International cooperation project "Innocare" Cost-benefit analysis of emergency button

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Table of Contents

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1 Introduction

International cooperation project "Innocare" was aimed at enhancing the living standard of elderly people on home care. The goal of the project was to increase the feeling of safety for the elderly through the usage of new technologies. The outcome of the project was increased knowledge on how to use new technologies in elderly home care.

The project lasted from November 2011 to December 2013. Lead partner and initiator of the project was Tallinn University Rakvere College. Other partners of the project included: West-Viru University of Applied Sciences and Rakvere City Council from Estonia, P. Stradinš Medical College, Ape City Council and Cēsis Social Agency from Latvia and Nacka municipality from Sweden.

2 Public service evaluation model

We have created log frame model and use this method to analyze the public service and conduct its cost benefit analysis. This model helps to clarify the keywords such as: **need, goal, input, actions, output, results, affects, relevance, productivity, effectiveness, efficiency, sustainability** and the context in which it is used in this project. Model is presented in two graphical formats on charts 1 and 2. Chart 1 shows the notions used to analyze the service and Chart 2 shows the logic behind our service evaluation.

Our model explains the general logic behind our service evaluation.
1. The basis for public sector intervention is **need** which in case of the Innocare project is providing elderly citizens with dignified retirement.
2. **Goal** is derived from need. Goal of the emergency button service is providing elderly with the opportunity to live at home for as long as possible.
3. Funds and organizing were required to fulfill that goal. These are considered **inputs**.
4. Main **action** is keeping the emergency button service operational.
5. Actions provide us with an **output** which in our case is providing correct help for the elderly when need arises.
6. As a **result** of the service two lives have been saved. Several elderly have been given the opportunity to live longer at home than they otherwise could have.
7. All of the above have had a positive **effect** on the municipalities resulting in a rise in the standard of living and most optimal use of resources.
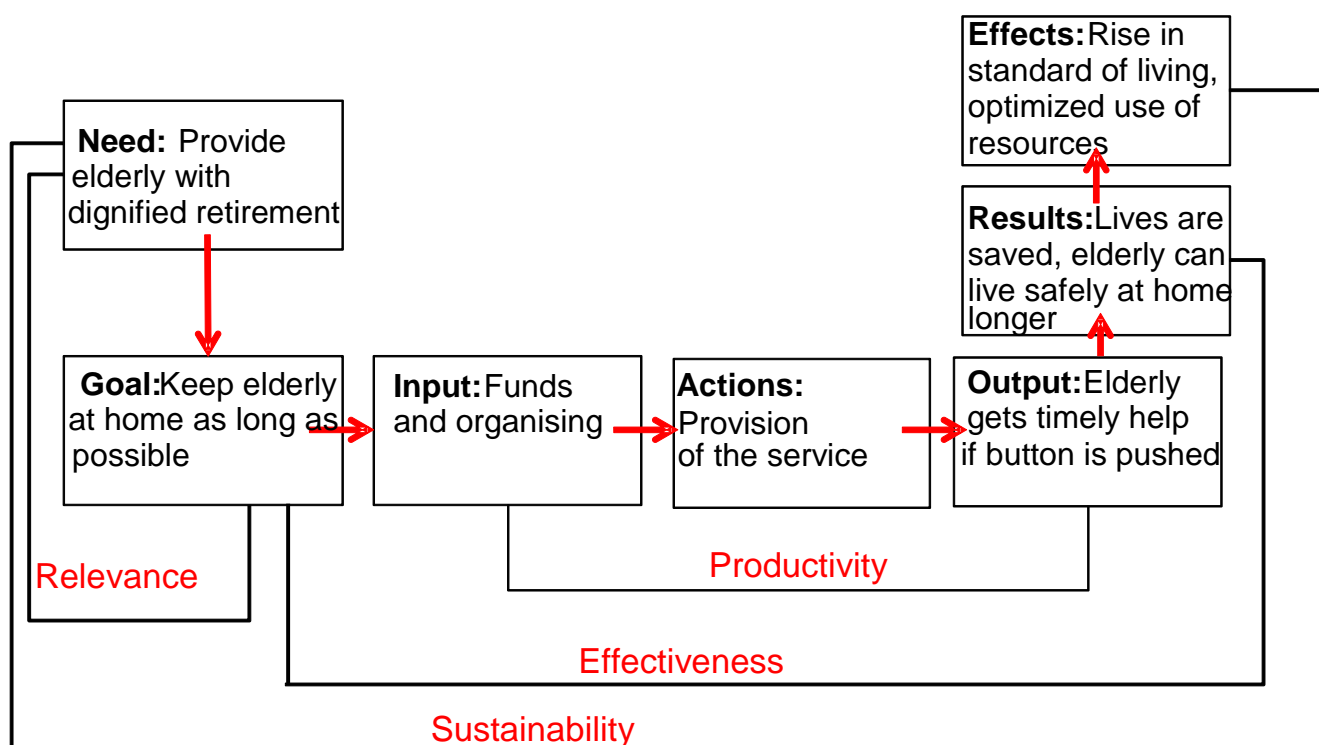
Chart 1 Log frame model

	Description	Indicators	Verification	Assumptions
Need	Provide elderly with dignified retirement	Safety level	Survey of elderly	
Goal	Keep elderly at home as long as possible	How many home years can the service "buy"?	Data from local department of social services	Elderly want to live at home
Input	Funds and organizing	Were funds and time spent economically?	Model of expenses and economy	Municipality supports the service
Activity	Providing the service	How well does the service work?	Survey and assessment	The service works with no errors
Output	Elderly gets help when the button is pushed	Calls received, patrols sent to solve problems	Statistics gathered by service providers	Help arrives in reasonable time
Result	Lives are saved, elderly can longer at home safely	Feedback from the elderly	Survey and data from local department of social services	Quality of the service stays high
Affect	Rise in attractiveness of the area and liveability indexes.	Feedback from the interested parties	Survey and data from local department of social services	Elderly do not want to go to nursing-homes

Chart 2 Log frame chart

3 Technologies used during the project

The purpose of this section is to give an overview of different technologies/services offered in Rakvere, Cēsis and Ape which are aimed at increasing the quality of living for the elderly on home-care. We have included devices that are supported by the municipalities and are already in use as well as devices that could be bought from the open market.

