CHERRIES
RESPONSIBLE HEALTHCARE ECOSYSTEMS

Report on identified needs

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Executive summary	CHERRIES experimentation process is permeated by a RRI approach, from need identification, to solution definition and co-creation and their adoption. This report is focusing the result of the first of two open calls in the CHERRIES experimentation phase; the call for needs. The aim of the call is to identify one need in each territory, a need which will be the focus for further territorial experimentation in CHERRIES. An open call for needs was launched targeting healthcare stakeholders (policy makers, patients, providers, and payors) and is based on bottom-up need articulation from within the sector. The project is aiming to identify needs in an open and participatory manner and subsequently will fund projects meeting these needs with innovative solutions. Each territory in CHERRIES has different requirements and scope. Due to this, the material and the process is adapted to the regional conditions. This have resulted in three slightly different call for needs with different methodological considerations and outcomes. In conclusion this first part of the project was successful in gathering and sorting different needs. The different contexts and demands in the three different regions was taken into account during the call for needs and all three regions have selected one regional challenge that will be the subject for the upcoming call for solutions.

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1. Introduction to the call for needs

The CHERRIES experiments are building on a Responsible Research and Innovation (RRI) approach, that is guiding the needs' identification, solutions' definition as well as the co-creation of solutions and their adoption. Throughout the whole process, the CHERRIES methodology aims to support healthcare actors to innovate according to RRI-based principles such as diversity and inclusion, openness and transparency, anticipation and reflection, responsiveness, and adaptability.

This report introduces the results of the first of two open calls in the CHERRIES methodology; the call for needs. The call for needs is the first part of the territorial experimentation in CHERRIES (see figure below). For more information about the whole experimentation methodology, see CHERRIES Deliverable 3.2 *Adapted territorial methodology for the experimentation per territory*.

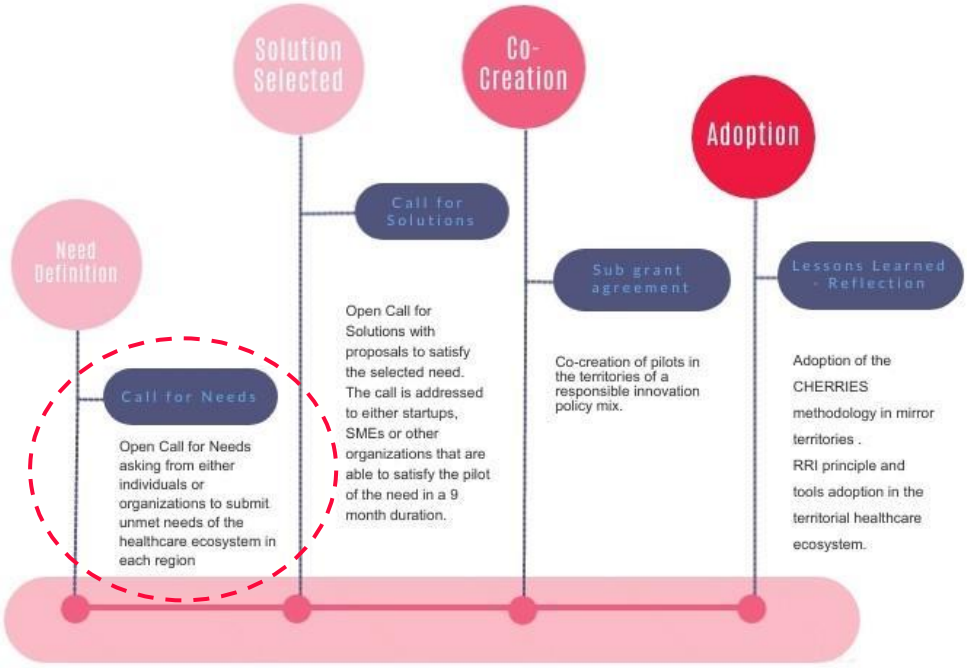

Fig 1. Overview of the phases in the CHERRIES territorial experimentation.

The first phase of the CHERRIES process focuses on the need identification. An open call for needs is launched targeting healthcare stakeholders (policy makers, patients, providers, and payors) and is aiming at a bottom-up need articulation from within the sector. Regional project partners launch a call for needs to identify unmet needs in the healthcare arena. Through this, one regional challenge will be selected in each region. The call for needs states the particular project requirements and thematic priorities for the experimentation phase.

The needs should arise from the healthcare system and go beyond the level of an individual patient, be concrete without but not overly-specific, fit the scope defined by the project framework, and be met with an innovative solution.

1.1 What is a need?

Needs in the CHERRIES project can be defined as singular requirements that are identified and reported by healthcare professionals or patients, they are associated with everything human beings require to function well.

In the context of CHERRIES, a need is an issue within or connected to the healthcare system that is affecting either the healthcare service delivery quality, is creating avoidable costs within the healthcare system or both things at once.

The reported needs are aggregated (if appropriate) into sectoral demands of the regional healthcare stakeholders (e.g. healthcare professionals, patients etc.). Thereby, CHERRIES is taking a clear user- or citizen-led approach to innovation processes. As the methodology involves citizens already at the level of problem definition, it is characterised by high degree of public engagement, sharing of power and collaboration between the public and administrations.

1.2 How do the needs connect to the innovations in CHERRIES?

CHERRIES is aiming to identify needs in an open and participatory manner and subsequently the project will fund projects meeting these needs with innovative solutions. These solutions could be new services, products, processes, inter- or intra-organisational routines or social practices that are considered as innovative and responsible.

An innovation in the context of healthcare generally refers to new medicines, diagnostics, health technologies, practices, objects, social or institutional arrangements perceived as novel by an individual or a unit of adoption. The OECD defines health innovations as: "*Health innovation identifies new or improved health policies, systems, products and technologies, and services and delivery methods that improve people's health and wellbeing. Health innovation responds to unmet public health needs by creating new ways of thinking and working with a focus on the needs of vulnerable populations. It aims to add value in the form of improved efficiency, effectiveness, quality, sustainability, safety and/or affordability. Health innovation can be preventive, promotive, curative and rehabilitative and/or assistive care*."[1]

Following this definition, CHERRIES engages the regional healthcare systems to identify needs, that if met by new or improved approaches, have the potential improve people's health and wellbeing. Thus, the overall aim of the Call for Needs is to signal a potential for improving healthcare delivery quality and a market opportunity to innovators. This demand-orientation supports the coordination between the regional healthcare and the Research and Innovation (R&I) sectors and creates a shared arena for aligning expectations and actual innovation outcomes.

