



D3.1 Evaluation of the SCIROCCO tool and processes

WP3 Evaluation



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Executive Summary

To ensure that more people will benefit from integrated care initiatives, scaling-up of successful initiatives is the right way forward. However, knowledge on how to achieve successful large-scale implementation is scarce. The EU-funded project Scaling Integrated Care into Context (SCIROCCO) aimed to develop an instrument, the so called “B3 Maturity Model” (B3-MM), into a validated and tested self-assessment tool to facilitate the successful scaling-up and transfer of good practices (GPs)¹ in integrated care. In doing so, SCIROCCO used a step-based scaling-up strategy to explore what to scale-up, and how to scale-up integrated care initiatives by matching the complementary strengths and weaknesses of regions involved in integrated care.

Work Package (WP) 3 was designed as a multi-method evaluation study with four objectives. Since the B3-MM is one of the first instruments with an explicit focus on facilitating the exchange of GPs and scaling-up of processes in integrated care, the first part of this study focused on a systematic evaluation of the B3-MM. To test its validity and reliability, the objectives of the first part of the evaluation were: 1. to test the validity and reliability of B3-MM as instrument to measure the level of maturity of integrated care; 2. to measure the level of maturity of integrated care in selected sites at baseline and after scaling up activities. In the second part, a two-folded qualitative evaluation was carried out; 3. to measure the level of knowledge translation in selected sites at baseline and after scaling up activities; 4. to assess to what extent SCIROCCO adheres to programme fidelity i.e. was implemented as intended and according to the goals that underlie its conception.

Regarding the first objective, content validity, structural validity, and internal consistency of the B3-MM were tested². At the start of the project, the content-validity of the B3-MM was assessed by comparing the B3-MM with other instruments measuring the maturity of integrated care by undertaking a literature review. Subsequently, a three-round survey conducted through a modified Delphi study with international experts in the field of integrated care was performed to test the relevance of the dimensions, the maturity indicators, the assessment scale used in B3-MM. Following on from the review, the outcomes indicated that the dimensions and indicators of the maturity model correspond to the items of instruments measuring maturity of integrated care in the academic literature. The Delphi study rounds resulted in various phrasing amendments of indicators and assessment scale. Moreover, the results showed that, after the third Delphi round, all the dimensions of the B3-MM were considered relevant by experts. In conclusion, the B3-

¹ SCIROCCO focused specifically on GPs in the area of integrated health and social care that were collected in the EIP on AHA. As a result, the EIPonAHA definition of a GP was used as a starting point and further modified. The EIP-AHA GPs are inspiring real-life examples of successfully applied innovations in active and healthy ageing: https://ec.europa.eu/research/innovation-union/pdf/active-healthy-ageing/scaling_up_strategy.pdf. The SCIROCCO GPs are defined as inspiring real-life examples of successfully applied innovations in integrated care.

² During the project, the B3-MM was refined, and the name was changed to the SCIROCCO tool. The different measurement properties which were tested were performed on different versions of the tool. After the details on the content validity study, throughout the rest of the document the B3-MM will be referred to as the SCIROCCO tool or, in short, the Tool.

MM dimensions, maturity indicators and assessment scale showed satisfactory content validity.

Next, the structural validity, internal consistency and convergent validity of the tool were tested. Exploratory factor analysis was used to investigate the structural validity of the 12-items of the SCIROCCO tool. Hereafter, internal consistency was assessed by calculating Cronbach's and ordinal alpha. The factor analysis revealed a one-factor structure and this structure was considered most relevant in representing the structural validity of the SCIROCCO tool. The study also showed that the scale of the SCIROCCO tool showed good internal consistency, Cronbach's alpha of the overall instrument was 0.92 and ordinal alpha was 0.94. Furthermore, a test-retest reliability evaluation is being performed to assess the degree to which the measurement is free from measurement error. For this, the online SCIROCCO tool was administered to a group of local stakeholders at baseline. Stakeholders from different regions were invited to participate in the first measurement round. Six to eight weeks after the conduct of the first measurement, the stakeholders were re-invited to participate in the second measurement round using the same version of the SCIROCCO tool.

To address the second and third objectives of the evaluation study, the original plan was to invite local stakeholders, who were identified in the five participating regions for the self-assessment processes, for completion of the SCIROCCO tool (for assessing the level of maturity) and the validated Development Model of Integrated Care (DMIC) survey (for assessing the level of knowledge translation) at baseline and one follow-up measurement. The baseline measurements using both tools were performed in the five regions after the self-assessment processes. From this the convergent validity of the Tool was explored by comparing the items of the SCIROCCO tool to the DMIC survey. The results showed that slightly over one-third of the expected relationships between the items of the tools, were found to be moderately correlated, thereby supporting the convergent validity of the SCIROCCO tool. The high number of low correlations between items of the two tools, however, suggests that the two instruments measure different aspects of integrated care and they should therefore not be used interchangeably.

For the follow-up measurements, WP3 intended to investigate whether early changes could be found in the regions after one year, and if these changes could possibly be detected in the tools. However, during the SCIROCCO project, it became clear that it was no longer possible to perform two consistent measurements in the regions. This was because the regions were offered two approaches for the twinning and coaching activities, the SCIROCCO tool was slightly adjusted, and different experts were involved than those attending the self-assessment workshop. Therefore, a qualitative approach was chosen to collect data from the stakeholders on the aspects of the knowledge transfer between the five participating regions.

To examine how the knowledge transfer processes unfolded within SCIROCCO, a qualitative multi-method design was used. Data collection methods included focus groups, project documents and action plans of the regions. The framework of knowledge exchange (KE) and the framework of knowledge mobilisation were used for data analyses. Five

components (including the themes) of KE could to a large extent be identified in the developed approach on the knowledge transfer (KT) processes. Furthermore, the four questions and accompanying categories of the framework of knowledge mobilisation, were also identified to a large degree. The observed incorporation of distinct forms of knowledge from multiple sources and the observed dynamic and fluid KT processes, suggest that SCIROCCO developed a comprehensive KT approach aiming to enable the adoption and scaling-up of integrated care.

The fourth objective focused on the evaluation of the implementation fidelity of the SCIROCCO step-based strategy. A multi-method evaluation design was used to understand what factors influence the implementation of the SCIROCCO strategy to support the scaling-up of integrated care. Data was collected in the five participating regions including interviews, focus groups, questionnaire studies, and project documents. Results show that all of the tasks that were described in the original plan were implemented. All five regions conducted the GP self-assessment, undertook the self-assessment process of their health care system context in their regions and participated in the twinning and coaching sessions.

Facilitative factors for implementation and the use of a flexible approach in implementing project activities were found. Deviations from adherence to the project plan timeline were found and the reasons for the main delays were mentioned in the open approach for developing the methods. Also, the engagement of the local stakeholders took longer than originally thought and the coverage of the local stakeholders per project component varied per region. Several regional factors were found to influence implementation. The five participating regions varied in the level of development and implementation of integrated care which might have influenced the recruitment procedures of local stakeholders. Furthermore, some stakeholders indicated that the terms used in the tool were difficult to understand. Therefore, the tool would benefit from further translation by considering the local terminology and context of regions.

Overall, the SCIROCCO tool and processes were found a promising approach offering regions a flexible but tailored path facilitating progress in integrated care. The findings regarding the content-validity, structural validity and internal consistency of the SCIROCCO tool provide initial support for the tool in assessing the maturity for integrated care of the health care system context of regions. Nonetheless, validation of a tool is a continuous process and validity of a tool only applies for the specific purpose and the specific situation in which it has been tested. It is therefore recommended to further explore the validity and reliability when the tool is used to assess the maturity of elements for integrated care of good practices. The results of the evaluation of the implementation of the SCIROCCO approach indicate that it was implemented with acceptable fidelity while being flexible to the context of implementation. The insights obtained on factors of influence on implementation could also support regions not receiving EU funding. Moreover, these insights may support decision making and to initiate processes for knowledge transfer with other regions to ultimately scale-up integrated care initiatives. Likewise, it is recommended to further test the SCIROCCO strategy in countries inside and outside Europe to assess the external validity of study findings.

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List of abbreviations

Acronym	Full name
AReSS	Agenzia Regionale Strategica per la Salute ed il Sociale (in English: Regional Strategic Agency for Health and Social Care)
B3-MM	B3 Maturity Model
Chafea	Consumers, Health, Agriculture and Food Agency
CD	Comparative Data
COSMIN	COnsensus-based Standards for the selection of health status Measurement INstruments
DMIC	Development Model of Integrated Care
EFA	Exploratory factor analysis
GP	Good Practice
ICT	Information and Communication Technology
IQR	Interquartile range
(MINRES	minimum residual method
NHS 24	National Health Service 24
PA	Parallel Analysis
Partnership	The European Innovation Partnership on Active and Healthy Ageing
SCIROCCO	Scaling Integrated Care in Context
TEC	Technology Enabled Care
T1	Baseline measurement
T2	Follow-up measurement
WHO	World Health Organization
WP	Work Package
VUB	Vrije Universiteit Brussel

1. Introduction

1.1. Background

European countries are dealing with both an evident increase in the proportion of older citizens and a rapid rise in the number of people with multiple health and care needs [3]. These changes place severe pressure on Europe's society, economy and healthcare systems [4]. The need to transform fragmented health and social care systems internationally towards people-centred and integrated health and social care is widely supported [5].

Already, in 2001, the World Health Organization (WHO) defined integration of care as 'bringing together inputs, delivery, management and organization of services related to diagnosis, treatment, care, rehabilitation and health promotion wherein integration is regarded as a means to improve the services in relation to access, quality, user satisfaction and efficiency' [6]. More recently, the WHO highlighted a people-centred and integrated health services approach (see Box 1) presented in the form of a global strategy and offering a way forward for comprehensive health system design [7]. Thus, there has been a considerable evolution in the definition of integrated care. A shift can be recognised from a definition focused on services towards a focus on people-centred care, including a comprehensive perspective of people's needs and a sensitivity to the context specific nature of health systems.

Box 1: WHO's definition on integrated health services and people-centred care [7]

Integrated health services: health services that are managed and delivered so that people receive a continuum of health promotion, disease prevention, diagnosis, treatment, disease-management, rehabilitation and palliative care services, coordinated across the different levels and sites of care within and beyond the health sector, and according to their needs throughout the life course. [7]

People-centred care: an approach to care that consciously adopts individuals', carers', families' and communities' perspectives as participants in, and beneficiaries of, trusted health systems that are organized around the comprehensive needs of people rather than individual diseases, and respects social preferences. People-centred care also requires that patients have the education and support they need to make decisions and participate in their own care and that carers are able to attain maximal function within a supportive working environment. People-centred care is broader than patient and person-centred care, encompassing not only clinical encounters, but also including attention to the health of people in their communities and their crucial role in shaping health policy and health services. [7]

Over the years, various integrated care initiatives have been developed and implemented in European health care systems [8-11]. To ensure that the wider population in Europe can benefit from integrated care, the scaling-up of successful initiatives is the way forward. In 2012, the European Commission launched the European Innovation Partnership on Active and Healthy Ageing (hereafter referred to simply as 'the Partnership'), which was designed to connect and engage stakeholders across sectors and to facilitate the scaling-up of innovations for active and healthy ageing [12]. Since then, over 300 GPs have been collected by the Partnership in the areas of prescription and adherence actions at regional level, prevention of functional decline and frailty, integrated care, independent living, and age-friendly environments. Within the Partnership, it is assumed that, by sharing experiences of the development and implementation of GPs in European regions, lessons for stakeholders in other regions can be provided that will help to simplify and speed up the process of adaptation and implementation in their regions. This assumption is

reflected in the Partnership Scaling-up Strategy [12]. The first three steps of the five steps of this strategy focus on “what to scale-up”, while the other two steps focus on “how to scale-up”.

To know “what to scale-up” is, however, a difficult task as evidence of successful (elements of) integrated care initiatives is not readily available. Several challenges abound. Despite the growth in GPs, many are implemented as pilots without having evaluated the implementation process systematically [13]. Notwithstanding reviews focussing on the effectiveness of integrated care interventions reported positive outcomes, heterogeneity in outcomes is also found [14-18]. The explanation of the heterogeneity in outcomes partly lies in the different approaches used for the implementation of interventions [14], the diversity in components used in interventions [14,17] and the evaluation or research paradigms used [14,15]. The scaling-up of these interventions is yet another challenge since elements specific to a pilot site, which enabled a pilot to work in that context, might not be present in a new context where the initiative is planned to be transferred to (i.e. another care setting, community or country). An understanding of what elements are related with successful implementation on a wider scale remains largely absent [11,13,19-22]. It is therefore, as a result, important to systematically evaluate the implementation process of integrated care interventions by using appropriate evaluation methods which are sensitive to the context of these interventions to obtain insight in what works in such interventions, in which context and what are the supporting decisions needed on what will be useful to scale-up and how to reach upscaling.

One of the six Action Groups within the Partnership, the B3 Action Group on Integrated Care has been focussing on the challenge to develop tools that can help to understand how to stimulate changes towards more sustainable health and care systems, how to support implementation, scalability and transferability of GPs for integrated care in Europe [23]. It was in this light, that the B3 Action Group on Integrated care developed a model, the B3-Maturity Model (B3-MM), to obtain a more standardised approach for scaling-up integrated care throughout Europe. Testing and validation of the B3-MM was needed in order to demonstrate its full potential as a tool for supporting regions in Europe to understand the preconditions for successful scaling-up.

Building on the extensive experience of the Partnership, the EU-subsidised project SCIROCCO therefore aims to provide a tool that facilitates the successful scaling-up and transfer of GPs in integrated care across European regions. In doing so, SCIROCCO used a step-based scaling-up strategy to explore *what* to scale-up in integrated care initiatives and *how* to scale-up these initiatives by matching the complementary strengths and weaknesses of regions and facilitating twinning and coaching activities to promote shared learning.

1.2. Purpose of the document

In this document, the evaluation study including four objectives which was undertaken by WP3 within the SCIROCCO project is presented. The first part of the evaluation was concerned with testing measurement properties of the B3-MM, to demonstrate its full potential as a tool assessing the maturity for integrated care. The specific objectives of

the first part of the evaluation were: 1. to test the validity and reliability of B3-MM as instrument to measure the level of maturity of integrated care; 2. to measure the level of maturity of integrated care in selected sites at baseline and after scaling up activities. The second part focused on the evaluation of the implementation of the SCIROCCO strategy to support the scaling-up of integrated care throughout regions in Europe to explore what factors foster or impede the implementation of strategy. The specific objectives for the second part were 3. to measure the level of knowledge translation in selected sites at baseline and after scaling up activities; 4. to assess to what extent SCIROCCO adheres to programme fidelity i.e. is implemented as intended and according to the goals that underlie its conception.

1.3. Research questions

The research question for the first part of the evaluation regarding the assessment of the validity and reliability of the B3-MM was:

1. What is the underlying structure, internal consistency, test-retest reliability and convergent validity of B3-MM?

The research questions for the second part of the evaluation regarding the evaluation of the specific SCIROCCO step-based approach included:

2. What knowledge transfer elements are shared between matched regions during the knowledge transfer activities facilitating the scaling-up and implementation of good practices?
3. What factors influence the implementation of the SCIROCCO strategy to support the scaling-up of integrated care in the health care regions involved in SCIROCCO?

2. Assessment of measurement properties of the SCIROCCO tool

The B3-MM instrument intends to show how healthcare systems are attempting to deliver more integrated care services for their citizens. It consists of 12 dimensions including a 0-5 assessment scale specific to every dimension. By considering each of the 12 dimensions and allocating a measure of progress or ‘maturity’ on the scale, the current situation within a healthcare system is assessed. From the assessment, a simple graphical representation (i.e. a radar diagram) of the status is developed, to reveal areas of strength (higher maturity level) as well as areas of lower maturity in integrated care. Since the B3-MM was a newly developed tool, WP3 concentrated on evaluating the validity and reliability of the Tool. The aim was to obtain quantitative evidence on what elements of the SCIROCCO tool are valid and gain insight in possible elements which need to be improved. For the assessment of the validity and reliability of the Tool separate steps were followed. First, the evaluation of the content-validity of the tool is described below. Thereafter, the further assessment of the underlying structure, test-retest reliability, internal consistency and convergent validity of the Tool is described.

2.1. Content validity of B3-MM

At the beginning of the project, a literature review and a modified Delphi study were undertaken to test the content validity of B3-MM as instrument to measure the level of maturity of integrated care. The study was published in the International Journal of Integrated Care, and all the information on the study written below was retrieved from this article [2]. Content validity can be determined using both quantitative or qualitative methods [24]. A qualitative approach consists of an accurate analysis of the representativeness and clarity of items in the literature and by consultation of experts [25]. Evidence of content validity is usually obtained by having knowledgeable people look at the test items and make judgments about the appropriateness of each item and overall coverage of the domain [26].

2.1.1 Methods

Literature review

A review was conducted to identify articles, papers and/or reports focusing on measures and instruments of the maturity of integrated care. Moreover, we were interested in describing and comparing the dimensions, indicators, measurement scales, and the psychometric property content validity of the selected measures and instruments.

The literature search consisted of two parts. For the first part, we built on the work of Bautista et al. [27] who recently conducted a systematic review in MEDLINE/PubMed on measurement properties of instruments measuring integrated care. The authors selected articles from the systematic literature review which focused on measures and instruments of the development of integrated care with indications of “maturity”, “phase”, “level”, or “degree” of integrated care.

To broaden the search for articles, a narrative review was undertaken. In narrative reviews, the authors have the objective to identify, evaluate and synthesize what is already known about a topic [28]. The preliminary search started in the electronic databases Cochrane, Google, Google Scholar, GreyLit, IDEA and OpenGrey using a combination of search terms, as shown in Table 1. The final search was restricted to the databases which retrieved adequate hits; Google (Filter: English only), Google Scholar and IDEA. The search terms used included terms referring to the construct, integrated care, and terms referring to an instrument. We used the terms from the study of Bautista et al. [27] who derived the terms from the work of Uijen et al. [29] and Terwee et al. [30]. We added search terms indicating a measurement feature of an instrument. The final key terms used in the ultimate search strategy are presented in Table 1.

To be included in the review, we used the two eligible article criteria:

1. availability of full-text English document; (Due to the large number of hits, we limited the search to that of English language only when possible);
2. description of items/constructs/measurement scales of measures and/or instruments on the maturity of integrated care.

First, one researcher (LG) screened the titles and abstract of the articles from the main search in the three databases to identify articles for full text read. Two researchers (LG and HV) independently screened the full texts to select articles to be included in the final review.

Table 1: Search terms used in narrative literature review

Component	Terms	Remarks
Construct	Integrated care, coordination of care, continuity of care, patient centred care	Based on the work of Uijen et al. [29] modified by Bautista et al. [27]
Instrument	Questionnaire, measure, survey, instrument	User-defined based on Terwee et al. [30]
Feature	Degree, maturity model, level, phase	Terms reflecting “maturity”

Data extraction and analysis of the literature review

Data were extracted by looking for descriptions on dimensions, indicators, and measurement scales in the selected articles which matched with the 12 dimensions, maturity indicators and assessment scale of the B3-MM. We marked all matching items and listed them in a table developed in MS EXCEL. Descriptions on dimensions, indicators or measurement scales in the selected articles which did not match, but which could nevertheless provide an addition to B3-MM, were also identified. Furthermore, we evaluated the overall quality of the measurement property content validity (definition in Box 2) of the instruments identified in the narrative review based on the criteria used by Bautista et al. [27].

Box 2: Definition of measurement property content validity (adapted from Uijen et al.) [29]

Content validity: the degree to which the content of an instrument is an adequate reflection of the construct to be measured.

In quality assessment, there is an important distinction between the quality of a study on measurement properties and the quality of an instrument [31]. In the article by Bautista et al. [27], the quality assessment of the studies and the instruments is guided by the CONsensus-based Standards for the selection of health status Measurement INstruments (COSMIN) [32-35]. In this study, the overall quality of the content validity for the instruments was assessed by the researchers (LG and HV) using the criteria for the levels of evidence and overall assessment of measurement properties of instrument (Table 2) by determining four factors [27,29,36,37]. The first factor includes the number of validation studies per instrument. Snowball sampling and hand searching in Google and Google Scholar were performed to identify validation studies on the retrieved instruments from the narrative search. The second factor concerns the assessment of methodological quality of the studies relating to content validity. This assessment was based on the criteria of the COSMIN checklist [33] using the four-point scale in the COSMIN checklist. A study was rated as poor, fair, good, or excellent according to its measurement property content validity. The third factor is about the assessment of the direction of results of the measurement property content validity (whether positive or negative). This was rated using the modified criteria as presented in Table 3 [29]. The fourth factor entails the assessment of the consistency of several studies on the same instrument.

Table 2: Criteria for the level of evidence and overall assessment of measurement properties

Criteria ^a	Overall assessment	Level of evidence
Consistent findings in multiple studies of good methodological quality OR in one study of excellent methodological quality	+++ or ---	Strong
Consistent findings in multiple studies of fair methodological quality OR in one study of good methodological quality	++ or --	Moderate
One study of fair methodological quality	+ or -	Limited
Conflicting findings from multiple studies	+/-	Conflicting
Only studies of poor methodological quality OR only indeterminate results from multiple studies regardless of methodological quality	?	Unknown
Measurement property not assessed	0	Not assessed

^aAdapted from Uijen et al. [29]

Table 3: Criteria for rating the adequacy of the reported measurement property

Measurement property	Reported Result	Quality criteria [29]
Content validity	+	The target population considers all items in the questionnaire to be relevant AND considers the questionnaire to be complete
	?	No target population involvement
	-	The target population considers items in the questionnaire to be irrelevant OR considers the questionnaire to be incomplete
	0	Did not assess content validity

Delphi study

To test the appropriateness of the items of the B3-MM to measure maturity of integrated care, an international Delphi study was performed. The Delphi technique is a widely used research method in healthcare research, which consists of “a series of data collection ‘rounds’ to capture and structure the knowledge and opinions of a ‘panel’ of participants on a topic with which they are perceived to have expertise” [42, p. 208].

Selection of experts

The experts were selected on basis of relevant experience in scientific research or having a practical background (medicine, nursing, managerial, policy making) with relevant experience in the development, implementation and/or monitoring of integrated care interventions. An overview of the type of experts who were invited to the first round of the Delphi survey is presented in Table 4. A total number of 55 experts received the email invitation that included information about the purpose and process of the study and a link to an online version of the questionnaire in SurveyMonkey. We asked the experts to commit their participation in two planned Delphi rounds.

Table 4: List of experts in the first Delphi round

Types of experts	Number of experts selected	Experts retrieved from
Corresponding/first author of scientific articles (researchers with experience in the measurement or development of integrated care)	10	Articles included in the literature review used in the study
Experts with practical experience in the development, implementation and/or monitoring of integrated care interventions	10	SCIROCCO consortium partners*
Experts from the B3 Action Group on	11	SCIROCCO consortium

Types of experts	Number of experts selected	Experts retrieved from
Integrated care		partners*
Experts with experience in the field of Information and eHealth services in the field of integrated care	10	SCIROCCO consortium partners*
Members of the SCIROCCO advisory board	5	SCIROCCO consortium partners*
Researchers with expertise in measurement of development of integrated care	9	A convenience sample provided by one of the researchers

*Basque Country (ESP), Norrbotten Lans Landsting (SE), Puglia region (IT), Olomouc region (CZ) and Scotland (UK).

First Delphi round

In the first Delphi round, experts were asked to rank the relevance of the dimensions, indicators and assessment scale of B3-MM to assess maturity of integrate care on a 9-point Likert scale (1=Extremely irrelevant to 9= Extremely relevant). The Likert scale corresponds to the conventional format used for comparative assessment and prioritisation of different health options (such as technologies) [39]. The survey started with general questions (including age, country of employment, disciplinary field, and years of experience) and continued with statements on the relevance of components of the B3-MM. These statements were presented in three different parts. The first part (A) considered statements on the relevance of the 12 dimensions (12 statements); the second part (B) reflected statements on the relevance of each indicator on the maturity scales on every dimension used in B3-MM (72 statements); the third part (C) included statements on the relevance of the assessment scale (12 statements). The survey concluded with a set of open-ended questions. One question included a possible addition to the assessment scale which was retrieved from the literature review on existing tools and measures by Ahgren & Axelsson [40]. Experts were asked to assess if a part of the measurement scale used in the tool of Ahgren & Axelsson [40], referring to the assessment of both the actual rank and the optimum rank of integration, could provide a meaningful addition to the assessment scale as used in B3-MM. Finally, experts were asked if they had any additional comments/suggestions on B3-MM or the survey. The survey was anonymised and a single reminder email message was sent to the experts. To diminish potential misunderstandings concerning the interpretation of the survey, the first survey round was pre-tested by two researchers (YM, LB). The survey was adjusted to reflect their feedback, including a clearer introduction to part B and C of the survey about statements on the assessment of the relevance of each indicator and scale. Experts were invited to the first survey in three different streams due to the arrival of late responses to the call for experts. The respondents were given one and a half weeks to complete the first survey.

Second Delphi round

The items for which insufficient agreement was found were rephrased by partners of the SCIROCCO consortium and presented to experts in the second Delphi round. A total number of 44 experts were invited to the second round. They were asked to reassess the relevance of the refined maturity indicators of the B3-MM items on the same 9-point Likert scale. Furthermore, they were asked to what extent they considered the addition to the assessment scale relevant by assessing both the actual rank and the optimum rank of

integration using the B3-MM. Again, the experts were asked if they had any comments on the rephrased items or feedback on the survey. The second invitation included a report on the outcomes of round one of the Delphi exercise, including (1) a median agreement rating (interquartile range (IQR)) on every statement, (2) the level of agreement among the experts, (3) the level of disagreement among experts, and (4) whether consensus had been achieved. After discussion among the researchers and members of the SCIROCCO consortium, it was decided to exclude certain participants from the exercise due to a perceived conflict of interest: five members from the SCIROCCO advisory board (who had not participated in the first round of the exercise) and two active members of the SCIROCCO consortium (who had participated in the first round) were excluded from further participation. Again, the experts were given one and a half weeks to complete the second Delphi round.

Third Delphi round

The third Delphi round was conducted to explore the level of agreement among experts on the items with insufficient agreement in the second Delphi round. These items were rephrased by partners in the SCIROCCO consortium. Using the same 9-point Likert scale, experts were asked to reassess the relevance of the refined features of the B3-MM. The 13 experts who participated in the second round were re-invited to participate in the third Delphi round. The invitation included a report on the outcomes of the previous round, including (1) a median agreement rating (IQR) on every statement which was included in the second round, (2) the level of agreement among the experts, (3) the level of disagreement among the experts, and (4) whether consensus had been achieved. Experts were given the opportunity to provide feedback on the survey. Due to the project's deadlines and the small number of statements in the third round, experts were given one week to complete the last round.

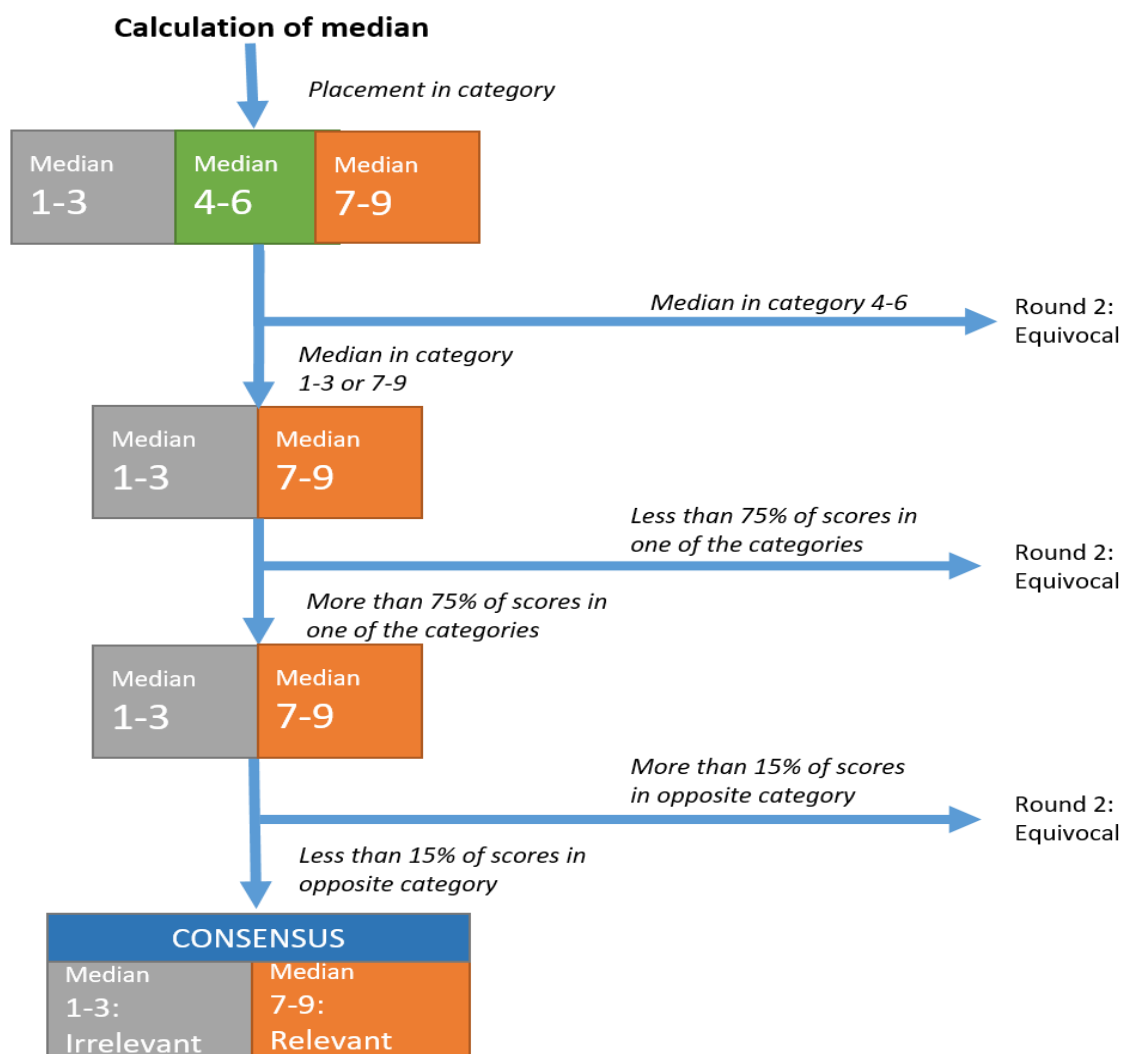
Data analysis of the Delphi study

Before conducting the Delphi survey, we defined the conditions of agreement among experts to be applied during the three Delphi rounds. In order to determine consensus within a Delphi study, many studies use a predefined level of agreement among the experts [41]. However, no standard threshold for consensus is offered by the literature [38], with thresholds for consensus ranging from 55%-100% [42]. In our study we decided on using a 75% cut off point, which is suggested and used by several studies to clearly differentiate the consensus and non-consensus results [38][43][44].

