventions and organizations through the understanding, managing, and communication of their impact in economic, social, and environmental terms (Maier et al., 2015). In the most recent SROI methodology guidance, SROI is defined as "a framework for measuring and accounting for the much broader concept of value. It seeks to reduce inequality and environmental degradation and improve wellbeing by incorporating social, environment and economic costs and benefits" (Nicholls et al., 2012).

The development of the SROI methodology started in in the late nineties by the Roberts Enterprise Development Fund (REDF). After multiple revisions and refinements by the New Economic Foundation and the integration of principles and processes normally used in economic evaluations and financial return on investment, a framework was built capable of capturing the wider impact of interventions (social, economic and environment) (Rotheroe & Richards, 2007). The SROI methodology reached maturity when its basic principles and different phases for implementation were established (Nicholls et al., 2012).

SROI principles:

1. Involve material stakeholders
2. Understand what changes
3. Value what matters
4. Include only what matters
5. Avoid over-claiming
6. Be transparent
7. Verify the results

Text box 1: The SROI principles

In total seven SROI principles (see Text box 1) and six process steps (see Textbox 2) are defined. Every SROI starts with establishing the Impact map (also called Theory of Change) with the relevant stakeholders. The term "stakeholders" refers to all those who are identified as potentially experiencing changes because of the activities under consideration. With this Impact map the relationship between all inputs and outcomes are visualized.

When this Impact map is ready, all inputs and outcomes need to be monetized. Monetization of the social or soft outcomes is one of the main challenges of this methodology as some of these are difficult to monetize, such as well-being, improved self-management skills and improved work-satisfaction. To ease this step, financial proxies can be used. These proxies provide estimations of financial value for outcomes or benefits that have no market value. In the last decade proxy databases have been developed to assist SROI practitioners in this valuation process. Before the SROI ratio can be calculated it is necessary to consider impact, by means of deadweight and attribution. Deadweight and attribution refer to what would have occurred anyway and is therefore not attributable to the activities under consideration. The final steps are to report the SROI ratio. As most SROIs are conducted by private consultation firms, only few SROIs are available in scientific literature. It seems that, to date, academics have been slow to adopt the SROI methodology in the evaluation of health and social care interventions (Hutchington et al., 2019).

SROI process:

1. Establish scope and key stakeholders
2. Map outcomes
3. Evidence and value outcomes
4. Establish impact
5. Calculate the SROI
6. Report, use and embed

Textbox 2. The SROI process

In general, there are two types of SROIs: the evaluative and the forecast SROI analyses. The evaluative SROI analysis is retrospective and is based on the actual outcomes achieved by an intervention. The forecast SROI is based on desk research and is prospective in nature. Especially during the planning stages of a programme or innovative project such as RE-SAMPLE the forecast SROI is very valuable to assess whether the planned outcomes that may be created if activities meet their intended outcomes. Like eHealth evaluations, the SROI analysis is periodic and can be integrated at any stage of the project cycle.

The outcome of the SROI analysis is the SROI ratio. This ratio is calculated as total present value divided by the value of inputs. Also the process of the SROI method is very valuable and can be considered as an outcome. During the process of the SROI method, stakeholders get to know each other and talk about their inputs and outcome related to the innovations and by this process the commitment between the stakeholders grows.

3.2 Planning

Within the RE-SAMPLE project both SROIs (forecast and evaluative) will be addressed. In total there are three three-month periods when SROI work will be executed. The aim of the SROI work during these three periods differ and over these periods the RE-SAMPLE SROI will mature and the SROI ratio becomes more and more precise. Table 1 provides an overview of these periods and their main aim, method and outcome.

Table 1: SROI periods within the RE-SAMPLE project

Period	Months	Type of SROI	Main aim	Main Method	Main outcome
1	7 / 9	Forecast	Familiarity with the SROI method and project and review to adjacent SROIs.	Literature review and desk-research.	Knowledge about SROI / first draft
2	22 / 24	Forecast	Full forecast SROI with meaningful SROI ratio.	Interviews / workshops with relevant stakeholder and desk-research.	Forecast SROI ratio
3	43 / 45	Evaluative	Full evaluative SROI with SROI ratio based on data observational cohort study.	Interviews / workshops with relevant stakeholder and data observational cohort study.	Evaluative SROI ratio

3.3 SROI-tool

To calculate the SROI ratio during these different periods, we use the SROI-tool developed by Sinzer (https://www.sinzer.org/). This tool is a dedicated Excel file and helps users work on the SROI method step by step. Each page of this Excel focuses one of the six SROI steps and includes some guidance on how to enter the necessary data.