2. Regional call for needs process

Each territory in CHERRIES has different requirements and scope, therefore both the material and the process must be adapted to the regional conditions. However, the process has followed the same steps in each region, which are:

- Launch of the call for needs. The project provided a template for submitting the needs, a template that each territory can modify and adapted to the territorial requirements.

[1] WHO, n.d., https://www.who.int/topics/innovation/en/ retrieved 24.06.2020

- Workshops to raise awareness and provide training for the call. This took place in parallel with the call for needs.
- Evaluation and selection. The project provided an evaluation template.

For the templates used in the call for needs, input and inspiration has come from two previous European projects, whose outputs have been exploited as far as appropriate:

- InDemand https://www.indemandhealth.eu/
- Social Challenges Innovation Platform https://www.socialchallenges.eu

The Call for Needs is an important alignment instrument, that builds on the RRI principals of inclusion and reflexivity. The information campaign and the Call for Needs templates aimed at supporting stakeholders in their reflection process. Further, RRI aspects like ethics, gender equality and societal engagement are core of the overall CHERRIES experiments. During this first step, inclusion of societal actors in reporting and selecting the most appropriate need has been essential.

2.1 Call for needs in Cyprus

2.1.1 Regional scope and orientation

Cyprus, an island in the Mediterranean boasts of a plethora of rural and remote idyllic landscapes with villages and communities spread in mountainous areas and seashores. A significant amount of the population of the island lives in these areas whilst the majority of them are adults or elderly. Their healthcare needs are growing over time and the commute for even simple diagnostics or basic medical treatment is becoming increasingly demanding and difficult, especially in the pandemic era where restriction measures and social distancing are strict and inevitable.

Healthcare in the Republic of Cyprus has been improving substantially with the recent long-anticipated implementation of a comprehensive National Healthcare System, which is set to make the sector more streamlined and cost effective. Major challenges face today's healthcare system for which health professionals including public and private hospitals and clinics, must be prepared. There is an immense need for better coordination, communication, and more efficient processes within hospitals but also with the patient experience as well as other key stakeholders of the healthcare ecosystem. In addition, we have both a culture and organization of care that separate our care into distinct systems such as hospitals, home care, skilled nursing facilities, with little formal communication, relationships, or collaboration between and among those settings. In addition, a significant population of the island live in rural and remote areas across the island or/and away from the densely populated areas where the critical infrastructure is situated – including hospitals, healthcare professionals and other relevant services.

In this context, eHealth solutions are expected to contribute to increasing the service delivery quality of individual organisations and coordination between organisation involved in care as well as the patients alike. Transforming systems in a way that would give patients and health professionals more of an active role, as users of new technology in the care continuum, is a priority.

The call for needs in the region of Cyprus was focused on three target groups:

- Healthcare professionals of both private and public sector.
- Associations of patients.
- Other public stakeholders (municipalities, organized groups) and citizen representatives.

Eligible consortiums could consist of one, two or three representatives of the target groups. However, it was compulsory for each consortium to have at least one healthcare professional from the AIK as it is essential to take them into account to run the pilot if the need is selected. Having said that, it was considered very important for us – the regional coordination team, to have a healthcare professional both from the AIK project partner perspective but also with their professional capacity to oversee the procedures and being involved in every step of the process as their experience and input will add value and quality to the overall process. In regards to thematic focus, the call in Cyprus remained open and did not provide any limitations to the nature of issues that could be reported as a need.

The call in Cyprus build upon previous experiences made in the course of the Social Challenges Innovation Platform project as well as the experience from running local challenges through activities over the years. It followed the best practices for generating a momentum and awareness around the scope of CHERRIES and the future potential benefits that will bring to the local ecosystem. Referring to ''best practices'' in this scope, we mainly refer to the actions taken in order to engage potential applicants not in terms of quantity but in terms of quality. Hence, we utilized the already established network through our previous experience but we also engaged impactful and relevant stakeholders through the AIK partnership as a project partner. AIK, as a leading healthcare provider in Cyprus and a Centre of Excellence was able to assist in the engagement and communication of the Call for Needs by introducing us to patient associations, organizations, relevant policy makers and the local healthcare ecosystem.

Eight proposals were received and thus the expectation was met. Experiences show, that the length of the application form as well as the COVID situation might have countered a higher return on the call.

Special attention has been given in properly explaining the importance of the Need definition and input, with back-and-forth interaction with potential applicants. It can be said that it was more time consuming as expected because applicants needed to provide a detailed description of the need as well as to understand the structure and the methodology to follow.

Overall, it is important to mention that the regional project team is satisfied that at the level of the need application, the majority of the needs reported would cover multiple RRI aspects as well as more than two out of the four groups of the 4P model. More specifically, within the 8 applications that have been received the classification of the applicants varies from Patient Associations (organized groups but also individuals in the areas of autism, psychology, nursing), Healthcare providers (group of professionals with specific specializations e.g. autism, gerontology, physiology) and payors (individuals representing communities of population living in rural and remote areas of the island). Since the submitters and their representatives have contacted us bilaterally before – during and after the submission of their needs we were able to identify a number of RRI dimensions that fulfilled their application such as inclusivity, people with special abilities, aging population but also dimensions that highlighted their privacy issues, the diversity of the needs that they individually had in terms of healthcare and last but not least, the policy making element, especially for communities that live in rural and remote areas of the island, they contribute to the National Health System but policy frameworks and strategy do not allow them yet to gain access to high quality standards of medical and healthcare support.

2.1.2 Technical implementation of the call

The submission template of the Call for Needs was designed in Microsoft Forms. The submission template followed the generic version of the application form that was initially proposed through the consortium and adjusted to the local requirements of the call. The form was written in English as it is the third official language of the country and is widely spoken in Cyprus.