3.1 Comparison of services and products in Rakvere, Cēsis and Ape

Emergency buttons were used by all three municipalities. Cell phones with an emergency button were used only in Ape. Both landline and GSM technology based emergency buttons were used. Emergency buttons based on landline technology were used in areas where GSM connection was weak or absent. Trend of the future lies with GSM based technologies. Due to this trend it is possible to acquire cheap or free emergency buttons based on landline technology from developed countries. Emergency buttons are the focus of this analysis, marked with red ovals on the chart. Other devices listed in chart 3 are for mentioning purposes. Other listed devices have a weaker effect on keeping elderly from moving to a nursing-home and are therefore not included in our cost-benefit analysis.

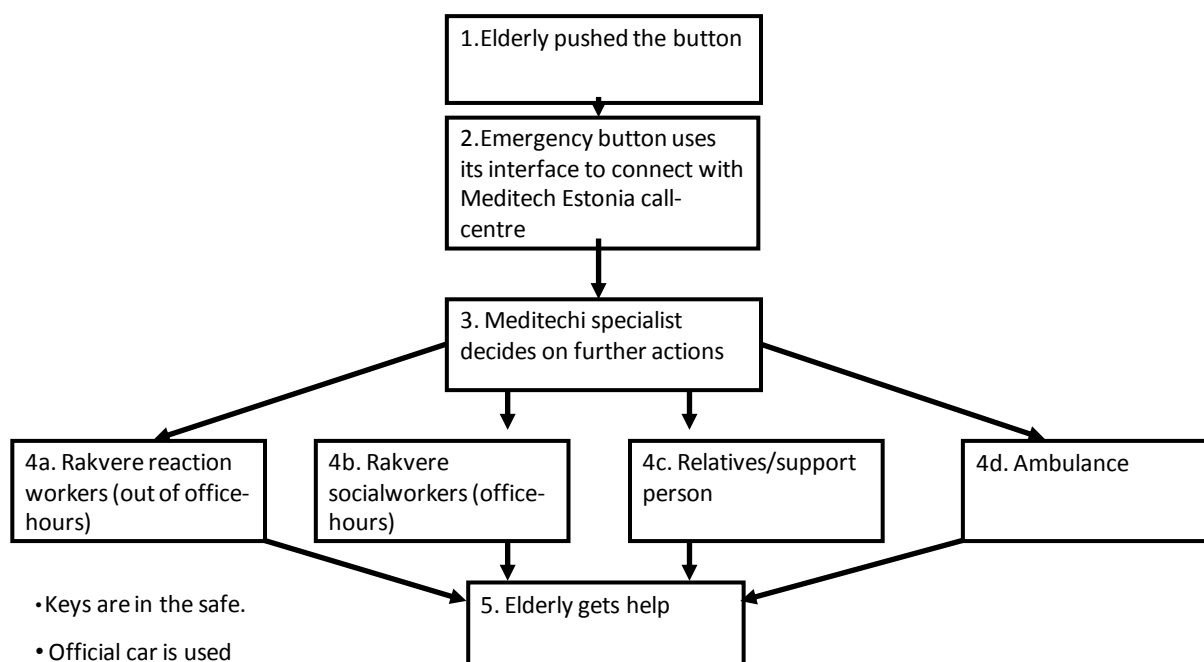| Company	Devices	Rakvere	Cēsis	Ape
	Em.button (line)	**Meditech Estonia**	**Samariesi**	-
	Em. button (GSM)	**Meditech Estonia**	**Samariesi**	**Samariesi**
	Cell phone w. em. button	**G4S** (can be purchased)	**Just5** (can be purchased)	**Just5**
	Automatic smokedetector	**Innohome**	taken down	-
	Medication dispenser	**Addoz** (rare)	**Addoz** (rare)	-
	Stove alarm	-	-	-
Prices €				
	Em.button (GSM)	399	339	339
	Em. button (line)	255	219	?
	Cell phone w. em. button	22	12,8; 23 (rental)	12,8
	Automatic smokedetector	14.64/month	170	32
	Medication dispenser	200-300	200-300	200-300
	Stove alarm	*ca* 200	*ca* 200	*ca* 200
Require-ments				
	Em.button (GSM)	GSM + 220V/battery 420h	GSM + 220V/battery 420h	GSM + 220V/battery 420h
	Em. button (line)	network + 220V/battery 100h	network + 220V/battery 100h	network + 220V/battery 100h
	Cell phone w. Em. Button	GSM	GSM	GSM
	Automatic smokedetector	-	-	-
	Medication dispenser	GSM + 220V/battery	GSM + 220V/battery	GSM + 220V/battery