4.   Results

In literature, there are no examples of SROI of innovative eHealth solutions. However, a current paper of Talboom et al., 2021) assesses the public value of the self-management programme available for chronically ill patients, such as those with COPD. Their analysis of the self-management program showed that each euro invested translated to a social return of 4.90 euros per patient per year (measured over 5 years). This result was mainly due to an increase in QoL and a decrease in healthcare costs. As the innovation of this paper of Talboom et al., 2021 focus on self-management, its outcome can help us to estimate the SROI ratio for our forecast SROI.

4.1   Forecast SROI

4.1.1.   Theory of Change

A Theory of Change (ToC) is normally depicted as a map, or a journey, linking the activities of a programme, intervention or organisation to the short-, medium- and long-term outcomes experienced by stakeholders. It is a living diagram and narrative that should be updated as the work of the organisation changes.

The ToC of the RE-SAMPLE innovations is still under discussion. Schematic representation of the ToC is presented in Figure 1. The main objective of the RE-SAMPLE project is to identify individual multi-morbid complex chronic conditions (CCCs) exacerbations and develop tailored referral to a multidisciplinary, adaptive virtual companionship programme for patients with COPD and CCCs. Already the Document of Action provides a lot of information on the RE-SAMPLE services and innovations. In total three are mentioned:

1. **Virtual companion** for patients consisting of (1) a RWD monitoring toolkit, (2) lifestyle coaching and (3) a communication tool (case manager of the patient).
2. **Active support programme** for healthcare professionals consisting of (1) an overview of data and alerts, (2) a risk profile and a monitoring profile, (3) a shared decision-making tool and (4) a communication tool to enable communication with the virtual companion of the individual patients and adaptation of the care plan.
3. **Monitoring and communication console at shared-care service centre** consisting of (1) additional monitoring and (2) support and communication.
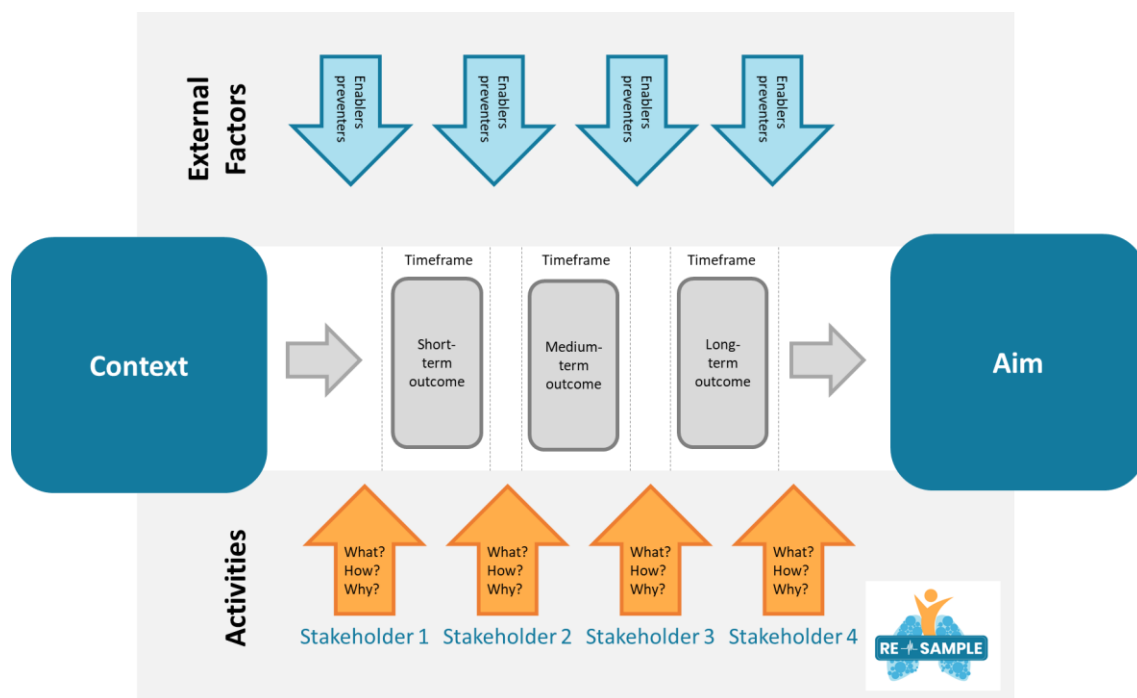

Figure 1: Schematic representation Theory of Change

4.1.2. Stakeholders

> Stakeholders are key people, groups or organisations that experience a change, whether positive or negative as a results of your innovation.

For a balanced SROI, it is important to consider the triangle of user, provider and payer (Figure 2). Users are the primary users of the innovation, often citizens, employees or patients. The provider is the stakeholder. Providers are stakeholders who give primary users access to the innovation, often the employer or a social or healthcare organisation. Payers are the ones who, in the current situation, finance the innovation, often a municipality for health insurances.