The 9-point scale was classified in three options; 1-3 as irrelevant, 4-6 as equivocal and 7-9 as relevant. The experts' overall consensus on every statement on the items in the B3-MM was analysed using the median of the group's scores and the "level of agreement" reached. Agreement among the experts on every statement on the items in the maturity model was reached when more than 75% of the experts' ratings were within the same three-point range (that is, 1-3, 4-6, or 7-9) as well as the observed median. Several studies use a cut-off point of more than 75% of participants scoring 7 to 9, and include the condition (without disagreement) that less than 15% of the participants should have a scoring of between 1 to 3 [45,46]. In this study, we used the 75% threshold for reaching consensus, including the condition that less than 15% of the participants should have a scoring in the opposite range of that scale (Figure 1). Furthermore, the qualitative comments derived from the answers to the question on the optimum and actual rank, and

the comments/suggestions on B3-MM and feedback on the survey were analysed using a qualitative approach. Analysis was performed in MS Excel. Under Belgium law no ethical approval is required to interview experts as part of a Delphi panel.

Figure 1: Flowchart calculation of consensus



2.1.2 Results

Literature review

Out of the 300 articles included in the study of Bautista et al. [27] a total of seven articles were selected for our review[40,47-52]. From the narrative search, an additional number of four articles were retrieved. One duplicate full-text article from Bainbridge et al. [53] selected from Google and Google Scholar described a framework to guide evaluation and a more recent study was available describing the instrument which was based on this framework [54]. We included this article in the review instead of the initial full-text article retrieved. Details on the review process are presented in Figure 2. The combination of final search terms used for each database, date searched, and the hits retrieved are shown in Table 5. The characteristics of the selected articles are shown in Appendix A.

Figure 2: Flowchart narrative review process

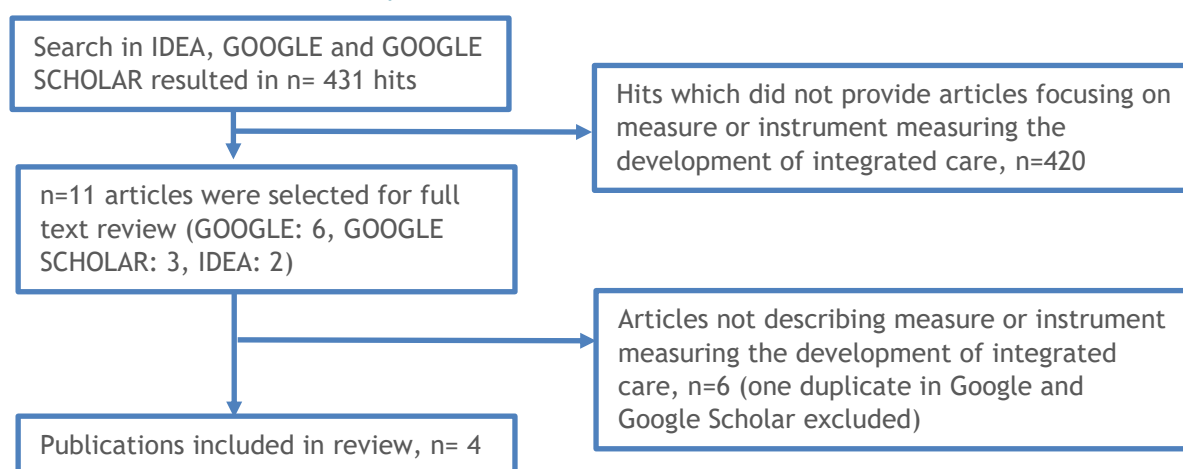


Table 5: Oversight narrative review search terms and hits

Database	Final used search term combination/string	Date search	Hits	Filter	Selected articles based on title/abstract	Selected articles after full text selection	Grey literature	Peer-reviewed literature	Total included in review
IDEA	"integrated care"	26-7-2016	126	None	2	1	0	1	1
GOOGLE	integrated care or coordination of care or continuity of care or patient centred care and measure or instrument or survey or questionnaire and degree or maturity model or level or phase	1-8-2016	164	English only	6 (1 duplicate with Google Scholar)	2	0	2 (1 dissertation)	2
Google Scholar	("integrated care" or "coordination of care" or "continuity of care" or "patient centred care") and (measure or instrument)	29-7-2016	141	None	3 (1 duplicate with Google)	1 (Retrieved from the article of Bainbridge et al.[53])	0	1	1

Overall, there was considerable similarity between the content of the original B3-MM model, and the instruments described in the articles selected from the literature review. All 12 dimensions and the related indicators described by the B3-MM corresponded with the content of the 11 retrieved articles (Table 6). Two dimensions of the B3-MM (“Information and eHealth services” and “Breadth of Ambition”) were described by all 11 articles. The content of over half of the articles matched with descriptions of ten of the dimensions. Less than half of the selected articles described items which matched with the two dimensions, “Population Approach” and “Innovation Management”. Apart from looking for matching descriptions, we searched for the use of possible dimensions, indicators or measurement scales which were not part of B3-MM (as it existed at the start of the project), and could complement or refine the B3-MM. One measurement scale was found which could provide a complement to the B3-MM: it was retrieved from the study of Ahgren & Axelsson [40]. They use a measurement model that can be used to evaluate the degree of integration, focusing on the functional aspects of clinical integration in arrangements of integrated care. In their model, the actual and the optimum rank of integration between units of the health authority are rated. This measurement feature could provide an extension to the B3-MM. It would enable the B3-MM to assess both the actual rank and the optimum rank of integration. Thus, it would provide a contextual explanation for the current situation in integrated care delivery while measuring the maturity of integrated care. This issue was further explored in the first two rounds of the Delphi study.

Regarding the assessment of the measurement property content validity of the instruments, we retrieved the data on the assessment of the overall quality rating score from the review of Bautista et al. [27] for the seven instruments selected from their study. Out of the 4 articles retrieved from the narrative review, three instruments were identified. No other validation studies on those three instruments were found by the hand searches and snowball sampling. In the dissertation included in the review concerning validation of the DMIC, three more validation studies were found. The results on the quality of the studies, the direction of results and the overall quality of the measurement property content validity of the instruments are shown in Table 7.

Delphi study

First round

A total of 31 experts responded to the first survey round (response rate 56%). Three experts did not complete the survey. Furthermore, two experts were excluded due to a conflict of interest. The final analysis included 26 experts (84% completion rate). Reasons for non-participation included one delivery failure, one retirement, and two time constraints. The rest of the respondents did not provide reasons for not participating.

The outcomes on every statement of the first Delphi round are shown in Appendix B. Sufficient agreement was found among the experts on all 12 dimensions of B3-MM. Insufficient level of agreement was found for the first few indicators per dimension. Additionally, sufficient agreement was found on the assessment scale of the dimensions, except for the scale of “Innovation Management”.

Comments and suggestions with regard to the dimensions, indicators or assessment scale OF B3-MM were provided by 17 out of 26 experts (65.4%). Although three experts provided

positive comments with regard to the B3-MM, three other experts commented that some dimensions were unclear or that indicators in some of the dimensions were already covered by other dimensions. A total of five experts commented that some indicators/scales were ambiguous or contradictory and did not follow a logical structure. From the experts who provided feedback to the survey, two experts stated that the survey was difficult to understand and four experts did not fully understand the scale assessment in part C.

Regarding answers to the question about assessing the actual and optimum rank of integration, 22 out of 26 experts (84.6%) agreed that the actual and the optimum ranks of integration should be taken into account when measuring maturity of integrated care in a region or country.

Second round

A total of 14 experts responded to the second survey round (response rate 34%). One expert did not complete the survey. The final analysis included 13 experts (92.9% completion rate). One expert was not able to participate due to time constraints. The rest of the potential respondents did not provide reasons for not participating.

The outcomes for every statement of the second Delphi round are shown in Appendix C. Sufficient agreement was found among experts on the rephrased indicators, except for the two rephrased indicators, 8.2 and 9.1. Furthermore, 92.3 % of the experts scored between 7-9 (median 7) in response to the question on the relevance of assessing both the actual rank and the optimum rank of integration, by applying B3-MM to provide a contextual explanation for the current situation while measuring maturity of integrated care. A total of six experts provided comments on the rephrased indicators. Three experts indicated that the rephrasing of the indicators was performed well. Furthermore, two experts emphasised that some of the rephrased indicators could still be made more explicit to distinguish these indicators clearly from the other indicators in their scale.

Third round

A total of 10 experts participated in the third Delphi round (response rate 76.9%). The rest of the potential respondents did not provide reasons for not participating. Sufficient agreement was found on both of the two rephrased indicators 8.2 and 9.1 (Appendix D).

The main characteristics of the expert group who participated in the first, second and Delphi round are presented in Table 8.

Table 6: Overview of articles matching descriptions with B3-MM

Dimensions and related indicators as described in B3-MM [55]	Number of article(s) [Reference]
1. Readiness to change to enable more integrated care 1.1 No acknowledgement of crisis 1.2 Crisis recognized, but no clear vision or strategic plan 1.3 Dialogue and consensus-building underway; plan being developed 1.4 Vision or plan embedded in policy; leaders and champions emerging 1.5 Leadership, vision and plan clear to the general public; pressure for change 1.6 Political consensus; public support; visible stakeholder engagement	8 [40,49,50,52,54,56-58]
2. Structure and Governance 1.1 No overall attempt to manage the move to integrated care 1.2 Change underway, but with fragmented organisations & plans 1.3 Formation of task forces, alliances and other informal ways of collaborating 1.4 Governance established at a regional or national level 1.5 Roadmap for a change programme defined and broadly accepted 1.6 Full, integrated programme established, with funding and a clear mandate	6 [40,49,52,54,57,58]
3. Information and e-Health Services 1.1 No connected health services, just isolated medical record systems 1.2 No integrated services used, only pilots/local services 1.3 eHealth deployed in some areas, but limited to specific organisations or patients 1.4 Voluntary use of regional/national eHealth services across the healthcare system 1.5 Mandated or funded use of regional/national eHealth infrastructure across the healthcare system 1.6 Universal, at-scale regional/national eHealth services used by all integrated care stakeholders	11 [40,47-52,54,56-58]
4. Standardisation & Simplification 1.1 No systematic attempt to standardise the use of citizen health & care data, or to simplify systems in use 1.2 Debate on information standards (e.g., coding, formatting); exploration of options for consolidating ICT 1.3 A recommended set of agreed information standards at local level; a few local attempts at ICT consolidation 1.4 A recommended set of agreed information standards at regional/national level; some shared	7 [49,50,52,54,56-58]

Dimensions and related indicators as described in B3-MM [55]	Number of article(s) [Reference]
<p>procurements of new systems at regional/national level; some large-scale consolidations of ICT underway</p> <p>1.5 A unified set of agreed standards to be used for system implementations specified in procurement documents; many shared procurements of new systems; consolidated data centres and shared services widely deployed</p> <p>1.6 A unified and mandated set of agreed standards to be used for system implementations fully incorporated into procurement processes; clear strategy for regional/national procurement of new systems; consolidated datacentres and shared services (including the cloud) is normal practice.</p>	
<p>5. Finance & Funding</p> <p>1.1 No special funding allocated or available</p> <p>1.2 Fragmented innovation funding, mostly for pilots</p> <p>1.3 Consolidated innovation funding available through competitions/grants for individual care providers</p> <p>1.4 Regional/national (or European) funding or PPP for testing and for scaling-up</p> <p>1.5 Regional/national funding for scaling-up and on-going operations</p> <p>1.6 Secure multi-year budget, accessible to all stakeholders, to enable further service development</p>	8 [40,48,49,52,54,56-58]
<p>6. Removal of inhibitor</p> <p>1.1 All projects delayed or cancelled due to inhibitors</p> <p>1.2 Some projects delayed or cancelled due to inhibitors</p> <p>1.3 Process for identifying inhibitors in place</p> <p>1.4 Strategy for removing inhibitors agreed at a high level</p> <p>1.5 Solutions for removal of inhibitors developed and commonly used</p> <p>1.6 High completion rate of projects & programmes; inhibitors no longer an issue for service development</p>	7 [40,49,52,54,56-58]
<p>7. Population Approach</p> <p>1.1 No consideration of population health in service provision</p> <p>1.2 A population focus of risk stratification but no risk stratification tools</p> <p>1.3 Individual risk stratification for the most frequent service users</p> <p>1.4 Group risk stratification for those who are at risk of becoming frequent service users</p> <p>1.5 Population-wide risk stratification started but not fully acted on</p>	5 [51,54,56-58]

Dimensions and related indicators as described in B3-MM [55]	Number of article(s) [Reference]
1.6 Whole population stratification deployed and fully implemented.	
8. Citizen empowerment 1.1 No systematic plan for empowerment 1.2 Citizens are not involved in decision-making processes and do not participate in the co-design of their services 1.3 Policies to support citizens' empowerment and protect their rights, but may not reflect their real needs 1.4 Incentives and tools to motivate and support citizens to co-create health and participate in decision-making processes 1.5 Citizens are supported and involved in decision-making processes, and have access to information and health data 1.6 Citizens are involved in decision-making processes, and their needs are frequently monitored and reflected in service delivery and policy-making.	7 [47,50-52,54,57,58]
9. Evaluation methods 1.1 No routine evaluation 1.2 Evaluation exists, but not as a part of a systematic approach 1.3 Evaluation established as part of a systematic approach 1.4 Some initiatives and services are evaluated as part of a systematic approach 1.5 Most initiatives are subject to a systematic approach to evaluation; published results 1.6 A systematic approach to evaluation, responsiveness to the evaluation outcomes, and evaluation of the desired impact on service redesign (i.e., a closed loop process)	6 [49,52,54,56-58]
10. Breadth of ambition 1.1 No level of integration 1.2 Services in silos; the citizen or their family as the integrator of services 1.3 Integration within the same level of care (e.g., primary care) 1.4 Integration between care levels (e.g., between primary and secondary care) 1.5 Integration includes both social care service and health care service needs 1.6 Fully integrated health & social care services	11 [40,47-52,54,56-58]

Dimensions and related indicators as described in B3-MM [55]	Number of article(s) [Reference]
11. Innovation management 1.1 No plan for innovation management 1.2 Isolated innovations across the region/country, but limited visibility 1.3 Innovations are captured and published as good practice 1.4 Innovation is governed and encouraged at a region/country level 1.5 Formalised innovation management process in place 1.6 Extensive open innovation combined with supporting procurement & the diffusion of good practice.	4 [49,54,57,58]
12. Capacity building 1.1 No plan for capacity-building 1.2 Single organisational initiatives engaged in process improvement 1.3 Some mechanisms for sharing knowledge among organisations 1.4 Systematic learning about IT; integrated care and change management 1.5 Knowledge shared, skills retained and lower turnover of experienced staff 1.6 A 'learning healthcare system' involving reflection and continuous improvement	8 [47-50,52,54,57,58]

Table 7: Number of validation studies, the methodological quality of the studies, the direction (positive or negative) of results of the measurement properties and overall quality measurement property content validity score

Instrument (data derived from Bautista et al. [27])	Author (name of first author only used) [reference]	Number of validation studies	Methodological quality of studies on content validity (COSMIN checklist)	Direction of results (Table 3) of measurement property content validity	Overall quality measurement property content validity score (Table 2)
Scale of Functional integration	Ahgren[40]	1	Fair	a	?
DELTA service user assessment	Ahgren [47]	1	Fair	a	+
Human Service Integration Measure	Browne [48]	1	Excellent	a	?
Unnamed1	Lukas [49]	1	Fair	a	+
Dual Diagnosis Capability in Health Care Settings (DDCHCS)	McGovern [50]	1	Not assessed	a	0
Patient Perceptions of Integrated Care Survey (PPICS)	Singer [51]	1	Fair	a	+
Unnamed2	Uyei [52]	1	Good	a	?
Instruments (derived from the narrative review)					
HCP integration survey	Bainbridge[54]	1	Fair	?	?
Unnamed3	Calciolari [56]	1	Fair	?	?
Development Model of Integrated Care (DMIC)		5			+++
	Minkman [57]		Excellent	+	
	Minkman [57]		Excellent	+	
	Minkman [57]		Excellent	+	

Instrument (data derived from Bautista et al. [27])	Author (name of first author only used) [reference]	Number of validation studies	Methodological quality of studies on content validity (COSMIN checklist)	Direction of results (Table 3) of measurement property content validity	Overall quality measurement property content validity score (Table 2)
	Minkman [57]		Excellent	+	
	Longpré [58]		Fair	?	

a: Data on direction of results per instrument was summarised in the review of Bautista et al. [23]. No individual data per instrument was provided.

Table 8: Characteristics of experts in Delphi rounds 1, 2 and 3 (in % unless stated otherwise)

Characteristic	Category	Expert group first round (n=26)	Expert group second round (n=13)	Expert group third round (n=10)
Age (year)	Min - Max	30-71	36-71	36-71
	Average (sd)	49.23 (11.73)	52.69 (13.22)	52.60 (13.43)
	< 40	23.1	23.1	20
	40 - 50	30.8	23.1	30
	>50	46.2	53.8	50
Gender	Male	30.8	46.2	50.0
	Female	69.2	53.8	50.0
Country	Belgium	3.8	7.7	10
	Canada	7.7	7.7	10
	Czech Republic	3.8	7.7	10
	Finland	3.8	0	0
	Germany	3.8	0	0
	Italy	15.4	15.4	0
	Luxembourg	3.8	0	0
	Netherlands	7.7	0	0
	Netherlands and USA	3.8	7.7	10
	Portugal	7.7	7.7	10
	Spain	7.7	15.4	20
	Sweden	7.7	0	0
	UK	15.4	23.1	20
	USA	7.7	7.7	10
Professional Affiliation	Medicine	15.4	15.4	20
	Nursing	7.7	7.7	10
	Policy	7.7	15.4	0
	Managerial	15.4	23.1	20
	Research	46.2	30.8	40
	Other	7.7	7.7	10
Years of experience	< 1	0	0	0
	1-5	38.5	23.1	30
	5-10	26.9	23.1	20
	> 10	34.6	53.8	50

2.1.3 Discussion

This study reports on the content validity of the B3-MM instrument, developed to measure the level of maturity of integrated care. The literature review and Delphi study allowed the assessment of the content validity of B3-MM and enabled the instrument to

be enhanced. Following on from the review, the dimensions and indicators of the maturity model correspond to the items of instruments measuring maturity of integrated care in the academic literature. The results of the Delphi study showed that all the dimensions of the B3-MM were considered relevant by experts in the field of integrated care. Initially in the first Delphi round, there was insufficient agreement on the first few maturity indicators on every dimension whereas, after rephrasing the indicators during the second and third Delphi rounds, experts agreed that all the indicators were relevant for the assessment of the maturity of integrated care. As a result, B3-MM is a comprehensive instrument consisting of a wide range of dimensions applicable to the development of integrated care.

The items included in another instrument, called the DMIC, described in two articles, matched all the dimensions of the B3-MM [57,58]. While the DMIC is regarded as a validated generic quality management model for integrated care, the model was developed and widely used in the Netherlands [59]. In comparison, the B3-MM is of a wider scope, developed on basis of lessons learned in achieving integrated care by 12 different European regions.

In line with other studies [29,60], a variety in the constructs and elements measured by the selected instruments was observed in this study. Furthermore, the assessment of the overall quality of the content validity for the instruments showed that only one out of ten instruments assessed, the level of evidence on the overall quality of the measurement property content validity was found to be strong. In their systematic review of measurement properties of care continuity instruments, Uijen et al. [29] indicated that these findings on the levels of evidence do not mean that the quality of the instruments is low, but rather that there is a need for high quality studies that can adequately assess the measurement properties and eventually the instrument quality. Moreover, out of the 300 articles retrieved in the literature review undertaken by Bautista et al. [27], only seven articles were included in this review. The need for high quality studies on measurement properties and the small number of selected articles indicates that the measurement of maturity in integrated care is not yet strongly developed in the academic literature. The complexity of the development, implementation and scale-up of the multi-stage process of integrated care makes the measurement of the maturity of integrated care a difficult exercise. However, if integrated care initiatives are to make a significant contribution to the transformation of health systems, solid measurement of the maturity of integrated care should become an essential element of their development. Measurement of the maturity of integrated care provides insight into both the problems experienced and the success factors that work when making progress on the development of integrated care services. It provides the knowledge needed to guide further development of integrated care initiatives in appropriate directions.

A few limitations need to be considered with regard to this study. The review was based on search terms derived from a systematic literature review which enabled a broad search in several databases. However, a first limitation of the narrative review was the focus on English language studies, which may have led to a language bias. A second limitation was that literature represent a large diversity of concepts (methods and measurements) concerning the measurement of integrated care [61]. Since “the

definition and application of the concept of integrated care is influenced by the background and health care systems of the various authors'' [12, p. 8], the data extraction from the literature conducted by the researchers was inevitably subjective. This is a disputable characteristic of any review that addresses complex interventions focusing on the items described for instruments in different contexts. A third limitation was that the review was susceptible to publication bias, although the search has been broadened to include literature found through various search engines. Concerning the overall assessment of the quality of the measurement property content validity we used data obtained from the review of Bautista et al. [27] on the score for the instruments and applied their criteria to the assessment of the instruments retrieved from our narrative review. The assessment was therefore subject to possible inconsistency although we tried to diminish this by discussing the assessment of the instruments among the researchers (LG and HV).

The Delphi technique has long been regarded as an appropriate research technique to reach consensus amongst groups of experts and has been widely applied in health and social studies [62]. However, there are currently no universally agreed criteria for the selection of experts; no directives on the minimum or maximum number of experts on a panel; and no firm guidelines on the correct number of rounds to be organised regarding the Delphi method; "rather the Delphi method appears to be related to common sense and practical possibilities" [46, p.208]. Furthermore, the sample of the expert panels in the Delphi method are not being judged in terms of being representative samples for statistical purposes, but rather assessed on the qualities of the expert [63]. Although, we tried to reduce possible artefacts, a few limitations need to be considered for the Delphi study. To reach a reliable consensus in Delphi studies, it was important to establish a balance among the participants who represent a particular topic. The balance between the expert types who were recruited for the Delphi study and who participated in the first Delphi round was as follows: about half of the respondents who participated included researchers with experience in the measurement or development of integrated care. The other half consisted of a pool of experts who were recruited via the SCIROCCO consortium partners (i.e. a mix of experts with a practical experience in the development, implementation and/or monitoring of integrated care interventions, with experience in the field of Information and eHealth services or experts from the B3 Action Group on Integrated care).

The agreement found among the experts on the items of the B3-MM represents the majority opinion of the experts, yet, it does not mean the 'right' answers have been found [38]. The results may be biased due to the recruitment strategy that involved partners of the consortium; however, it may be expected that the experts provided their nuanced opinions garnered from their expertise. Furthermore, we provided room for the experts' comments and suggestions as well as ensured that the Delphi rounds were completed anonymously without the influence of other panel members, to obtain a reliable and diverse collection of opinions. Additionally, a gradual decline in the number of experts participating in each Delphi round was observed. Although we provided experts with more than a week for responding and sent reminders, by asking for their participation in several rounds the Delphi technique asks much more dedication from respondents than does a simple survey, and the potential for low responses increases

considerably [38]. A final limitation to the study was that a few expert respondents found the survey difficult to understand, which indicates that it was not evident that the instrument was easy to understand. The different backgrounds of the experts, concerning their fields of experience and origins (including variations in the types of health care systems, social values, and on-going health reform) may have also an influence on the way in which the instrument was interpreted. To obtain an adequate understanding of the instrument among its users, a clear manual explaining the meaning and application of the instrument would be desirable.

2.1.4 Conclusion

Notwithstanding the pragmatic nature of the initial development of the B3-MM, this study was the first step to validate the B3-MM instrument to measure the maturity of integrated care. While today the B3-MM is a unique instrument based on existing knowledge and lessons learned in implementing integrated care, further research on its measurement properties is needed to enhance the quality of the B3-MM as instrument. The determination of the validity of an instrument measuring a construct is important. This further research on its measurement properties should preferably be guided by the COSMIN manual [34]. Moreover, in the SCIROCCO project, the use of the B3-MM instrument was further explored as a tool to facilitate the exchange of GPs and scaling-up of integrated care processes in Europe. As the B3-MM is used as a starting point from which regions are matched and shared learning is facilitated, insight in the measurement properties of the tool is a prerequisite to ensure a valid and reliable assessment of the maturity level of the regional healthcare system. This enables the more tailored process of achieving progress in the path towards integrated care for health care regions.

3. Further assessment of measurement properties of the SCIROCCO tool: structural validity, internal consistency and convergent validity.

The aim of the study described below was to examine the structural validity, internal consistency and convergent validity of the SCIROCCO tool. Assessing the measurement properties of an instrument, is significant in determining the quality of the tool [37]. Hence the research question of this study: What is the structural validity, internal consistency and convergent validity of the SCIROCCO tool?

All information provided in this section was retrieved from the manuscript which was submitted to BMC Medical Research Methodology (*manuscript under review*).

3.1. Methods

The measurement properties, sample and data collection methods used for this study are presented below. Thereafter, the instrument used to assess convergent validity is described and the data analysis techniques are presented.

Assessment of measurement properties

The measurement properties structural validity, internal consistency and convergent validity of the SCIROCCO tool were tested in this study. Structural and convergent validity are aspects of construct validity. Construct validity 'is based on the assumption that the measurement instrument validly measures the construct to be measured and should be assessed in case a gold standard is lacking' [37]. The first measurement property, structural validity, is defined as 'the degree to which the scores of a measurement instrument are an adequate reflection of the dimensionality of the construct to be measured' [35]. This type of validity can be explored by examining the instrument's factor structure using factor analysis. The second property, convergent validity, refers to the extent to which two instruments capture a corresponding construct [64] and can be assessed by investigating associations between these instruments. Finally, the measurement property, internal consistency, was assessed which is an aspect of reliability. It is a measure of the homogeneity of a scale and indicates the extent to which items in a scale are intercorrelated.

Sample and data collection

Structural validity and internal consistency

To assess the structural validity and internal consistency of the SCIROCCO tool, subjects were invited to fill in the online SCIROCCO tool in three rounds between June 2017 and February 2018. The subjects were recruited according to the following criteria: individuals from European regions involved in the design and deployment of integrated care, including no more than 10 people per region, from several disciplines (i.e. a decision-maker, healthcare professional, an information technology specialist, regulators, payers, users group, and innovation agencies), different sectors (i.e. health care, social care, housing and voluntary sector) and different positions (i.e. senior

management, front-line, back-office). In the first round, subjects were recruited from the five regions that participated in the SCIROCCO project and were recruited by SCIROCCO project members. The subjects came from the five participating European regions (Basque Country (Spain), Norrbotten (Sweden), Puglia (Italy), Olomouc (Czech Republic) and Scotland). In the second round, subjects that were involved in other relevant EU projects were recruited to fill in the SCIROCCO tool. These subjects were recruited by the project coordinator and by SCIROCCO project members, mainly during dissemination activities that took place within the SCIROCCO project. In the last round, subjects were recruited by the researchers from the Vrije Universiteit Brussel. These subjects were recruited from other European regions (i.e. Denmark, England, Germany, the Netherlands, and France) and were derived from a convenience sample (contacts provided by one of the researchers). All those who were identified and selected received a general invitation e-mail that described the purpose and procedure of the study. The invitational e-mail also included a paper providing an overview of the SCIROCCO tool and a web-link to illustrative videos and demos on how to use the online version of the tool.

Convergent validity

To examine the convergent validity of the SCIROCCO tool, the participants who were invited in the first round were also invited to fill in the DMIC Quickscan. In a period of 6-24 weeks after the participants filled in the SCIROCCO tool, they were invited to fill in the DMIC Quickscan. The 22 statements of the Quickscan were presented in an online survey that took about 10 minutes to complete. Subjects received an invitation by e-mail, including information on the survey, ethical considerations, and the link to the online DMIC Quickscan questionnaire. To construct a general profile of the subjects, data were collected about their professional position, and the name of their organisation, region and service or network.

DMIC Quickscan

The DMIC Quickscan is based on the Development Model of Integrated Care (DMIC) questionnaire, which consists of 89 items [anonymous reference]. In a recent literature review comparing the B3-MM with existing instruments that focus on assessing the development of integrated care, the DMIC was found to match with all the dimensions of the B3-MM [anonymous reference]. The elements of the DMIC represent a wide range of activities considered as relevant to the realisation of integrated care which are grouped in nine clusters; 'patient-centeredness', 'delivery system', 'performance management', 'quality of care', 'result-focused learning', 'interprofessional teamwork', 'roles and tasks', 'commitment' and 'transparent entrepreneurship'. Implementing the elements of all nine clusters contributes to the further development of integrated care. The DMIC is being used to serve as an assessment tool for health care professionals, managers and integrated care coordinators to support the implementation of improvement activities. The systematic development of the DMIC consisted of a literature study, a Delphi study and several survey studies [anonymous reference]. The level of evidence on the overall quality of the measurement property content validity for the DMIC was found to be strong [anonymous reference]. Moreover, the DMIC was empirically validated in stroke, acute myocardial infarct, and dementia services in the Netherlands [anonymous reference]. Furthermore, the model has been used, mainly in Europe and Canada, to evaluate and describe a variety of integration contexts [2 anonymous 7].