Chart 3 Used technologies

4 Emergency button scheme in Rakvere, Cēsis and Ape

We have created two schemes which show the emergency button process to give a better overview of the service and its pricing. Chart 4 shows the process in Rakvere while Chart 5 shows the processes in Cēsis and Ape. In general the services provided in Rakvere, Cēsis and Ape are similar– if the button is pressed, the client will be connected with a call-centre through a stationary communication device. Call centre specialist will decide what following actions will be taken.
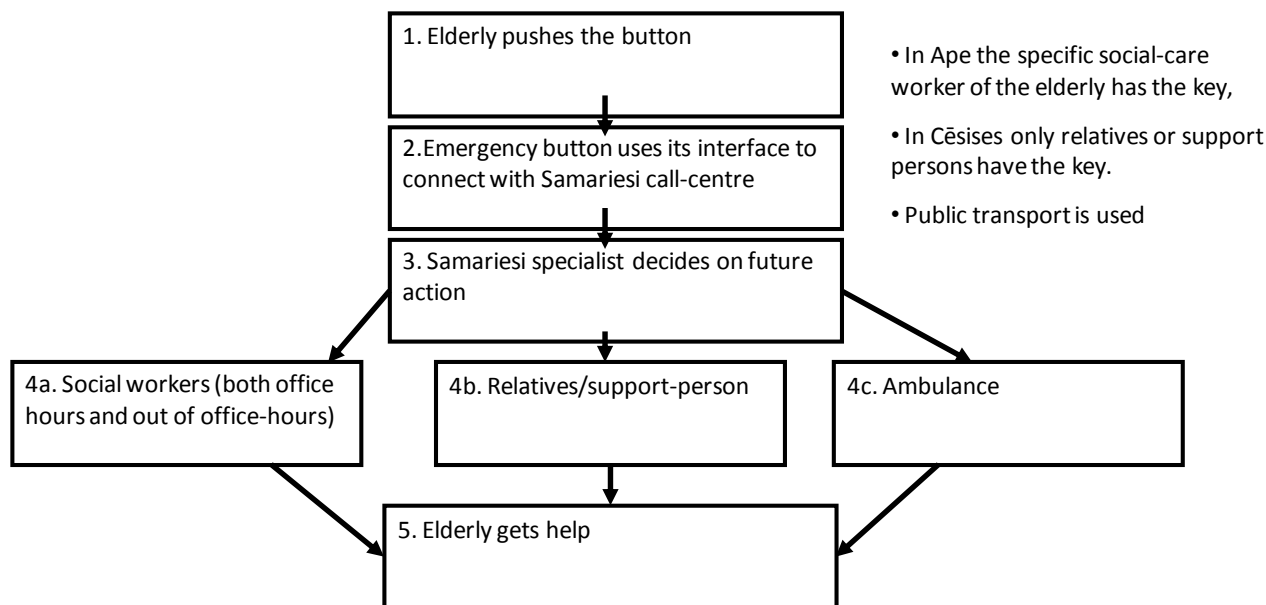
Service in Ape and Cēsis is the same but some elements differ from the service in Rakvere:

- Rakvere social care workers use electrical cars;
- Rakvere has an all around the clock emergency patrol team consisting of 2 employees;
- Keys of the elderly are copied and kept in a shared safe in Rakvere.

In Rakvere the service Provider is Meditech Estonia while in Cēsis and Ape the service provider is Samariesi. The price of the service is slightly higher in the case of Meditech Estonia. Chart 4 shows the emergency button service in Rakvere and Chart 5 shows the emergency button service in Ape and Cēsis.

```
                    ┌──────────────────────────┐
                    │ 1.Elderly pushed the button │
                    └──────────────────────────┘
                                 │
                    ┌──────────────────────────┐
                    │ 2.Emergency button uses   │
                    │ its interface to connect with │
                    │ Meditech Estonia call-    │
                    │ centre                    │
                    └──────────────────────────┘
                                 │
                    ┌──────────────────────────┐
                    │ 3. Meditechi specialist   │
                    │ decides on further actions │
                    └──────────────────────────┘
```

4a. Rakvere reaction workers (out of office-hours)

4b. Rakvere socialworkers (office-hours)

4c. Relatives/support person

4d. Ambulance

- Keys are in the safe.
- Official car is used

5. Elderly gets help

Chart 4 Scheme of emergency button service in Rakvere

```
┌────────────────────────────────┐          • In Ape the specific social-care
│ 1. Elderly pushes the button   │            worker of the elderly has the key,
└───────────────┬────────────────┘
                │                              • In Cēsises only relatives or support
┌───────────────▼────────────────┐              persons have the key.
│ 2.Emergency button uses its    │
│ interface to connect with      │            • Public transport is used
│ Samariesi call-centre          │
└───────────────┬────────────────┘
┌───────────────▼────────────────┐
│ 3. Samariesi specialist decides│
│ on future action               │
└─┬─────────────┬──────────────┬─┘
  │             │              │
┌─▼───────────┐┌▼────────────┐┌▼────────────┐
│4a. Social   ││4b. Relatives││4c. Ambulance│
│workers (both││/support-    ││             │
│office hours ││person       ││             │
│and out of   ││             ││             │
│office-hours)││             ││             │
└──────┬──────┘└──────┬──────┘└──────┬──────┘
       │              │              │
       │       ┌──────▼──────┐       │
       └──────▶│5. Elderly   │◀──────┘
               │gets help    │
               └─────────────┘
```

Chart 5 Scheme of emergency button service in Cēsis and Ape

5   Best foreign practices

The purpose is to introduce similar services and technological devices from elsewhere in the world which are used to make elderly home-care safer and better. The focus is on technologies and services that fulfill the function of the emergency button and finding out their technical solutions and prices.

5.1   Best practices in foreign countries

Emergency button services around the globe can be placed into two categories.
1. First category follows the Meditech Estonia and Samariesi model, where the emergency button device is connected to a call-centre. Devices can use landline, GSM or internet technology.
2. Second method is operated without call-centre and is based on devices that have pre-programmed numbers of relatives of elderly. The device will start to call through the numbers once an alarm is detected

United States – Listed below are some emergency button service providers and their total monthly fees including device rent.
- **Agingcare landline -   16 € per month** LINK- http://www.bayalarmmedical.com/medical-alert-system/
- **Agingcare GSM-   25 € per month** LINK - http://www.bayalarmmedical.com/medical-alert-system/
- **Lifestation landline – 19 € per month** LINK- http://www.lifestation.com/
- **Alert-1 landline –   19 € per month** LINK- http://www.alert-1.com/pricing/plans/225

- **Mobilehelp GSM-   22 € per month** LINK-
  https://accounts.mobilehelpsys.com/orders/main.aspx

All of these service providers use the same method and similar technology as Meditech Estonia and Samariesi. The service consists of a wearable emergency button and a stationary communication device which creates a connection to a call centre.