The form was uploaded on CyRIC Microsoft server and Cyprus created a dedicated section with all the details and description of the call along with a direct link to apply on the website. Also, AIK uploaded the relevant communication material for the Call for Needs in their online media and social network accounts and the ‘’call to action’’ for the application form was diverted through the same link to our cloud based application form.

The data inserted into the application form were only accessible through the CyRIC server infrastructure, hence only authorised people had access to all the relevant material for GDPR purposes. By the completion of the Call for Needs, all material was extracted in printed form and shared only between the evaluation committee members which are listed below in this report. Initially the call was open for three weeks but over further engagement with stakeholders and the metrics of the participation, they extended the call for another two weeks. During these two weeks the applicants had the ability to enhance their already submitted inputs as well as receive two more applications

2.1.3 Regional dissemination of the call

For the dissemination of the call, it has been decided to use multiple channels through social media as well as bilateral communication with individual potential applicants. That was considered important to acknowledge the project and the upcoming Call for Solutions in the future, as well as inform them about the need collection process and their involvement.

As mentioned above, the target groups to be reached through the call were:

- Healthcare professionals of both private and public sector.
- Associations of patients.
- Other public stakeholders (municipalities, organized groups) and citizen representatives.

This decision has led us to envisage a provision of different approaches on how to first inform them about the call for needs and secondly to engage actively with them in order to achieve their interest in applying. Different groups require a different approach due to their nature. Indicatively, Healthcare professionals (either private or public sector) are people with high competences and understanding of the sector but at the same time they are very busy and more hesitant to apply and commit for a need, because it is exposing – as they explained, their position. However, a more delicate approach and further explanation that the ‘’Call for Needs’’ is the first step to achieve – within the project framework, a potential change for a better future in the sector was followed and eventually we had healthcare professionals submitting applications. As for the patient associations, it was the easiest way to approach them as they all – and always have issues that need to be addressed in many ways – the policy level, the healthcare professional level etc., due to their societal aspect. Associations of patients were more motivated and more enthusiastic in submitting their application in the Call for Needs because it was an opportunity to expose their problems and potentially ask for a solution. As for other public stakeholders and organized groups was also a motivational action for them and they were less hesitant than the healthcare professionals but more hesitant than the patient associations. We believe that the reason for that – as they mentioned was because as organized groups – this submission of the call for needs would also expose their vulnerabilities as well as allocating to them a proportion of responsibility to provide immediate solutions to their problems. However, the organized group of a community was more than eager to submit their Need since – as they mentioned, they have reached to a point that healthcare is more important than political or other societal implications.

Overall, the above mentioned difficulties were more or less expected. The most difficult part was to explain the sequence that the project foresees meaning that they have to submit a ‘’Need’’ – and potentially receive

a solution in the future and not just suggest a direct solution to their need. This – for them, was the most difficult part to explain.

Due to the COVID situation instead of physical meetings, the Cyprus team organised

1. Bilateral calls with stakeholders to inform them about CHERRIES, the Call for Needs as well as their potential and future involvement (always following up with emails and attachments of relevant material)
2. Bilateral teleconferences with stakeholders and potential applicants to follow up conversations on current and future implications of their involvement.
3. Social Media campaigns though Facebook and LinkedIn that are mainly active and broadly used in Cyprus with follow up private messages to potential applicants and general awareness of the project itself.

Overall, the Cyprus team hosted 26 bilateral teleconferences and several phone calls with organizations/ individuals/professional and associations.

2.2 Call for needs in Murcia

2.2.1 Regional scope and orientation

The healthcare and research priorities of the SMS and the Ministry of Health are COVID-19, telemedicine, chronic patients, surgical performance, integrated care, epidemiological surveillance, prevention and health promotion (physical activity, tobacco, obesity) empowering patients. Despite this, the SMS has decided not to limit the theme of the challenge proposals, with an open approach since priority is an evaluation criterion that will be applied in a later phase.

The Call for Needs in the region of Murcia addressed three main target groups:

- Healthcare professionals of SMS, both sanitary and not-sanitary (IT, administrative etc.).
- Associations of patients.
- Research groups of universities (there are three universities in the region of Murcia, two public and one private).

Eligible groups could consist of one, two or three representatives of the target groups. However, it was compulsory for each consortium to have at least one healthcare professional from the SMS as it is essential to take them into account to run the pilot if the need is selected.

The Murcia team followed experience made in the context of the inDemand project and followed the best practices of the project creating a culture of intrapreneurship among SMS professionals, supporting them in explaining the content of the call and the preparation of a proposal and through the different processes. The thematic focus of the call was on eHealth as a regional culture on finding ICT-based solutions for these needs has been established in the course of various European projects. Within this eHealth topic, SMS discarded deeper priorities leaving the framework open for proposals and hoping to select the winner by aligning with SMS strategies.

The number of proposals received, 8 proposals, was lower than expected due to the COVID situation, which has been the main priority of the SMS professionals.

In regards to RRI, the call paid special attention to widening the group of recipients by involving new stakeholders (patient associations and Universities) that were not familiar with the Call for Need process. while the SMS healthcare professionals already made experiences with such processes in the course of projects like inDemand.

2.2.2 Technical implementation of the call

Following the best practices of inDemand, Murcia used the same submission template to collect the needs, adjusted to CHERRIES requirements.

The template was uploaded on the SMS intranet using the web tool developed in inDemand. This tool was based on a web shared rewriting tool called "*Orbeon*" which permits to confidentially write, delete and add information both, to the responsible of the proposal and the advisor.

This tool was only accessible for the SMS professional as it was located in the SMS intranet to facilitate the control to the access with the safest conditions. The tool was opened a few days before the second webinar, that took place on November 3rd, 2020, focused on the process of submission of the need proposals. The platform remained open for three weeks, improving the quality of each of the needs' proposals thanks to the frequent interactions of the proposers with the advisor.