In this study, to ensure a high response rate, we chose to use the DMIC Quickscan, due to a shorter completion time; 10 minutes compared to 45 minutes for the DMIC. The Quickscan was extracted from the 89 items of the DMIC, of which a total of 22 items were selected based on priority scores [anonymous reference]. These 22 items are presented as statements in the Quickscan, which reflect the different activities that can be undertaken to implement and develop integrated care. Subjects were asked to rate whether the description on the separate statements matches the current situation of their integrated services/network by using a 5-point scale (which ranges from fully agree-fully disagree). The DMIC Quickscan was translated to English, Czech, Spanish and Italian by experts in the field of integrated care. Notwithstanding the theoretical validity of the DMIC and the derivation of the DMIC Quickscan from the DMIC, measurement properties including construct validity, internal consistency and convergent validity have not been tested for the DMIC nor the DMIC Quickscan. Since to our knowledge, no other similar instruments than the SCIROCCO tool are available, the Quickscan was the most appropriate comparator available to test the construct validity of the SCIROCCO tool.

The convergent validity of the SCIROCCO tool was evaluated by comparing elements of the tool using an instrument measuring a similar construct, the DMIC Quickscan. This means that the convergent validity of the SCIROCCO tool was based on comparisons between related, but not quite equivalent, concepts. The SCIROCCO tool concentrates on the maturity of elements for integrated care operating in the health care system and the DMIC Quickscan focuses on the development of practical elements in integrated care practices or networks. Even though both instruments are considered to operate on a different level, we expected to find a correspondence between the elements of both tools since those elements indicated to be present in the practice/network might also provide an indication of progress on these elements in the healthcare systems of those regions.

Data analysis

Quantitative data-analysis was performed to assess the structural validity, internal consistency and convergent validity of the SCIROCCO tool. Analyses were performed using SPSS software, version 25.0.

Structural validity

A specialist additional module for factor analysis, R V2.4.3 was added to SPSS for the analysis of the structural validity [65]. Conventional methods of exploratory factor analysis (EFA) rely on Pearson correlations and/or maximum likelihood techniques, however assumptions for using these methods (item distributions that approach an equal intervals scale and a multivariate normal distribution) were not met in this study. Therefore, the polychoric correlation matrix was analysed to obtain a more accurate reproduction of the correlation structure [66]. Furthermore, EFA using minimum residual method (MINRES) of the polychoric correlation matrix was conducted to explore the structure of the items of the SCIROCCO tool. MINRES is a robust factor extraction method, as it does not require any distributional assumptions, and it can be used with small samples [67].

Multiple methods to determine the numbers of factors to extract for ordinal skewed data exist and the use of a combination of several methods is suggested [65]. In this study, two accurate techniques, Parallel Analysis (PA) [68] and Comparative Data (CD) [69], were chosen as methods to determine the number of factors to retain. Although both extraction methods' accuracy rates are decreased with smaller samples [69,70], they are

the most accurate methods known [71-73]. PA was applied using random column permutations of real data matrix, factor estimation, polychoric correlation matrix and mean eigenvalue criterion, a 1,000 datasets were simulated. For CD, Spearman rank order correlation matrix was used to fit the ordinal scale [65]. The items of the tool relating to 'maturity for integrated care' were expected to be correlated, therefore oblique rotation was selected as the rotation technique. A factor loading of >0.35 was applied.

Descriptive statistics were used to characterize the study sample. To check whether the dataset was suitable for factor analyses, Bartlett's test for sphericity and Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy were assessed. Furthermore, the data were screened for any invalid data patterns (e.g., selection of "0"s for all questions), skewness and missing values. We decided to exclude items with an extreme skewed distribution ($>90\%$ of all the responses in one category) for the analyses. Items with a high non-response ($>5\%$ missing values) were also excluded from the analyses.

Internal consistency

After the factor analysis was completed, the internal consistency of the tool was assessed using Cronbach alpha and ordinal alpha coefficients. Theoretically, the Cronbach alpha is only appropriate when variables are continuous, and it has been shown that Cronbach- α is negatively biased when it is used to measure the reliability of ordinal variables [71]. However, this measure is frequently used in practice and leads to valid results despite data that are highly skewed. In the event that the assumption of normality is violated, the ordinal alpha coefficient has been recommended as a more appropriate estimate of reliability than Cronbach's Alpha [74]. However, Chalmers indicates that coefficient α has never required continuous item-level data and that ordinal alpha should not be reported as a measure of a tests reliability, but instead should be understood as hypothetical tool [75]. Therefore, the internal consistency of each factor was examined by calculating both the Cronbach's alpha and the ordinal reliability alpha.

Convergent validity

After the two tools (SCIROCCO tool and DMIC Quickscan) were administered, quantitative data analysis was used to compare the items of the instruments. The convergent validity of the items of the SCIROCCO tool was evaluated by testing whether scores on the items of the SCIROCCO tool were positively associated with scores on the corresponding items of the DMIC Quickscan. Hypotheses were formulated where we expected moderate correlations between items of the two instruments. This expectation was based on the correspondence between descriptions of items of the SCIROCCO tool and the descriptions of items of the DMIC Quickscan. This resulted in the testing of 23 predefined hypotheses (see Appendix E). Not all 22 items of the Quickscan were included in the formulated hypotheses, since some item descriptions did not correspond to any of the 12 items of the SCIROCCO tool. Correlations were calculated to test the hypothesized relationships. Strong correlations were not expected a priori because the two instruments do not measure identical constructs. Correlations falling within the range 0.30-0.50 were considered low, within the range 0.50-0.70 were considered moderate and correlations within the range 0.70-0.90 were considered high [76]. Since the distribution of the data was skewed, the agreement between the items of the SCIROCCO tool and the DMIC Quickscan instrument were assessed using Spearman's ρ correlation coefficients. To provide an indication of the significance and size of a statistical effect, MacKinnon et al. (2004) recommend using confidence limit estimation [77]. Therefore, bias-corrected accelerated (BCa) confidence intervals (CI, 95%) were computed using bootstrapping (1000 samples) for all intervals. This technique has been advised in situations where parametric assumptions are not met [78,79].

3.2. Results

Factor analysis

A total of 69 respondents filled in the SCIROCCO tool. Of these, one questionnaire (1.3%) was excluded because of incompleteness. The respondents came from 13 different European countries. A large part of the respondents was active in the health sector (70.6%) and work mainly in management (33.8%) or as a health professional (23.5%). The characteristics of all the respondents are shown in Table 9.

Table 9: Characteristics of participants who completed the SCIROCCO tool (n=68)

		n (%)
Residential country	Belgium	1 (1.5)
	Czech Republic	9 (13.2)
	Denmark	1 (1.5)
	Estonia	1 (1.5)
	France	1 (1.5)
	Greece	2 (2.9)
	Hungary	2 (2.9)
	Italy	11 (16.2)
	The Netherlands	3 (4.4)
	Poland	4 (5.9)
	Spain	13 (19.1)
	Sweden	8 (11.8)
	United Kingdom	12 (17.6)
Healthcare system	Asturias, Spain	3 (4.4)
	Basque Country, Spain	10 (14.7)
	Czech Republic	9 (13.2)
	Greece	2 (2.9)
	Lombardy, Italy	1 (1.5)
	Netherlands	3 (4.4)
	Norrbottnen, Sweden	8 (11.8)
	Puglia, Italy	10 (14.7)
	Scotland	10 (14.7)
	Other	11 (16.2)
Sector	Health	48 (70.6)
	Health, Social Care	11 (16.2)
	Social Care	2 (2.9)
	Social Care, Voluntary	1 (1.5)

		n (%)
	Voluntary	2 (29)
	Others	4 (5.9)
Role	Care Professional	6 (8.8)
	Health Administrator	3 (4.4)
	Health Economist	1 (1.5)
	Care Administrator	1 (1.5)
	Health ICT	5 (7.4)
	Health Professional	16 (23.5)
	Management	23 (33.8)
	Regulator	1 (1.5)
	Other	12 (17.6)

Table 10: Item distributions per item of the SCIROCCO tool (The abbreviation of the items are fully described in Table 11)

Item distributions		RtC	S&G	ICT&eHealth	S&S	Funding	Rol	PA	CE	EM	BoA	IM	CB
Answer category	0	1	10	14	7	6	2	7	7	13	7	3	7
	1	17	5	14	20	23	39	29	13	13	12	14	17
	2	17	18	22	17	14	9	12	24	12	6	28	16
	3	22	19	12	15	14	15	9	20	20	16	17	21
	4	8	7	5	8	8	3	8	4	8	18	5	2
	5	3	9	1	1	3	0	3	0	1	9	1	5
Median		2	3	2	2	2	1	1	2	2	3	2	2
Total		68	68	68	68	68	68	68	68	67	68	68	68
% missing values		0	0	0	0	0	0	0	0	1,4	0	0	0
Kurtosis		-0,543	-0,680	-0,536	-0,727	-0,657	-0,559	-0,411	-0,541	-1,093	-1,057	0.134	-0,251
Skewness		0.250	-0,068	0,261	0,239	0,430	0,790	0,724	-0,255	-0,036	-0,347	0,209	0,343

In Table 10, the item distributions are presented per item of the SCIROCCO tool. The distribution of the data over the items was non-normal and one item response was missing to the item. Evaluation Methods (1.4%). The proportion of responses per items in one answer category did not exceed the >90% threshold.

The respondent with one item response missing was excluded in the item analysis, thus the final sample size used for the analysis was n=67. In terms of the suitability of factor analysis for this dataset, Bartlett's test for sphericity was significant ($\chi^2 = 558.549$, $p < .000$), while the KMO statistic of .873 demonstrated a good sampling adequacy.

EFA was carried out on the matrix of polychoric correlations (two-step) to examine the dimensional structure underlying the SCIROCCO tool. The PA and CD techniques identified a one-factor structure of the instrument, explaining 55.57% of the variance. All the 12 items showed high factor loadings (>0.60) to the identified factor (Table 11).

Table 11: Factor loadings (unrotated) of the SCIROCCO tool on one factor

	F1
Capacity Building (CB)	,866
Structure and Governance (S&G)	,823
Evaluation Methods (EM)	,785
Standardisation and Simplification (S&S)	,785
Removal of Inhibitors (RoI)	,771
Citizen Empowerment (CE)	,757
Funding	,726
Innovation Management (IM)	,721
Readiness to Change (RtC)	,702
Population Approach (PA)	,698
Breadth of Ambition (BoA)	,651
ICT and eHealth services (ICT and eHealth)	,626

Reliability

The factor showed a Cronbach's alpha of 0.92, and the ordinal alpha coefficient score was 0.94, presenting a high internal consistency level for the 12 items.

Convergent validity

A total of 36 responses were collected using the DMIC Quickscan. Four respondents did not complete the full Quickscan and an additional four respondents were excluded as their matching replies to the SCIROCCO tool were not traceable due to an incorrect name. Therefore, a total of eight responses were excluded from the analyses. The characteristics of the 28 respondents are presented in Table 12.

Table 12: Characteristics of participants (n=28) who completed the SCIROCCO tool and DMIC Quickscan

		n (%)
Residential country	Czech Republic	5(17.9)
	Italy	10(35.7)
	Spain	6(21.4)
	Sweden	3(10.7)
	United Kingdom	4(14.3)
Sector	Health	18(64.3)
	Health; Social Care	4(14.3)
	Other(s)	2(7.1)
	Social Care	2(7.1)
	Voluntary	2(7.1)
Role	Care Professional	4(14.3)
	Health Administrator	1(3.6)
	Health ICT	2(7.1)

		n (%)
	Health Professional	4(14.3)
	Management	11(39.3)
	Other	6(21.4)

Table 13 shows that 7 out of the 23 hypothesized relationships between the SCIROCCO tool and items of the DMIC tool were confirmed by showing moderate correlations. All the three positive hypothesized relationships between the Structure and Governance item of the SCIROCCO tool and three items of the Quicksan showed a moderate relationship. Furthermore, moderate correlations were found between Information & eHealth services, Citizen Empowerment, Evaluation Methods and Breadth of Ambition and their hypothesized relationships with items of the Quicksan. Low correlations (0.3-0.5) were found between the items of both tools in 13 of the 16 remaining hypotheses. Only four of those low correlations were found to be significant.

Table 13: Hypothesized relationships between the items of the SCIROCCO tool and DMIC Quickscan

Hypothesis	SCIROCCO tool items	Median (IQR)	DMIC Quickscan statement per dimension	Median (IQR)	Spearman's ρ and 95% BCa CI	P-value (2-tailed)
1	Readiness to Change	3(1)	Commitment: 19	4(2)	0.492 [.147-.763]	0.008*
2	Structure & Governance	2.5(2)	Result-focused learning: 11	4(1)	0.594 [.237-.802]	0.001*
3	Structure & Governance	2.5(2)	Roles and tasks: 15	4(2)	0.698 [.407-.865]	0.000*
4	Structure & Governance	2.5(2)	Commitment: 20	4(1)	0.535 [.138-.801]	0.003*
5	Information & eHealth Services	2(2)	Client-centeredness: 3	4(2)	0.315 [-.137-.667]	0.103
6	Information & eHealth Services	2(2)	Delivery system: 5	3.5(2)	0.502 [.196-.723]	0.007*
7	Standardisation & Simplification	2(2)	Delivery system: 5	3.5(2)	0.284 [-.066-.543]	0.143
8	Finance & Funding	3(3)	Transparent entrepreneurship: 22	3(2)	0.302 [-.119-.615]	0.119
9	Removal of Inhibitors	1(1)	Result-focused learning: 12	3.5(2)	0.240 [-.107-.554]	0.219
10	Removal of Inhibitors	1(1)	Transparent entrepreneurship: 21	4(1)	0.146 [-.154-.462]	0.460
11	Population Approach	1.5(3)	Interprofessional teamwork: 13	4(0)	0.367 [-.091-.727]	0.055
12	Citizen Empowerment	2(2)	Client-centeredness: 3	4(2)	0.571 [.260-.773]	0.002*
13	Citizen Empowerment	2(2)	Performance management: 8	3(3)	0.474 [.092-.722]	0.011*
14	Citizen Empowerment	2(2)	Quality of care: 10	3(2)	0.325 [-.083-.627]	0.091
15	Evaluation Methods	2(3)	Performance management: 6	4(3)	0.400 [-.035-.735]	0.035*
16	Evaluation Methods	2(3)	Performance management: 7	4(2)	0.594 [.260-.814]	0.001*
17	Breadth of Ambition	3(3)	Delivery system: 4	4(1)	0.274 [-.141-.665]	0.158
18	Breadth of Ambition	3(3)	Interprofessional teamwork: 14	4(1)	0.320 [-.107-.702]	0.097
19	Breadth of Ambition	3(3)	Roles and tasks: 15	4(2)	0.367 [-.069-.743]	0.055

Hypothesis	SCIROCCO tool items	Median (IQR)	DMIC Quickscan statement per dimension	Median (IQR)	Spearman's ρ and 95% BCa CI	<i>P</i> -value (2-tailed)
20	Breadth of Ambition	3(3)	Roles and tasks: 16	4(2)	0.334 [-.039-.658]	0.082
21	Innovation Management	2(1)	Result-focused learning: 12	3.5(2)	0.369 [-.104-.678]	0.054
22	Capacity Building	2.5(1)	Performance management: 7	3.5(2)	0.642 [.356-.843]	0.000*
23	Capacity Building	2.5(1)	Result-focused learning: 12	4(2)	0.477 [.092-.744]	0.010*

3.3. Discussion

In this study, measurement properties of the SCIROCCO tool were evaluated by examining structural validity, internal consistency and convergent validity. The findings regarding the internal structure and internal consistency provide initial support for the SCIROCCO tool. EFA supported a one-factor structure of the tool with high loadings of the items to the factor. The one-factor structure explained 55.57% of the variance in all the items. Moreover, the internal consistency, as measured with the Cronbach alpha and ordinal alpha were high, thus suggesting that the different items of the SCIROCCO tool are related.

With regard to the convergent validity, slightly over one-third of the hypothesized relationships were found to be moderately correlated, thereby supporting the convergent validity of the SCIROCCO tool. The high number of low correlations between items of the two tools, however, suggests that the two instruments measure different aspects of integrated care and they should therefore not be used interchangeably. The SCIROCCO tool concentrates on the healthcare system while measuring the maturity for integrated care, while the DMIC Quicksan focuses on the presence of elements in integrated care in a practice (network). Since, to our knowledge, there is no gold standard instrument available with respect to measuring maturity for integrated care, the DMIC Quicksan included in this study was the most appropriate choice that was available.

The SCIROCCO tool can be considered as a start of instrument development in assessing maturity for integrated care in the healthcare system context. However, we need to be careful in interpreting the findings since the sample size was modest, and this challenges the interpretation of the results. Furthermore, the period between filling in the SCIROCCO tool and the DMIC Quicksan varied from 6 to 24 weeks which could have also affected the outcomes. This variation was the result of the fact that the respondents were participating in the self-assessment process of the SCIROCCO project; due to workload, some regions decided to wait a bit longer to invite the respondents to complete the DMIC Quicksan to ensure a high response rate. It is recommended to perform the analysis on a larger sample size to explore whether more correspondence among the items of the instruments will be found supporting the convergent validity of the tool or to investigate whether the instruments do measure different constructs.

The study has three limitations. The first, and main, limitation was the modest sample size, which may have influenced the robustness of the factor analysis. In conducting the EFA, several aspects guided us in choosing the appropriate factor extraction method. When the sample size and number of factors are expected to be small, the use of an unweighted least squares method to determine the factor structure is recommended [80-82]. In our study, we used MINRES, which is equivalent to unweighted least squares. MINRES is very robust and it does not require any distributional assumptions, therefore it can be used with small samples and when a correlation matrix is not positive definite [67]. Furthermore, calculation of the sample size necessary to assess structural validity is recommended by a subjects-to-variables ratio ("N to p" ratio, where "N" is the sample size and "p" the number of items included in analysis). The subjects-to-variables ratio of our sample 5.5:1, was considered sufficient as it falls within the range of acceptability [71]. In the literature, an acceptable ratio ranges from at least 5:1, while a 10:1 ratio is considered as rule of thumb for determining a priori sample size. To estimate consistency of the results, we repeated the analyses using the alternative method of principal axis factoring. The analysis resulted in the same factor loadings (the results of this analysis are available

via the corresponding author). Notwithstanding the acceptable subject-to-variable ratio, the use of MINRES as the extraction method, and the stable alternative analysis, the modest sample size of our study does not allow for strong conclusions about the factor solution. However, we consider the one factor solution relevant. It is important to perform additional analyses, using confirmatory factor analyses on a larger sample to test how well the measured variables confirm the underlying factor structure found in this study.

A second limitation of the study was that we did not conduct a nonresponse analysis and, therefore we have no specific information about the non-responders. Subjects were invited to fill in the SCIROCCO tool via three rounds, including project members of SCIROCCO, during several dissemination activities which were organized by the project consortium. Therefore, we were unable to track the response rate in the study. Several factors may have contributed to non-responses. One of these was the fact that the tool was spread among several countries in Europe available in only four languages, which may have created an obstacle for some respondents to fill in the tool. Other factors could be the demands on some respondents of participating in the SCIROCCO project (multiple requests were made), a lack of time, or not feeling a specific urge to fill in the tool or seeing the immediate benefit from doing so.

A third limitation which needs to be considered was the availability of the SCIROCCO tool, and the undertaking of the DMIC Quickscan, in several languages. The tool was originally developed in English and the content-validity of the tool was assessed using this language version. Thereafter, the tool was translated, and the adequacy and clarity of this translation was checked by the consortium partners based in the different European regions. Since the context, languages and commonly used expressions of the different regions in Europe may have an influence have on the description of various aspects and concepts related to integrated care, the translations could have resulted in slightly different wordings in the SCIROCCO tool. Furthermore, the DMIC Quickscan was also translated to English by its developer and to Czech, Italian and Spanish by mother-tongue speakers who are researchers in the field of integrated care. The translations could also have led to there being slightly different wordings in the DMIC Quickscan. We expect that these slight differences may have resulted in the provision of different answers to the items of the SCIROCCO tool among the different regions. It is therefore recommended, as a next step, to explore the factor structure of the different language versions of the SCIROCCO tool.

3.4. Conclusion

The SCIROCCO tool is a promising instrument which offers regions a tailored approach facilitating progress in integrated care. It provides insights into the strengths and weaknesses in integrated care on which regions can be matched and shared learning can be facilitated. Determination of its measurement properties is important to ensure a valid and reliable assessment of the maturity level of the regional healthcare system. This was the first study to have assessed the structural validity, internal consistency and convergent validity of the SCIROCCO tool. The construct of the SCIROCCO instrument presented one relevant underlying factor: it seems that the tool reflects the maturity for the health care system context in providing integrated care with adequate validity. The internal reliability of the one-factor structure was high. For the convergent validity, only 7 out of the 23 hypothesized relationships on the correlations between the SCIROCCO tool and the DMIC Quickscan were met, possibly due to the modest sample size or the partly different focus of both tools. Further studies should therefore be conducted in larger samples of individuals involved in integrated care to confirm the validity and assess the reliability of this instrument.

3.5. Test-retest assessment of the SCIROCCO tool (in progress)

This section outlines the approach for the assessment of the test-retest reliability of the SCIROCCO tool. Test-retest reliability is assessed by applying the (same version of) SCIROCCO tool at baseline and one follow-up measurement. It refers to ‘the degree to which the measurement is free from measurement error’ [83]. The study is ongoing. The methods describing the approach for the test-retest assessment of the SCIROCCO tool were developed in July 2017. However, after discussing the approach with the Consortium partners, it was decided to postpone the assessment to a later stage in the project, when a more definitive version of the Tool was made available. The third version of the SCIROCCO tool was available last April 2018, and the collection of measurements for the test-retest study started in June 2018.

3.6. Methods

Test-retest reliability of the Tool is assessed by administering the online SCIROCCO tool to a group of local stakeholders at baseline (T1). After six to eight weeks have passed since conducting the first measurements, the tool is re-administered to the same group (T2). To be able to assess the test-retest reliability of SCIROCCO tool, a minimum of 50 measurements is targeted. Local stakeholders are invited via three streams to fill in the SCIROCCO tool for the purpose of the test-retest assessment. First, the partners in the SCIROCCO consortium are asked to identify professionals (in other regions) in their country which are involved in the development or implementation of integrated care. They invited these stakeholders by email. Secondly, participants are recruited from EU regions which are involved in the B3 Action Group on Integrated Care. Furthermore, WP3 invited stakeholder from a convenience sample.

All stakeholders received a general invitation by e-mail (which was based on the invitation for the self-assessment process of the SCIROCCO project) including information about the purpose and procedure of the study. The invitation included an attached paper providing an overview of the Maturity Model and a web-link to illustrative videos and demos on how to use the online version of the tool. The subjects were recruited according to the following criteria: individuals from several EU regions were invited to use the third version of the tool to assess the maturity in adoption of integrated care of their region. Eligibility criteria were: individuals involved in the design and deployment of integrated care from several European regions; from several disciplines (i.e., decision-makers, healthcare professionals, IT specialists, regulators, payers, users groups, innovation agencies), from different sectors (e.g., health care, social care, housing and voluntary sector) and different positions in an healthcare organisation (i.e., senior level, front-line, back-office).

WP3 collaborated with WP5, which is responsible for the administration of the data collected by the Tool, to keep track of the stakeholders who filled in the third version of the SCIROCCO tool. WP3 re-invited all the stakeholders, who performed a valid first assessment, after 6-8 weeks. These stakeholders received the second invitation email including information about the purpose and procedure of the study. Furthermore, the stakeholders were informed that participation in the study is voluntary and that they are free to withdraw from the study at any time without justification or prejudice and that confidentiality of data will be guaranteed. On completion of T2, stakeholders were asked two questions including whether completing the test at T1 had changed the way they work, and whether there were any other changes in their work that might have affected the way they had filled in the tool a second time. These questions were asked as these aspects may affect the stakeholders’ responses to the filling in of the SCIROCCO tool.

3.7. Data analysis

When an adequate number of measurements is collected for the test-retest study, quantitative data analysis will be performed to assess the test-retest reliability of the SCIROCCO tool. Calculations will be performed using SPSS software, version 22.0. The measurements will be collected using an online database which is accessible by one of the partners in the SCIROCCO consortium (WP5). Members of WP3 will receive a file with the anonymised data to perform the analysis. After performing a baseline and follow-up measurement using the definite SCIROCCO tool, a reliability coefficient is calculated to determine the relationship between the two scores obtained. In the optimal situation, the same results are obtained from both the two tests (coefficient=1.0). For each item of the MM, test-retest reliability will be analysed using intra-class correlation coefficient (ICC) (with a two-way random model intraclass correlation coefficient (ICC2,1)). An intraclass correlation of 0.80 will be used for items that are expected to remain stable.

3.8. Status of the study

A total of 44 local stakeholders filled in the SCIROCCO tool for the purpose of the test-retest assessment. After 6-8 weeks, all the stakeholders were invited to fill in the Tool for the second time. The update on the numbers of stakeholders provided by the administrator of the dataset last November, the 5th 2018, was a total number of two valid second measurements. After this update, stakeholders were sent reminders asking them to perform the second assessment. In a recent update, received on the 28th of November, a total of three valid second measurements were collected. This means that we did not succeed to collect an adequate number of measurements to continue with the data analysis. However, although the dataset is not appropriate to use for a test-retest assessment, the collected measurements can be used to perform a confirmatory factor analysis. WP3 will discuss with the SCIROCCO project coordinator what will be the next feasible step to undertake.

4. Assessment of implementation fidelity of SCIROCCO's step-based strategy

4.1. Introduction

In order to gain valuable insights into potential problems in progress and into relevant success factors for integrated care interventions, the SCIROCCO project was designed to explore how the available knowledge and experiences on integrated care models can be shared to enable “easier and faster” adaptation and implementation in other settings. SCIROCCO aims to facilitate the implementation of GPs at local, regional or country level by recognising the maturity requirements of GPs and health and care systems in order to achieve scaling-up and knowledge transfer amongst European Member States. SCIROCCO implemented a step-based strategy to provide an understanding of the context and environment (i.e. the regional delivery system and political and organisational environment) of integrated care interventions. In this strategy, five participating regions assessed their maturity for integrated care of their health care system context and of a GP in their system. This assessment identified specific areas of strengths and weaknesses of the regions or the GP. In the next step, SCIROCCO used these results to match regions that have complementary strengths and weaknesses to organise twinning and coaching activities to facilitate regional progress in integrated care.

The SCIROCCO step-based strategy consists of multiple components which are implemented in different settings. A variety of factors can influence the fidelity to the implementation of a strategy, such as the context in which an intervention is implemented [84] and the complexity of the intervention [85]. The local contexts of the different regions within SCIROCCO might lead to necessary adaptations to the strategy. It is therefore important to obtain an understanding of the way in which the strategy was implemented across settings. Assessment of the fidelity of the SCIROCCO strategy provides insight in the (adapted) elements of implementation of the strategy, by documenting and reporting the implementation of the strategy [86]. As unknown factors may have influenced the outcomes of SCIROCCO, a profound understanding of how the implementation of the strategy functions within the five different contexts is important to know which component(s) of the strategy influenced the implementation outcome(s). Furthermore, insight in the workable elements/contextual conditions of the SCIROCCO strategy provides information/lessons for people who are interested in SCIROCCO's step-based approach and future use of tool/processes. In our recently published study protocol, the approach we used for the assessment of implementation fidelity, based on the work of Carroll et al., and Hasson, is described [1]. The objective of the study was to provide information on the extent to which the envisaged activities within the SCIROCCO project have been implemented in line with expectations and if, how, and how far relevant initiatives have been developed between 2016 and 2018. This information aims to support the evolvement of accurate conclusions about the implementation of the strategy.

4.2. Methods

SCIROCCO strategy and tool

The SCIROCCO step-based strategy is shortly described in the following steps: in step 1, five participating European regions assessed their maturity in the provision of integrated care of one GP and their health system context, by using the new SCIROCCO tool. The SCIROCCO tool is available in the form of an online self-assessment tool and the details of the SCIROCCO tool are also described in the study protocol. The

outcomes of the assessments were presented as a ‘radar diagram,’ which shows areas of strengths and weakness in each dimension of the tool. In step 2, SCIROCCO facilitated the comparison of the radar diagrams and regions with complementary strengths and weaknesses were matched. In the last step, SCIROCCO explored how matching the complementary strengths and weaknesses of regions can potentially deliver two benefits: a strong basis for successful twinning and coaching that facilitates shared learning and a practical support for the scaling-up of GPs in integrated care.

Procedure

The extended conceptual framework for implementation fidelity, developed by Hasson et al.[87] and based on the work of Carroll et al., [88] was used for evaluating implementation fidelity of SCIROCCO’s step-based approach and is presented in Figure 3. The measurement of implementation fidelity is a measurement of adherence, with its subcategories content, frequency, duration and coverage (dose) [88]. To systematically evaluate the implementation fidelity of the SCIROCCO project, a stepwise approach was used. To operationalise implementation fidelity, we first identified the “main” programme components of the SCIROCCO project, Figure 3. In the second step, we formulated research questions for each subcategory of adherence based on the framework for fidelity, as well as for the two moderating factors “availability of facilitation strategies” and “participant responsiveness”[87]. A Table was developed where each element of the implementation fidelity is presented in the first column, followed by the programme component of the SCIROCCO project, research questions, start of the programme component, measurement method for the programme component and planning of data collection. A short version of the Table is presented in Table 14.

