Puglia, Italy: MARIO – Managing active and healthy ageing with use of caring service robots

Part 1: General Information

Publication on EIP on AHA Portal	Yes
Copyright	No
Verification of the Good Practice	Yes
Evaluation of the Good Practice	No
Type of the Good Practice	Promising practice

Part 2: Description of the Good Practice

Name of the Good Practice	Managing active and healthy ageing with use of caring service robots
Short name (Acronym)	MARIO
URL of the Good Practice	www.mario-project.eu
Geographical scope	European level
Country	Ireland, France, UK, Italy, Greece, Germany
Region(s) involved	The pilot sites of the project are located in Connacht (Galway), Greater Manchester (Stockport), Puglia (San Giovanni Rotondo).
Status of the Good Practice	On-going
Stakeholders involved	- Hospitals - Research centres - Academia - Specialised physicians - Nurses - Nursing homes - Informal caregivers - Local public authorities - Small-sized industry
Size of population covered	25-99
Targeted audience	<65-79; 80+

Summary of the Good Practice

MARIO addresses the difficult challenges of loneliness, isolation and dementia in older persons through innovative and multi-faceted inventions delivered by service robots. The effects of these conditions are severe and life-limiting. They burden individuals and societal support systems. Human intervention is costly but the severity can be prevented

and/or mitigated by simple changes in self-perception and brain stimulation mediated by robots. From this unique combination, clear advances are made in the use of semantic data analytics, personal interaction, and unique applications tailored to better connect older persons to their care providers, community, own social circle and also to their personal interests. Each objective is developed with a focus on loneliness, isolation and dementia. The impact centres on deep progress toward EU scientific and market leadership in service robots and a user driven solution for this major societal challenge. The competitive advantage is the ability to treat tough challenges appropriately. In addition, a clear path has been developed on how to bring MARIO solutions to the end users through market deployment.

Key words: assistive robots, comprehensive geriatric assessment, people with dementia, reduction of isolation and loneliness, healthy ageing

Good practice being part of the larger programme

Yes.

Our practice results from our participation to the PHC-19-H2020 EU funded MARIO project. We have a role in all project activities and specifically we lead WP4 (Advanced Robotic Solutions for CGA) and have the peculiar commitment of piloting the robot for people with dementia hospitalized in our Geriatrics department.

Challenges / problems addressed by the good practice

1. Addressing the multi-factorial problems linked to loneliness, isolation and dementia in the elderly through interventions delivered by service robots
2. To assist caregivers and physicians in the Comprehensive Geriatric Assessment (CGA) of subjects with a high risk of loneliness, in our specific pilot site they are hospitalized patients affected by dementia at its first stage
3. To use near state of the art robotic platforms that are flexible, modular, accepted by the users and sustainable from a cost point of view
4. To bring service robotics out of the lab and into healthcare practice

Importance of the challenges / problems before starting to implement good practice

The challenges addressed by our practice are affecting a large part of the European population. Globally, it is estimated that 44.35 million people have dementia and this is expected to reach 135.46 million by 2050. Western Europe has the highest prevalence of dementia in the world estimated at 7 million in 2013 and a projected increase to 13.4 million by 2050.

Environment before the good practice was implemented

From a clinical point of view the main achievement of the project will be the support service robots can give to healthcare professionals in delivering Comprehensive

Geriatric Assessment (CGA). This is a multidimensional, usually interdisciplinary, diagnostic process intended to determine an older person's medical, psychosocial, and functional capacity and problems with the objective of developing an overall plan for treatment and long-term follow- up. The robot could ease to gather autonomously important information for CGA and give the possibility to record a larger number of health assessment measurements (also through connected sensors and natural language processing) leading to a more appropriate determination of patient's health condition. To our knowledge, the MARIO robot will be the first robot to assist healthcare professionals in performing CGA.

Key innovative elements of the good practice and how the good practice improved situation compared to previous practice

Performing CGA is a time-consuming process that traditionally involves healthcare professionals who deliver it, in best case scenarios, at hospital admission and at discharge. The key innovative element from a clinical point of view is the possibility that the robot could perform non-obtrusive measurements of activities of daily living (like bathing, toileting, feeding, dressing, urine and bowel continence, and transferring). It will also ease to assess patient independence in eight activities that are more cognitively and physically demanding like managing finances, taking medications, using the telephone, shopping, using transportation, preparing meals, doing housework, and washing. It could also ease to assess the cognitive status.

Part 3: Transferability of the Good Practice

Cost-effectiveness of the good practice (including all kind of costs and outcomes such as better health, quality of life or other resources)	Equal costs, improved outcomes

Resources required for the deployment of the good practice (personnel, equipment, facilities, ICT and other resources required)

This model does not require additional resources, but rather is based on the redistribution of current resources. This holds true in each of the three sectors. Each of the three sectors has allocated time and resources within their current structures and budgets for the participation of professionals in multidisciplinary work groups, quality improvement and ongoing continuing education in order to implement this model.