2.2.3 Regional dissemination of the call

The target groups of our regional dissemination strategy in Murcia were the associations of patients, the researchers and the SMS healthcare professionals. The approach started with a conceptual webinar in order to recruit the new target groups (associations of patients, and researchers) which didn´t know the inDemand model. For the dissemination the date base of proposers created during the inDemand project, as well as the mails of Associations of patients and universities extracted from the EIP on AHA of Region of Murcia and identified for the CHERRIES mapping were used.

Due to the COVID situation instead physical meetings, Murcia organised three webinars

1. The first webinar had a conceptual scope, introducing CHERRIES project, RRI approach and inDemand as a good practice on healthcare. [October 28th, 2020]
2. The second webinar was focused on the process to write and send a proposal of need, explaining rules, templates and useful tools. [November 4th, 2020]
3. Finally, a specific webinar devoted to RRI was given by an RRI expert. [December 1st, 2020]

76 participants were registered from all different profiles and each webinar was attended by 20-25 people. The novelty and the covid scenario that forced exclusively virtual meetings hindered to involve these two new sectors in the webinars. In fact, the SMS healthcare professionals, who already knew the process of the call for needs, were involved in minor quantities than inDemand calls.

2.3 Call for needs in Örebro

2.3.1 Regional scope and orientation

In order to achieve a more focused approach and to be able to target and engage the right stakeholders, the Örebro team has chosen to focus on a limited issue: mental health of the elderly. In Sweden, almost a quarter of the population is over 65 years of age and life expectancy is increasing. Compared with younger age groups, mental well-being is greater in the age group 65-84 years. At the same time, the share of people using psychotropic drugs is higher in older age groups compared with younger people, and the same applies to suicide, which is highest among men over the age of 84. There is also a large proportion of older people who state that they have, for example, difficulty sleeping or anxiety. Just over half of the elderly in elderly care also state that they are bothered by loneliness.

Since this is an issue that greatly effects the provision of healthcare, but that is not specifically owned by healthcare actors, a range of stakeholders was targeted by the call. This included regional and municipal healthcare and civil society organisations. The call was also open for private citizens.

2.3.2 Technical implementation of the call

The Örebro team has used the call for needs template developed in CHERRIES. However, some adjustments have been made. The adjustments have primarily been based on the fact that the stakeholders, the Örebro team aimed to reach, are not always used to writing this type of material, and thus in order to be open and inclusive towards these stakeholders the form has been adjusted accordingly. The questions regarding scalability (as the call was not limited to one hospital or institution), description of objectives and indicators of the solution, and the commitment (as the call was open for private citizens, who cannot be expected to make that commitment) have been removed from the template.

The Örebro team aimed for simplicity and thus chose to provide the submission form as an editable PDF. Submission have been accepted in digital and handwritten form. The template has been published together with information on call for needs on Region Örebro county's website. The website was open for 3,5 weeks.

2.3.3 Regional dissemination of the call

The target groups for the call for needs where broad; civil society organisations, public institutions including healthcare, and general public/private citizens. To reach civil society, the main dissemination channel was the civil society umbrella organisation Möckelnföreningarna. To reach public officials and health care professionals we mainly used our ordinary channels in the region and the municipalities. To reaching private citizens, dissemination was made through information in local radio and through Möckelnföreningarna's communication channels.

Three participatory workshops have been organised to promote the Call for Needs. The first one primarily targeted civil society organisations and private citizens, the second one has primarily been aimed at professionals, and the third one has had mixed participants. The first of the three has been carried out physically, while the other two events had to be organised online. The workshops provided information about CHERRIES and about Call for Needs. As experience shows, people tend to go directly to possible solutions without sufficiently reflecting the needs, the focus has also been also on identifying and analysing needs.

Additionally, a webinar introducing RRI approaches has also been carried out during the time the call was open. Although this webinar was not focusing on the Call for Needs, the call was promoted during the webinar.

The submission form was published together with information on call for needs on Region Örebro county's website. Information was also disseminated on Activa's website and in the Region's social media channels, in newsletters and in meetings with stakeholders.

In summary, a number of dissemination actions were made to reach the target groups. Although, there were some difficulties to reach and engage especially healthcare sector and private citizens, which most likely had effect on the reported needs.

3 Identified needs

In the following chapter, the identified needs in CHERRIES are presented and discussed for each region.

3.1 Collected needs by territory, sector and 4P model

In total, the number of collected needs per territory is as follows:

Region	Number of needs
Cyprus	8
Murcia	8
Örebro	6

Table 1. Submitted needs per territory.

Divided by sector, it can be seen that the regions had different orientations. Most of the submitted needs came from healthcare/public sector, followed by civil society/associations. In Murcia's case, many of the needs were submitted by a consortium of organisations, thus the total numbers in the table are higher than the total number of collected needs in Murcia. The breakdown by stakeholder groups shows that the majority of needs were identified by actors of the healthcare sector. However, the opening of established routines in Cyprus and Murcia led to a significant engagement of civil society actors in the call. While in Örebro, where the partnership between public administration and the civil society actors is well established, this group submitted the most needs. Academic actors were only involved in consortia reporting needs in Murcia. Private citizens proved to be harder to reach but submitted a need in Cyprus and Örebro respectively.

	Cyprus	Murcia	Örebro	Total
Healthcare/public sector	5	8	2	15
Civil society/associations	2	3	3	8
Universities	0	3	0	3
Private citizens	1	0	1	2
Total	8	14	6	28

Table 2. Submitted needs divided by territory and sector.

Broken down by the 4P model, we also see differences between the regions. In Cyprus and Örebro, half or more than half of the collected needs came from providers and in Murcia, all but one of the submitted needs came from providers (SMS healthcare professionals). None of the needs in either region were submitted by payors. Although, that is a question of definition – in Murcia, SMS is the main healthcare payor and in Örebro, OLL (the regional healthcare organisation) is also the main payor – but here they are defined as Providers.

	Cyprus	Murcia	Örebro	Total
Policy makers	0	0	0	0
Patients	3	1	3	7
Providers	5	8	3	8
Payors	0	0	0	0
Total	8	9	6	23

Table 3. Submitted needs divided by territory and 4P model.

The category *Patients* in the 4P model in this case includes patients, patient organisations and also private individuals, who can be said to belong to the same sphere of interest. The category *Providers* here includes healthcare professionals, but also associations that provide community service.