Figure 3: Assessment of fidelity and moderating factors in the present study in accordance with the modified version (Hasson et al) of the Conceptual Framework for Implementation Fidelity (Carroll et al)

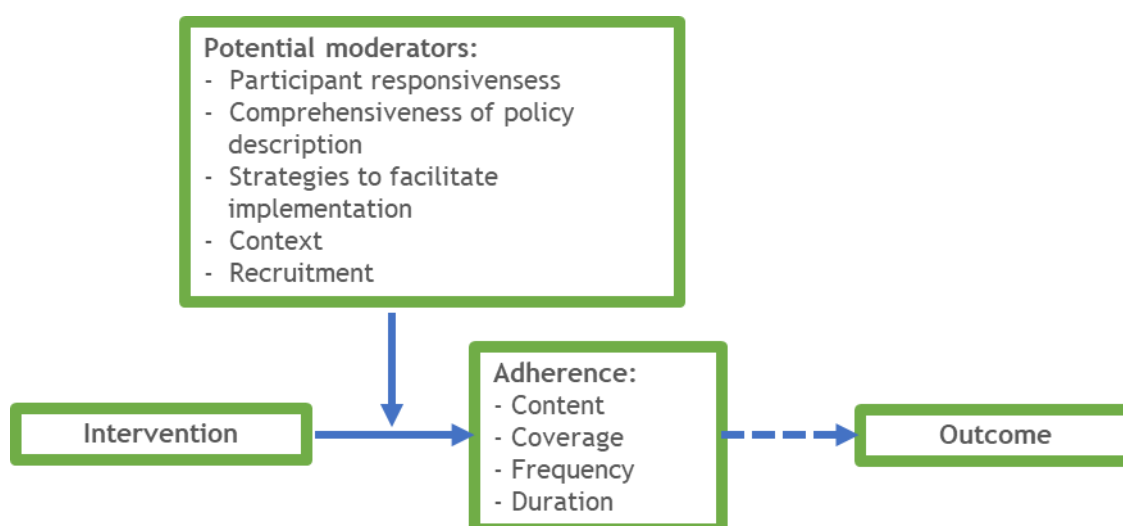


Figure 4: Five main components of the SCIROCCO strategy

Main components of implementation SCIROCCO project				
WP4 Assessment of maturity requirements in selected good practices in the five regions	WP5 Refinement of the MM	WP6 Self-assessment process in the five regions	WP7 Knowledge transfer processes in the five regions	WP8 Capture the lessons learned
Tasks				
T4.1 Viability assessment of GP T4.2 Data collection T4.3 Maturity requirements	T5.1 First refinement of the MM T5.2 Measurement scale T5.3 Self-assessment tool T5.4 Methodology for self-assessment	T6.1 Self-assessment process in five European regions T6.2 Strengths and weaknesses of the European regions in integrated care T6.3 Methodology for twinning and coaching T6.4 Second Refinement of the MM	T7.1 Coaching and twinning T7.2 Action Plans T7.3 Final refinement of the MM	T8.1 Analysis of the experience of knowledge transfer T8.2 Main issues of scaling-up

Table 14: Implementation fidelity components, research questions, data collection procedure / source and planning

Adherence Subcategory	Research question	Data collection procedure/source	Measurement planning
Content	How are the different programme components of SCIROCCO delivered?	<ul style="list-style-type: none"> -Semi-structured interview with project leader(s) of WP 1,4,5,6,7,8 -Semi-structured interview with regional partners of SCIROCCO in the five participating regions -Work documents (i.e. progress reports, interim reports) of WP 1,4,5,6,7,8 -Deliverables of WP 1,4,5,6,7,8 	<ul style="list-style-type: none"> After the respective programme component is finished After the matching of regions, first and last twinning/coaching sessions Alongside SCIROCCO project Alongside SCIROCCO project
Frequency/Duration	Are the programme components of SCIROCCO implemented as often and as long as planned?	<ul style="list-style-type: none"> -Semi-structured interview with project leader(s) of WP 1,4,5,6,7 -Semi-structured interview with regional partners of SCIROCCO in the five participating regions -Work documents (i.e. progress reports, interim reports) of WP 1,4,5,6,7 and regional partners -Deliverables of WP 1,4,5,6,7 	<ul style="list-style-type: none"> After the respective programme component is finished After the matching of regions, first and last twinning/coaching sessions Alongside SCIROCCO project Alongside programme

Adherence Subcategory	Research question	Data collection procedure/source	Measurement planning
Coverage (Reach)	What proportion of target group participated in the different activities of the SCIROCCO programme?	-Work documents of WP 4,6,7 -Deliverables of WP 4,6,7	Alongside programme Alongside programme
Potential moderating factors			
Participant responsiveness	How did the participants get engaged with the SCIROCCO project? How satisfied were the participants with their participation in SCIROCCO? How did the participants perceive the outcomes and relevance of participating in SCIROCCO?	- Semi-structured interview leaders op WP 1,4,5,6,7 -Semi-structured interview with SCIROCCO partners in the participating regions -Semi-structured interviews with local stakeholders of the five participating regions -Work documents of WP 1,4,5,6,7 and regional partners -Deliverables of WP 1,4,5,6,7 -Short survey with the local stakeholders of the five regions on experience in the self-assessment process in their region -Short survey with the local stakeholders of the five regions on experience in the twinning and coaching activities in their region	After the respective programme component was finished After the matching of regions, first and last twinning/coaching sessions After the last twinning/coaching sessions Alongside SCIROCCO programme Alongside SCIROCCO programme After the self-assessment process in the regions After the first twinning/coaching sessions

Adherence Subcategory	Research question	Data collection procedure/source	Measurement planning
Participant recruitment	<p>What recruitment procedures were used to attract regions to the SCIROCCO project?</p> <p>What constituted barriers to maintaining involvement of regions?</p>	<p>- Semi-structured interview leader of WP 1,4,5,6,7</p> <p>- Semi-structured interview with SCIROCCO partners 1-5</p> <p>-Semi-structured interviews with local stakeholders of the five participating regions</p> <p>-Work documents of WP 1,4,5,6,7 and regional partners</p> <p>-Deliverables of WP 1,4,5,6,7</p>	<p>After the respective programme component was finished</p> <p>After the matching of regions, first and last twinning/coaching sessions</p> <p>After the last twinning/coaching sessions</p> <p>Alongside SCIROCCO programme</p> <p>Alongside SCIROCCO programme</p>
Strategies to facilitate implementation	<p>What strategies were used to support implementation of the SCIROCCO project? How were these strategies perceived by SCIROCCO partners and local stakeholders involved in the project?</p>	<p>-Semi-structured interview with project leader(s) of WP 1,4,5,6,7,8</p> <p>-Semi-structured interview with regional partners of SCIROCCO in the five participating regions</p> <p>-Semi-structured interviews with local stakeholders of the five participating regions</p> <p>-Work documents (i.e. progress reports, interim reports) of WP 1,4,5,6,7,8</p> <p>-Deliverables of WP 1,4,5,6,7,8</p>	<p>After the respective programme component was finished</p> <p>After the matching of regions, first and last twinning/coaching sessions</p> <p>After the last twinning/coaching sessions</p> <p>Alongside SCIROCCO project</p> <p>Alongside SCIROCCO project</p>

Adherence Subcategory	Research question	Data collection procedure/source	Measurement planning
Context	What factors at political, economic, organizational and work group level affected the implementation of the SCIROCCO project?	<ul style="list-style-type: none"> -Semi-structured interview with project leader(s) of WP 1,4,5,6,7,8 -Semi-structured interview with regional partners of SCIROCCO in the five participating regions -Semi-structured interviews with local stakeholders of the five participating regions -Work documents (i.e. progress reports, interim reports) of WP 1,4,5,6,7,8 -Deliverables of WP 1,4,5,6,7,8 	<ul style="list-style-type: none"> After the respective programme component was finished After the matching of the regions, first and last twinning/ coaching sessions After the last twinning/coaching sessions Alongside SCIROCCO project

Data collection

Qualitative data, including semi-structured interviews and working documents (interim report, final report, project deliverables and e-mails), were the main data source to explore adherence and possible factors that moderate adherence to the implementation of three SCIROCCO components (WP4, 6 and 7) (Figure 4). The following topics were extracted from the data: content (the way in which the work package activities were undertaken, changes in activities), frequency/duration (duration was interpreted by checking the timeline and deadlines of the project components), facilitation strategies (quality and usefulness of the protocol, guidance and collaboration within the project), context (barriers and facilitators in carrying out the activities), participant recruitment procedures, and in addition: points of improvement. Furthermore, extra data was retrieved on the component of WP7 on the following topics from focus groups: participant recruitment procedures, participant responsiveness, and points of improvement. For the components of WP5 and WP8, not all topics were investigated as those components were intertwined with the other components in the project and we were unable to examine some concepts, like the timelines, coverage of participants involved, participant recruitment and responsiveness for the two components as they were not clearly specified in the documents. The following topics content, facilitation strategies, context and points of improvement were extracted for the two components (WP5 and WP8) and were retrieved semi-structured interviews and working documents. As there was no benchmarking available, we did not assess the quality of delivery and comprehensiveness of policy. The semi-structured interviews were conducted over Skype with members of the SCIROCCO project responsible for delivering the tasks described in the different work packages (WPs) (n=12). The interviews were held by the researchers of the evaluation work package within the project, lasted about 60 minutes each, further details of the interviews are presented in Table 15.

Table 15: Details of the interviews

Participants	Main topic discussed	Time of interview
WP 1 (2 members)	Views and experiences in undertaking the work regarding the coordination of the project.	August 2018
WP 4 (3 members)	Views and experiences in undertaking the work regarding identification of maturity requirements of selected local integrated care interventions (GPs) which have the potential for scaling-up	First interview in June 2017. Second interview on revised methodology September 2018 (duration ± 30 min).
WP 5 (2 members)	Views and experiences in undertaking the work on the refinement of MM	August 2018
WP 6 (2 members)	Views and experiences in undertaking the work regarding the self-assessment process of SCIROCCO regions	July 2018
WP 7 (2 members)	Views and experiences in undertaking the work regarding coaching and twinning of regions	July 2018
WP 8 (1)	Views and experiences in undertaking the	July 2018

member, and 1 member provided feedback to the summary of interview)	work regarding the collection lessons learned on the process of scaling-up	
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Table 16: Characteristics of the focus groups

Location of focus group	Subject of focus group	Participants	Number of participants
Puglia	Experience study visit Puglia on GP in integrated care	Experts from Puglia (3), Olomouc (5) and Scotland (6)	14
Basque Country	Experience study visit Basque country on GP in integrated care	Experts from the Basque country (3) and Norrbotten (3)	6
Scotland	Experience study visit Scotland on dimension of the SCIROCCO tool	Experts from Scotland (3) and Norrbotten (5)	8
Norrbotten	Experience study visit Norrbotten on dimension of SCIROCCO tool	Experts from Norrbotten (4) and Olomouc (4)	8
Scotland	Experience study visit on GP in Scotland	Experts from Scotland (3), Puglia (4) and Basque country (6)	13
Together			49

In the original plan as described in the study protocol, the objective was to collect information on concepts of implementation fidelity of the regional partners of SCIROCCO after the matching of regions and the first and last twinning and coaching sessions. During implementation of the project, the partners in the SCIROCCO regions were occupied undertaking the activities of the project, to make sure the partners were not overloaded, it was decided to only collect their experiences after the twinning and coaching sessions. Five focus groups were organised after each of the five twinning and coaching study visits and included the SCIROCCO partners in the five regions and the external members who participated in the study visits (referred to as 'local stakeholders').

The focus groups were held in collaboration with another work package within SCIROCCO (WP8) and lasted approximately an hour. In Table 17 an overview of the characteristics of each focus groups are provided. The same participants were sometimes included in two focus groups, because they participated in two study visits, meaning the topic of the focus group was different. The interviews and focus groups were, after obtaining signed consent, audiotaped and transcribed.

Table 17: Characteristics of participants who completed the survey (n=40)

Overall	(n) of participants	
Original region of participants	Region 1 = 8 Region 2 = 9 Region 3 = 10 Region 4 = 6 Region 5 = 7	
Transferring regions	10	
Adopting regions	30	
Per study visit:		
Puglia (GP in telehome-monitoring) (n=12)	Transferring region Puglia= 2	Adopting regions: Olomouc =5 and Scotland=5
Scotland (dimension innovation management) (n=6)	Transferring region Scotland=2	Adopting region Norrbotten=4
Basque country (GP in advanced care planning) (n=6)	Transferring region Basque country=3	Adopting region Norrbotten=3
Scotland (GP in the voluntary sector) (n=9)	Transferring region Scotland=0	Adopting region Puglia=4 and Basque Country=5
Norrbotten (dimension eHealth) (n=7)	Transferring region Norrbotten=3	Adopting region Olomouc =4

After the study visits were conducted, a survey was distributed among the participants. The original plan was to distribute a short survey among the local stakeholders of the five regions after the self-assessment process of their regions and twinning and coaching sessions. During the implementation it became clear that this was too much to demand from the local stakeholders. Only one short survey was distributed after the twinning and coaching sessions, to collect information on participants responsiveness (expectations, satisfaction, clarity and usefulness of results of study visit) and any other comments. The characteristics of the participants who completed the survey are shown in Table 18. Some stakeholders participated in two study visits and completed the survey for both visits. In addition, to collect details on the content of the organised study visits, the programs of the study visits were examined.

Table 18: Characteristics of participants who completed the survey (n=40)

Overall	(n) of participants	
Region of origin participants	Region 1 = 8 Region 2 = 9 Region 3 = 10 Region 4 = 6 Region 5 = 7	
Transferring regions	10	
Adopting regions	30	
Per study visit:		
Puglia (good practice in telehomemonitoring) (n=12)	Transferring region Puglia= 2	Adopting regions: Olomouc =5 and Scotland=5
Scotland (dimension innovation management) (n=6)	Transferring region Scotland=2	Adopting region Norrbotten=4
Basque country (good practice advance care planning) (n=6)	Transferring region Basque country=3	Adopting region Norrbotten=3
Scotland (good practice voluntary sector) (n=9)	Transferring region Scotland=0	Adopting region Puglia=4 and Basque Country=5
Norrbotten (dimension eHealth) (n=7)	Transferring region Norrbotten=3	Adopting region Olomouc =4

Data analysis

The interviews focus groups and document data collected were analysed using content analysis. A coding scheme, including the implementation fidelity concepts and each intervention component was used during the coding process. The scheme was tested independently by two researchers prior to undertaking the coding process. The analysis of the transcripts and documents was conducted in NVivo 12. The first coder (the corresponding author) coded all transcripts using the coding scheme and the second coder (the last author) operated as a control and coded a random selection of 10% of the transcripts and 10% of the collected documents. The results from this coding process was discussed among the researchers and any disagreement was resolved until consensus was reached. The surveys collected after the twinning and coaching study visits were analysed using both descriptive methods in SPSS v. 25.

4.3. Results implementation fidelity assessment

Content

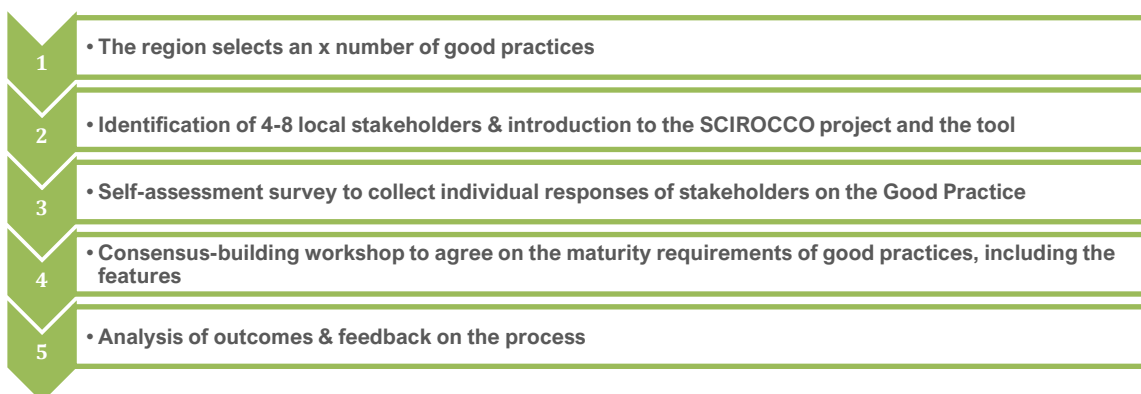
All the programme components of SCIROCCO (WP4 Maturity requirements in selected GPs, WP5 Refinement of the MM, WP6 Self-assessment, WP7 Knowledge transfer, WP8

Lessons learned) were implemented with acceptable fidelity in line with what was stated in the Grant Agreement. More details on the content of the components which were executed by the responsible work packages (WPs) are described below.

WP4

The four activities of WP4 as described in the Grant Agreement regarding the definition of the selection criteria for the GPs, viability assessment of GPs, selection and data collection for GPs in each region, viability assessment for scaling-up and prioritisation of the GPs, assessing the maturity requirements of the prioritised GPs were performed within the project. The WP leaders indicated that the precise content of the tasks of WP4 were further specified and were open to discuss and agree on with the consortium partners during the implementation of the project. One activity, the maturity requirement assessment of the selected GPs in the regions, was performed twice. This was due to observed heterogeneous outcomes across the five SCIROCCO regions as a result of implementing the first methodology (and requested by CHAFAE). The main differences between the first and second methodology is the number of assessors and focus of the assessment. In the first assessment, the focus was on the maturity of the context wherein the Good Practice was developed and was performed by a single representative of the GP. In the second methodology, a group of experts assessed the GP with the focus on the maturity needed to implement the GP in different health and social care settings. All GPs were re-assessed using the revised methodology in the period February 2018-October 2018. In Figure 5, the process of the revised methodology is presented.

Figure 5: revised methodology on the maturity assessment of GPs



WP5

The activities of WP5 including the refinement rounds of the B3-MM, the development of an objective measurement scale, development of an online version of MM, and the development of a methodology for the self-assessment process were implemented with flexibility as was anticipated. Since the lead partner of this WP was also the lead partner of the task concerned with the three refinement rounds of the tool (which were presented under other WPs), details on the content of the implementation of several refinement rounds of the tool are described below under this WP. The WP leaders indicated that the methodology used to undertake the several refinements of MM, was planned agile and consisted of a mixture between value-sensitive design and

user-centred design. The users of the tool were involved throughout all iterative phases of the tool in the form of feedback questionnaires or direct interviews which resulted in refinement and improvements of the tool and informed the technical development of the tool. The design options were regularly presented and consulted with the consortium partners to inform improvements of the tool. In total, one more refinement of the tool was executed than was anticipated. A total of four refinements of the tool were implemented in the project:

1st refinement after the Delphi study

2nd refinement after the testing of the Tool for the purpose of WP4

3rd refinement after the testing of the Tool for the purpose of WP6

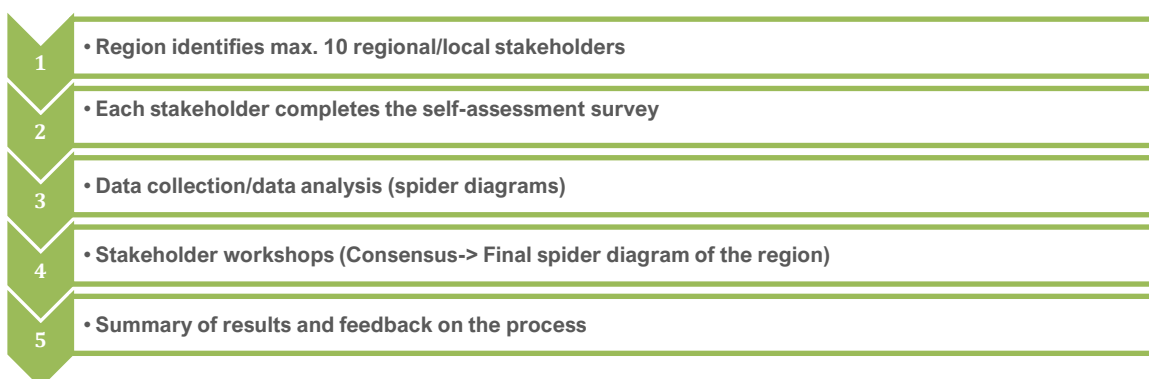
4th final refinement after the testing of the Tool for the purpose of WP7

The first version provided the basis for the first prototype of SCIROCCO online self-assessment tool, which became accessible from December 2016. Three sets of methodologies and accompanied guides were designed for the use of the online SCIROCCO tool: to assess maturity requirements of good practices; to assess the maturity of health and social care systems; to facilitate the twinning and coaching processes. In addition, several illustrative videos, educational and training documents were developed to support the use of the SCIROCCO tool in the online self-assessment. Another unanticipated activity within the WP was the translation of the tool in three languages (Czech, Italian and Spanish), which was performed to facilitate access of stakeholders to the tool.

WP6

The tasks of WP6 regarding the self-assessment process in the five European regions and analysis of strengths and weaknesses of those European regions in integrated care as described in the Grant Agreement, were according to the WP leaders performed in a homogeneous and standardised way. The methodology for the self-assessment process was developed in collaboration with WP5, WP8 and with the support of the local project team of WP6 and the project coordination in WP1 and WP5. WP6 tested the methodology for the self-assessment in their own region before the other four regions executed the self-assessment process in their regions. The developed methodology is shown in Figure 6. The use of the methodology ensured the consistency of the assessment process, however some local adaptations were required due to linguistic and cultural differences of engaging local stakeholders in the different regions (more details are provided in the participants recruitment section). In the last step, the analysis of the outcomes (gap analysis) of the self-assessment process was conducted to identify the strengths and weaknesses of a particular region in integrated care. The outcomes of this self-assessment process informed the following twinning and coaching activities with an objective to address a particular gap or need. The last task, development of the methodology for twinning and coaching, was undertaken by WP7.

Figure 6: Developed methodology on the maturity assessment of health care systems



WP7

The tasks of WP7 regarding the twinning and coaching activities and the development of Action plan in each of the five European regions were executed within the project. The methodology for the twinning and coaching processes was developed together with WP5 and the planning of the processes was supported by WP1. The twinning and coaching activity was informed either by the maturity of particular healthcare system or maturity requirements of selected good practices. This was facilitated by SCIROCCO online self-assessment tool and commonly agreed developed twinning and coaching methodology. The methodology designed to conduct twinning and coaching activities consists of three key phases:

Phase 1: Planning for the twinning and coaching

Phase 2: Knowledge transfer activities

Phase 3: Capturing the outcomes of twinning and coaching

In Figure 7, an overview of the process of the developed knowledge transfer activity is provided. Again, the use of the methodology ensured the consistency of the knowledge transfer process though some local adaptations were required. The scope of the twinning and coaching process was defined by each individual region reflecting the local need and strategic priorities for integrated care. This has also informed the structure and the size of twinning and coaching teams locally. The outline of the programme for the study visits varied depending on the topic of the study visit and the need of the adopting regions. The general outline of the programme included presentations of the transferring and/or adopting regions, live demonstrations/site visit of the GP (if relevant) and a facilitated discussion on the maturity requirements using the SCIROCCO tool (more details are provided under the frequency and participants recruitment section). With regard to the last task, developing the Action plans, all five regions participated as receiving regions and wrote an Action plan reflecting the outcomes of the twinning and coaching activities. The developed methodology to capture the learning from the knowledge transfer activities was as follows: the receiving regions were asked to organise a local meeting in their region reflect on the outcomes of knowledge transfer activities and agree on the local priority actions for the transferability of learning. Where after, the Action plans were co-designed by transferring and receiving regions. Once completed, the Action plans were uploaded in the online SCIROCCO tool and shared with all relevant stakeholders. In the last step, the intention was to promote the outcomes of the knowledge transfer activities locally and across the regions (disseminate the learning from the knowledge transfer activities).

Figure 7: Twinning and coaching process

1. Contact the region(s)/organisation(s) or the owner of the GP of interest
2. Identify local experts to be involved in the knowledge transfer process
3. Organise introductory webinar(s) for the transferring and adopting regions, and exchange available resources to initiate the coaching.
4. Organise a study visit to the transferring region. The study visit should include a maximum of five experts from the adopting region. The duration of the visit can be up to two days.
5. Capture the experience of the regions in the twinning & coaching process

WP8

A general description of the tasks for WP8 was written in the Grant Agreement. The two tasks included in this study are the analysis of the experience of knowledge transfer and identification of in main issues of scaling-up. When the project started, a preliminary working protocol was designed by the WP leaders, which was shared with the other partners and open to discuss. After consultation with the consortium, it was agreed to undertake focus groups to capture the experiences in the regions. The first focus group was tested with stakeholders from regions who had previous experiences with the MM and were asked questions about the tool. When the project moved forward it was decided to also conduct five focus groups at the end of each study visit to capture the experiences of the stakeholders on the twinning and coaching processes. These were facilitated in collaboration with WP3. The objective of the focus groups was to capture the experience of stakeholders in using the tool and to learn about the further improvement and enhancement of the tool. An activity which was performed in addition to the original plan was the collection of the experiences of the stakeholders after the GP assessments. The result of the WP was a White Paper which presented the lessons learned and policy recommendations on how to address the issues of scaling-up, using the experience of five European regions with the SCIROCCO tool knowledge-sharing.

4.4. Frequency/duration

In Table 19, a general overview is provided on the frequency of the three SCIROCCO programme components, to see whether the different components were implemented as often as planned by presenting the target number as described in the Grant Agreement for the different activities and the numbers which were delivered. The overall target number of activities was fully executed, sometimes even exceeded the target. When looking into the developed methodology on the maturity assessment of GPs, all the five regions followed the steps of the process in the first assessment. In the second assessment, almost all the regions followed the steps of the developed process, but one deviation was observed during the second GP assessment of one GP in Scotland. This GP was embedded as part of the routine practice at national level with the aim to increase the capacity of third sector to provide the statutory integrated care services. As such, it was not possible to conduct a second assessment on the GP

itself, and was not included for the purpose of the WP4 analysis. Another deviation was found with regard to WP7, where one twinning and one coaching activity per region was envisaged. During implementation, one region did not play the role of coaching region due to low maturity scoring across all SCIROCCO dimensions. Furthermore, two regions participated twice as receiving region and one region as transferring region. The developed methodology was implemented with flexibility. This resulted in a variation in the implementation of the steps between the different regions. The scope of the twinning and coaching process varied per activity, as it was defined by each individual region reflecting the local need and strategic priorities for integrated care. In addition, prior to the study visit, the plan was to organise introductory webinar(s) between the transferring and adopting regions. The implementation of prior contact between regions varied (sometimes only emails were exchanged, or online meetings or webinars were organised). Furthermore, during the several study visits, the tool was applied in different ways to be able to test the process and the tool was not explicitly used in one study visit because of time constraints.

Table 19: Frequency of SCIROCCO's activities

	Activities		Target	Delivered	Region 1 (B)	Region 2 (O)	Region 3 (N)	Region 4 (P)	Region 5 (S)
WP4	Interventions (good practices) with viability assessment done in the five regions and meet the criteria of the viability assessment.		30	32	7	4	6	8	7
	Good practices selected and assessed for maturity assessment	Assessed with first designed methodology	13	15	3	3	3	3	3
		Assessed with revised methodology	13	14	3	3	3	3	2
	Workshops conducted				3	3	3	3	2
	Consensus diagrams and analysis of the outcomes	Assessed with revised methodology			3	3	3	3	2
WP6	Regions performed self-assessment (individual assessment and workshop)		5	5 (100%)	1	1	1	1	1
	Completed and documented assessments		5	5 (100%)	1	1	1	1	1
WP7	Performed role as		≥5	5	1	0	1	1	2

	transferring/ coaching region in twinning and coaching activity								
	Duration of study visit				1,5 day	0	1,5 day	1,5 day	One 1,5 day and one 1 day
	Performed the role as adopting region		≥5	7	1	2	2	1	1
	Transfer/scaling-up documented/ Agreed Action plans to transfer and/or scale-up interventions		≥5	7	1	2	2	1	1

Another concept we looked at was whether the different programme components were implemented in all five regions according to the planned time schedule of the project. An overview of the planned timeline and the executed timeline is provided in Appendix F. During the execution of the project, adjustments were made in the timeline and planned deadlines of the activities by all the work packages in the SCIROCCO project. Since SCIROCCO used a step-based approach, a 3-month delay in activities of, for example, WP3 caused delays in activities of the subsequent WPs. The reasons for the delays within the project were mentioned in the flexible/open approach for developing the methodologies of the different project components during the implementation of the project because of in-depth discussions among the consortium partners or the representatives of regions it sometimes took more time than anticipated. Furthermore, organising the local-self-assessment for WP6 took longer than expected. During the implementation it became clear that the local stakeholders needed much more support from the local project coordinators in order to participate in this exercise. As a result, the set of educational and training documents were prepared as well as illustrative videos on how to use SCIROCCO Maturity Model in the self-assessment process. It was also agreed to translate the Tool in three additional languages (Czech, Italian and Spanish). This caused delays in organising the local self-assessment processes. The outcomes of the self-assessment process were then analysed in a later stage. The planning of the tasks of WP7 was depended on the outcomes of WP4 and WP6. Due to the delays caused by the re-assessment of the maturity requirements of 15 Good Practices (WP4) and the delays in WP6, the twinning and coaching processes were organised with a delay of 6 months. These delays were mitigated though by parallel development of SCIROCCO methodology for twinning and coaching which allowed immediate start with the testing of methodology and its implications for the refinement and development of SCIROCCO tool.

4.5. Coverage

The coverage of the local stakeholders participating in the three main components of the implemented strategy are shown in Table 20. Since the methodology of the different activities was designed during implementation the target number for the local stakeholders to participate the different activities per region was not defined in the project plan but were indicated during implementation. These target numbers for the different activities are also presented in Table 20. The number of stakeholders involved in the first good practice assessment of WP4 was 1 per good practice assessment, and each region assessed 3 GPs. For the revised methodology, the number of stakeholders involved in the individual assessment and workshop varied per region, not all were able to recruit a minimum of 4 participants in their region. With regard to WP6 and 7, the scope of activities was defined by each individual region reflecting the structure of their healthcare systems and the concept of integrated care. This influenced the structure and the size of the teams locally, which resulted in a variation in the number of participants per region.