In the healthcare sector, grant and regional funding did allow for a few professionals to have protected time to initiate and oversee the process. Other professionals that participated in the work groups were allocated time from their organisations. Primary care teams incorporated the screening tools into their daily practices, without additional time or resources needed.

An early intervention team was formed under the umbrella of social services in conjunction with the deployment of this model, which facilitated the assessment and preparation of individualized intervention plans. Professionals from the three sectors also participate in assessment and quality control groups, which is part of their professional duties and time.

In education, professionals formed a department for early intervention amongst experienced current employees, in order to better address the needs of young children and implement screening tools in the preschools. Representatives from the third sector were also allocated time to participate in work groups.

The early structural changes in each sector are now in place in Bilbao and professionals can dedicate their time and efforts to quality improvement and enhancing implementation.

Total budget of the Good Practice	€1M-€5M
Source of funding	European funding

The main actions that have to be done to deploy the Good Practice

The first trial will start in few days, on November, 2016. Before the beginning of the trial many actions are on going. The first of three robot was delivered on August, 2016 and now all technical preparatory activities are underway. Simultaneously healthcare professionals are going to start the first training period. The training session will illustrate the robot main functionalities and limitations, specifically how to train the robot to vocal commands and what are the expected interaction patterns to put in place. A particular attention will be devoted to the process of troubleshooting.

Issues during the implementation of the Good Practice

As soon as the practice starts, the main concerns are relative to the acceptability and usability of the robot by healthcare professionals and by the patients. Other issues involve the fact that, due to a technological limitation, the use of the robot is limited to rooms that host only one patient.

Other important issues are data security and the possibility of errors in the measurements of CGA by the robot. This risk will be mitigated with a yet defined methodological framework consisting of a sound pilot protocol.

Additional resources required to scale up Good Practice

Yes.

The main cost of the practice is linked to robot procurement. Possible additional resources in scaling up could be the establishment of a clinical monitoring service in charge of assessing the results of the clinically relevant measures recorded by MARIO robot.

Basis to support sustainability of the Good Practice
The sustainability of the practice will be a consequence of specific agreements between the partners of the consortium after the end of the project.
Evidence to observe the Good Practice
A practice report Video or other digital media (web page, audio) A visit to an implementation site Youtube channel: https://www.youtube.com/channel/UCdxaxbf9BLZjl698HCuTyBQ Twitter feed: https://twitter.com/mario_project Website: http://www.mario-project.eu

Part 4: Viability assessment of the Good Practice

Time needed to deploy the Good Practice
Less than a year. The implementation of the robot was prepared through an intense process aimed at identifying the needs of people with dementia, their careers and family members. Interviews and focus groups took place involving all stakeholders in all pilot sites. So far 88 persons with dementia and more than 200 careers were involved in these activities.
Investment per citizens / patient / client in terms of financial resources
More than €5.000 EUR per targeted citizen / patient. The value is calculated considering the budget assigned to Casa Sollievo della Sofferenza in the MARIO project divided by the number of patients to involve in the trial period. Projecting costs beyond the end of the trial, given the cost of a single robot that can follow nearly one patient per week (typical average stay time in a geriatric ward), a cost of less than 1.000 Euro per patient could be assumed as realistic.
Evidence behind the Good Practice
No knowledge about evidence. No evaluation or documentation of effect has been carried out. No evidence is available at the moment as the first trial period is going to start shortly. We expect to observe important impact in various health dimensions of patients with dementia. We could observe an improvement of quality of life, a delay in cognitive decline, an increase in physical activities, a more active participation in society, increased patient satisfaction. We also expect positive impact on healthcare expenditures as healthcare professionals' time could be saved thanks to automatic detection of the variables involved in CGA.

Maturity of the Good Practice
Proof of concept is available: it works in a test setting and the potential end-users are positive about the concept. End users were actively involved prior to the MARIO robot development and judge positively the introduction of the robot in their hospital stay. The robot works fine and is able to accept all the apps that will be implemented in it.
Estimated time of impact of the Good Practice
Long term and sustainable impact – e.g. a long time after the pilot project ended and routine day-to-day operation began
Impact observed
Not available.
Transferability of the Good Practice
Transferability has not been considered. The innovative practice has been developed on local/regional/national level and transferability has not been considered in a systematic way. Given the current state of the project the MARIO robot is not yet ready to be transferred although a detailed and ambitious exploitation plan is ongoing.

Part 5: Your organisation

Name of the organisation	IRCCS Casa Sollievo della Sofferenza
Address of the organisation	Viale Cappuccini snc, 71013 San Giovannni Rotondo (FG)
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