Based on the information in the document of action, on the discussions between partners during the project and on WP meetings, the following stakeholders are identified for this first forecast SROI:
- The patient with COPD (with CCCs)
- The primary care facility (GPs or physical therapist)
- The secondary care facility (hospitals)
- The shared care facility
- The technology or platform provider
- The insurance company

This is not the final set of stakeholders. During the project discussions with internal and external project partners will help us to define the final set of stakeholders. Therefore, based on these results, stakeholders such as spouses, employers and municipalities could be added.
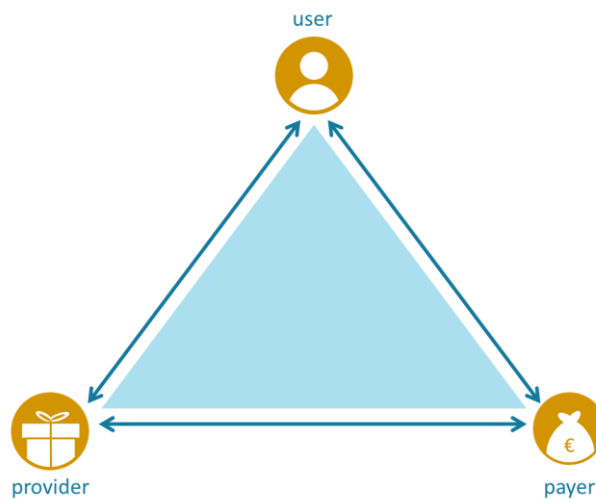

Figure 2: Schematic presentation of the User-provider-payer triangle

4.1.3. Input

> Input refers to the resources needed for your innovation. These can consist of money, time of people or donations. All inputs are valued in monetary terms but the category financial/non-financial can be set to filter the inputs.

For this forecast, it is difficult (in this phase of the project) to decide on the actual input. Therefore, we do an estimation based on literature and our own experiences with the SROI method and these kinds of innovations.

To implement and execute the RE-SAMPLE innovation the patient (or patients), healthcare providers (primary and secondary) and shared care facility needs to invest time (initial and structural). Patient needs time to learn to use the tool and to actually use the tool. Healthcare professionals are asked to change their

routines and spend extra time on getting familiar with the RE-SAMPLE innovation, to select and inform patients. Most important they have to use the tool and support their patient in using the tool. This time investments will be calculated for an average primary and secondary care facility. The time investment of patients and healthcare professionals are valuated according to the recommended evaluations method of the Nation Healthcare Institute (in Dutch Zorginstituut Nederland). Healthcare professionals and care facilities have out-of-pocket costs for training, hardware and software purchase and maintenance, and project management to implement and execute the RE-SAMPLE innovation.

Table 2: Social Return on Investment (forecast) impact map of RE-SAMPLE innovation

Stakeholder	Input	Outcome	Indicator
The patient with COPD (and CCCs)	Time (associated with learning using the RE-SAMPLE innovation)	Improved QoL	QALY
The primary care facility (GPs or physical therapist)	Time and costs (associated with implementing and executing supported self-management)	Less time spent in care process Better efficiency of care	Time saving by self-management Time saving by reductions of consultation
The secondary care facility (hospitals)	Time and costs (associated with implementing and executing supported self-management)	Less time spent in care process Better efficiency of care	Time saving by self-management Time saving by reductions of consultation
The shared care facility	Time and costs (associated with implementing and executing supported self-management)	Better efficiency of care	Time saving by self-management
The technology or platform provider	RE-SAMPLE innovation	None	Not applicable
The insurance company	None	Lower healthcare costs	Average costs per patient

4.1.4. Output

> Output is a measurable unit of production created by each activity of a stakeholder. Output can be goods or services delivered.

At this point the main foreseen value divers are an increase in Quality of Life (QoL) for patients and a decrease in healthcare costs for healthcare related to lowering the risks of exacerbation or even prevention of exacerbations.

The foreseen QoL is based on an average Quality Adjusted Life Years (QALY) gain of 0.06 for patient that benefit from the RE-SAMPLE innovation. This QALY is based on previous research of Jordan et al., 2015. This study provides us with details on the utility scores for COPD stable GOLD health states. The mean utility score found across GOLD health stages 2–4 was 0.693. Next to this, this paper provides us with very valuable information on utility loss due to exacerbations. A moderate exacerbation was assumed to result in a loss of 0.104 QALYs for 1 month and a severe exacerbation was assumed to result in a 0.346 loss of QALYs in the first month, reducing to a loss of 0.173 QALYs for month 2 and 3. An average QALY is valued at €36.000 based on the recommended value of the Dutch National Institute for Public Health and the Environment (RIVM). This same institute indicates that healthcare costs for COPD were estimated at 415 million euros, on average 1400 euros per patient (RIVM, 2012). Following their report, the main cost drivers were hospitalisations, medication, and nursing. Given the document of action, the RE-SAMPLE innovation will lead to an 15% reduction of healthcare costs (210 euro per patient). Next to this, the gain of QoL can be monetarized to 2160 euro per patient.