Table 20: Coverage of key interventions

	Activities		Region 1 (Basque Country)	Region 2 (Olomouc)	Region 3 (Norrbotten)	Region 4 (Puglia)	Region 5 (Scotland)	Total
WP4	Number of participants assessed the maturity of the context where the Good Practices was developed (first methodology)		3x1	3x1	3x1	3x1	3x1	15
	Number of individual questionnaires collected per GP (4-8 experts maximum) (second methodology)		1x4 1x4 1x4	1x2 1x3 1x3	1x5 1x4 1x4	1x5 1x5 1x6	1x3 1x4	56
	Number of participants in face-to-face workshop per GP (second methodology)		1x4 1x4 1x4	1x2 1x3 1x3	1x5 1x4 1x4	1x5 1x5 1x6	1x3 1x4	56
WP6	Number of stakeholders invited to fill in the questionnaire of the SCIROCCO tool (target max. 10 local stakeholders per region)		10	>20	9	11	12	
	Number of individual questionnaires completed		10	5	7	11	9	42
	Number of participants in face-to-face workshop		9	5	7	11	5	37
WP7			Study visit Basque Country	Study visit Norrbotten	Study visit Puglia (good)	Study visit	Study visit Scotland	

	Activities		Region 1 (Basque Country)	Region 2 (Olomouc)	Region 3 (Norrbotten)	Region 4 (Puglia)	Region 5 (Scotland)	Total
			(good practice)	(dimension)	practice)	Scotland (good practice)	(dimension)	
	Number of actively involved participants in the study visit (transferring and receiving region)		15	19	22	14	15	
	Number of actively involved participants from the adopting region in the study visit (max. 5 per region)		5 (one left early)	4	5 (Olomouc) 6 (Scotland)	6 (Basque country) 4 (Puglia)	4	

4.6. Potential moderating factors

Participant recruitment

Recruitment for good practice assessment

The WP leaders of WP4 provided instructions to the regional SCIROCCO partners for the selection of GPs and procedure of the first developed methodology for GP assessment. In each of the five SCIROCCO regions, the local SCIROCCO partners (in contact with the local practice leaders) selected the good practices the predefined criteria. The selected practice leaders were sent a link to a survey in SurveyMonkey to fill in the data on the transferability of their practice. Some of the regional SCIROCCO partners themselves were affiliated with a selected GP and performed the assessment. After all the data was collected, a self-assessment scoring approach was adopted and the GP leaders, supported by the wider team, were asked to assess their good practice interventions along the six-criterion viability assessment framework. This resulted in 15 prioritised GPs in five SCIROCCO regions which then were assessed by the GP leaders using the MM on the maturity requirements for their adoption and replication in Europe. The GP leaders received the link to an online tutorial on how to use the Model to perform the assessment of their respective GP. A spider diagram was developed for each of the GP illustrating the outcomes of the self-assessment process.

In the second assessment using the revised methodology, the assessment process was changed, and the assessment was performed by a multi-disciplinary team rather than a single key informant. The team consisted of stakeholders with different profiles, backgrounds and experiences. In general, the local stakeholders received an invitation and briefing about the assessment process and were invited to use the online version of the SCIROCCO tool to conduct their individual assessments. All stakeholders received the details on the objective, process and expected outcomes of the assessment by the local project partners. All the individual assessments as well as consensus-building workshops were held in local languages except for one region which was also held in English. The recruitment procedure of stakeholders varied per region.

In the first region, local stakeholders were identified with the support of an organisation in charge of the public healthcare system. The experts were invited to a meeting to explain the project and the assessment process, where after they were invited to perform the individual assessment, all identified stakeholders participated in the GP assessment activities.

In the second region, the local SCIROCCO partners invited stakeholders including those directly involved in the operation of the practice, however, only a small number participated in all three assessments. The other participants were interested in the task but could not participate in the assessment for various reasons. The same local stakeholders participated in two of the three GP assessments.

In the third region, local stakeholders were identified with the support of the local steering group and the local project managers. This region had set-up a local steering group, which appointed people to be part of a local project team, including people with different roles and responsibilities to have a multi-disciplinary team. This local working group worked on the activities of the SCIROCCO project and from this group

some stakeholders were also recruited to participate as the stakeholder team throughout the project. For some of the activities the regional SCIROCCO partner also asked other experts outside of the local stakeholder group. All the selected local stakeholders, including the SCIROCCO project partners in that region participated in all the three GP assessments.

In region four, the regional SCIROCCO partners invited local stakeholders which were all involved in the different phases of the selected three GPs.

In the last region, the local stakeholders of one GP were identified during a meeting about the GP by the regional project partners. Four of the identified stakeholders were invited to participate in the assessment process based on their knowledge and experience of implementing this GP, both from the policy and practice's perspectives. Unfortunately, one stakeholder could not participate in the assessment process due to other commitments. For the other GP, the regional SCIROCCO project partners identified stakeholders which were invited to participate in the assessment process and all participated.

Recruitment for self-assessment of health care systems

WP6 discussed with and showed the local SCIROCCO project partners how to perform the self-assessment process, and provided written guidelines, on how to perform the process. The local experts in the five regions were actively recruited by the regional SCIROCCO partners to participate in the self-assessment activities. The stakeholders were selected according to pre-defined criteria by SCIROCCO project and a range of supportive documents were provided by the project about SCIROCCO's objectives and methodology for the self-assessment. Although local SCIROCCO partners within the project recruited the local stakeholders in their own regions, during implementation it became clear that the local stakeholders needed more support to understand how to participate in the SCIROCCO activities. In some regions, more time was needed to communicate the clear added-value and benefits of the assessment process. Some of the documentation prepared for inviting stakeholders in the assessment process required translations and changes in the structure or the content of the invitation letter. Furthermore, the regional coordinators in the region 1,2 and 4 advised about the need to translate the Tool in order to successfully engage with local stakeholders. The engagement in the regions varied in using different communication channels and also the length of the process to engage experts. In addition, it was also a challenge to organise the local stakeholders' diaries for participation in the consensus workshops. The slightly different implemented procedures to recruit the local stakeholders in the self-assessment process of five regions is described below.

In region one, local stakeholders were identified and after inviting these local stakeholders to participate in the self-assessment process, an introductory meeting was carried out in the region with the objective to provide the experts with further information.

The recruitment process of region 2 was as follows: local stakeholders known to the organisation of the regional SCIROCCO partner involved in SCIROCCO were addressed to participate. The potential participants received an invitation letter predefined by the project and subsequently they were called by phone. The common invitation letter

was not always well understood due its complexity and the fact integrated care was not a subject on the (political) agenda. A more intensive approach to invitation of stakeholders was necessary, as the response rate to the invitation letter was low. The region adjusted the general project documents, including the invitation letter and supportive documents to tailor it to the understanding of the local stakeholders. Which led to inviting more stakeholders. A total of ten participants used the online tool, but not all of them completed the assessment. Most of the invited stakeholders had difficulties to reserve a time slot for the exercise and some of them expressed that it is hard to fill in the online tool in the view of “integrated care” not being on the urgent agenda in the region.

For region three, the local stakeholders were identified with the support of the local and were invited to conduct the individual self-assessment. The local team of the SCIROCCO partner in region four invitation emails to all identified stakeholders including i.e. an invitation letter in the local language, enclosed the invitation letter in English agreed by the partners in the project. All invited stakeholders completed the questionnaire and they did not require additional information on filling in the questionnaire. In region five, stakeholders were invited to complete the online self-assessment survey and also received information about the objectives of the assessment process and instructions how to use SCIROCCO tool. In addition, a briefing telecom was organised for the invited stakeholders to explain the added value of SCIROCCO tool and how it strategically contributes to the existing tools and approaches in Scotland as assessment is usually perceived as “politically sensitive.” Five local stakeholders who completed the self-assessment survey attended the workshop.

Recruitment for twinning and coaching

The local experts were actively selected and invited by the local SCIROCCO partners in all five regions, to participate as experts for the adopting region in the study visit/twinning and coaching activities. The SCIROCCO project partners in the receiving regions identified invited the stakeholders/experts to participate as receiving regions in the twinning and coaching activities. In general, the stakeholders/experts were selected based on their experiences in the field of the subject of the twinning and coaching activities. A few experts were already involved in previous activities within the SCIROCCO project and the majority were new to the project. The engagement of experts in the regions varied per activity, in terms of use of different communication channels and in length of the process to engage experts. Exact details on how the experts were invited (i.e. by email, phone or else) could not be retrieved from the data.

Participant responsiveness

In the focus groups, which were held after each of the five study visits, the experiences of the stakeholders were collected on participating in the study visit as part of the twinning and coaching process. A survey was also distributed after the visits. The percentage of stakeholder’s responses to the four questions of the survey, are presented in Table 21.

Table 21: 21% of answers from stakeholders to the four questions of the survey

Questions	Answer categories				
	Very unclear	Unclear	Neither clear, nor unclear	Clear	Very clear
Q1. Prior to the study visit, how clear was the information provided on the content and process of the study visit?	5%	0%	5%	55%	35%
	Strongly disagree	Disagree	Undecided	Agree	Strongly agree
Q2. Were you able to ask and discuss everything you wanted during the study visit?	0%	7.5%	10%	35%	47.5%
	Much less than expected	Less than expected	As expected	More than expected	Much more than expected
Q3. How well did the study visit matches your expectations?	0%	10%	22.5%	35%	32.5%
	Not at all influence	Slightly influence	Somewhat influence	Moderately influence	Extremely influence
Q4. To what extent do you think the content discussed during the study visit should influence decisions in your region? (1 answer missing)	0%	7.5%	42.5%	40.5%	7.5%

In 4 out of 5 focus groups, the usefulness of the study visit was explicitly mentioned. The sharing of experiences and collaboration during the study visits were explicitly mentioned in two focus groups *“there is a lot to learn, from the way the regions are dealing with the issues.”* The study visits were considered as an inspiration and regarded as an *“injection of optimism”* to improve elements in their own regions. In particular, the onsite experiences were appreciated. In three focus group, the appreciation for seeing the other practices in their real context was indicated. However, during another study visit a respondent indicated that the visit was a bit less concrete and practical than expected.

The amount of time planned for the study visits was in some cases regarded as sufficient and in other cases a limited amount of time for the study visit was experienced. Some respondents indicated that they did not have enough time to reflect on information which was shared. Another respondent mentioned that prior to the visits, it would be nice to go through the tool and have a meeting or webinar with the transferring regions to have a better understanding of what will be the interest of the visiting regions. When two regions participated as adopting regions in the study visit, a few stakeholders indicated that more time would probably be needed for the study visit. On the site of the study visit organisers (transferring regions) it was indicated in two focus groups that the organisations of the visit might have benefited from more time to prepare, to for example arrange *“even more practical examples”* and to be able to *“to have the perfect team in place.”*

During the study visit the tool was tested in facilitating the discussion between the regions. The use of the tool during the study visit was regarded in four focus groups as a support to facilitate the discussion by providing a structure to the conversation. Not all stakeholders had experience using the SCIROCCO tool. Two respondents explicitly mentioned that they thought the tool was difficult to understand the first time. A difficulty experienced with the tool was mentioned in the language of the tool, as it was not regarded as the simplest English. The terms used in the tool need to be locally interpreted, *“as it should be translated into a local terminology and context.”* Furthermore, it was indicated by a few stakeholders that having a translator present during the study visit was critical.

Strategies to facilitate implementation

At the start of the project, bi-weekly telecom conferences (virtual meetings) were set for every second Monday of the month, to facilitate effective communication with the partners. The telecoms took place over the course of the entire implementation of the project and all actively involved project partners participated regularly in the virtual meetings. During these telecoms, among other things, the draft methodologies designed for the different activities were discussed among the partners. Throughout the course of the project partners were always given the opportunity to provide feedback on any issues that emerged or on the activities that were planned. Several additional online meetings within the consortium were also organised to make sure that all partners understood how to implement the different activities. Furthermore, written guidelines on how to implement the different activities in the regions were also shared by email to the partners. In addition, five project assembly meetings were

organised during the whole project period were the partners were given the opportunity to share and discuss their work on implementing the project activities.

All work package leaders who were interviewed indicated that they experienced that the project was well organised and well-coordinated by project coordination which managed the whole process, by i.e. organising the virtual meetings and communicating with the partners regularly by email or by individual calls and if necessary, by sending reminders on project activities. A facilitator for implementation mentioned during the interviews was regarded in a strong commitment of all the project partners to achieve the objectives of the project. With regard to the collaboration within the project the design of the methodologies to implement the different project components were developed in collaboration with the support of other work packages and of the project coordination. The methodology of WP4, 6 and 7 was actively co-designed by WP5. The collaboration among the different WPs and the local project partners was regarded as open and a positive experience by almost all the interviewed WP leaders. For WP8, the direct link to other project activities was regarded as a facilitative factor for implementing the tasks of WP8. The outcomes of the focus groups, interviews and questionnaires fed directly to the refinement and improvement of the SCIROCCO tool and supported the consortium to formulate issues and challenges and were regarded to nourish the project. In addition, what worked well overall with the focus groups were that they were held in conjunction with (another) associated SCIROCCO project activity i.e., people were attending another event, so also attending the focus group was easy for them. Focus groups were always held in the country of the stakeholders

Context

Regional context for the implementation SCIROCCO

The regional context of the five SCIROCCO regions was mentioned to influence the implementation of the SCIROCCO project. The variation of the regions in the level of development and implementation of integrated care influenced the implementation of project components. In one region, integration of care was not a topic on the political agenda, which resulted in a difficulty to find local stakeholders to participate in the project activities. Furthermore, it was indicated that in the regions where the “integrated care” agenda was strongly established, the implementation of the activities of the project ran smoother. It was also mentioned that the regions varied in their perspectives as some were more policy driven, some more practical or more focused on research, and that all those perspectives were considered in the design approach for the development of the tool.

Regional changes during implementation

During implementation of SCIROCCO, changes in the local environment of the different participating regions also occurred. Some organisational changes in the public authorities where the regional partners were affiliated, was indicated for to possibly influence implementation. For one region the focus of their health system agenda changed. In another region, the change in management influenced how well known the project was and how much leverage the project had. A change on the level of a GP was also observed during implementation. One GP was embedded as part of the

routine practice at national level with the aim to increase the capacity of third sector to provide the statutory integrated care services. As such, this GP could not be included in the second assessment on the GP.

A factor mentioned by two WPs which helped to make the project go straight forward was the fact that they had several co-workers from their region involved in the project. Another WP indicated that the direct added value of their work to the project was regarded as facilitating for implementation of the project component for which they were responsible. An ongoing issue experienced during implementation of the project, was concerned the financial, administrative and project management tasks/responsibilities of SCIROCCO partners. Some partners were not experienced with European projects, which sometimes resulted in difficulties in communicating, and getting the correct financial claims on time, despite of the awareness raising webinars which were organised by the project coordination.

The flexible approach of SCIROCCO in being able to develop the different methodologies during implementation and sometimes deviate from the original plan was regarded as a facilitator for implementation. It was appreciated that the developed methodologies were regarded as an outline, *“you give kind of an idea on how it should work, but then in real life things happen in a different way.”* The pilot testing of the developed methodology for the self-assessment process before the other regions implemented was regarded useful. Also, the flexible attitude of partners facilitated implementation. Furthermore, the flexible approach in the organisation of the different study visits was mentioned to be an important factor for implementation to be able to test the processes.

Other concepts

Outcome and success of the project

The WP leaders of five WPs explicitly indicated that main the outcome of the project is the SCIROCCO tool. A user-friendly tangible outcome, that has been built by the people who tested and used it. Furthermore, the methodological asset was mentioned by four WPs, on how to use the tool, the design of the processes around the use of the tool.

The methodology on how to use tool has been tested in the assessment of maturity requirements of good practices and maturity of health and social care systems. Many additional stakeholders were involved in testing the tool, and two WPs indicated that the additional engagement with regions, in Europe and outside Europe, helped the project to gain additional rich and diverse information on the Tool, which was of value for the quality of the tool, that will be sustainable beyond the end of the project, which was considered part of its success. One WP leader indicated that the interest of the high number of people in transferring good practices, has driven the idea for the next project. In the next project, the ambition is to explore the real impact of what happens when you apply the tool and process and you utilise that data from that to the implementation of integrated care. This ambition was already covered by one region which indicated that the self-assessment the SCIROCCO assessment gives an indication of the status of the region, where after the region will perform a deeper analysis on what this assessment really means for their region. It was indicated that

what has been beneficial to that region, was highlighting both strengths and weaknesses, and they will continue to figure out what type of actions are needed and what will be the next step for their region to progress.

Another indicated success of the project is that the tool and the processes are very flexible and can be used by a range of diverse stakeholders. One stakeholder explicitly mentioned that before the assessment it is important that the stakeholders know what it is that they want to achieve, before they start applying the process. Also, a regional partner indicated that because local stakeholders participated in an international project, when it is transfer of knowledge, there is an increase in competence of the local stakeholders.

Points of improvement

In terms of the tool, issues that were found when it was tested in real life and were captured in the focus groups which helped the consortium to formulate important issues and challenges that the members wish to explore in the future. Part of the evaluation activities within the project focuses on the systematic validation of the SCIROCCO tool/MM. Various perspectives were shared on the execution of these activities. One respondent indicated that an important asset going forward to the next project as well is that the tool has been validated in the project. Although evaluating the Tool which was being adjusted was difficult according to two WPs, “because you are always firing a model target that is not stable, statistical methodologies aren’t very good with dealing with that it provided at least some level of confidence.” Two WPs indicated that evaluation of the tool could have been better since during implementation the partners didn’t give much relevant to the evaluation, the partners could have collaborated better on the validation activity.

In the original programme, when the partners were thinking about the description of the WPs, what might have been improved was the duration of the project, longer time for implementation could have given the partners a bit more breathing space. Furthermore, in some cases, also the distribution of the resources among the work packages might have benefited from a different allocation, as time relates to the resources as well. For the implementation of the GP assessment the WP leaders indicated that it perhaps would have been good to also pilot test the method in their own region before other regions followed.

4.7. Discussion

This is the first study to assess implementation fidelity of a European project which used a step-based approach to explore how to facilitate the scaling-up of good practices at local, regional or country level by recognising the maturity requirements of good practices and health systems in order to achieve scaling-up and knowledge transfer among European Member States. The evaluation focused on the implementation of the five main project components in the five participating European regions. The results show that all the five components of the step-based scaling-up strategy were implemented with acceptable fidelity in line with was stated in the Grant Agreement. The tasks which were described in the Grant Agreement for all the five components were executed, except one deviation was observed as one

region did not participate as transferring (coaching) region. All the five regions conducted the GP self-assessments and undertook the self-assessment process of their health care system context in their regions. Each region also participated in the twinning and coaching process and wrote one or two Action plans. In addition, the targets which were set for each component were met or even exceeded the target.

In terms of deviations from adherence to the original plan, most adjustments were made to the timeline of the project. Since the project used a step-based approach, a delay in one project component automatically resulted in a delay for the other project components. The reasons for the main delays within the project were mentioned in the open approach for developing the methodologies of the different project components which sometimes took more time than anticipated, because of in-depth discussions among the consortium partners or the representatives of regions. Also, the engagement of the local stakeholders took longer than originally thought. Another deviation from the plan was the fact that the developed methodology for the GP assessment was revised and implemented twice.

During implementation, the original plan left room to develop and discuss the exact approach for the execution of the main components (WP4,6 and 7) in the five regions. The developed methodologies supported the implementation of the different project activities in the five regions. However, local variations were observed in the implementation of the different activities. The variety in implementation of the activities in the five regions corresponds to the recognition that by Carroll et al., that an “intervention cannot always be implemented fully in the real world. Local conditions may require it to be flexible and adaptable [88].” This occurred within SCIROCCO as the scope of the activities were informed by each individual region reflecting the structure of their healthcare systems, the concept of integrated care and the local need and strategic priorities for integrated care.

Important influencing factors for implementation of the project components were found in the facilitation strategies, since all WP leaders indicated that they experienced that the project was well-managed and collaboration with the partners was perceived as good. The flexible approach of SCIROCCO was regarded as a facilitator for implementation to develop the different methodologies during implementation and sometimes deviate from the original plan. In the regional context of implementation, several regional factors were found to influence implementation. The five participating regions varied in the level of development and implementation of integrated care which influenced the recruitment procedures of local stakeholders. One region struggled to recruit local stakeholders to participate in the project activities and did not participate as a transferring region in the twinning and coaching activities. Other regions had several co-workers from their region involved in the project, which helped to implement the project straight forward. Another factor which influenced implementation was reflected in the fact that changes in the local environment of the regions also occurred during implementation of the project, which were caused by organisational changes in the public authorities where the regional partners were affiliated.

Strengths and limitations

The opportunity to study the implementation of the SCIROCCO project in its real-life setting of five European regions enabled us to collect several types of data to gain in-depth insight in implementation. The complete framework for implementation fidelity, which was originally developed by Carroll et al. and slightly extended by Hasson guided us in collecting valuable information on the implementation. The methods used, including member checks, methods triangulation (using multiple data resources of collect data on the implementation concepts) and testing of the coding schemes by two researchers, enhance the quality of the study outcomes. Nevertheless, being a partner in the consortium responsible for undertaking the evaluation activities, the subjective experiences of the participants (WP leaders, local SCIROCCO partners and local stakeholders) could have been influenced by social-desirability or recall bias.

During the study we were aware of our role concerning the evaluation activities within the project and we did not interfere with implementation of the project. Our role within the project provided a unique opportunity to obtain a close collaboration with the partners to collect the data needed for the implementation fidelity assessment.

The opportunity to study the implementation of the SCIROCCO project in its real-life setting of five European regions enabled us to collect several types of data to gain in-depth insight in implementation. However, due to time constraints and a high demand on the participants, we were not able to collect data on all pre-planned moments which limited the study coverage of the potential factors, influencing the implementation of complex interventions. Only data from one WP could be collected during implementation, whereas the rest of the data were collected at the end of the implementation. This implied that we were unable to collect all participants' responsiveness scores to the SCIROCCO activities.

Furthermore, the fact that the main activities, including the revised method and the twinning and coaching activities were performed at the end of the project, the quality of the reports written may have suffered from the rush to finish the reports on time. For example, reports of the regions were scanned in our study, to collect data on the participants recruitment procedures and coverage. To check the collected numbers stated in these reports, emails were sent to the responsible local SCIROCCO partners. The information collected in the reports did not always corresponded to reply of the local SCIROCCO partners in this check. Also, details on the timeline reported in some reports differed with the timeline indicated in other reports.

The SCIROCCO project fits nicely with other past and present European projects focusing on the implementation and scaling-up of integrated care initiatives. For example, completed in 2016, the INTEGRATE project aimed to define what constitutes good quality integrated care provision, by gaining valuable insights into integrated care especially in terms of care process design, service delivery, the professional skills mix, patient involvement, funding flows, regulatory conditions, and enabling information communication technology, in order to create connectivity, alignment, and collaboration within and between the cure and care sectors [89]. The results of the project provide valuable insights into those elements of integrated care that are useful to scale-up. SCIROCCO complements the work of INTEGRATE by addressing the

issues of knowledge transfer and scaling-up of innovative initiatives in integrated care in Europe and by an evaluation of its own work.

Another European project, ACT@Scale, started simultaneously with the SCIROCCO project in spring 2016. It has the objective to develop, test and consolidate “best practice” Care Coordination and Telehealth (CC & TH) concepts. They can be leveraged by the participating healthcare regions to expedite the scaling-up of their services but can also be transferred to other regions through Europe and beyond. ACT@Scale is targeting different GPs across Europe. It is tracking and evaluating changes in the process, structure and outcomes of the services during two one-year intervention cycles, thereby generating knowledge about upscaling across programmes and health issues. The two projects, ACT@Scale and SCIROCCO, complement each other by gaining knowledge on scaling-up interventions in Europe. The MM can potentially be used to assess the maturity of healthcare care system structure in a region and monitor changes in the healthcare system over time, as well as similarities or differences in the healthcare system between services. For ACT@Scale, the MM could provide insight into the context in which certain interventions did have certain outcomes. In return, it is interesting to compare these outcomes with the ACT@Scale outcomes of the assessment using MM, so as to see if and how the MM can monitor the changes in services.

Overall, the SCIROCCO tool and processes were regarded as a promising approach offering regions a tailored but flexible path facilitating progress in integrated care. The insights obtained could support other regions, not receiving EU funding, on what to consider when they are interested to use the tool and processes to achieve knowledge transfer with other regions to ultimately scale-up integrated care initiatives. However, caution is advised as the flexible approach can also pose a danger if one deviates too far from the original concept. In addition, the use of the tool and processes in the five regions and this evaluation study took place within the project, where dedicated resources were provided. The question is whether the SCIROCCO processes will be as successful without these available resources and whether the evaluation study will encounter other factors that apply to the implementation in these settings. To test the external validity of study findings it would be recommended to also test the SCIROCCO strategy in other countries in- and outside Europe.

4.8. Conclusion

The multi-method design of this evaluation study has yield knowledge about what elements are involved in implementing and evaluating a European scaling-up strategy concerning integrated care initiatives. The SCIROCCO tool and processes are regarded as a promising approach offering regions a tailored but flexible path facilitating progress in integrated care. The use of the theoretical framework helped us to document the process by which the strategy was implemented and understand the level of implementation fidelity achieved. These insights yield conclusions about the characteristics of the strategy and contexts that are favourable for implementation, assists us to further improve the strategy, informs the adaptation of the process in the different contexts and helps to manage the risks with implementation of the strategy

in different European countries in the future. Similar European projects that are based on collaboration between several European regions can learn from the lessons captured in SCIROCCO and can become more aware of the facilitating factors and pitfalls of implementing such projects. Furthermore, lessons on implementation of the developed Action Plans would also be useful for interested regions. However, the SCIROCCO project, due to its limited durations, did not address the implementation and monitoring of the Action Plans. The follow-up project of SCIROCCO (2019-2021), will focus on the implementation of integrated care by applying the tool and processes in some of the participating and newly added regions. Further evaluation research is needed to gain insight in the implementation processes of the plans and the monitoring of their progress in the new participating regions.

5. Evaluation of knowledge transfer

An important part of the SCIROCCO project was the twinning and coaching process to facilitate the knowledge transfer between the five participating regions within SCIROCCO. This part of the document describes the evaluation of the experience of knowledge transfer in the five participating regions to facilitate the scaling-up and implementation of GPs. As described in the executive summary, during implementation of the project, it became clear that it was no longer possible to follow the original plan as was written in the Grant Agreement (i.e. "to measure the level of knowledge translation in selected sites at baseline and after scaling up activities"). The two consistent measurements in the regions needed to perform this assessment were no longer an option, since the regions could choose two approaches for the twinning and coaching activities, the SCIROCCO tool was slightly adjusted, and different experts were involved than in the self-assessment workshop. Therefore, a qualitative approach was chosen to collect data from the stakeholders on the aspects of the knowledge transfer between the five participating regions. The SCIROCCO project was testing a unique process of knowledge sharing/transfer and information flow among five European regions using the tool to assist this process. Since the transfer of knowledge is suggested to be a complex process and the SCIROCCO's approach took place between several regions, including different health systems, it was at the start of the project unknown how the process would unfold in practice. Despite the lack of adequate models to guide the evaluation of the KT approach, it was considered important to gain insight in the way in which the processes of the KT activities in SCIROCCO will play out. This study, therefore, has the objective to examine the KE processes within the SCIROCCO project (to obtain insights in how the processes intended to add value to the regions). Providing an understanding of the processes involved in this KT process is valuable, as the expected insights can support policymakers and stakeholders of other regions, what to consider when they are interested in using the tool and processes to realise KT with other regions to eventually scale-up integrated care initiatives.

Using theory will allow for an understanding on how KE works in the SCIROCCO context and how the knowledge translation intervention can add value and will also allow for increased valid and rigor outcomes. Therefore, two models will support the study in gaining insight in the processes of KT within the SCIROCCO. The objective of this study was to examine how the knowledge transfer processes unfolded within SCIROCCO. Five focus groups were conducted, and the Action Plans written by the regions after the twinning and coaching activities are being collected. The outcomes of this evaluation were expected to provide insights in the process of knowledge transfer between the five participating regions during the several organised study visits within the SCIROCCO project.

5.1. Conceptual frameworks

The framework of KE

To provide insight in the complex process of KT during the SCIROCCO project, this evaluation study is guided by the framework for KE developed by Ward and colleagues

[89]. The authors suggested that the framework can be used to gather evidence from case studies of KT interventions and recommend it could also be used as a template for evaluating KT activities. The initial conceptual framework on KE was developed out of a review of 28 different models which focused on explaining the KT process. Five common components of the KT process identified were [90]:

- Identifying and communicating about the problem which the knowledge needs to address;
- Analysing the context which surrounds the producers and users of knowledge;
- Developing and selecting the knowledge to be transferred;
- Selecting specific knowledge transfer activities or interventions;
- Considering how the knowledge will be used in practice.

The review identified three types of knowledge transfer processes: a linear process, a cyclical process and a dynamic multidirectional process. Subsequently, the authors empirically tested the framework and refined it were the five components are connected via a complex multidirectional set of interactions (i.e. the individual components can occur separately or simultaneously or in any given order and can occur more than once during the knowledge transfer process and illustrating some of the possible connections between them (Figure 8). This is depicted by the fluidity of the five streams and the illustrative connections between them.

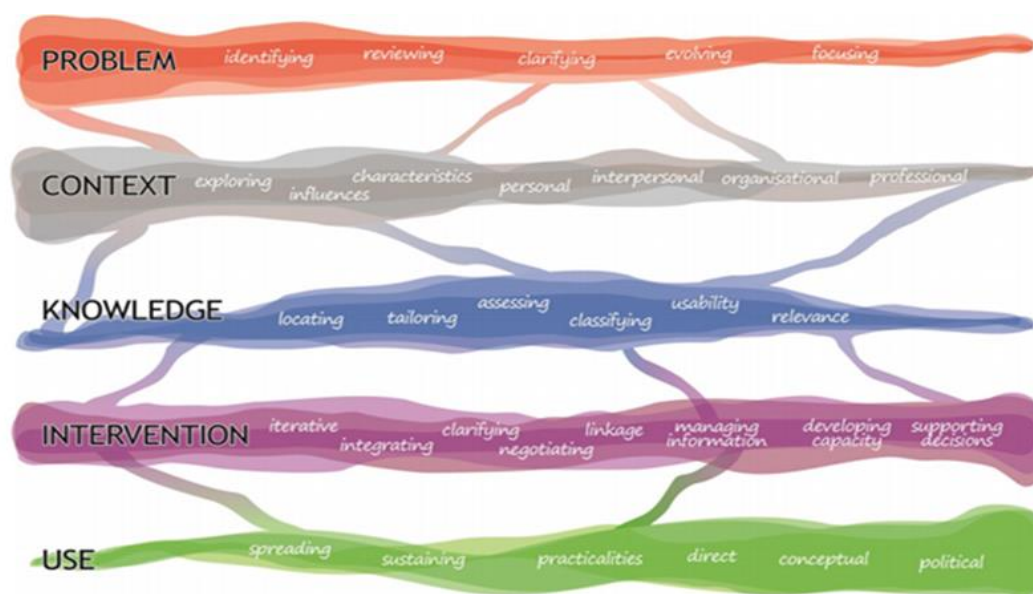


Figure 8: Revised KE framework by Ward et al [89]

The framework of knowledge mobilisation

Effectively sharing knowledge requires different strategies depending on who is sharing the knowledge, what knowledge is being shared, how it is shared, and the purpose for which it is shared [91]. More recently, Ward developed a framework for knowledge mobilisers based on a review of 47 knowledge mobilisation models. The framework consists of four questions: Why is knowledge being mobilised?; Whose knowledge is being mobilised?; What type of knowledge is being mobilised?; and How is knowledge being mobilised? [92] Ward argues that these questions and

accompanying categories can help knowledge mobilisers reflect on, communicate and evaluate their aims and objectives, increasing clarity and understanding across the field [92]. It is designed to help those involved in knowledge mobilisation to reflect on their personal and/or project-related aims and objectives in a structured way and provide a pointer towards models and sets of literature which best fit those aims and objectives. Therefore, this framework is also used in this study to examine the KT processes within the SCIROCCO project.