One of the companies selling pre-programmed devices is called Callforassistance. Price of the device is 254 € with no monthly fees. Small fees will be added to customers regular phone bill if an emergency procedure has been used.

Great Britain - The main emergency button service provider in the UK is AgeUK**.**
AgeUK uses the same method and similar technology as Meditech Estonia and Samariesi. The service consists of a wearable emergency button and a stationary communication device which creates a connection to a call centre. Monthly service fee including device rent is 17 €. Installation fees of 156 € are much higher than in Estonia or Latvia.
More info: http://www.ageuk.org.uk/products/mobility-and-independence-at-home/personal-alarms/

It is possible to route all emergency button calls in Great Britain to a state financed call-centre.

South African Republic - Call4Care uses also call centre system. Set consists of wearable emergency button and fixed line device which connects the calls. Installation fee is similar to Rakvere amounting 61 €. Monthly fees start from 14 €. More info: http://www.call4care.co.za/home-care.html

5.2 Alternative solutions and future possibilities

First passive solutions which require no pressing of the button have been invented.
Such devices will measure persons movement, acceleration, orientation, heart-rate and possible impact with the ground. An extra sensor can detect whether the elderly is wearing the device or not.

- Automated devices will report an emergency even in the case of lost consciousness or inability to press alarm
- Some solutions do not need wearing and are therefore more convenient

- Automated devices are not yet commonly used due to false alarms.
- Feeling being followed by devices might cause psychological discomfort

More info on such technologies can be found here: http://www.agingcare.com/Articles/automatic-fall-detection-calls-for-help-automatically-143104.htm

One alternative to emergency buttons could be specialized wrist-watches created by Viveo in Finland. These watches have an in-built emergency button. More info: http://www.vivago.com/products-and-services/products/care-8001/

Other potential solutions for the future include smart-watches that have built in telephone functions. Development in that field is ongoing and we will most likely see options to create applications or free software for smart-watches in the future. Smart-watches could prove to be successful emergency button solutions if their usage can be made as easy as possible and battery lifetime is prolonged.

There is a service in the US where a computer is programmed to periodically call clients elderly relatives and play them a recorded message. If the phone call is answered and elderly voice is detected, the client will receive a text-message confirming that the relative is OK. The service is called Simplychekingin

6 Analysis of expenses and cost-benefits

Expenses, costs and potential savings need to be calculated in order to successfully continue the emergency button service. Potential savings are calculated by comparing emergency button expenses to expenses to be made on alternative methods.

6.1 Model of expenses and economy in Rakvere, Cēsis and Ape

We have created an Excel worksheet to map out all the expenses. To open it, right click on chart 6, go to "worksheet object" and press "open". The worksheet allows one to calculate the one-time and running expenses of the emergency button service for the municipality and the elderly with different initial values. The worksheet consists of a source material field which has changeable orange coloured numbers and results fields which show calculations. Changing the data in results fields can alter their function.

Source material	
New users per month	2
Elderly self-financing	10,00%
No. Of elderly	21
Emergency patrol expenses	475
Used car kilometres	9
Device purchasing price	399
Monthly service fee	22

Legend:	Change only orange numbers in Source material field
	Tables consist of calculations, changing the data can alter their function
	Yellow marks elderly self-financing costs

Economy evaluation - Minimal expenses were made to fulfill goals

One-time Expenses for the municipality

No. Of Elderly	Installation and instructions	Safe for keys	Copying and storing the keys	Purchasing price of the devices (GSM)	One-time cost per elderly
21	1260	20	111	8379	465

Running expenses per month for the municipality

No. Of Elderly	Monthly service fee	Used car kilometres	Transportation costs (0,2€/km)	Emergency patrol expenses	New elderly users	Installation and instruction expenses	Copying and storing the keys	Total expenses per month	Expenses per one elderly	Elderly self-financing %	Bill for the elderly
21	462	9	2	475	2	120	11	1069	51	10,0%	5

Running expenses per year for the municipality

No. Of Elderly	Municipality expenses per year	Total expenses per elderly	Municipality expenses per elderly	Yearly expenses for the elderly
21	12833	611	550	61

Chart 6 Model of expenses and economy in Rakvere, Cēsis and Ape

6.2 Analysis of expenses in Rakvere, Cēsis and Ape

Rakvere

One-time expenses per one elderly client were 465 €, which consists of the device, installation, training, company car fees, emergency patrol wages, copying and storing the keys. Rakvere has purchased 21 emergency button devices. Running expenses are dependent on the number of clients.

Total expenses for Rakvere with 21 elderly are 1 069 € per month or 12 832 € per year. Expenses for one elderly were 51 € per month or 611 € per year.

Cēsis

One-time expenses per one elderly client were 113 €, which consists of the device, installation and training. One-time expenses were low because Cēsis has purchased 5 emergency button devices and is currently renting 10 devices. Running expenses are dependent on the number of clients.

Total expenses for Cēsis with 15 elderly are 294 € per month or 3 528 € per year. Expenses for one elderly were 20 € per month or 240 € per year.

<u>Ape</u>

One-time expenses per one elderly client were 1 022 €, which consists of the device, installation, training, copying and storing the keys. One-time expenses for Ape were high because 12 devices were bought, but only 4 people currently use the devices. Running expenses are independent of the number of clients until all devices are in use.

Total expenses for Ape elderly are 51 € per month or 614 € per year. Expenses for one elderly were 13 € per month or 156 € per year.