The absence of needs submitted by Policy makers can be explained by their role in the CHERRIES model as well as in the project as a whole. In the CHERRIES model, the policy makers are the policy owner and shape the environment through instruments (sticks, carrots and sermons), they are not the ones answering the call but the ones addressing stakeholder in the in the need identification. During the project, the project team takes the role of the "policy owner" in the experiment design. Subsequently, the policy makers are present in CHERRIES in partner roles and are responsible for the
overview and to ensure sustainability of the process. Thus, they were not targeted in the Call for needs – although public entities would still welcome to submit needs. On the other hand, policy makers had an important role in the evaluation of the needs in each region. In Örebro, policy makers were also present in the Call for needs workshops, but did not submit any written need.

3.2 Identified needs in Cyprus

Eight proposals were received through the open Call for Needs. During the application period, CyRIC and AIK personnel were interacting and guiding potential applicants through the application process with elaborations, enhancement of the input and generally answering questions related to the subject and the project.

It is worth mentioning, that during the interaction with stakeholders, potential applicants, professionals and individuals, more interest was given on the upcoming Call for Solutions rather than the Call for Needs, and it was important to clarify the necessity of the demand driven process of the project. Additionally, given the definition of the challenge, it was designed in such a way that it would provide reflection and replicability of the need and the upcoming solution in mirror territories. For example, a need that frames a specific potential solution could either be the basis for solving more than one issue.

Regarding the sectors where needs were received, it is shown by the below breakdown:

- One need was submitted by a patient association. The same need was submitted by an individual and a professional
- One need was submitted by a healthcare professional that also represents a community that lives in rural and remote areas of the Republic.
- One need was submitted by the same professional that represents all the citizens but also this specific portion of the citizens with their need.
- One need was submitted by an ex-professional that currently is out of the field.
- One need was submitted through a provider (through an individual representing the provider and a population group)
- All 8 needs have described common issues that mostly refer on describing provision of medical services and prescribed medicines to specific patient groups.

Need title and description	Characterisation of the person/group submitting the need	Assessment of the Committee
Electronic request of repetitive prescriptions, examinations and other tests needed by patients on a regular basis	Individual Carer of an elderly sibling which faces difficulties in getting in touch with their GP	The problem is evident but the overall marking on all categories is average in terms of commitment, innovation, feasibility and other parameters that can be explained in detail. (8.5/15)
Day Care services for autism patients	Association (Autism Support Famagusta). Association for parents with kids that have autism.	Very clearly stated and commitment is evident from the parents perspective. Low rate on the innovation factor (10/15)
"Professional and effective SEN and psychiatric support services	Healthcare professional from the UK, specialized in autism treatment	Satisfactory description but average on feasibility and innovation (7.5/10)
Prescribing (Electronic)	Retired NHS Employee experiencing problems in prescribing medicine while living in Cyprus.	Evident need discussing eHealth issues but not providing the technical background and capacity although the need is very well described (09/15)
A need to develop awareness, communication and distribution of flu and other vaccines via public messaging, private/individual messaging and scheduling	Patient describing a problem related to the Need and directly related to eHealth solutions	Average description of the Need. The Deputy Ministry of Research , Innovation and Digitization have already provided a solution in collaboration with the Ministry of Health (and currently working on it) (8.75/15)
The need for staff that can understand and handle autistic persons. Give them priority as they are disabled. Disability is not just the wheelchair. At least one trained person on every shift on every hospital or clinic that can be reached on demand	Individual person – patient (mother of an autistic child).	Need highlighting the lack of digital and eHealth solutions in autism support through COVID-19 and in general. Need averagely described, highly appreciated coming from a parent. Lack of feasibility and innovation (7.67)
Telemedicine-Need for remote health care services	Ex-Healthcare professional working in a different sector now. Submitted to acknowledge a problem.	Submission was focusing on the psychological support aspect but no specific reference or professional description of the Need. Very average (7.42/15)
"Provision of medical services to the Cypriot citizens that live in Northern Cyprus as well as Cypriot citizens that live in rural and remote areas who do not have easy	Healthcare Professional + Patient Association (Group Representative living in rural /remote area)	The need described all the difficulties that a rural and remote location is currently facing for many years with multiple issues that eHealth solutions would solve them

access to healthcare services and prescribed medicines		such as chronic patients, people with disabilities, medical prescribing and simple day-to-day healthcare services. Detailed description with indicative suggested solutions representing a whole community and also with replicability for all other communities embodying eHealth Solutions.

Table 4. Submitted needs in Cyprus.

Policy makers are already informed on the process and their efforts and interest are expected to be through the co-creation and further sustainability of the project rather than submitting a need.

Special Interest has been given in identifying potential parties for the co-creation process that also represent an association/organization because they might express potential interest to adopt and/or sustain the solution.

3.2.1 Collected needs – clusters and themes

Based on the needs collected and listed below two main clusters were reported. The major one – mentioned in all needs was the general need of telemedicine support since many of the reportedly different disabilities had this feature as a commonly missing element. As a second cluster we could classify the disability of autism since an organized group (patient association) and a healthcare professional (autism specialist submitted the need). It is worth mentioning that through their application what they highlighted the most was the lack of telemedicine support for kids with autism especially through the COVID-19 era, where autism kids and parents would not be able to join any scheduled special treatments and normal visits to their doctors. It is very important to state that all of the needs submitted had the lack and the demand of telemedicine support very high on their priority list.

The titles of the proposals received are the following:

- “Electronic request of repetitive prescriptions, examinations and other tests needed by patients on a regular basis”
- “Day Care services for autism patients”
- “Professional and effective SEN and psychiatric support services”
- “Prescribing (Electronic)”
- “A need to develop awareness, communication and distribution of flu and other vaccines via public messaging, private/individual messaging and scheduling”
- "The need for staff that can understand and handle autistic persons. Give them priority as they are disabled. Disability is not just the wheelchair. At least one trained person on every shift on every hospital or clinic that can be reached on demand. "
- “Telemedicine-Need for remote health care services”
- “Provision of medical services to the Cypriot citizens that live in Northern Cyprus as well as Cypriot citizens that live in rural and remote areas who do not have easy access to healthcare services and prescribed medicines”

3.2.2 Selected need

The regional partners along with their expertise and the persons involved in the committees of the hospital gathered in order to formally assess and qualify the selected Need that needed to be addressed and proceed according to the project to the ‘’Call for Solutions. All members were invited in order to compound a committee respecting an adequate balance of gender and stakeholders in innovation (healthcare professionals, associations of patients, policy makers and companies).