This RIVM reports also shows us that the costs of sick leave due to COPD were on average 1900 euros per employee and the mean annual costs of lost productivity due to early retirement of a patient with COPD were 1200 euros. Sick leave and disability were highest among older employees with COPD. For patients older than 55 years, costs of production losses exceeded healthcare costs. Given these costs, it could be interesting for our SROI to add employers to the set of stakeholders.

4.1.5. Impact Claim

> Impact is an estimation of how much of the outcome would have happened regardless of the innovation and what proportion of the outcome can be isolated as being added by the innovation's activities, taking into account deadweight, attribution and displacement.
>
> Deadweight is a measure of the amount of outcome that would have happened even if the activity had not taken place.
>
> Attribution is an assessment of how much of the outcome was caused by the contribution of other organisations or people.
>
> Displacement is an assessment of how much of the outcome was displaced to another outcome.

For a forecast SROI, we use three categories for the impact claim: low, average, and high (Table 3). By applying the impact factors deadweight and attribution in a conservative way, overclaiming is prevented and too positive or unrealistic scenarios are avoided. At this point, the middle category for the impact claim seems appropriate for the RE-SAMPLE innovation.

Table 3: Categories of impact claim

Impact claim category	Deadweight	Attribution	Net impact effect
High	30%	30%	49%
Middle	50%	50%	25%
Low	80%	80%	4%

4.1.6. SROI ratio

At this moment in the project, there are too many unknowns. It is difficult to determine the foreseen inputs and outputs per stakeholder when the ToC of the RE-SAMPLE innovation is still under discussion. For various self-management innovations supported by technology, comparable to the RE-SAMPLE innovation, SROI ratio are calculated, in recent years. An overview of these innovations are provided in Table 4 together with the general aim of the innovation and the forecast SROI ratio calculated by RRD. Next to these examples of forecast SROI ratio, the study of Talboom et al., 2021, also provides us with an evaluative SROI ratio of 4.9 for a self-management program for chronic patients in primary care. Based on all these earlier outcomes and our first estimation of the outcome we estimate a positive SROI ratio between 3.00 and 4.00.

Table 4: Overview examples forecast SROIs with SROI ratio

Name	Aim	Forecast SROI ratio
PERSILLA *public health domain*	To prevent frailty among older adults (65-75 years old) by an online tool to screen for frailty and to provide only training to improve mental and physical fitness and eating habits.	5.30
Region lifestyle app *public health domain*	To improve within the region the general lifestyle by means of an mHealth application	2.66
Stranded *public health domain*	To prevent frailty among adults (<55 years old) by means of a gamified web application.	1.59
MyQii *public health domain*	To promote self-reliance, self-awareness, and self-development among teen-agers my means of a mobile application and social media influencers.	2.91

5. Discussion

The objective of this deliverable was to describe the SROI methodology and to present the outcome of the first forecast SROI of our foreseen RE-SAMPLE innovation. As the ToC is still under discussion, it is difficult to determine the foreseen in- and outputs per stakeholder. However, given our experiences and the available SROI in literature, we estimate a positive SROI ratio between 3.00 and 4.00 for the RE-SAMPLE innovation.

Task 7.4 (Evaluation of social impact) of the RE-SAMPLE project is a returning task and there are in total three three-month periods when SROI work will be done. The aim of this first period was to get familiar with the SROI methodology and to estimate a first forecast SROI for the foreseen RE-SAMPLE innovation. Over these two upcoming periods the RE-SAMPLE SROI will mature and the SROI ratio will become more and more precise. The outcomes of this process will be presented in D7.6 (Final SROI ratio for three hospital sites [M45]).

Our use of the SROI methodology during the project is in line with a current review of Gosselin et al., 2020. In their opinion, the SROI analysis should start with a forecast-type SROI to model and predict the potential social impact of the intervention prospectively. During the two upcoming periods (M22/24 and M43/45) this first forecast will need to mature towards a full forecast SROI with meaningful SROI ratio (period 2) and a full evaluative SROI with SROI ratio based on data observational cohort study (period 3).

The SROI methodology is mainly used by consultancy, and the academic engagement is low. As most SROIs are conducted by private consultation firms, only a small part of the SROIs is available in scientific literature. Our search in literature led to only one scientific paper of an innovation comparable to the RE-SAMPLE. Academics have been slow to adopt the SROI methodology in the evaluation of health and social care intervention (Hutchington et al., 2019, Gosselin et al., 2020). At this point, we aim to write two papers concerning Task 7.4. First a paper focusing on the applicability of the SROI methodology for eHealth planned to the end of this year. The second paper presenting the full evaluative SROI of the RE-SAMPLE innovation is planned for the end of the RE-SAMPLE project.

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