5.2. Methods

This qualitative multiple method study was undertaken to obtain a detailed understanding of how the KT processes within the SCIROCCO project unfolded. The data collection included study visit programs, focus groups, action plans and a project document outlining the SCIROCCO methodology for twinning and coaching.

Setting

This study took place within the European funded SCIROCCO project under the 3rd Health Programme (2014-2020). A short description of the project is provided in the introduction, a more detailed description of the project is available elsewhere[1]. This study was conducted by members of the work package 3 (WP3), who were responsible for evaluation activities within the project. The twinning and coaching activities were facilitated for the five participating regions within the SCIROCCO project (Scotland, Basque Country, Puglia, Olomouc, Norrbotten) and were intended to be organised as study visits, webinars and various other online tools. In each participating region, two or three local project partners were involved in organising the activities and involved in the KT process for their regions. The project partners also recruited a maximum of five local experts to participate in the twinning and coaching sessions for their region.

Data collection

Focus groups

Between June 2018 and September 2018, a total of five focus groups were conducted after the study visits, which took place in a suitable venue on the specific locations where the study visits were organised. By undertaking focus groups, several perspectives of the participants can be collected while encouraging the participants to question each other, as well as exchanging and commenting on each other experiences and understandings [93]. All the experts who participated in the study visits were invited to participate in the focus groups. These experts were recruited by the local partners based on their experience with the GP or expertise in the subject of the study visit. Some experts of the transferring regions were involved in the study visit by providing presentations and were not involved in the complete study visit, those experts were not participating in the focus groups. The questionnaire for the semi-structured focus groups was developed in collaboration with members of two other work packages (WPs 5 and 8) who were active partners within the SCIROCCO project. WP8 was interested to collect the lessons learned on the process of KT using the SCIROCCO tool and the other WP5 was interested to ask questions on the design of the SCIROCCO tool. The framework for KE of Ward et al. was used to partly guide the topic

list development [89]. An overview of the topic list of the focus group is presented in Appendix G, the full questionnaire is available from the corresponding author.

The focus groups were alternately facilitated by one member of WP3 and two members of WP 8. The three moderators had a minimum of a master's degree and experience in qualitative research. At the start of the focus groups, the moderator provided the introduction to the focus group by introducing themselves, explaining the purpose of the focus group and requesting the participants to sign the informed consent form (see ethics statement). All participants received an overview of the focus group questions at the beginning of the study visits. Each focus group lasted approximately one hour and were audio-recorded and transcribed verbatim. An overview of the focus groups is presented in Table 22.

Documents

Document data including the action plans, study visit programs and a project document on the twinning and coaching methodology were collected within the SCIROCCO project between April 2018 and January 2019. The action plans included the descriptions on the outcomes of the study visits. The plans were co-designed by transferring and receiving regions. The study visit programs included information on the experts involved in the study visit and the program for the 1 or 1,5 day study visit. A total of seven action plans, five study visit programs and one project document were collected.

Data analysis

The analysis of the data was guided by the frameworks of Ward (et al.).[89,92] All data were analysed using content analysis[94]. A coding scheme, including the five KE components and themes derived from the framework and the four knowledge mobilisation elements and categorisations, was used during the coding process. By using a deductive approach, all the text documents were reviewed for content and coded per KT case according to the categories of the coding scheme,[95] to achieve fewer content-related categories.[96] The coding scheme was tested independently by the two researchers prior to implementing the coding process. During the coding process, some codes did not directly fit the data, therefore, some codes were slightly adjusted to fit this study. With regards to the component “knowledge”, besides looking into the type knowledge offered by the transferring regions, we also included the type of knowledge needed by the receiving regions as a code. In addition, for the component intervention, we included “to be used” after type of intervention, as the actions were indicated as proposed actions. Since this study took place within a project facilitating KT between known transferring and receiving regions, we chose to add an additional category under “Whose knowledge is being mobilised?” by including “knowledge receivers” referring to the knowledge recipients involved as the experts of the receiving regions. We also included an elaboration to the description of one group of “knowledge donor/receiver” and included policy makers to the category “DMs” to better match it to the interpretation of our study. Furthermore, we slightly adjusted the categories of “Why knowledge is being mobilised”.

The coding process took place in QSR International's NVivo 12 software. After all the data were coded, the final data analytic phase was a cooperative effort between LG and HV. The analysis was an iterative process made up of initial analyses by LG,

followed by discussions between LG and HV, further analyses and discussions in order to identify concordant and discordant themes. Any disagreement was resolved through discussion.

5.3. Results

The planned outline for the twinning and coaching sessions (KT process), included the following steps: step 1: each participating region was asked to express their interest for the twinning and coaching activity to be 1) informed by Good Practices (GPs) or to be 2) informed by the assessment of the healthcare system. One twinning and one coaching activity was envisaged for each of the five SCIROCCO regions. In the second step, the twinning and coaching process/ matching of the receiving and transferring region was intended to be initiated, including introductory webinar(s) between the transferring and receiving region(s). In the third step, a study visit to the transferring region was planned to be facilitated. The study visits were organised at the location of the transferring region, which was the region/ authority acting as the “coaching” partner in the KT process. The receiving region was the region/ authority seeking support and know-how in order to deploy a GP and/or improve a specific aspect of integrated care acting as the “learning” partner. In the final step, a local meeting with the experts in the receiving regions was planned to be organised to reflect on the learning from the twinning and agree on the priority actions for the improvement(s), including policy recommendations and potential impact, which were then captured in the development of an Action Plan using the SCIROCCO template building on the outcomes of the study visit.

A total of five twinning and coaching sessions, referred to as KE cases (in short cases) were organised including five study visits of which one took place in Puglia (Italy), one in Basque Country (Spain), two in Scotland and one in Norrbotten (Sweden). Three cases included one transferring region and one participating receiving region, and two cases included one transferring and two participating receiving regions. Each participant involved in the twinning and coaching, received a detailed program of the study visit, which included details of the planned focus group at the end of the visit. The characteristics of the focus groups are presented in Table 22.

Table 22: Characteristics of the focus groups

Location of study visit and focus group	Local stakeholders involved	Subject of study visit	Subject of focus group	Interviewer(s)	Date of interview
Puglia	Olomouc stakeholders	GP in telemonitoring in Puglia	Experience study visit Puglia	WP3	14th of June 2018
	Scotland stakeholders				
	Puglia stakeholders				
Basque Country	Norrbotten stakeholders	GP in advance care planning	Experience study visit	WP8	12th of June 2018

Location of study visit and focus group	Local stakeholders involved	Subject of study visit	Subject of focus group	Interviewer(s)	Date of interview
	Basque Country stakeholders	in Basque country	Basque Country		
Scotland	Norrbotten stakeholders	Dimension of the tool: Innovation management	Experience study visit Scotland	WP3	26th of June 2018
	Scotland stakeholders				
Norrbotten	Olomouc stakeholders	Dimension of the tool: eHealth	Experience study visit Norrbotten	WP8	12-13 September 2018
	Norrbotten stakeholders				
Scotland	Basque Country stakeholders	GP in Third sector	Experience study visit Scotland	WP3	5-6 September 2018

In the following the findings of the analysis are presented. The structure of the findings follows the five components (problem, context, knowledge, intervention and use) of KE, including the distinct themes describing the nature of KE. The four questions derived from the knowledge mobilisation framework clarify some of the components. The whose and what type of knowledge is being mobilised questions are included under knowledge. The why and how questions on knowledge mobilisation are included in the intervention component. Where appropriate findings are illustrated with quotes from respondents.

Problem (Problem definition appeared to be a process in its own right which involved identifying, clarifying, focusing, reviewing and evolving the problem over time)

During several moments within in the KT process, attention was paid to the challenge the receiving regions chose to address. Two different approaches were designed for carrying out the KE activity. The first approach was informed by the maturity assessment of the healthcare system using the SCIROCCO tool. The outcomes of the assessment provided insight in the strengths of and challenges for integrated care in the region. Hereafter the regions chose one domain for improvement and sought support from another region (i.e. the transferring region) who had previously demonstrated a significant progress in the corresponding domain (as shown in the outcomes of the maturity assessment). Within the project, two cases focused on improving a specific domain/aspect of integrated care using the first approach. In the second approach, the problem identification focused around a strategic interest of the receiving regions in one of the GPs (GPs) as selected by the participating regions in the project. After the selection, the requirements of that GP for its adoption and transferability were assessed using the SCIROCCO tool. Then, the receiving region assessed the maturity of the healthcare system for the adoption of the GP (using the SCIROCCO tool). Were after the regions looked into the requirements

of the healthcare system to adopt the GP and the twinning and coaching process was initiated. Within the project, a total of three cases focused on the second approach.

After the regions were matched, different approaches were used by the regions to clarify the problem/ challenge of the adopting regions before the study visit. One transferring region explicitly indicated to be in contact with the adopting region prior to the visit and prepared the visit towards the need of the adopting region (case 5). In the other cases, the involved regions did not provide details on the preparations on clarifying the challenge of the receiving regions, and participants in case 2 mentioned that the study visit would benefit from more preparation.

Clarifying/ focussing on the challenge of the regions occurred during the study visits. In the program of four out of five study visits, explicit time was scheduled to discuss the rationale for the twinning and coaching between the transferring and receiving region(s). The challenge of the adopting and transferring regions were sometimes also mentioned during the focus groups. Some respondents talked about reviewing the problem of their region based on the knowledge they had received during the study visit. For example, one respondent (R1) in case 2 mentioned that “this kind of sharing and collaboration, helps you to reflect on many things you are doing, and what other regions are doing with the same issue. And it helps a lot to keep on going and keep on sharing.” More quotes are presented in Appendix H.

At the final step of the KT process, the challenge of the regions was described in the action plans by the regional project leaders of SCIROCCO. The transferring regions described, depending on the focus of the visit, either the challenges which were addressed by the GP or their regional progress in a specific domain in integrated care (details are provided in Appendix H). The problem of the receiving region was described in the plan as well as the needs of the receiving region. For all five cases, the background of the problem was identified as being part of a broader process for change and/ or improvement of the health and social care systems. Almost all regions (transferring and receiving), acknowledged that the sustainability of their health and social care systems becomes a challenge and that they felt the need for a change in the way care is currently delivered. Hereafter, the problem was more focused towards the subject of the KE activity, a short description on these challenges are presented in Appendix H. No direct observations were made were the regions evolved the problem over time. In two cases, respondents mentioned that the tool could be used to track progress over time. For example, S3 in case 1 indicated: “I think it would be a really useful tool to measure your progress, do it in 3-6 months, to actually be able to compare where you are at and want to go next. Whether the spider diagram has shifted the way we wanted to. I think there is value there.”

Context (Exploring, discovering and revealing context which includes the personal, interpersonal, organisational, and institutional characteristics relevant to transferring knowledge into action)

Exploring, discovering and revealing contextual characteristics was a central part of the five KE activities within the SCIROCCO project. This was supported by using the SCIROCCO tool. In the first approach, the outcomes of the maturity assessment of the health care system, using the SCIROCCO tool, informed the KT in a particular aspect of

integrated care. In the two study visits, a facilitated discussion was organised comparing the self-assessments of the transferring and receiving region, including per dimensions, the (identified) features of the health care system. The features were considered as concrete attributes of the environment that are necessary for improvement. The receiving regions explored what needed to change/ improve in the local environment to enable the improvement of that domain in their local context and whether improvement in this specific aspect on integrated care related to other dimensions of the SCIROCCO tool. The receiving regions also assessed how feasible it was to adopt/ transfer the features of the transferring regional context/ health care system, and in particular the features of the specific domain, to the local environment. These aspects were later captured in the action plan.

In the second approach, the KT was informed by the assessment of maturity requirements of a GP for adoption and the maturity assessment of the health care system of the receiving region. A maturity requirement is a feature that a GP needs from the environment for it to be implemented. In two out of the three study visits, a discussion was facilitated focusing on what would be the requirements of local health care systems to adopt/ transfer this GP (one did not because of lack of time). The receiving regions also reflected on how feasible the transfer of the features might be to their local health care systems. A feature was defined as a concrete attribute in the environment that is a necessary requirement needed to implement the GP. The outcomes informed the development of the action plan.

Regarding the contextual structural characteristics, some regions indicated organisational or professional contextual characteristics. In Appendix I, the classification based on the assessment of the extent to which the transfer of knowledge per contextual dimensions was regarded feasible to the local context and the organisational or professional characteristics are presented.

Knowledge (Involving: Locating the knowledge, Classifying the knowledge, Assessing the knowledge Tailoring the knowledge, Usability of the knowledge/practical limitations + whose and what knowledge?)

SCIROCCO's KE procedure

The SCIROCCO tool and project activities supported regions in locating the knowledge. The tool and project activities assisted in the matching of regions and the further KE processes. Assessing the relevance and usefulness of knowledge by the experts of the participating regions receiving regions occurred during facilitated discussions in six out of the seven study visits. The experts assessed, based on the contextual dimensions and features, whether transferring the learning about the GP or the learning about a dimension was feasible to their region's context. This was done by indicating whether transferability was feasible (yes or no), and when considered feasible this was further assessed by indicating whether this required little or much effort/ adaptations.

After looking into the feasibility, a further selection of the knowledge was made. In the action plans, the receiving regions listed a maximum of three prioritised features to be considered for the transferability of learning about GP or improvement in dimension to the receiving regions local context. Hereafter, the adopting regions described per listed feature the suggested adaptations (tailoring knowledge) to their

local context to enable the creation of conditions for the adoption of the learning from the GP or dimension (Appendix I).

Type of knowledge

Transferring regions

The knowledge shared by the transferring regions came from different sources, including presentations and discussions among the experts from the transferring and receiving regions, and in four cases knowledge also came from practical site visits. Further, the transferring regions provided information in the action plan of the receiving regions. The knowledge shared among the regions came from a mix of “knowledge donors,” who were involved in the KT activities and differed per case/ study visit (Appendix I). Only one transferring region, case 3, included members of the public acting as or on behalf of their communities and people in receipt of services (SUs). Furthermore, the type of knowledge which was offered by the transferring regions during the five organised KE activities within SCIROCCO varied per visit/ case (Appendix I). In three study visits, scientific/ factual knowledge was shared in the form of data on the performance of the practice shown during presentations or were described in the action plans. Technical knowledge was shared during the presentations in the study visits (several presentations were scheduled in the study programmes). The sharing of technical knowledge and practical wisdom were reflected in both sharing experiences with the experts of the transferring regions during the discussions and demonstrations in the site visits.

Receiving regions

The participants of the receiving regions, which were regarded as the “knowledge receivers”, included a mix of experts, including project members of SCIROCCO and invited regional experts (Appendix I). In all cases programme and programme developers (Dev) were involved as experts. Only one receiving region, included a member of the public acting as or on behalf of their communities and people in receipt of services (SUs) as recipient.

With regards the type of knowledge, the adopting regions described in their action plans per listed feature the suggested adaptations/changes of the features to their local context. The type of knowledge which was of interest for the regions are shown in Appendix I. The type of knowledge needed categorised as scientific/ factual knowledge (Sci), were described by two of the receiving regions and included the feature “Evaluation Methods.” The need for technical knowledge (T) was noted in all the seven receiving regions. Technical knowledge was about developing (implementation) plans/mechanisms (enabling adoption), reforming/developing legislation and embedding learning through education and training and included different “dimensions/features.” The last needed type of knowledge, practical wisdom (Wi), was found in five regions. The need for practical wisdom included raising awareness about a new way of working, increasing public awareness and demonstrating benefits of the GP/ improvement in an aspect of integrated care. Features that came up included Removal of Inhibitors, Citizen Empowerment, Readiness to Change, Innovation Management and Information and eHealth services.

Intervention (Involving: Negotiating KT roles and responsibilities, Clarifying the type of intervention to be used (information management, linkage, decision/implementation support, capacity development) Integrating the intervention, Making the intervention iterative + why and how mobilise knowledge?)

For the concept intervention, a distinction is made between the intervention consisting of the SCIROCCO project itself and the priority actions of the adopting regions as described in the action plans.

SCIROCCO intervention

When focussing on the SCIROCCO project, three types of KE activities/ interventions were reflected in the methodology for twinning and coaching sessions. Starting with information management, the project supported the regions in finding the knowledge in another participating region. Then, linkage and exchange occurred as the five KE activities organised by SCIROCCO included study visits to bring together the matched regions. All study visits included presentations from the transferring region and almost all included discussions among the regions based on comparing of the self-assessments and some also included practical site visits. Finally, capacity building was facilitated by helping the regions to reflect on the possibility to transfer and adopt the learning about the GP or dimensions to local settings, by drawing up an action plan following the study visit. About the negotiating KT roles and responsibilities within the SCIROCCO project, the SCIROCCO local project members were part of the KT activities representing their regions and they invited/ selected several types of regional experts to be part of the KT, details on these types of experts are presented in the “Knowledge” section. The knowledge mobilisation technique used by SCIROCCO can be categorised as “making connections between knowledge stakeholders and actors by establishing and brokering relationships (Con).”

The participants provided feedback on the SCIROCCO study visits, a short overview of these are presented first. The use of the SCIROCCO tool as part of the knowledge change activity was considered supportive “in focussing the discussion during the study visit between the regions.” (respondent X). A respondent in case 4 indicated on the process that R1: “I like the discussion, it is not only the scores, but to have time to have these discussions after. I think it is important.” One expert (C1) indicated that it is a “good basis for various exercises for consideration of transfer of GP but “That means there are things that need to be edit or need to be considered in addition to the tool, as such [...]. But it is not complete for our environment.” Some experts indicated experiencing issues with the language of the tool. One respondent (R5, case 2) indicated that she missed the focus on soft factors “When I am thinking about the tool, [...], but talking about those soft experiences that you want. We had one which was like cultural, but it was not, I mean that there quite many like, hard factors. Not so many of the softer ones.” What came out of the study visits which include practical site visit it the fact that the experts really liked the practical visits. For example, R4, case 3 indicated: “it was a really great opportunity to get here and to see in real life how it works and like this team plan today with the patient and doctors. To see it in the real context, it was great.” In two cases (1 and 2) the collaboration/ sharing of information between the regions in the project was explicitly mentioned as a positive experience. S3 in case 2 indicated: “I think the wealth of and generosity of sharing

this information as you would say, the challenges, your whole experience, your generosity of sharing all of that amongst us all is very much appreciated.” Furthermore, R7 in case 4 indicated “[...] This way of comparing is actually mutual learning. This way of learning is actually mutual learning. It’s not just coaching or receiving. We get plenty of information about what you are actually doing [...].” In case 1 and 2 experts explicitly indicated to appreciate the presentations, which were part of the study visit program. In three cases (case 1,3 and 5), a wish for more time was mentioned by experts for preparing the visits or the duration of the visit.

Interventions to be used by receiving regions

During the study visits, there was room for the regions to clarify and discuss possible interventions to transfer the learning/ knowledge to their local contexts. In the sense that the adopting regions discussed what changes/ improvements were needed in their local context to enable the transfer of the GP or the improvement in an aspect of integrated care in their local environments (also reflected in the knowledge needed by the regions as presented under “knowledge” section). Once back home, these processes were further clarified and written down in the action plans in the form of priority actions. An iterative process of selecting an intervention by the regions could not be observed. At the end of the action plans, the regions listed proposed actions to enable conditions for the adoption of learning about GP/ to enable conditions for improvement of innovation management in the local context, including objectives, anticipated outcomes and policy implications.

The priority actions of the regions are categorised under the type of intervention to be used and are presented in Appendix J. The type of interventions categorised as capacity development is found in all the regions. Capacity development was found for several regions and involved: raising awareness among professionals or citizens or when regions mentioned certain improvements were needed. It concerned e.g. engaging professionals or embedding/ improving education and training. Also, strengthen/ improving or position several roles in developing or participating as part of the intended change were considered part of capacity development. Linkage, as intervention, came up as engaging/ involve several stakeholders or joining efforts among actors, encouraging participation and partnership building in the intended change. Decision and implementation support were reflected in receiving regions referring to developing plans or strategies for implementation, or extending or scaling up initiatives, or embedding elements in regulations or policies. Information management came up in a few regions, indicating the collection of data/ information on the particular change and publishing of data. We also looked whether the actions could be categorised under the “How mobilise knowledge?” concept. However, since the action plans refer to “proposed” actions and policy “implications” the actual implementation of these plans were out of scope of the project, it was not possible to categorise the “How mobilise knowledge?” concept for these actions.

Attention was paid to negotiating KT roles and responsibilities in the action plan as the receiving regions were encouraged to think of responsible actors for the priority actions. Six of the seven regions indicated the responsible actors (see Appendix J). Furthermore, the regions indicated policy implications, which can be considered as a form of integrating the intervention/ priority action to their local context.

Use (Involving: Deciding how the knowledge will be used (knowledge was used in a range of different ways: directly (i.e. with little modification), conceptually (i.e. to change opinions) or politically (i.e. to confirm or challenge practices or policies)), Considering the practicalities of use, Spreading knowledge to others, Sustaining knowledge use)

In the action plans, the regions listed proposed actions, including objectives, anticipated outcomes and policy implications. A range of ways on how the knowledge will be used could be retrieved from this data (see Appendix J). The KEd during the twinning and coaching sessions, is expected to be used mainly conceptually (to change opinions) and politically by the receiving regions. The receiving regions indicated policy implications for the proposed priority actions. Some regions indicated to have a range of policies in place supporting the actions, while other regions were in the middle of developing or opted for the need of policies or strategies to support the action. The indicated policy implications are presented in Appendix J under “knowledge used politically.” These policy implications, including the request to think of the responsible actor(s) and anticipated duration, can be considered as SCIROCCO’s way to support the receiving regions to think of sustaining and spreading knowledge.

The receiving regions also indicated the practicalities of knowledge use, during the assessment of knowledge indicating feasibility to transfer as sometimes regions indicated the knowledge would not be feasible to transfer (see context section). The other consideration of practicalities is reflected in the action plans, where the adopting regions indicated the benefits and opportunities of the adoption of the GP/of improving in the dimension in their region. These are summarised in Appendix J. The categories on “why knowledge is being mobilised” are also reflected in these practicalities are presented in Appendix J. The reasons for mobilising knowledge between the regions are found mainly to be a mix of “To (further) develop new policies, programmes and/or recommendations (Po)”, and “to change practices and behaviours (Ch).” Also, a few regions were planning to use the knowledge “To adopt / implement clearly defined transferring regions (ideas on) practices and policies (Imp).

5.4. Discussion

This multi-method study aimed to provide insights in how the processes of KT facilitated between five European regions unfolded as part of the SCIROCCO project aimed at the transfer and scaling-up of successful integrated care initiatives. To explore this aim, data were collected within the project by conducting focus groups and collecting project documents.

The frameworks used to guide this study were found to be useful for analysing the KE processes. Moreover, the SCIROCCO project appeared to have designed an extensive approach for the KT process among five participating regions. It was found that the five components (including the themes) of KE [89] could to a large extent be identified in the developed methodology for the twinning and coaching activities. Furthermore, the four questions and accompanying categories of the framework for knowledge mobilisers [92], were also identified to a large degree and provided additional insights in the SCIROCCO KT processes. These key findings are discussed below.

Problem

In all five cases, during several moments within the KE process, attention was paid to the problem definition. Evolving the problem definition over time could not be observed in the five cases of this study. There are two possible explanations. The first may be the difference in both studies in the type and intensity of interactions between the facilitating party “the knowledge broker” and the receiving “team.” In the study of Ward et al. [89] the knowledge brokering/ broker activities were driven by the teams’ own problem-solving processes. The outlined step-based design of KT processes within SCIROCCO were implemented within the (limited) scope of a project, therefore it might not have been possible to allow sufficient time and space for the problem to evolve. Some regions indicated the ability to use the tool to track changes over time in the future. As Ward et al.[89] observed “that an inability to revise and evolve KE problems can hamper the desired change process”, it is advised to allow for evolution of problem in the design of the KT processes in the future. The other possible explanation is that in the study of Ward et al., [89] the knowledge broker participated in the KE process of three teams over a period of 10-15 months and collected observational fieldnotes. In our study, data were collected on four moments and no direct observations were made during the exchange of knowledge within SCIROCCO. This could mean that we were unable to detect evolution of the problem over time. Furthermore, this could also explain the fact that insufficient data were gathered to contain a comprehensive insight in step 2 where the regions were matched and prepared themselves before the study visits. One region explicitly prepared themselves by being in contact with the other region, and one region indicated that they would like to have more time for preparation. The request for more preparation, could also have been the result of conducting KT activity within the scope of the project where because of deadlines the KT processes sometimes could have been set-up in a rush.

Context

Contextual characteristics were specifically considered in the five KE cases by using the SCIROCCO tool to inform three steps of the KT processes. Not all identified themes of context by Ward et al., were reflected in the SCIROCCO approach [89]. The contextual characteristics within SCIROCCO are more focused on the macro regional health care system related to integrated care but some organisational and professional structural characteristics were reflected in the suggested adaptations to the context as addressed by some receiving regions. Ward et al. indicate that their findings suggest that “that KE is a social and political rather than behavioural phenomenon which involves professional identities and norms in addition to individual beliefs” and that “fractions within a group may instigate KE as part of a strategy of contesting professional norms and identities.”[89] This is observed in SCIROCCO by several receiving regions indicating to raise the awareness of professionals for the need for or benefits of change. Some regions go even further and mention to pay attention to raising awareness among citizens. Ward et al. [89] further suggests [...] that knowledge translation approaches need to focus beyond individual behaviour or specific organisational characteristics.” The wide scope of the contextual dimensions which are part of the KE process in SCIROCCO, although focused on integrated care, could be interesting to consider in the framework of Ward et al. [89] as well as in other/ future

KE processes. Visa versa, the focus on individual and interpersonal characteristics could be useful when receiving regions would be interested to transfer the knowledge retrieved to the practice level.

Knowledge

All five cases were actively supported by the SCIROCCO project in locating, assessing and tailoring knowledge during several steps of the transfer process. The assessment of knowledge was based on what the experts perceived to be feasible to transfer/ fit to their local context. Ward et al.[89] observed in their study that locating and tailoring knowledge was “rarely instigated by the knowledge broker” and that the teams “classified and selected knowledge in relation to their professional backgrounds and training and that these that these preferences are amenable to change through reflexive action by team members.” In contrast, the processes for locating, assessing and tailoring knowledge in SCIROCCO was outlined in the approach. The professional background of experts could have played a role in the classification and selection of knowledge within SCIROCCO and in the study visits the facilitated discussions may have supported reflective action among the experts. However, since data were only collected through focus groups, were reflection is part of the data collection technique, and no observations were made during the discussion in the study visits, the influence of the professions on changing preferences and reflexive actions could not be observed. Nonetheless, as Ward et al. [89], “suggest that naturalistic processes of reflexivity and discrimination could be harnessed by those who are planning formal knowledge translation”, in the facilitated SCIROCCO KE process, there was room for discussions suggesting to support “that naturalistic processes of reflexivity and discrimination.”

The knowledge offered by the transferring regions came from a mix of knowledge donors, which were identified by the categories of Ward [92], and several types of knowledge were offered. In contrast to Ward. [92], we did focus on knowledge receivers as this would provide insight in the type of experts involved in the knowledge change process within SCIROCCO. Moreover, SCIROCCO was found to include a wide range of experts as knowledge receivers. Ward[92] indicated that focusing on knowledge receivers “suggests that knowledge is a product which is to be translated into practice, [...] and is at odds with observations of the fluid, multidirectional nature of knowledge mobilisation.” In the process of knowledge transfer between several international regions, you need designated experts to participate in the process. This did not mean that the KT process of SCIROCCO did not consider a fluid, multidirectional nature of the KT process, the diverse types of experts were encouraged to think of how to deploy knowledge in the regions and to think of responsible actors. Furthermore, a positive experience of sharing knowledge and mutual learning between the matched regions was indicated by experts. However, the way in which the knowledge will be sustained and spread in real life could not observed as the implementation of the action plans is out of scope of the SCIROCCO project.

Intervention

The themes identified by Ward et al.[89], on the “intervention” component were found to be facilitated within the SCIROCCO project. Regions having discussions on

“making the intervention iterative were not observed.” Possible reasons, reflected in the limited scope of the project or lack of direct observations, are elaborated on above under “Problem.” Ward et al.[89] found in their study that “many of the KE activities which we observed were an integral part of the process of change in which the teams were engaged” and argued that “the development of more effective, contextualised knowledge translation interventions could begin by focusing on these naturalistic KE activities: not only could this increase the willingness of employees and work teams to engage with them, it would also make knowledge translation interventions more easily conceivable in the absence of resources for formal, external facilitation.” All regions involved in the KT activities of SCIROCCO were found to be engaged in a broader process of change. However, the KE process of SCIROCCO can be regarded as an “add-on” intervention (using external resources and skills) to facilitate the KT process between regions. In addition, the SCIROCCO project also focused on the development of the tool to facilitate transfer among regions, which required additional resources. Nonetheless, the approach of SCIROCCO seems to correspond to elements of the natural processes of KE found by Ward et al. and be open to a wide range of sources and selecting and assessing different types of knowledge resulting in a variety of types of interventions intended to be used. Furthermore, the tool seems to be a useful tool providing support to the regions to identify the problem, locate, clarify and assess (discuss) knowledge and possible interventions during the KT processes. This indicates that the SCIROCCO tool has shown potential in the knowledge transfer process to facilitate the transfer of information between the regions on improving local conditions to enable the adoption and scaling-up of integrated care. The general trend among the participants was a positive experience of the study visits. The approach of matching regions will, however, require external resources.