7 Effectiveness, relevance and benefit of the emergency button

Relevance and benefit of the emergency button service can be divided into monetary and social benefit. Monetary benefit for the municipality can be seen from the comparison with alternative costs that the municipality would have to make if there were no emergency buttons in use. Social benefit comes from the fact that the elderly wish to live at home as long as possible. Monetary benefit can be shown in numbers, however social benefit has been found by conducting a survey among the elderly.

7.1 Comparison with alternative costs

Chart 7 shows the difference in costs associated with the emergency button service and alternative costs associated with nursing homes. Typically costs of nursing house exceed retirement pension. When person is placed to nursing home then pension is directed to cover partly those costs and only small fraction of it is left at disposal of elderly for out-of-the-pocket expenses. Municipality covers the difference between actual cost of nursing-home and pension.
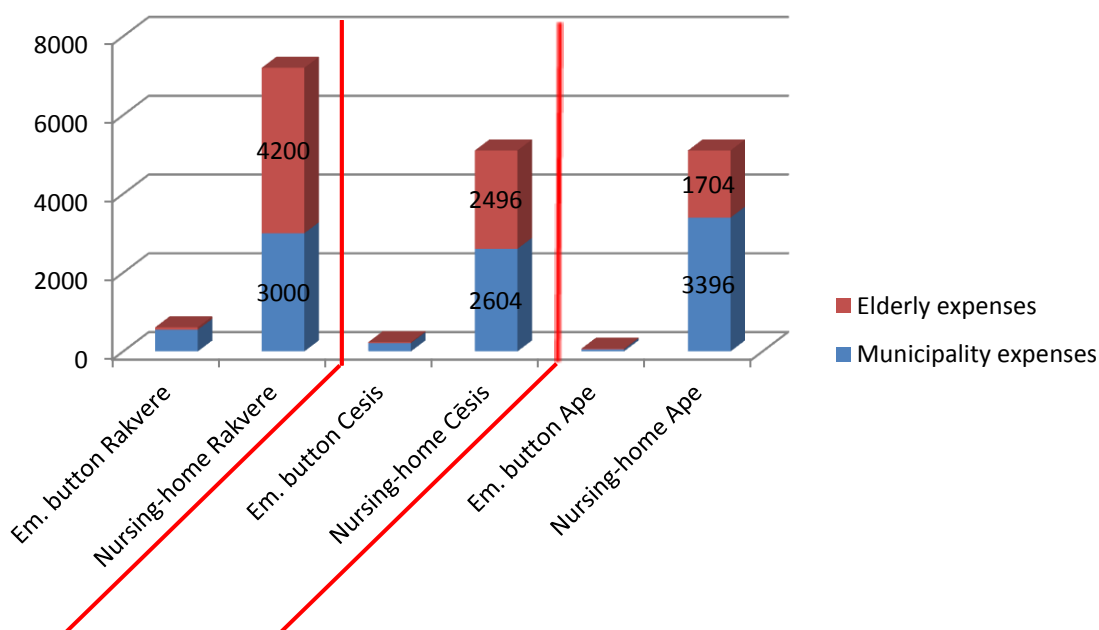
Chart 7 Comparison with alternative costs

Chart 8 shows average prices for nursing homes in Rakvere, Ape and Cēsis

Costs/month	Rakvere	Cēsis	Ape
Nursing home	600 €	440 €; 425 €; 385 €	425 €
Emergency button	51 €	20 €	13 €

Chart 8 Alternative costs

Estimated expenses on a nursing-home spot for the municipality
- Rakvere = 3 000 € a year;
- Cēsis = 2 600 € a year;
- Ape = 3 396 € a year.

Emergency button service expenses dependent on the number of users and self-financing.
- Rakvere = 346-625 € a year;
- Cēsis = 190-230 € a year;
- Ape = 138-145 € a year.

From the data above we can conclude that keeping elderly at home for as long as possible is very cost-efficient.

Cooperation between municipalities in organising a joint call-centre would help reduce costs even further as the high service fees of Meditech Estonia and Samariesi are caused by the low number of clients.

Note - During the first year there were one-time expenses made on purchasing the emergency button devices. These expenses were covered by the Innocare project. Total one-time expenses per one elderly were:
- 465 € in Rakvere;
- 113 € in Cēsis ;
- 1 022 € in Ape.

Expenses in Cēsis were low because only 4 devices were bought and other devices are being rented. Expenses in Ape were high because only 4 people used the service while 8 devices were not used.

Expanding the service could be beneficial even though there are additional expenses for buying new devices when compared to nursing-home prices. Ape could expand the service without making any extra expenses as they have 8 unused devices.

Cost-benefit calculation of Rakvere

In the case of 21 emergency buttons and 10% self-financing - the municipality will save 2 450 € per elderly a year when the emergency button allows an elderly to be on home-care instead of the nursing-home. Break-even point for the emergency button service with 21 users is therefore equal to the expenses of keeping 4 people in nursing-home.

According to these calculations we can determine that every elderly removed from the nursing home saves enough funds to provide emergency-button service for 5 people.

**Cost-benefit calculation of Cēsis**

In the case of 15 emergency buttons and 10% self-financing - the municipality will save 2 392 € per elderly a year when the emergency button allows an elderly to be on home-care instead of the nursing-home. Break-even point for the emergency button service with 15 users is therefore equal to the expenses of keeping one person in nursing-home.

According to these calculations we can determine that every elderly removed from the nursing home saves enough funds to provide emergency-button service for 12 people.

Cost-benefit calculation of Ape

In the case of 4 emergency buttons and 10% self-financing - the municipality will save 3 258 € per elderly a year when the emergency button allows an elderly to be on home-care instead of the nursing-home. Break-even point for the emergency button service with 4 users is therefore equal to the expenses of keeping one person in nursing-home.

According to these calculations we can determine that every elderly removed from the nursing home saves enough funds to provide emergency-button service for 24 people.