The date and venue were decided by the organizes (CyRIC and AIK) and per the availability of the AIK conference room.

Before the physical meeting, the project manager on behalf of CyRIC shared a consolidated PDF of the submitted solutions and the template of the excel assessment spreadsheet (the scanned and signed forms can be provided upon request). The project manager of CyRIC participated as the moderator of the meeting.

The Selection committee consisted of:

- Management expert, CyRIC, male
- Management expert, AIK, male
- Scientific Committee, AIK, male
- IT expert, AIK, male
- Clinical expert, AIK, male
- Market – Commercialization expert, CyRIC, male
- Patient/Community Association, Maronite Community, female

Communication about the event

The event was a private event for the evaluation committee. After the finalization of the results, the applicants were notified about the results.

During the 2-hour session we hosted at the evaluation process we identified that the needs had a common denominator- eHealth. All the submitted Needs had to do with the description of existing problems and needs that specific groups of people come across on their daily life and all had to do with providing healthcare services from a distance. The Needs submitted (as can also be seen in the excel description titles) described the problems that certain groups of people had e.g., prescription, monitoring, autism training etc. Response no8, showcased and reflected all these problems coming from a specific community living in a rural and remote location on the island, whilst having very limited access to the healthcare services provided on the island. That was the best example to represent the whole description of the need because the scope was to present all the needs that are related to eHealth from various perspectives. The selected Need covers all the individual aspects of the rest, and additionally provide the flexibility to potentially receive solutions that will be built for the whole community as a base to build upon for the future.

Title of the Need: “Provision of medical services to the Cypriot citizens living in rural and remote areas with no easy access to healthcare services and prescribed medicines”.

The overall aim of the need is to provide medical services to the population of the villages in Cyprus (or anybody else with no easy access to medical centres and health professionals) without the need of bothersome travels, that might include the crossing of checkpoint borders to visit a health professional.

The challenge will foresee a modular system that can be expended after an initial pilot phase, during which a solution will have to provide a proof-of-concept. Ideas and potential challenges to be solved by the pilot:

1. Remote visits to the doctor - where the doctor will speak with the patient via VIDEO conference and with the assistance of the local nurse will get the information and data needed for a diagnosis to be made. He will then give (written) instructions to the nurse and patient about the next actions to be made. He will prescribe any necessary medication. The prescription will be forwarded to the Government Office responsible to provide the medication to the village patients.
2. Chronic patients such as diabetics who need monitoring based on daily measurements can, provide, with the assistance of the local nurse, the measurements that will allow the doctor to monitor.
3. Physiotherapy - patients who need to exercise for a specific problem can attend sessions with a physio via Video calls.
4. Guidelines on how to approach crises such as the one of Coronavirus that we are facing currently.
5. Guidance to the professional care stuff on how to deal with emergencies and accidents until further support arrives.
6. Collecting the needs such as flu vaccine for the vulnerable etc.

3.3 Identified needs in Murcia

Eight proposals were received during the three weeks long submission period. The regional team supported applicants in improving their applications. The number of applications was lower than expected in comparison with the previous processes of inDemand, when 68 and 32 proposals were received. The reason was probably due to these two factors:

1. The demanding situation of COVID pandemic with worst rates and trends of infections each week, to which healthcare professionals were completely devoted to.
2. And the added difficulty of building a group of healthcare professionals, associations of patients and research groups of universities to propose a need.

Regarding actor constellations for the reported needs, the following picture has been observed:

- Obviously, all eight proposals were submitted with participation of SMS healthcare professionals, as their involvement was mandatory.
- Three needs i alliances with Associations of patients but only one was written by an association inside the challenger team.
- Three needs included researchers from universities. In one case, as a double role as some SMS professionals are also involved in the University, in other cases as a consultant and in only one as a co-writer of the proposal.

Need title and description	**Characterisation of the person/group submitting the need**	**Assessment of the Committee**
AMBU-DESEO The Ambulance of Desire is a foundation whose main objective is to help patients with a serious illness to fulfill their wish at the end of their life. Despite having resources (a headquarters, two ambulances and more than 150 altruistic volunteers) and being	Patients with a serious illness, 150 volunteers, foundation, healthcare professionals.	It is interesting to grow the access and activity of this service. It is very challenging to face the integration with the corporate IT tools.

available 365 days a year, the service is underused, perhaps due to lack of communication or information. For this reason, an improvement in accessibility of 35% in 10 months is proposed as a challenge through ICT tools.		
CADEM It is focused on early detection of the progression in Multiple Sclerosis applying sensors to patients by internet of things (IoT) further than current test face to face every 6 or 12 months.	Patients, patient association, health professionals (neurologists and nurses), researchers from the Department of Biomedical Engineering of the Polytechnic University of Cartagena.	It is a very complete RRI approach with the active participation of the patient association and the two areas of knowledge about the challenge: clinical and technical. It was the winning proposal.
DDSP Digitization of multidisciplinary follow-up of pelvic floor dysfunction.	Patients, multidisciplinary healthcare professionals (gynecologists, surgeons, urologists, rehabilitators, anesthetists, psychologists)	Prior to proposing the development of an ICT, It is needed the SMS approval of the guideline for multidisciplinary follow up of pelvic dysfunction.
EVOA It proposes the optimization of human resources management in multidisciplinary work environments of sudden substitutions.	Healthcare professionals (mainly nursing) and their managers.	This is an important challenge but limited to professionals.
FISAPTIVAT It is focused on creating support materials for a virtual health education in patients with musculoskeletal pathology.	Patients, multidisciplinary healthcare professionals (rehabilitators, physiotherapists, general practitioners).	It is a very interesting approach but the current priority on rehabilitation is to face the face to face work.
TIME It proposes an integrated information system among the different work groups of emergency professionals.	Patients, multidisciplinary healthcare emergency professionals (physicians, nurses, technicians).	It is included in a current work line. The group who led this proposal was added to the development and validation.
OCUPACIÓN This challenge proposes to promote the role of the occupational therapist working virtually to help Primary Care in the covid scenario.	Patients, Primary Care professionals (physicians & nurses) and occupational therapists.	It is interesting to consider this approach but is not the current priority on Primary Care during covid.
AVAP It proposes voice recognition and natural language processing technologies to improve the Primary Care electronic record	Patients, Primary Care professionals (physicians & nurses).	It is very interesting to help our Primary Care daily experience and records but it is difficult to apply due to the impact for integrating with the current IT systems.

registration and the consultation experience.		