Use

Conceptualisations of knowledge use were found to be part of the SCIROCCO KT activities and included various ways of intended knowledge use in the five cases. Ward et al.[89] suggest in their study that “KE can be understood as a dynamic and fluid process which incorporates distinct forms of knowledge from multiple sources.” The incorporation of distinct forms of knowledge from multiple sources are reflected in the SCIROCCO approach and the dynamic and fluid process could to a certain extent be observed. Some or sometimes all components have been shown to occur simultaneously at different steps within the KT processes of SCIROCCO. However, a fluid process was not always reflected in the processes. This could be due to the limitations in our data collection (lack of direct insight in reflections and evolution over time, making the intervention iterative and the components which were involved during step 2). Another explanation lies in the fact that the transfer processes of SCIROCCO consisted of a facilitated matching and more or less outlined programme. Due to the limited options of a time-bound defined programme, this could have resulted in a more “set order”/ “linear” approach which could have compromised the fluid processes.

All together, we consider the insights gained into SCIROCCO’s unique methodology for KE and how it unfolded in practice valuable. The findings contribute to the lack of practical insight in the specific methods of KT initiatives, as knowledge mobilisation

models have been found to focus on how change occurs, lacking practical utility and do not focus on the content of change activities.[97,98] Furthermore, it is questionable whether there are even any others insights available from other studies looking into practical knowledge transfer between international regions, as many studies focus on knowledge transfer between science and practice. The insights obtained in this study are compelling for other regions that are interested in SCIROCCO's KE process or, more generally, in the exchange of knowledge in integrated care.

Strengths and limitations

There are three main strengths of this multi-method study. First, this study was guided by two frameworks which supported the data collection and analyses. This use of frameworks is important as the transfer of knowledge and the scalability of elements of integrated care initiatives to other organisations/regions lacks clarity and poses great challenges, and the literature (on KT) supported us in obtaining a better understanding. Second, the focus groups enabled us to achieve depth and by conducting document analysis breadth was achieved to examine the KT processes. The multi-method qualitative nature of this research has allowed some practical insights in a KE transfer initiative which was implemented in an international context and demonstrates what the approach yields for participants. Finally, the collected data of the exchange of knowledge between several diverse European regions, enabled us to obtain insights which are likely applicable to other contexts.

The main limitation of the study is the fact that data were collected on four moments and no direct observations were made during the exchange of knowledge within SCIROCCO. The methodology for the KE process were developed and planned on short notice within the framework of a wider project which dealt with delays and deadlines. Although we were part of the SCIROCO project, which enabled us to follow the project closely, we had to consider the work of other project activities and thereby make choices for our data collection. This limited the ability to collect data to cover all the potential components reflected in the KT process.

Another limitation which need to be addressed is the practical use of the frameworks of Ward (et al.) [89,92]. Ward et al.[89] stated that the framework of KE has “that elements of our framework need further examination” but suggested that “to act as a starting point for exploration and evaluation.” For the other framework Ward[92] mentioned that “although the framework does not offer an easy set of methods or tools for evaluating knowledge mobilisation initiatives, it can provide some basic building blocks for determining and planning suitable evaluation strategies.” Despite the limitations of practical applicability of the frameworks, given that there is a lack of available tools and mechanisms for evaluating knowledge mobilisation projects, to our understanding, these were the most comprehensive KT frameworks which were available which fit our study. We found that some elements did not fit to the specific knowledge changes process of SCIROCCO as the focus of the studies differed. Furthermore, some descriptions of concept were fairly broad. Therefore, we did adjust some concepts and provided our own interpretation to some concept as SCIROCCO focuses on the macro level and on integrated care.

5.5. Conclusion

This multi-method study provides new insights in how the KT processes unfolded as part of a European project aimed at the transfer and scaling-up of successful integrated care initiatives. When compared to two frameworks which focus on KE and mobilisation, the SCIROCCO project seems to have used an extensive approach for the KT processes implemented in several European regions. The insights obtained could support other regions interested to use the SCIROCCO tool and processes what to consider during KT with another region, in order to improve local conditions enabling the adoption and scaling-up of integrated care. The SCIROCCO project, due to its limited duration, did not address the implementation and monitoring of the action plans, which were written by the regions to capture the learning of the twinning and coaching sessions. The implementation of the action plans would benefit from iterative implementation process and could also be useful for interested regions. Further evaluation research is recommended to gain insight in the implementation processes of the plans and the monitoring of their progress in the regions.

6. References

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7. Appendices

Appendix A Characteristics of articles identified

	First author	Year	Country	Study design	Study objective	Instrument	Purpose of instrument	Type of measurement instrument (survey/questionnaires)	Items and measurement scale (items/scale)	Definition of maturity/development	Construct/items measured	Domain/Construct classification	Type of respondent	Sample population	Context & setting	recruited	N, analysed	Health status
1	Ahgren	2005	Sweden	Cross-sectional	To conceptualize and validate a model of measurement that can be used to evaluate the degree of integration in Local Health Care and similar arrangements of integrated care	Scale of Functional integration	To evaluate the degree of integration in local health care and similar arrangements of integrated care	Integration ranks were reported per health care unit based on consensus, data on integration were collected in self-assessment forms	One graphic scale (beginning with full segregation (rank=0) and ending in full integration (rank=100) is used to derive integration ranks for specific units identified (28 health care units)	The model is based on a continuum of integration, extending from full segregation through intermediate forms of linkage, coordination and cooperation to full integration.	Clinical integration	Other: Functional clinical integration	Health care providers	Integration ranks were reported per health care unit based on consensus	Primary care, secondary care, specialist care & community	25 (health care units)	18	(with disease) health care providers consider patient groups (with disease) of frequent occurrence
2	Ahgren	2009	Sweden	Cross-sectional	To develop a model that can be used to assess the integration of welfare services from the perspective of the users and also to evaluate the results of these services.	DELTA service user assessment	To assess service integration	Questionnaire	Other: ordinal scales and open questions where used for the assessment. 32 items. The final questionnaire contained 16 structured questions linked to different ordinal scales.	The process of integration requires adequate structural conditions, and together the process and the structure contribute to the outcome of integration. Together these dimensions can be used as a model to assess the integration of welfare services from the perspective of the service users.	Care integration (i.e. integration (dimensions of integration : process, structure and outcome)	Clinical integration	Patients (service users)	Services users of DELTA project (in Swedish delta means "to participate")	Specialist care other local association for financial coordination between four different welfare institutions in vocational rehabilitation	552	386 (computed from total response rate)	(with disease) undergoing vocational rehabilitation
3	Browne	2004	Canada	Cross-sectional	To propose a model and a measure of human service	Human Service integration Measure	To quantify the extent, scope and	Telephone interview, web-form, in-person, or during workshops	Not-item based, identifies specific services in the left	This model can be used in any setting to identify the level of total and partial	Care integration (i.e. intra- and inter sectorial service	Organisational integration	Health care providers	Agencies that participated included groups	Other: Children programs : Healthy babies, Healthy	27	Not applicable	Not applicable

D3.1 Evaluation of the SCIROCCO tool and processes

	First author	Year	Country	Study design	Study objective	Instrument	Purpose of instrument	Type of measurement instrument (survey/questionnaires)	Items and measurement scale (items/scale)	Definition of maturity/development	Construct/items measured	Domain/Construct classification	Type of respondent	Sample population	Context & setting	recruited	N, analysed	Health status
					integration through strategic alliances with autonomous services as one way to achieve comprehensive health and social services for target populations		depth of integration as perceived by local service providers : a quantitative integration measure for each service and a total integration measure of the level of service integration-pilot test		hand column that are participating in programmes of care. Rating scale, ordinal scale articulates a five domain continuum of increasing integration (0-4)	integration of human service along each of the three dimensions, or axes (services, goal and funding and other resources). It also permits analysis of the level of total and partial integration of human service across the three axes together, or across any two axes in any given setting. It identifies sectors or services missing from collaborative networks.	integration)			from health, social, education, and community resources	children HBHC. Early years program.			
4	Lukas	2002	USA	Cross-sectional	To measure system integration in two ways by presenting empirically confirmed dimensions of system integration by providing a tool designed for ongoing use for managers.	Unnamed	To measure system integration	Survey	Rating scale. 11 initial domains. The central component of the scorecard is measuring system integration (2)—the extent to which the system is actually coordinated across operating units. Five scales represent aspects of system integration reported across all	The scorecard is intended to provide insight not only to the extent of system integration but also to the organizational features that lead to integration and to the system performance associated with System integration.	Care integration	Combination (clinical, professional, system and normative)	Health care providers		Primary care, secondary care, community, home-based care, nursing home	1042	1042	Healthy

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	First author	Year	Country	Study design	Study objective	Instrument	Purpose of instrument	Type of measurement instrument (survey/questionnaires)	Items and measurement scale (items/scale)	Definition of maturity/development	Construct/items measured	Domain/Construct classification	Type of respondent	Sample population	Context & setting	recruited	N, analysed	Health status
									staff groups. Four additional integration system dimensions are based on questions unique to the managers' version of the instrument.									
5	McGovern	2012	USA	Cross-sectional	To assess the development and feasibility of DDCHCS to assess the level in which a care organization offers integrated behavioural health care services within the traditional medical settings	Dual Diagnosis Capability in Health Care Settings (DDCHCS)	To assess degree to which an organisation offers integrated behavioural health care service in both mental and substance abuse within traditional medical settings.	“field test” a new measure of organizational capacity of behavioural health service integration. All assessments included in the study were made by a pair of raters.	The instrument used in this study (DDCHCS, version 2.0) is composed of 36 benchmark items and organized by seven dimensions. Rating scale.	This measure, the Dual Diagnosis Capability in Health Care Setting (DDHCS) index, was designed specifically to assess the degree to which an organization offers integrated behavioural health care services, both mental health and substance use, within traditional medical settings. The DDCHCS is developed to be a practical benchmark measure of policy, practice and workforce dimensions which can serve to access integration at baseline, and then objectively guide quality improvement efforts.	Care integration	Clinical integration	Others: organization level assessment	DDCHS assessment teams, assessment was conducted at the organization level	Primary care, community	13	13	Not applicable
6	Singer	2013	USA	Cross-	To develop	Patient	To	Survey	29 items. 7	Our analysis of	Care	Combination	Patients	Patients	Primary	527	527	(with

D3.1 Evaluation of the SCIROCCO tool and processes

	First author	Year	Country	Study design	Study objective	Instrument	Purpose of instrument	Type of measurement instrument (survey/questionnaires)	Items and measurement scale (items/scale)	Definition of maturity/development	Construct/items measured	Domain/Construct classification	Type of respondent	Sample population	Context & setting	recruited	N, analysed	Health status
				sectional	and pilot a new instrument to measure integration of patient care from patients' perspectives	Perceptions of Integrated Care Survey	measure level of integration from patient perspective		dimensions. Dichotomous and Likert scale	responses to a pilot survey developed to measure aspects of integrated care suggests a six-dimension measurement framework that is largely consistent with our theoretical model and that can be used by health-system reformers to gauge the ongoing progress of their initiatives.	integration	(i.e. clinical and professional integration)		with multiple chronic conditions	care			disease) multiple chronic conditions
7	Uyei	2014	South-Africa	Cross-sectional	To describe the development and results of a survey instrument that was designed to measure the degree to which TB and HIV services were jointly organized and delivered at clinics in Cape Town	Unnamed	To assess the delivery of TB, pre-art and art services in the clinic	Survey	35 items, rating scale. Scores ranged from 0 (strongly disagree) to 5 (strongly agree). A score of 5 corresponded to a stronger degree of service integration, whereas a score of 0 corresponded to a weaker degree of integration.	Clinical integration refers to the extent to which diagnostic, treatment, care, rehabilitation and health Promotions are concurrently or synchronously delivered to the patient. Services can be integrated in terms of structure (existence of formal guidelines and protocols regarding the practice of joint service delivery), process (behaviour and practice of delivering services) and culture (workplace culture and	Care integration	Combination (i.e. functional, organisational and clinical integration)	Health care providers	Clinicians (doctors and nurses)	Public, other public clinics	77 (68.8% nurses, 31.2% doctors)	77	Not applicable

D3.1 Evaluation of the SCIROCCO tool and processes

	First author	Year	Country	Study design	Study objective	Instrument	Purpose of instrument	Type of measurement instrument (survey/questionnaires)	Items and measurement scale (items/scale)	Definition of maturity/development	Construct/items measured	Domain/Construct classification	Type of respondent	Sample population	Context & setting	recruited	N, analysed	Health status
										personal identification with integrated service delivery). [...] instrument designed to quantify the extent to which services were integrated in 33 clinics and presented in the results of the survey.								
8	Bainbridge	2015		Cross-sectional	Our objective was to assess horizontal integration within a PCN (palliative care network) from the perspectives of HCPs, guided by an empirically derived conceptual framework for the evaluation of integrated palliative care (Bainbridge et al., 2010).	HCP integration survey	To assess horizontal integration within a PCN from the perspectives of HCPs	Survey	60 items. Rating scale, Likert scale and dichotomous.	Examination of interprofessional collaboration and functionality that suggest the extent to which horizontal integration exists among a care network of service agencies. Through this survey we were able to identify tenants of horizontal integration present in the study network of HCPs, but also gaps, many revealed specifically in response to the added items in the survey. The framework uses a Donabedian systems approach (Donabedian, 1966), specifically system structure, process and outcome. Our examination	Care integration	Professional integration	Health care providers	Nurses, palliative care physicians, personal support workers, therapists, social workers and other health professionals	Primary care, secondary care, specialist care & community	279	86	(with disease) health care providers providing palliative care

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	First author	Year	Country	Study design	Study objective	Instrument	Purpose of instrument	Type of measurement instrument (survey/questionnaires)	Items and measurement scale (items/scale)	Definition of maturity/development	Construct/ items measured	Domain/Construct classification	Type of respondent	Sample population	Context & setting	recruited	N, analysed	Health status
										focused on the process level elements which constitute factors that are both indicative of and complementary to horizontal integration[...].								
9	Calciolari	2015	Italy	Cross-sectional	The present study had two main objectives. First, it tests the construct validity and reliability of a parsimonious instrument aimed to assess the phenomenon of care integration. Second, it proposed a conceptual framework designed to analyse the conditions or antecedents of integration, including the context and culture.	Unnamed	To measure care integration	Questionnaire	Rating scale, Likert and binary scale, 24 items.	A variety of international experiences support the interpretation of care integration as the result of a complex combination of contributing factors. We grouped the influential factors into four categories: contextual traits, transition management culture, organizational arrangements, and operating means. [...] we found that integration depends on a range of factors at multiple levels, rather than being determined merely by the implementation of operating means.	Care integration	Combination (i.e. organisational, functional)	Directors	the Director of Social Services, Director of a Social Care District, Director of the Geriatrics Operative Unit, or the Director of the Department of Geriatrics	Hospital and community care services,	144 LHU	The dataset was constructed between July 1st, 2011 and March 6th, 2012 and consists of 102 useful responses from 87 different LHUs, with a response rate of 60.4% and 19 Regions represented.	The cover letter instructed the respondents to refer exclusively to 'frail elderly patients', who were defined as follows: (a) geriatric complex cases, suffering from polymorbidity and presenting a high risk of adverse outcomes and (b) those who require comprehensive care, often being discharged from the hospital or a long-term care institution into a protected regime
10	Minkman	2011	Netherlands	Validation study	Our aim in this study	DMIC	To explore	Literature study, Delphi	For this study we	Four phases of development	Integrated care	Integrated care	Coordinators	Coordinators of	Primary care,	32 out of the 36	See previous	(with disease)

D3.1 Evaluation of the SCIROCCO tool and processes

	First author	Year	Country	Study design	Study objective	Instrument	Purpose of instrument	Type of measurement instrument (survey/questionnaires)	Items and measurement scale (items/scale)	Definition of maturity/development	Construct/ items measured	Domain/Construct classification	Type of respondent	Sample population	Context & setting	recruited	N, analysed	Health status
	(Chapter 8)				was to assess whether the four development phases were recognised by integrated care services in the Netherlands.		how local integrated care services are developed in the Netherlands, and to conceptualise and operationalise a development model of integrated care	methodology (expert judgements and comparison of the judgements in several rounds), concept mapping + a questionnaire	compiled a three-part Excel-based questionnaire (A-C). Part A focussed on general information about the integrated care service. In part B the respondents rated the 89 elements of the DMIC in terms of relevance and existence in daily practice and where applicable since which year. In part C the descriptions of the four development phases were presented and the respondents each assessed their own development phases. Further questions concerned the completion of previous development phases, the duration of phases and the crucial factors for	can be identified in integrated care practice. We also calculated phase scores for each service, based on the number of relevant and implemented elements and the overlap with the top-ten elements per phase made by the experts [11]. The top-ten elements can be considered as a set of elements that is the most related to and representative for that phase.				integrated stroke, AML and dementia services	secondary care, specialist care and community	stroke services (89%), 9 out of the 12 AML services (75%) and 43 out of the 50 dementia services (86%) participated.	box	Coordinators of integrated stroke, AML and dementia services

D3.1 Evaluation of the SCIROCCO tool and processes

	First author	Year	Country	Study design	Study objective	Instrument	Purpose of instrument	Type of measurement instrument (survey/questionnaires)	Items and measurement scale (items/scale)	Definition of maturity/development	Construct/items measured	Domain/Construct classification	Type of respondent	Sample population	Context & setting	recruited	N, analysed	Health status
11	Longpré	2015	Canada	Quantitative cross-sectional design	Our objectives are: 1) to determine the extent to which nursing interventions in care pathway implementation converge with demands for greater integration of care and services; and 2) to determine the extent to which nursing practice is at similar or different phases of development in the integration process in different	Development model for integrated care (DMIC)	Survey	89 elements, yes/no	The DMIC consisted of 89 items corresponding to activities considered integrative. For each item, nurses were asked to answer yes-no questions relating to, on one hand, the relevance of the activity to their practice, and on the other, its presence, that is, to what extent they considered the activity to be prevalent (or valued) within their service. The second component, , was a validated grid developed by Minkman et al. that positioned 40 activities (out of the 89 integrative activities) considered the most	The activities associated with these dimensions are ranked by complexity, making it possible to identify, using an analysis grid, four phases of development in the integration process: 1) initiative and design; 2) experimentation and execution; 3) expansion and monitoring; and 4) consolidation and transformation of the integration project.	Integrated care	Integrated care	Health care providers	All personnel with clinical functions except for patient care attendants (nursing assistant, technician, nurse clinician, counsellor, navigator, liaison nurse, nurse practitioner) and management functions (coordinator, head nurse, assistant head nurse, director, manager).	Primary care, secondary care, specialist care and community	200	107	(with disease) nurses working in four different care pathways

D3.1 Evaluation of the SCIROCCO tool and processes

	First author	Year	Country	Study design	Study objective	Instrument	Purpose of instrument	Type of measurement instrument (survey/questionnaires)	Items and measurement scale (items/scale)	Definition of maturity/development	Construct/items measured	Domain/Construct classification	Type of respondent	Sample population	Context & setting	recruited	N, analysed	Health status
									significantly representative of the four phases of the process (10 activities per phase). The third component consisted of 10 multiple choice and short answer questions added to the survey to capture information on sociodemographic variables.									

Appendix B Outcomes Delphi round 1

Statements	Round 1 (n=26)				
	Overall Experts Median and IQR	Agreement in 7-9 regions (%)	Agreement in 4-6 regions (%)	Agreement in 1-3 region (%)	Overall consensus
Dimensions					
1. Readiness to change	9 (1)	96.2	3.8	0	Relevant
2. Structure and Governance	8,5 (1)	100	0	0	Relevant
3. Information and eHealth Services	8 (2)	96.2	3.8	0	Relevant
4. Standardisation and simplification	8 (1)	92.3	3.8	3.8	Relevant
5. Finance and funding	8 (2)	100	0	0	Relevant
6. Removal of inhibitors	8 (1,25)	96.2	0	3.8	Relevant
7. Population approach	8 (4)	88.5	11.5	0	Relevant
8. Citizen empowerment	8 (4)	92.3	7.7	0	Relevant
9. Evaluation methods	8 (2)	88.5	11.5	0	Relevant
10. Breadth of ambition	8 (1)	92.3	7.7	0	Relevant
11. Innovation management	8 (1,25)	88.5	11.5	0	Relevant
12. Capacity building	8 (1)	88.5	11.5	0	Relevant
Indicators					
1. Readiness to change to enable more integrated care					
1.1. No acknowledgement of crisis	6.5 (5)	50	23.1	26.9	Equivocal (Round 2)
1.2 Crisis recognized, but no clear vision or strategic plan	7 (2.25)	61.5	23.1	15.4	Equivocal (Round 2)
1.3 Dialogue and consensus-building underway; plan being developed	8 (1)	80.8	19.2	0	Relevant
1.4 Vision or plan embedded in policy leaders and champions	8 (2)	88.5	11.5	0	Relevant

Statements	Round 1 (n=26)				
emerging					
1.5 Leadership, vision and plan clear to the general public; pressure for change	8.5 (1)	100	0	0	Relevant
1.6 Political consensus; public support; visible stakeholder engagement	8 (1)	88.5	11.5	0	Relevant
2. Structure and Governance					
2.1 No overall attempt to manage the move to integrated care	8 (4.25)	61.5	19.2	19.2	Equivocal (Round 2)
2.2 Change underway, but with fragmented organisations & plans	7.5 (2.25)	61.5	26.9	11.5	Equivocal (Round 2)
2.3 Formation of task forces, alliances and other informal ways of collaborating	8 (2)	88.5	11.5	0	Relevant
2.4 Governance established at a regional or national level	8 (2)	92.3	7.7	0	Relevant
2.5 Roadmap for a change programme defined and broadly accepted	8 (1.25)	92.3	7.7	0	Relevant
2.6 Full, integrated programme established, with funding and a clear mandate	8 (1)	84.6	11.5	3.8	Relevant
3. Information and eHealth Services					
3.1 No connected health services, just isolated medical record systems	7.5 (3.75)	61.5	15.4	23.1	Equivocal (Round 2)
3.2 No integrated services used, only pilots/local services	8 (2.5)	53.8	30.8	15.4	Equivocal (Round 2)
3.3 eHealth deployed in some areas, but limited to specific organisations or patients	8 (2)	73.1	15.4	11.5	Equivocal (Round 2)
3.4 Voluntary use of regional / national eHealth services across the healthcare system	7.5 (2)	69.2	23.1	7.7	Equivocal (Round 2)

Statements	Round 1 (n=26)				
3.5 Mandated or funded use of regional/national eHealth infrastructure across the healthcare system	8 (0.25)	100	0	0	Relevant
3.6 Universal, at-scale regional/national eHealth services used by all integrated care stakeholders	8 (2)	88.5	7.7	3.8	Relevant
4. Standardisation & Simplification					
4.1 No systematic attempt to standardise the use of citizen health care data, or to simplify systems use	8 (3.5)	61.5	15.4	23.1	Equivocal (Round 2)
4.2 Debate on information standards (e.g., coding, formatting); exploration of options for consolidating ICT	6.5 (3.5)	50.0	26.9	23.1	Equivocal (Round 2)
4.3 A recommended set of agreed information standards at local level; a few local attempts at ICT consolidation	7.5 (2)	73.1	19.2	7.7	Equivocal (Round 2)
4.4 A recommended set of agreed information standards at regional/national level; some shared procurements of new systems at regional/national level; some large-scale consolidations of ICT underway	8 (1.25)	76.9	15.4	7.7	Relevant
4.5 A unified set of agreed standards to be used for system implementations specified in procurement documents; any shared procurements of new systems; consolidated data centres and shared services widely deployed	8 (1.25)	84.6	11.5	3.8	Relevant

Statements	Round 1 (n=26)				
4.6 A unified and mandated set of agreed standards to be used for system implementations fully incorporated into procurement processes; clear strategy for regional/national procurement of new systems; consolidated datacentres and shared services including the cloud) is normal practice.	8 (2)	84.6	11.5	3.8	Relevant
5 Finance & Funding					
5.1 No special funding allocated or available	7 (2)	73.1	3.8	23.1	Equivocal (Round 2)
5.2 Fragmented innovation funding, mostly for pilots	8 (2)	73.1	15.4	11.5	Equivocal (Round 2)
5.3 Consolidated innovation funding available through competitions/grants for individual care providers	8 (1)	80.8	11.5	7.7	Relevant
5.4 Regional/national (or European) funding or PPP for testing and for scaling-up	8 (2)	84.6	15.4	0	Relevant
5.5 Regional/national funding for scaling-up and on-going operations	8 (1)	100	0	0	Relevant
5.6 Secure multi-year budget, accessible to all stakeholders, to enable further service development	8.5 (1)	84.6	11.5	3.8	Relevant
6. Removal of inhibitors					
6.1 All projects delayed or cancelled due to inhibitors	7.5 (4.25)	65.4	11.5	23.1	Equivocal (Round 2)
6.2 Some projects delayed or cancelled due to inhibitors	7.5 (4)	65.4	15.4	19.2	Equivocal (Round 2)

Statements	Round 1 (n=26)				
6.3 Process for identifying inhibitors in place	8 (2.25)	76.9	19.2	3.8	Relevant
6.4 Strategy for removing inhibitors agreed at a high level	8 (3)	73.1	23.1	3.8	Equivocal (Round 2)
6.5 Solutions for removal of inhibitors developed and commonly used	8 (1)	88.5	7.7	3.8	Relevant
6.6 High completion rate of projects & programmes; inhibitors no longer an issue for service development	8 (2)	80.8	15.4	3.8	Relevant
7. Population Approach					
7.1 No consideration of population health in service provision	7.5 (3)	57.7	23.1	19.2	Equivocal (Round 2)
7.2 A population focus of risk stratification but no risk stratification tools	7 (2)	53.8	38.5	7.7	Equivocal (Round 2)
7.3 Individual risk stratification for the most frequent service users	8 (2)	73.1	19.2	7.7	Equivocal (Round 2)
7.4 Group risk stratification for those who are at risk of becoming frequent service users	8 (1)	88.5	7.7	3.8	Relevant
7.5 Population-wide risk stratification started but not fully acted on	8 (1)	92.3	3.8	3.8	Relevant
7.6 Whole population stratification deployed and fully implemented.	8 (1)	84.6	7.7	7.7	Relevant
8. Citizen empowerment					
8.1 No systematic plan for empowerment	8 (4.5)	57.7	19.2	23.1	Equivocal (Round 2)
8.2 Citizens are not involved in decision-making processes and do not participate in the co-design of their	8 (4.25)	61.5	15.4	23.1	Equivocal (Round 2)

Statements	Round 1 (n=26)				
services					
8.3 Policies to support citizens' empowerment and protect their rights, but may not reflect their real needs	7 (3.25)	61.5	23.1	15.4	Equivocal (Round 2)
8.4 Incentives and tools to motivate and support citizens to co-create health and participate in decision-making processes	8 (1.25)	80.8	11.5	7.7	Relevant
8.5 Citizens are supported and involved in decision-making processes, and have access to information and health data	8 (1.25)	88.5	3.8	7.7	Relevant
8.6 Citizens are involved in decision-making processes, and their needs are frequently monitored and reflected in service delivery and policy-making.	8 (1.25)	84.6	7.7	7.7	Relevant
9. Evaluation methods					
9.1 No routine evaluation	8 (4.25)	19.2	15.4	65.4	Equivocal (Round 2)
9.2 Evaluation exists, but not as a part of a systematic approach	7.5 (2.75)	19.2	19.2	61.5	Equivocal (Round 2)
9.3 Evaluation established as part of a systematic approach	8 (2)	80.8	15.4	3.8	Relevant
9.4 Some initiatives and services are evaluated as part of a systematic approach	8 (2)	84.6	11.5	3.6	Relevant
9.5 Most initiatives are subject to a systematic approach to evaluation; published results	8 (1.25)	88.5	11.5	0	Relevant
9.6 A systematic approach to evaluation, responsiveness to the evaluation outcomes, and evaluation of the desired impact on service	8 (1)	92.3	7.7	0	Relevant

Statements	Round 1 (n=26)				
redesign (i.e., a closed loop process)					
10. Breadth of ambition					
10.1 No level of integration	7 (4)	61.5	19.2	19.2	Equivocal (Round 2)
10.2 Services in silos; the citizen or their family as the integrator of services	8 (3.5)	61.5	23.1	19.2	Equivocal (Round 2)
10.3 Integration within the same level of care (e.g., primary care)	8 (2.25)	76.9	19.2	3.8	Relevant
10.4 Integration between care levels (e.g., between primary and secondary care)	8 (2)	88.5	3.8	7.7	Relevant
10.5 Integration includes both social care service and health care service needs	8 (1)	88.5	3.8	7.7	Relevant
10.6 Fully integrated health & social care services	8 (1)	84.6	7.7	7.7	Relevant
11. Innovation management					
11.1 No plan for innovation management	7.5 (4)	57.1	19.2	23.1	Equivocal (Round 2)
11.2 Isolated innovations across the region/country, but limited visibility	7.5 (2.25)	53.8	26.9	19.2	Equivocal (Round 2)
11.3 Innovations are captured and published as good practice	8 (3)	73.1	19.2	7.7	Equivocal (Round 2)
11.4 Innovation is governed and encouraged at a region/country level	8 (1)	80.8	15.4	3.8	Relevant
11.5 Formalised innovation management process in place	8 (1)	80.8	11.5	7.7	Relevant
11.6 Extensive open innovation combined with supporting procurement & the diffusion of good practice.	8 (2)	84.6	11.5	3.8	Relevant
12. Capacity building					

Statements	Round 1 (n=26)				
12.1 No plan for capacity-building	7 (3.75)	65.4	11.5	23.1	Equivocal (Round 2)
12.2 Single organisational initiatives engaged in process improvement	7 (2.25)	61.5	23.1	15.4	Equivocal (Round 2)
12.3 Some mechanisms for sharing knowledge among organisations	8 (3)	73.1	15.4	11.5	Equivocal (Round 2)
12.4 Systematic learning about IT; integrated care and change management	8 (1.25)	80.8	11.5	7.7	Relevant
12.5 Knowledge shared, skills retained and lower turnover of experienced staff	8 (1)	88.5	3.8	7.7	Relevant
12.6 A 'learning healthcare system' involving reflection and continuous improvement	8 (1.25)	84.6	11.5	3.8	Relevant
Maturity scale (0-5)					
1. Readiness to change	8 (1.25)	84.6	11.5	3.8	Relevant
2. Structure and Governance	8 (2)	84.6	11.5	3.8	Relevant
3. Information and e-Health Services	8 (1.25)	84.6	11.5	3.8	Relevant
4. Standardisation and simplification	7 (1)	80.8	11.5	7.7	Relevant
5. Finance and funding	8 (2)	92.3	3.8	3.8	Relevant
6. Removal of inhibitors	8 (1)	88.5	7.7	3.8	Relevant
7. Population approach	8 (2)	84.6	7.7	7.7	Relevant
8. Citizen empowerment	8 (2)	80.8	11.5	7.7	Relevant
9. Evaluation methods	8 (2)	88.5	7.7	3.8	Relevant
10. Breadth of ambition	8 (2.25)	76.9	19.2	3.8	Relevant
11. Innovation management	7 (2)	73.1	23.1	3.8	Equivocal (Round 2)
12. Capacity building	8 (1.25)	80.8	15.4	3.8	Relevant