7.2   Assessment of effectiveness

The amount of time that the elderly can be safely kept at home can be increased with an emergency button. Every month that an elderly can be kept out nursing-home means less expenses for the local municipality and the elderly. Emergency button will extend the period that the elderly can live at home. Chart 9 describes life of average citizen. The goal is to

maximize independent life at home depicted with green colour. If health deteriorates and person needs support then it is the most cost efficient to maximize period of use of emergency button, depicted with yellow colour on the chart. This in turn reduces time of more costly nursing-home alternative.
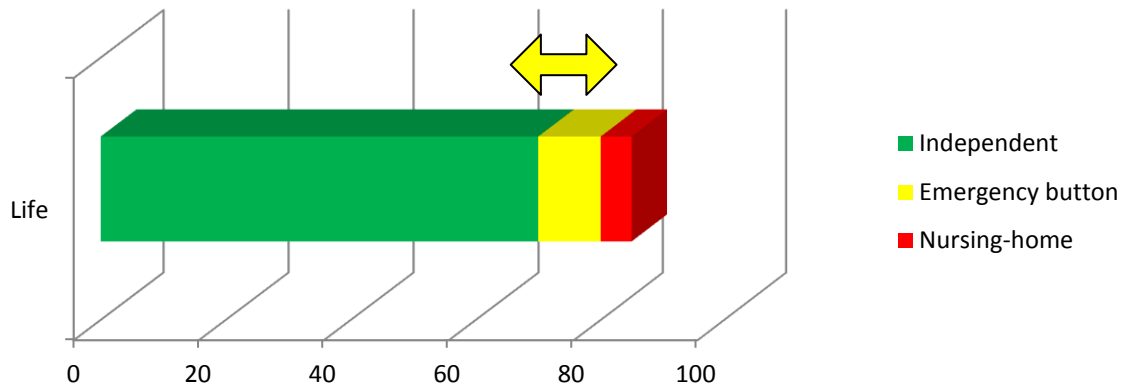

Chart 9 Goal of the emergency button

7.3   Productivity of the service and its relevance to the elderly

The benefits of the emergency button are not only economical but can also be measured through social parameters such as safety and quality of life. The main relevant points to the elderly about the emergency button service are the following:

- About 90% of the elderly in Rakvere wish to live at home as long as possible and want to avoid moving to the nursing-home.
- Emergency button is a tool that can make relevant help available when needed.
- The benefit of the emergency button is not only financial but also social – elderly people feel more secure if they have the button.
- Emergency button helped to save the lives of 2 elderly.
- Also employees of the social service admitted that they do not worry for those patients who have emergency button in use
- Naturally relatives of elderly could also be more relaxed knowing that in case of emergency help is always at hand

Change in safety feeling of persons due to emergency button is depicted on chart 9. Safety buttons service added significantly secure feeling in all cities involved in the project.
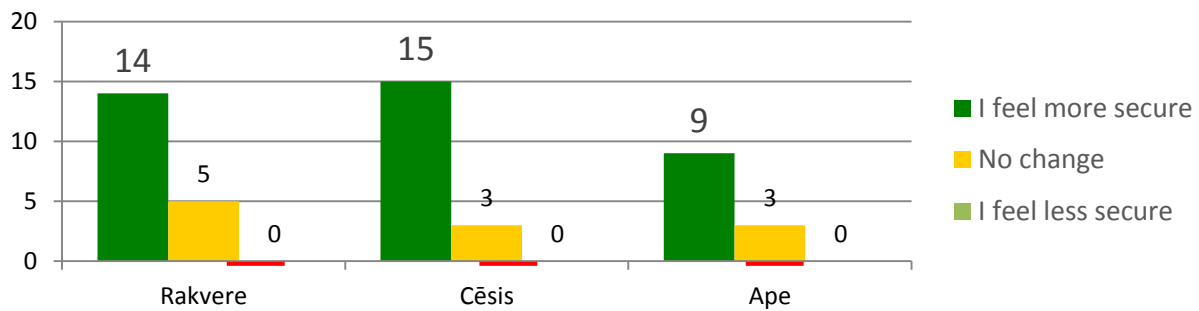
Chart 10 Changes in elderly feeling of safety

8 Critical success factors for continuing the service after the project

Critical success factors are the main tasks or actions that need to happen in order for the service to stay viable after support from Innocare is no longer available. All initial investments and current costs were covered from budget of Innocare project. After project support period it is necessary to find new ways to finance and provide the service. Therefore critical success factors were formulated.

Critical success factors of continuing with emergency button service beyond time limits of Innocare project:

- Municipality is willing to continue supporting the service both financially and by providing organisational support;
- Current expenses should fall due to new and improved technologies or at least stay unchanged;
- Elderly should be satisfied and willing to continue using the service;
- Self-financing should be minimal not to drive away the users;
- Cooperating with neighbouring municipalities would help reduce costs and increase the user base;
- Municipalities should open emergency button service for free market competition which would generate prerequisites for reduction of prices, technological development and increase of user satisfaction.

8.1 Sustainability and motivation to continue

Sustainability of the emergency button service is dependent on municipalities, service providers and elderlys' satisfaction with the service and motivation to continue:

Assumption 1:
- Emergency button provides elderly with more safety;
    Elderly feel safer in Rakvere, Cēsis and Ape:
Assumption 2:

- Municipalitys' satisfaction with the service;
  General feeling is positive which is shown by continuing the service.

Assumption 3:
- Will of the municipality to continue the service;
  There is political will to keep the service going - however in different volumes.

Assumption 4:
- Will of the elderly to keep using the service;
  Elderly were positive about continuing in Rakvere, Cēsis and Ape.

Assumption 5:
- Will of the elderly to pay for the service;
  Elderly only in Rakvere and Ape agreed with self-financing.

Assumption 6:
- Companies are motivated to continue;
  Companies in Latvia and Estonia are interested in keeping the service going.

Chart 11 is a summarizing table for sustainability assumptions and stakeholder motivation.