Table 5. Submitted needs in Murcia.

Regarding to 4P group where needs were received from:

- The eight proposals were submitted by providers (SMS healthcare professionals). SMS is also the main payor entity.
- Patients were addressed in three proposals but only one was proactively submitted by one of them.
- The three needs that involved researchers of universities deserve further comment because their role caused a specific discussion in the Evaluation Committee about the possible competition between universities and companies, and the advantage of the universities when entering in the call for needs, taking part of the challenge group.

The call for needs targeted primarily the professionals, patients and the society in general, who are the stakeholders with first-hand experience of health needs. Policymakers had preferred not to take part of the needs collection call to prevent conflicts of interest. Nevertheless, Representatives of the Regional Government have been involved in the whole process, especially in the evaluation to ensure that the selected need was aligned with the regional policy strategies. Furthermore, the Regional Government is one of the members of the CHERRIES consortium, which entails involvement and awareness when including the RRI in the processes/procedures of the administration itself.

3.3.1 Collected needs – clusters and themes

The themes and areas related with the proposals received were:

- Needs to improve the administrative tools for clinicians.
- Needs to improve the access for the patients to the healthcare services.
- Needs to improve the coordination among different healthcare professionals.
- Needs to help with the workload due to covid situation.

3.3.2 Selected need

The Evaluation Committee was formed by different profiles involved in Health Innovation and respecting the gender balance:

- Top Management expert:
  - SMS General Deputy Director of Projects & Innovation, male
- IT expert:
  - SMS Deputy Director of Technologies and Information, male
- Innovation expert:
  - SMS Responsible for Innovation, male
- Clinical expert:
  - SMS Neurologist, female
- Public policy expert:
  - Head of Unit at General Direction of European Union, female
- Market expert:
  - CEO of Ticbiomed, male
- Patient Associations:
  - Coordinator at EMACC, female
  - Social worker at AECC, female
- Neurologist challenger:

- Head of Neurology Unit at SMS, male

- Biomedical engineer:
  - Lecturer at Polytechnic University of Cartagena (UPCT), male

Finally, after the meeting of the Evaluation Committee, the proposal with the acronym CADEM was selected as winner. It is focused on early detection of the progression in Multiple Sclerosis applying sensors to patients by internet of things (IoT) further than current test face to face every 6 or 12 months. The approach is to carry out a controlled clinical trial with at least 30 patients during 5 months.

This need was the only one submitted by an association of patients (*EMACC, Esclerosis Múltiple Asociación de Cartagena y Comarca*) in addition with a researcher group of Biomedical Engineering from the Polytechnic University of Cartagena (UPCT) and the Neurology Service of Cartagena Hospital. This was the most complete RRI approach among all proposals of needs received.

Multiple Sclerosis (MS) is an inflammatory neurodegenerative disease of the Central Nervous System that is the main cause of neurological disability in young adults. Its prevalence is 100 cases per 100,000 inhabitants, with an estimated three million cases in the world, more than 45,000 in Spain and more than 1,500 in the Region of Murcia. In 85% of cases MS manifests in a relapsing/remitting form (rRMS) and in 15% in a primary progressive form. Over the years, rRMS progresses to a secondary progressive form (SPMS) that progressively incapacitates the patient. The disability manifests itself in impairment of gait, cognition, manual dexterity and vision. This progression (PEM) begins to be seen in a more overlapping manner from the early stages of MSrr, undetected by current assessment methods. Fatigue is a frequent and very limiting symptom of the disease in daily activities. Measurements of gait speed and manual dexterity are part of the ways of monitoring MS The usual way of detecting progression is periodic review every 3 to 6 months - for 30 minutes with a neurologist and 20 minutes with a nurse - consisting of questions and neurological examination using different types of standardised tests. With this usual screening method, it has been estimated that there is a delay of 3 years in the detection of progression, with only 33% of cases being diagnosed[2]. Patients and neurologists need a faster and more sensitive way to detect MS progression so that treatment can be started as early as possible to avoid disability. Faster and more sensitive detection of progression would also shorten treatment evaluation times in clinical trials in collaboration with the pharmaceutical industry. The main objective is to create and validate a more agile, comfortable and sensitive solution for the detection of progression in MS based on the daily recording of gait disturbances, manual dexterity and cognitive assessment, and the relationship of the latter with fatigue and mood.

Despite the challenge of starting from a low level of maturity, the complementarity of skills, experience, and commitment of the team involved led to a favourable assessment. It is expected for the pilot with the company the co-creation and validation of a solution for the collection, analysis and monitoring of the daily activity of patients with Multiple Sclerosis.

3.4 Identified needs in Örebro

During the Call for Needs, six proposals were received. This is a lower number than expected. The assumption is, that stakeholders as professionals and associations were occupied with the ongoing pandemic. On the other hand, elderly people as the main target group, have been hard to reach during the pandemic both physically and digitally.

[2] Cree et al. *Silent progression in disease activity-free relapsing multiple sclerosis.* Ann Neurol. 2019 May;85(5):653-666. Epub 2019 Mar 30. https://pubmed.ncbi.nlm.nih.gov/30851128/

Further, during the workshops a great deal of commitment could be observed, but the step of filling in a form and submit the need seemed to pose an additional barrier that was not present in sharing during a workshop. In the workshops, the Örebro team has been able to collect many good proposals that were later not submitted in written form. The Örebro team thus chose to take the workshop results into consideration during the assessment of the submitted needs. The workshops have contributed to the understanding of the issue and therefore made it easier to assess the submitted needs. When reporting the number of needs received below, however, only those that have been received via the form are reported.