	Assumptions for sustainability	Stakeholder motivatsioon
Elderly	**Emergency button provides elderly with more safety**	*Elderly feel safer in Rakvere, Cēsis and Ape*
	Will of the elderly to keep using the service	*Elderly were positive about continuing in Rakvere, Cēsis and Ape*
	Will of the elderly to pay for the service	*Elderly only in Rakvere and Ape agreed with self-financing*
Municipality	**Municipalitys' satisfaction with the service**	*General feeling is positive which is shown by continuing the service*
	Will of the municipality to continue the service	*There is political will to keep the service going - however in different volumes*
Companies	**Motivation of the companies**	*Companies in Latvia and Estonia are interested in keeping the service going*

Chart 11 Sustainability and motivation to continue

8.2 Elderly assessment on continuing the service

A survey was conducted for the elderly living in Rakvere, Cēsis and Ape asking about the emergency button service. Below are the results.

Elderly were questioned about their attitude towards moving to a nursing-home. In addition the survey asked about the emergency button service and its potential promise to keep elderly living at home as long as possible.
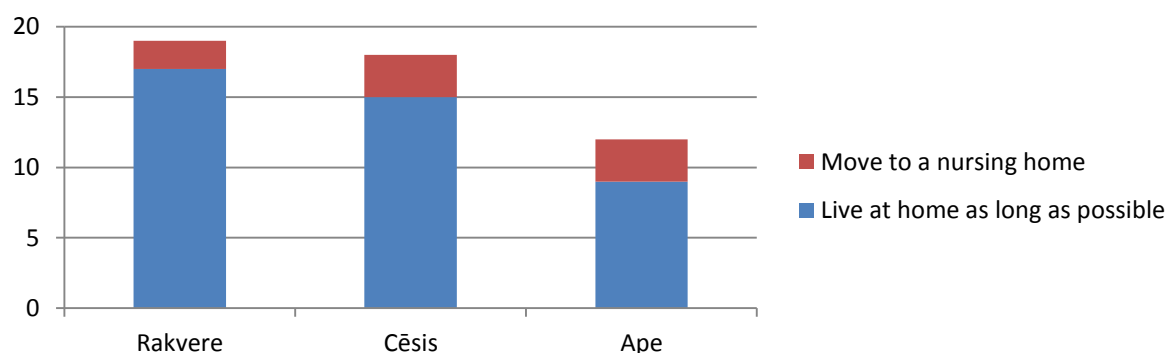
**Chart 12 Willing to stayi at home or move to a nursing-home**

Majority of the elderly wished to live at home as long as possible.

More than two thirds of the elderly thought that the emergency button service would allow them to stay at home even if their health deteriorated. Elderly were confident that the service would keep them safe as they would be able to call for help at any time.
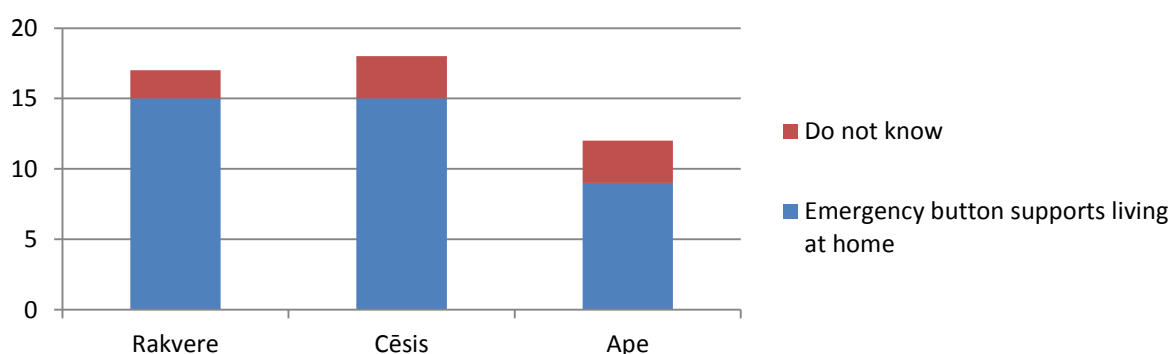

Chart 13 Emergency buttons' relevance to people staying at home

Social care workers in three municipalities agreed that the emergency button service would allow their clients to live longer at home even if their health deteriorates. The emergency button can be used until the person is sane and he/she can move on his/her own.
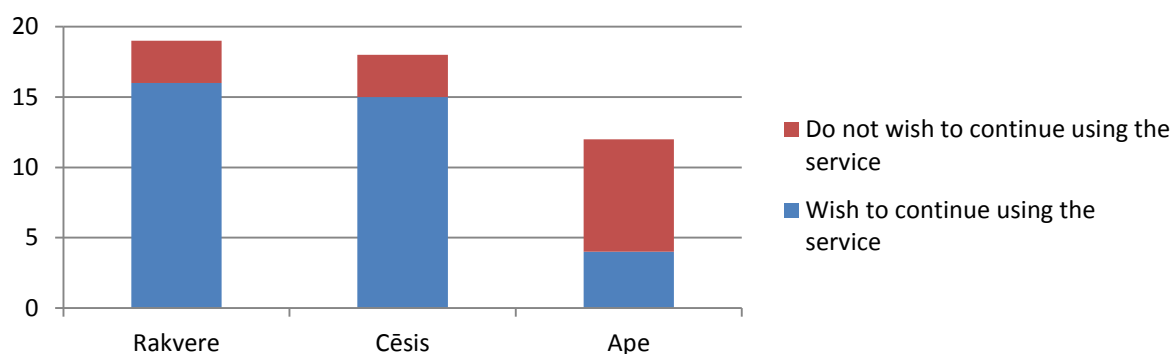
Chart 14 Willingness to continue using the service

Majority of the elderly want to continue using the service in Rakvere and Cēsis as chart 14 shows. Four elderly who wish to continue using the service in Ape can get the service for free since Ape is willing to support four emergency buttons. Every next excessive elderly has to pay for the service themselves that is why they did not wish to continue using the service.
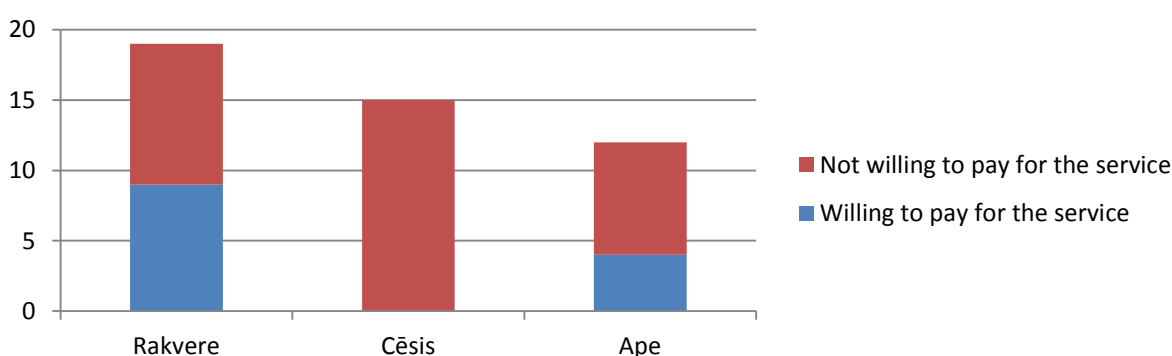
Chart 15 Willingness to pay for the service

Half of the elderly living in Rakvere are willing to pay for the service. Results are shown on chart 15. Social care workers in Cēsis argued that the elderly should not pay for the service. Four people in Ape were willing to pay for the service.

8.3   Assessment from Rakvere, Cēsis and Ape Social Support Centers on continuing the service

Social workers in all three municipalities agreed that the emergency button service reduces their concerns about the elderly living alone. Emergency button service provides the municipalities with an opportunity to reduce costs associated with nursing-homes and should be continued.

Rakvere

21 elderly in Rakvere use the service. Rakvere municipality has allocated funds to continue the emergency button service till the end of 2014. Partial self-financing by the elderly is planned to start from 2015.

Leader of Rakvere Social Support Centre and other social care workers are convinced that keeping the emergency button service alive is essential and hope that the municipality will keep allocating funds for the service from 2015.

Social employees agree that at least one man can be spared from the nursing-home thanks to the emergency button. They also revealed that in total there are 90 people on home-care in Rakvere and that the elderly receiving the emergency button were selected carefully.

Cēsis

15 elderly in Cēsis use the service. The municipality of Cēsis is willing to pay for 15 elderly clients and does not expect any self-financing. Should more elderly in excess for 15 wish for the emergency button they will have to pay for the service themselves.

General situation for social service employees in Cēsis is more difficult as there are no emergency patrol workers and public transport has to be used. Social care employees have to be ready to respond to emergencies around the clock due to no emergency patrol. **There are up to 40 wheelchair users, 800 people older than 80 and 1 000 handicapped people living in Cēsis. There are only 4 social care workers currently in Cēsis.**

Social workers say that the emergency button is a necessity because it helps to increase the safety of the elderly. At the moment there are no eligible clients whom could be spared from the nursing-home.

Ape

Ape municipality has bought 12 devices but only 4 people are actively using the device. Ape municipality is paying for the running expenses of 4 people, should more elderly wish for the button they will have to pay for the service themselves.

General situation for social workers in Ape is more difficult as there are no emergency patrol workers and public transport has to be used. Social care employees have to be ready to respond to emergencies around the clock due to no emergency patrol.

The motivation to keep elderly on home-care in Ape is not so high because the municipality owns the local nursing-home. Apes' aim is to keep the number of clients in the nursing-home stable.

Leader of Apes' Social Support Centre said that the emergency button increases security of the elderly. At the moment they have two elderly emergency button users that would have to be moved to the nursing-home if the service stopped.

9 Recommendations

Recommendations for all parties:
- Consider alternative solutions (emergency watches, cell-phones with emergency buttons and smart-watches, movement sensors);
- The device needs a safety lock and should give feedback once activated, should operate also outside the flat, enable voice communication with emergency button;
- Offer emergency button to anyone in the municipality to whom it might be useful;
- Offer self-financed, mobile phone based, services for more agile elderly;
- Increase the flexibility of home-care solutions before sending the elderly to a nursing-home;
- Start testing new solutions of emergency button in parallel with use of existing solutions. If results are positive then make decisions about new mix of technologies to be used. Test also new technologies for municipalities involved (staircase robot for wheelchair, movement sensors). Open market of technical support for elderly to new service providers and solutions.

Recommendations for Rakvere:
- Increase the amount of elderly clients – more users will lead to less expenses per client.

Recommendations for Cēsis:
- Teach the elderly how the button works – will lead to more elderly wearing the button.

Recommendations for Ape:
- Avoid automatically sending elderly clients to the nursing-home;
- Teach the elderly how the button works – will lead to more elderly wearing the button.

10 Summary

Moving from nursing-home service to home-care service allows for a more dignified retirement for the elderly. This helps to increase the quality of life for the elderly. Emergency button is a technology based service aimed at keeping elderly people living longer at home.
The service is financially valid if it can keep people away from nursing-homes.
Every elderly removed from the nursing home saves enough funds to provide emergency-button for 6 people in Rakvere, 12 people in Cēsis and 24 people in Ape. The emergency button helped to save the lives of two elderly.
Continuation of the service will be successful if all parties are satisfied and motivated to proceed. Technological advancements and cooperation in organising a joint call-centre would help reduce costs even further. Image and liveability factors will become some of the key words describing cities and municipalities of the future. Projects like the emergency button service will enhance the standard of living and raise the attractiveness of the municipality.