The following needs were submitted. One proposal contained more than one identified need, therefore there are more identified needs in the list below than the total number of submitted proposals.

Need title and description	**Characterisation of the person/group submitting the need**	**Assessment of the Committee**
Counteract involuntary loneliness[3], create more opportunities for social contact	Private citizen. Female	Highlights the importance and potential of the civil society. Has no clear challenge owner.
Social contact and support	Representing a CSO for non-formal adult education. Female.	Highlights the importance and potential of the civil society. Vague description of the need, has no clear challenge owner.
Digital skills to counteract loneliness		
Opportunities to take part in physical and cultural activities		
Meeting places/venues for various activities and social interaction	Representing a CSO for social and mental health. Female.	Stresses the importance to reach the people most in need of social interaction. Highlights the importance and potential of the civil society. Vague description of the need. Focus on the own organisations need for new members (not societal issues).
Sense of community and to belong	Municipality official, culture and associations. Female.	Vague need description, focus on (societal) economical aspects that CHERRIES has no impact on.
Social interaction – “Life telling groups”	Healthcare professional, occupational therapist and psychotherapist. Female.	Stresses the importance to reach the people most in need of social interaction. Focus on a specific solution, the method “Life telling groups”.
Lack of knowledge of existing activities, especially among elderly with poor technical and digital skills	Representing a CSO umbrella organisation. Female.	Stresses the importance to reach the people most in need of social interaction. Highlights the importance and potential of the

[3] In Sweden, the concept *Involuntary loneliness* describes the subjective feeling of being lonely and is used to emphasise the difference between people who suffer from loneliness and people who live in solitude by their own choice – where the former having a larger negative effect on our health.

		civil society and co-ordination of activities.

Table 6. Submitted needs in Örebro.

3.4.1 Collected needs – clusters and themes

Analysing the collected needs, a few themes are shown:

- The need for social contacts among elderly overall
- The need for social contacts among the elderly that are loneliest today
- Technical skills and the possibility to use digital tools among elderly (to counteract loneliness)
- The potential in civil society when it comes to meet the needs – regardless of the need

These themes were also well represented in the discussions during the three workshops. Thereby the workshops can be seen as validation of the collected needs, as the number of collected needs was quite low.

3.4.2 Selected need

The selection committee consisted of the following profiles:

- CEO Activa Foundation, female
- Healthcare director in western Örebro county, OLL, female
- Director of the Unit for Social welfare and Public health at the department for Regional development, OLL, male
- Researcher in Culture geography / Development leader, OLL, male
- Development Leader in Public health with focus on elderly, OLL, female

The local committee also had the possibility to, if needed, consult other experts of mental health in elderly, patient participation in healthcare, and innovation in healthcare, for assessment and opinions. However, the committee did not need to engage these experts in the assessment.

To support an objective assessment, the committee used an evaluation template with criteria to help assess the collected needs. But since several of the collected needs concerned the same needs and at the same time, several of the collected needs was poorly described, the committee landed in a mutual assessment of the collected needs and, rather than selecting one of the collected needs – one submitter – selected a need that had more than one submitter. The need selection was also supported by the results of the workshops conducted earlier in the call for needs process.

The collected needs concerned involuntary loneliness and the need for social contacts in various ways as well as the challenge of reaching those most in need. Involuntary loneliness is a concern especially for elderly people that significantly impacts the mental health of some patients. Long-term loneliness could result in self-isolation from social contacts and society in general. Expectations that others will make contact, is rooted in a perception that elderly do not want to be a burden to family and society Therefore, people with the greatest need for social contacts can be difficult to reach with various efforts that aim to break the loneliness and offer a social context. The selected need concerns the need to find new ways to reach these groups.

4 Conclusions

This report provides an introduction, procedural aspects and results of the Call for Needs in the CHERRIES project. Thus, it represents the outcome of the first step in the CHERRIES experiment process. This experimentation process is building on a broad RRI-based approach to public engagement in the definition of innovation problems. It starts by a bottom-up need identification process, that is followed by an open innovation process aiming at finding solutions and subsequently co-creation and their adoption of solution in the field, where the need has been first identified. Through the methodology and throughout the different pilot phases, CHERRIES help healthcare innovation players act according to RRI process dimensions such as diversity and inclusion, openness and transparency, anticipation and reflection, responsiveness, and adaptability.

In order to align the tripartite experiment with regional requirements and cultures, each regional experiment team has the needed degree of freedom in adjusting the process. Thus, the second section of the deliverable contains the main aspects considered by the regional teams and explains the scope and orientation of the regional calls. Taking this clear place-based perspective is an essential feature of the CHERRIES project and is supposed to increase the experiment's acceptance and subsequently the sustainability and impact within the regional eco-system. The third part of this repot, contains the presentation of the needs collected by region. In total, the CHERRIES experiments collected 22 needs from different actors within the eco-systems. Out of these, each region successfully selected one need that will be the focus for the upcoming steps in the territorial experimentation:

- Cyprus – Provision of medical services to the Cypriot citizens living in rural and remote areas with no easy access to healthcare services and prescribed medicines.
- Murcia – Development and validation of a solution for the collection, analysis and monitoring of the daily activity of patients with Multiple Sclerosis.
- Örebro – Counteract involuntary loneliness among elderly – reaching the loneliest and isolated elderly and meeting their need for social contacts.

Each territory in CHERRIES has different requirements and scope. Due to this, the material and the process is adapted to the regional conditions. This is an important part of the methodology, which also have resulted in three different calls with different outcomes, regarding the people or organisations submitting needs as well as the identified and selected needs in the regions.

The number of submitted needs per territory was lower than expected. This has several explanations but the main cause is likely the pandemic situation during the call.

In conclusion this first part of the project was successful in gathering and sorting different needs. The different contexts and demands in the three different regions was taken into account during the call for needs and all three regions have selected one regional challenge that will be the subject for the upcoming call for solutions.

CHERRIES Partners

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