Appendix C Outcomes statements round 2

Statements	Round 2 (n=13)				
	Overall Experts Median and IQR	Agreement in 7-9 regions (%)	Agreement in 4-6 regions (%)	Agreement in 1-3 region (%)	Overall consensus
Rephrased indicators					
1. Readiness to change to enable more integrated care					
1.1 No acknowledgement of compelling need to change	8 (0.5)	100	0	0	Relevant
1.2 Compelling need is recognised, but no clear version or strategic plan	8 (1)	92.3	7.7	0	Relevant
2. Structure and Governance					
2.1 Fragmented structure and governance in place	8 (0)	100	0	0	Relevant
2.2 Recognition of the need for structural and governance change	8 (1)	84.6	15.4	0	Relevant
3. Information and e-Health Services					
3.1 Information systems are not designed to support integrated care	8 (2)	84.6	15.4	0	Relevant
3.2 Information & eHealth services to support integrated care are being piloted	8 (1)	92.3	7.7	0	Relevant
3.3 Information & eHealth services to support integrated care are deployed but there is not yet region wide coverage	8 (1)	100	0	0	Relevant
3.4 Information & eHealth services to support integrated care are available via a region-wide service but use of these services is not mandated.	8 (1)	92.3	7.7	0	Relevant

Statements	Round 2 (n=13)				
	Overall Experts Median and IQR	Agreement in 7-9 regions (%)	Agreement in 4-6 regions (%)	Agreement in 1-3 region (%)	Overall consensus
Rephrased indicators					
4. Standardisation & Simplification					
4.1 No standards in place or planned that support integrated care services	8 (2.5)	76.9	23.1	0	Relevant
4.2 Discussion of the necessity of ICT to support integrated care and of any standards associated with that ICT	8 (1)	84.6	15.4	0	Relevant
4.3 An ICT structure to support integrated care has been agreed together with a recommended set of information standards - there may still be local variations	8 (1)	92.3	7.7	0	Relevant
5. Finance & Funding					
5.1 No additional funding is available to support the move towards integrated care	8 (1)	84.6	7.7	0	Relevant
5.2 Funding is available but mainly for pilot projects and small scale implementation	8 (1)	100	0	0	Relevant
6. Removal of inhibitors					
6.1 No awareness of the effects of inhibitors on integrated care	8 (1)	84.6	15.4	0	Relevant
6.2 Awareness of inhibitors but no systematic approach to their management is in place	8 (1)	92.3	7.7	0	Relevant
6.4 Strategy for tackling inhibitors is agreed at a high level	8 (0)	100	0	0	Relevant

Statements	Round 2 (n=13)				
	Overall Experts Median and IQR	Agreement in 7-9 regions (%)	Agreement in 4-6 regions (%)	Agreement in 1-3 region (%)	Overall consensus
Rephrased indicators					
7. Population Approach					
7.1 Population health approach is not applied to the provision of integrated care services	8 (0.5)	92.3	7.7	0	Relevant
7.2 A population risk approach is applied to integrated care services but not yet systematically or to the full population.	7 (1.0)	92.3	7.7	0	Relevant
7.3 Risk stratification is used systematically for certain parts of the population (e.g. high-use categories)	8 (0)	100	0	0	Relevant
8. Citizen empowerment					
8.1 Citizen empowerment is not considered as part of integrated care provision	8 (1.5)	100	0	0	Relevant
8.2 Citizens are consulted on integrated care services but are not involved in co-creation and coproduction of services	8 (2)	69.2	30.8	0	Equivocal
8.3 Citizen empowerment is recognized as important but effective policies to support citizen empowerment are still in development	7 (1)	84.6	15.4	0	Relevant

Statements	Round 2 (n=13)				
	Overall Experts Median and IQR	Agreement in 7-9 regions (%)	Agreement in 4-6 regions (%)	Agreement in 1-3 region (%)	Overall consensus
Rephrased indicators					
9. Evaluation methods					
9.1 Integrated care service evaluation is not seen as distinct from standard evaluation approaches	7 (2)	69.2	30.8	0	Equivocal
9.2 Recognition and development of evaluation designed to evaluate integrated care services	7 (1)	92.3	7.7	0	Relevant
10. Breadth of ambition					
10.1 Integrated services arise but not as a result of planning or the implementation of a strategy	8 (1.5)	76.9	23.1	0	Relevant
10.2 The citizen or their family may need to act as the integrator of services in an unpredictable way	8 (1.5)	84.6	15.4	0	Relevant
11. Innovation management					
11.1 No innovation management in place	8 (1.5)	76.9	23.1	0	Relevant
11.2 Innovation is encouraged but there is no overall plan	8 (1.5)	76.9	23.1	0	Relevant
11.3 Innovations are captured and there are some mechanisms in place to encourage knowledge transfer	8 (1.5)	84.6	15.4	0	Relevant

Statements	Round 2 (n=13)				
	Overall Experts Median and IQR	Agreement in 7-9 regions (%)	Agreement in 4-6 regions (%)	Agreement in 1-3 region (%)	Overall consensus
Rephrased indicators					
12. Capacity building					
12.1 Integrated care services are not included in capacity planning	8 (1.5)	76.9	23.1	0	Relevant
12.2 Some systematic approaches to capacity building for integrated care services are in place	8 (1)	84.6	15.4	0	Relevant
12.3 Cooperation on capacity building for integrated care is growing across the region.	8 (1)	100	0	0	Relevant
Statement on Actual and Optimum rank (Ahgren & Axelsson, 2005)	7 (1)	92.3	7.7	0	Relevant

Appendix D outcomes Delphi round 3

Statements	round 3 (n=10)				
	Overall Experts Median and IQR	Agreement in 7-9 regions (%)	Agreement in 4-6 regions (%)	Agreement in 1-3 region (%)	Overall consensus
8. Citizen empowerment					
Rephrased indicators second round					
8.2 Citizens are consulted on integrated care services but are not involved in co-creation and coproduction of services	8 (2)	69.2	30.8	0	Equivocal
Rephrased indicator third round					
8.2 Some citizen consultation on integrated care but not as part of a systematic approach to citizen empowerment for integrated care	8 (1)	90.0	10.0	0	Relevant
9. Evaluation methods					
Rephrased indicators second round					
9.1 Integrated care services evaluation is not seen as distinct from standard evaluation approaches	7 (2)	69.2	30.8	0	Equivocal
Rephrased indicator third round					
9.1 No evaluation of integrated care services is in place or in development	8 (0)	100	0	0	Relevant

Appendix E Hypotheses' SCIROCCO tool vs DMIC Quick scan

We hypothesise that there are correlations between the items of the SCIROCCO tool presented in the left column and the items of the DMIC Quick scan displayed in the right column. Higher scores on the subscales about the items of the SCIROCCO tool in the right column, would be highly positively associated with scores on items of the DMIC Quickscan in the left column.

ITEMS SCIROCCO tool	ITEMS DMIC QUICK SCAN PER DIMENSION
<p>1. Readiness to Change Objectives: If the existing systems of care need to be re-designed to provide a more integrated set of services, this will require change across many levels, the creation of new roles, processes and working practices, and new systems to support information sharing and collaboration across care teams. This will be disruptive and may be viewed negatively by workers, press and public, so a clear case needs to be made for those changes, including a justification, a strategic plan, and a vision of better care.</p> <ul style="list-style-type: none"> •Creating a compelling vision, with a real sense of urgency, and enlisting stakeholder support including political leadership, management, care professionals, public and press. •Accepting the reality that care systems are unsustainable and need to change. •Publishing a clear description of the issues, the choices that need to be made, and the desired future state of the care systems, stating what will be the future experience of care. •Creating a sense of urgency to ensure sustained focus, and building a 'guiding coalition' for change. <p>Assessment scale:</p> <p>0 - No acknowledgement of compelling need to change 1 - Compelling need is recognised, but no clear version or strategic plan 2 - Dialogue and consensus-building underway; plan being developed 3 - Vision or plan embedded in policy; leaders and champions emerging 4 - Leadership, vision and plan clear to the general public; pressure for change 5 - Political consensus; public support; visible stakeholder engagement.</p>	<p>Commitment: 19. Senior leaders of the involved partner organisations are in support of the aims.</p>
<p>2. Structure & Governance Objectives: The broad set of changes needed to deliver integrated care at a regional or national level presents a significant challenge. It needs multi-year programmes with excellent change management, funding and communications, and the power to influence and (sometimes) mandate new working practices.</p>	<p>Result-focused learning: INDICATORS QUICKSCAN: 11. It is clear what health and care support the partner organisations will deliver and the benefits of the collaboration for each care partner are clear.</p>

ITEMS SCIROCCO tool	ITEMS DMIC QUICK SCAN PER DIMENSION
<p>This means alignment of purpose across diverse organisations and professions, and the willingness to collaborate and put the interest of the overall care system above individual incentives. It also means managing the introduction of eHealth services to enable integrated care in a way that makes them easy to use, reliable, secure, and acceptable to care professionals and citizens alike.</p> <ul style="list-style-type: none"> •Enabling properly funded programmes, including a strong programme, project management and change management; establishing ICT or eHealth competence centres to support roll-out; distributed leadership, to reduce dependency on a single heroic leader; excellent communication of goals, progress and successes. •Managing successful eHealth innovation within a properly funded, multi-year transformation programme. •Establishing organisations with the mandate to select, develop and deliver eHealth services. <p>Assessment scale:</p> <p>0 - Fragmented structure and governance in place</p> <p>1 - Recognition of the need for structural and governance change</p> <p>2 - Formation of task forces, alliances and other informal ways of collaborating</p> <p>3 - Governance established at a regional or national level</p> <p>4 - Roadmap for a change programme defined and broadly accepted</p> <p>5 - Full, integrated programme established, with funding and a clear mandate.</p>	<p>Roles and tasks:</p> <p>INDICATORS QUICKSCAN:</p> <p>15. Clear agreements on tasks and responsibilities of the involved partner organisations are present.</p> <p>Commitment:</p> <p>20. The different interests of the partner organisations in the collaboration are being taken into account, and collaboration is based on trust.</p>
<p>3. Information & eHealth Services</p> <p>Objectives: Integrated care requires, as a foundational capability, sharing of health information and care plans across diverse care teams that leads progressively to systems for enabling continuous collaboration, measuring and managing outcomes, and enabling citizens to take a more active role in their care. This means building on existing eHealth services, connecting them in new ways to support integration, and augmenting them with new capabilities, such as enhanced security and mobility.</p> <ul style="list-style-type: none"> •Essential components to enable information-sharing, based on secure and trusted services. •‘Digital first’ policy (where possible, move phone and face-to-face services to digital services to reduce dependence on staff and promote self-service). •Availability of fundamental building blocks to enable eHealth and eServices (‘infrastructure’). •Confidentiality and security designed into patient records, registries, online 	<p>Client-centeredness:</p> <p>INDICATORS QUICKSCAN:</p> <p>3. Partner organisations ensure that the offered information is accessible and relevant to communication styles and needs of clients.</p> <p>Delivery system:</p> <p>INDICATORS QUICKSCAN:</p> <p>5. Partner organisations have made agreements on procedures for the exchange of client information and how to work with or share electronic client records.</p>

ITEMS SCIROCCO tool	ITEMS DMIC QUICK SCAN PER DIMENSION
<p>services etc.</p> <ul style="list-style-type: none"> •Enabling of new channels for healthcare delivery to replace face-to-face and telephone contact. <p>Assessment scale:</p> <p>0 - Information systems are not designed to support integrated care</p> <p>1 - Information and eHealth services to support integrated care are being piloted</p> <p>2 - Information and eHealth services to support integrated care are deployed but there is not yet region wide coverage</p> <p>3 - Information and eHealth services to support integrated care are available via a region-wide service but use of these services is not mandated</p> <p>4 - Mandated or funded use of regional/national eHealth infrastructure across the healthcare system</p> <p>5 - Universal, at-scale regional/national eHealth services used by all integrated care stakeholders.</p>	
<p>4. Standardisation & Simplification</p> <p>Objectives: When considering eHealth services and how they can support the information sharing and collaboration needs of integrated care, the task can be made easier if the number of different systems in use, and the formats in which they store data, can be simplified. Practically, this means trying to consolidate data centres, standardising on fewer systems, and agreeing on what informatics standards will be used across a region or country.</p> <ul style="list-style-type: none"> •Simplification of infrastructure; fewer integration points to manage; easier interoperability. •Consolidation of applications and data centres into fewer sites. •Regional standardisation on fewer (or single) solutions. •Ability to view and exchange medical data from different systems across diverse care settings. <p>Assessment scale:</p> <p>0 - No standards in place or planned that support integrated care services</p> <p>1 - Discussion of the necessity of ICT to support integrated care and of any standards associated with that ICT</p> <p>2 - An ICT infrastructure to support integrated care has been agreed together with a recommended set of information standards - there may still be local</p>	<p>Delivery system:</p> <p>INDICATORS QUICKSCAN:</p> <p>5. Partner organisations have made agreements on procedures for the exchange of client information and how to work with or share electronic client records.</p>

ITEMS SCIROCCO tool	ITEMS DMIC QUICK SCAN PER DIMENSION
<p>variations</p> <p>3 - A recommended set of agreed information standards at regional/national level; some shared procurements of new systems at regional/national level; some large-scale consolidations of ICT underway</p> <p>4 - A unified set of agreed standards to be used for system implementations specified in procurement documents; many shared procurements of new systems; consolidated data centres and shared services widely deployed</p> <p>5 - A unified and mandated set of agreed standards to be used for system implementations fully incorporated into procurement processes; clear strategy for regional/national procurement of new systems; consolidated datacentres and shared services (including the cloud) is normal practice.</p>	
<p>5. Funding</p> <p>Objectives: Changing systems of care so that they can offer better integration requires initial investment and funding; a degree of operational funding during transition to the new models of care; and on-going financial support until the new services are fully operational and the older ones are de-commissioned. Ensuring that initial and on-going costs can be financed is an essential activity that uses the full range of mechanisms from regional/national budgets to 'stimulus' funds, European Union investment funds, public-private partnerships (PPP) and risk-sharing mechanisms).</p> <p>Assessment scale:</p> <p>0 - No additional funding is available to support the move towards integrated care</p> <p>1 - Funding is available but mainly for the pilot projects and testing</p> <p>2 - Consolidated innovation funding available through competitions/grants for individual care providers and small-scale implementation</p> <p>3 - Regional/national (or European) funding or PPP for scaling-up is available</p> <p>4 - Regional/national funding for on-going operations is available</p> <p>5 - Secure multi-year budget, accessible to all stakeholders, to enable further service development</p>	<p>Transparent entrepreneurship:</p> <p>INDICATORS QUICKSCAN:</p> <p>22. Agreements on the resources and financial risks for the integrated care service have been reached.</p>
<p>6. Removal of Inhibitors</p> <p>Objectives: Even with political support, funded programmes and good eHealth infrastructure, many factors can still make integrated care difficult to deliver, by delaying change or limiting how far change can go. These include legal issues with data governance, resistance to change from individuals or professional</p>	<p>Result-focused learning:</p> <p>INDICATORS QUICKSCAN:</p> <p>12. A partnership culture focusing on mutual learning, knowledge exchange and improvement has been developed.</p>

ITEMS SCIROCCO tool	ITEMS DMIC QUICK SCAN PER DIMENSION
<p>bodies, cultural barriers to the use of technology, perverse financial incentives, and lack of skills. These factors need to be recognised early, and a plan developed to deal with them, so as to minimise their impact.</p> <ul style="list-style-type: none"> •Actions to remove barriers: legal, organisational, financial, skills. •Changes to the law concerning e.g., medical acts, information governance, data sharing -factors which may hold up innovation. •Creation of new organisations or collaborations to encourage cross-boundary working ('normative integration'). •Changes to reimbursement to support behavioural change and process change. •Education and training to increase understanding of ICT and speed up solution delivery. <p>Assessment scale:</p> <p>0 - No awareness of the effects of inhibitors on integrated care</p> <p>1 - Awareness of inhibitors but no systematic approach to their management is in place</p> <p>2 - Strategy for removing inhibitors agreed at a high level</p> <p>3 - Implementation Plan and process for removing inhibitors have started being implemented locally</p> <p>4 - Solutions for removal of inhibitors developed and commonly used</p> <p>5 - High completion rate of projects & programmes; inhibitors no longer an issue for service development</p>	<p>Transparent entrepreneurship</p> <p>21. There is a commitment to a joint responsibility for the results to be achieved.</p>
<p>7. Population Approach</p> <p>Objectives: Integrated care can be developed to benefit those citizens who are not thriving under existing systems of care, in order to help them manage their health and care needs in a better way, and to avoid emergency calls and hospital admissions and reduce hospital stays. This is a practical response to meeting today's demands. Population health goes beyond this, and uses methods to understand where future health risk (and so, demand) will come from. It offers ways to act ahead of time, to predict and anticipate, so that citizens can maintain their health for longer and be less dependent on care services as they age.</p> <ul style="list-style-type: none"> •Understanding and anticipating demand; meeting needs better. •Improving the resilience of care systems by using existing data on public health, health risks, and service utilisation. •Taking steps to divert citizens into more appropriate and convenient care 	<p>Interprofessional teamwork:</p> <p>INDICATORS QUICKSCAN:</p> <p>13. The targeted client group of the care service has been defined.</p>

ITEMS SCIROCCO tool	ITEMS DMIC QUICK SCAN PER DIMENSION
<p>pathways based on user preferences.</p> <ul style="list-style-type: none"> •Predicting future demand and taking steps to reduce health risks through technology-enabled public health interventions. <p>Assessment scale:</p> <p>0 - Population health approach is not applied to the provision of integrated care services</p> <p>1 - A population risk approach is applied to integrated care services but not yet systematically or to the full population</p> <p>2 - Risk stratification is used systematically for certain parts of the population (e.g. high-use categories)</p> <p>3 - Group risk stratification for those who are at risk of becoming frequent service users</p> <p>4 -Population-wide risk stratification started but not fully acted on</p> <p>5 - Whole population stratification deployed and fully implemented</p>	
<p>8. Citizen Empowerment</p> <p>Objectives: Health and social care systems are under increasing pressure to respond to demands which could otherwise be handled by citizens and carers themselves. The evidence suggests that many individuals would be willing to do more to participate in their own care if easy-to-use services, such as appointment booking, self-monitoring of health status, and alternatives to medical appointments, were available to them. This means providing services and tools which enable convenience, offer choice, and encourage self-service and engagement in health management.</p> <p>Assessment scale:</p> <p>0 - Citizen empowerment is not considered as part of integrated care provision</p> <p>1 - Citizen empowerment is recognised as important part of integrated care provision but effective policies to support citizen empowerment are still in development</p> <p>2 - Citizen empowerment is recognised as important part of integrated care provision, effective policies to support citizen empowerment are in place but citizens do not have access to health information and health data</p> <p>3 - Citizens are consulted on integrated care services and have access to health information and health data</p> <p>4 - Incentives and tools exist to motivate and support citizens to co-create</p>	<p>Client-centeredness: INDICATORS QUICKSCAN</p> <p>3. Partner organisations ensure that the offered information is accessible and relevant to communication styles and needs of clients.</p> <p>Performance management: INDICATORS QUICKSCAN</p> <p>8. There is a systematic procedure for the evaluation of the experiences of clients and their families.</p> <p>Quality of care: INDICATORS QUICKSCAN</p> <p>10. People and their families are meaningfully involved in the improvement of the integrated care service (f.i. in improvement projects).</p>

ITEMS SCIROCCO tool	ITEMS DMIC QUICK SCAN PER DIMENSION
<p>healthcare services and use these services to participate in decision-making process about their own health</p> <p>5 - Citizens are fully engaged in decision-making processes about their health, and are included in decision-making on service delivery and policy-making.</p>	
<p>9. Evaluation Methods</p> <p>Objectives: As new care pathways and services are introduced to support integrated care, there is a clear need to ensure that the changes are having the desired effect on quality of care, cost of care, access and citizen experience. This supports the concept of evidence-based investment, where the impact of each change is evaluated, ideally by health economists working in universities or in special agencies. Health technology assessment (HTA) is an important method here, and can be used to justify the cost of scaling up good practices to regional or national level.</p> <ul style="list-style-type: none"> •Establishing baselines (on cost, quality, access etc.) in advance of new service introduction. •Systematically measuring the impact of new services and pathways using appropriate methods (e.g., observational studies, incremental improvement, clinical trials). •Generating evidence that leads to faster adoption of good practice. <p>Assessment scale:</p> <p>0 - No evaluation of integrated care services is in place or in development</p> <p>1 - Evaluation of integrated care services exists, but not as a part of a systematic approach</p> <p>2 - Evaluation of integrated care services is planned to take place and be established as part of a systematic approach</p> <p>3 - Some integrated care initiatives and services are evaluated as part of a systematic approach</p> <p>4 - Most integrated care initiatives are subject to a systematic approach to evaluation; published results</p> <p>5 - A systematic approach to evaluation, responsiveness to the evaluation outcomes, and evaluation of the desired impact on service redesign (i.e., a closed loop process).</p>	<p>Performance measurement:</p> <p>INDICATORS QUICKSCAN:</p> <p>6. Performance indicators and data sources have been defined to monitor outcomes.</p> <p>7. An evaluation of impact and process is carried out periodically and used to improve implementation.</p>
<p>10. Breadth of Ambition</p> <p>Objectives: Integrated care includes many levels of integration, such as integration between primary and secondary care, of all stakeholders involved in</p>	<p>Delivery system:</p> <p>INDICATORS QUICKSCAN:</p> <p>4. Partner organisations have made agreements on referral</p>

ITEMS SCIROCCO tool	ITEMS DMIC QUICK SCAN PER DIMENSION
<p>the care process, or across many organisations. It may be developed simply for healthcare needs (i.e., vertical integration) or it may include social workers, the voluntary sector, and informal care (i.e., horizontal integration). The broader the ambition, the more numerous and diverse the stakeholders who have to be engaged. Similarly, integration may include all levels of the system or may be limited to clinical information sharing. The long-term goal should be fully integrated care services which provide a complete set of seamless interactions for the citizen, leading to better care and improved outcomes.</p> <ul style="list-style-type: none"> •Integration supported at all levels within the healthcare system - at the macro (policy, structure), meso (organisational, professional) and micro (clinical) levels. •Integration between the healthcare system and other care services (including social, voluntary, informal, family services). •Seamless transition for the patient between and within care services. <p>Assessment scale:</p> <p>0 - Integrated services arise but not as a result of planning or the implementation of a strategy</p> <p>1 - The citizen or their family may need to act as the integrator of service in an unpredictable way</p> <p>2 - Integration within the same level of care (e.g., primary care)</p> <p>3 - Integration between care levels (e.g., between primary and secondary care)</p> <p>4 - Integration includes both social care service and health care service needs</p> <p>5 - Fully integrated health & social care services.</p>	<p>processes and care pathways</p> <p>Interprofessional teamwork: INDICATORS QUICKSCAN: 14. Professionals collaborate with each other in multidisciplinary team(s).</p> <p>Roles and tasks: INDICATORS QUICKSCAN: 15. Clear agreements on tasks and responsibilities of the involved partner organisations are present. 16. Professionals understand and draw on each another's expertise and roles.</p>
<p>11. Innovation Management</p> <p>Objectives: Many of the best ideas are likely to come from clinicians, nurses and social workers who understand where improvements can be made to existing processes. These innovations need to be recognised, assessed and, where possible, scaled up to provide benefit across the system. At the same time, universities and private sector companies are increasingly willing to engage in open innovation, and innovative procurement, in order to develop new technologies, test process improvements and deliver new services that meet the needs of citizens. There is also value in looking outside the system to other regions and countries that are dealing with the same set of challenges, to learn from their experiences. Overall, this means managing the innovation process to get the best results for the systems of care, and ensuring that good ideas are</p>	<p>Result-focused learning: INDICATORS QUICKSCAN: 12. A partnership culture focusing on mutual learning, knowledge exchange and improvement has been developed.</p>

ITEMS SCIROCCO tool	ITEMS DMIC QUICK SCAN PER DIMENSION
<p>encouraged and rewarded.</p> <ul style="list-style-type: none"> • Adopting proven ideas faster. • Enabling an atmosphere of innovation from top to bottom, with collection and diffusion of best practice. • Learning from inside the system, as well as from other regions, to expand thinking and speed up change. • Involving universities and private sector companies in the innovation process (i.e., 'open innovation'). • Using innovative procurement approaches (Pre-Commercial Procurement, IPP, PPP, Shared Risk, Outcome-Based Payment) • Using European projects (e.g., Horizon 2020, EIP, CEF). <p>Assessment scale:</p> <p>0 - No innovation management in place</p> <p>1 - Innovation is encouraged but there is no overall plan</p> <p>2 - Innovations are captured and there are some mechanisms in place to encourage knowledge transfer</p> <p>3 - Formalised innovation management process is planned and partially implemented</p> <p>4 - Formalised innovation management process is in place and widely implemented</p> <p>5 - Extensive open innovation combined with supporting procurement & the diffusion of good practice is in place</p>	
<p>12. Capacity Building</p> <p>Objectives: As the systems of care are transformed, many new roles will need to be created and new skills developed. These will range from technological expertise and project management, to successful change management. The systems of care need to become 'learning systems' that are constantly striving to improve quality, cost and access. They must build their capacity so as to become more adaptable and resilient. As demands continue to change, skills, talent and experience must be retained. This means ensuring that knowledge is captured and used to improve the next set of projects, leading to greater productivity and increasing success.</p> <ul style="list-style-type: none"> • Increasing technology skills; continuous improvement. • Building a skill base that can bridge the clinician-technologist gap and ensure that needs are understood and addressed by ICT. 	<p>Performance measurement:</p> <p>INDICATORS QUICKSCAN:</p> <p>7. An evaluation of impact and process is carried out periodically and used to improve implementation.</p> <p>Result-focused learning:</p> <p>INDICATORS QUICKSCAN:</p> <p>12. A partnership culture focusing on mutual learning, knowledge exchange and improvement has been developed.</p>

ITEMS SCIROCCO tool	ITEMS DMIC QUICK SCAN PER DIMENSION
<ul style="list-style-type: none"> • Providing tools, processes and platforms to allow organisations to assess themselves and build their own capacity to deliver successful change. • Creating an environment where service improvements are continuously evaluated and delivered for the benefit of the entire care system. <p>Assessment scale:</p> <p>0 - Integrated care services are not considered for capacity building</p> <p>1 - Some systematic approaches to capacity building for integrated care services are in place</p> <p>2 - Cooperation on capacity building for integrated care is growing across the region.</p> <p>3 - Systematic learning about integrated care and change management is in place but not widely implemented.</p> <p>4 - Systematic learning about integrated care and change management is widely implemented; knowledge is shared, skills retained and there is a lower turnover of experienced staff.</p> <p>5 - A 'person-centred learning healthcare system' involving reflection and continuous improvement.</p>	

Appendix F Timetable - planning project and executive activities

Blue: anticipated duration of task. **Red:** actual duration of task spent during implementation as indicated in reports. **Yellow:** deviated actual duration spent as indicated by other reports

Month	Apr 16 (M1)	May 16 (M2)	June 16 (M3)	July 16 (M4)	August 16 (M5)	Sep 16 (M6)	1						2						3														
							Oct 16 (M7)	Nov 16 (M8)	Dec 16 (M9)	Jan 17 (M10)	Feb 17 (M11)	Mar 17 (M12)	Apr 17 (M13)	May 17 (M14)	June 17 (M15)	July 17 (M16)	Aug 17 (M17)	Sep 17 (M18)	Oct 17 (M19)	Nov 17 (M20)	Dec 17 (M21)	Jan 18 (M22)	Feb 18(M23)	Mar 18 (M24)	Apr 18 (M25)	May 18 (M26)	June 18 (M27)	July 18 (M28)	Aug 18 (M29)	Sep 18 (M30)	Oct 18 (M31)	Nov 18 (M32)	
WP3-Evaluation																																	
T3.1 Validity & reliability of B3-MM (Delphi study)																																	
T3.1 Validity & reliability of B3-MM (Delphi study)																																	
WP4-Maturity requirements in selected good practices																																	
T4.1 Viability assessment of GP																																	
T4.2 Data collection																																	
T4.3 Maturity requirements																																	
							1st																2nd										
WP5-Refinement of the B3-MM																																	
T5.1 First refinement of the B3-MM																																	
T5.2 Measurement scale																																	

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Appendix G Topic list of the focus groups

Background to twinning & coaching
Role of the SCIROCCO tool in twinning and coaching
Insights, outcomes and potential benefits of study visit
Ways of enhancing, and difficulties with, twinning & coaching
Specific comments on the SCIROCCO tool

Appendix H Overview of content problem per KT case

Concept Problem	Case 1 Puglia	Case 2 Basque Country	Case 3 Third sector Scotland	Case 4 Scotland IM	Case 5 Norrbotten
Transferring region	<p>The five challenges that Hospital@Home GP addresses are:</p> <ul style="list-style-type: none"> -Reduction of the number of patients with chronic diseases in the process of instability -Reduction of hospitalisation and re-hospitalisation -Activation of protected resignation -Optimisation of the therapy and diagnosis according to international guidelines -Promotion of the integrated management of hospital and community. 	<p>The challenges that Advanced Care Planning (ACP) addresses are:</p> <ul style="list-style-type: none"> -Improvement of the quality of end-of-life care, respecting patients' preferences -Promotion of citizen participation in shared decision-making -Improvement of care communication between patients and careers -Increase of health, social workers and caregivers' competences regarding ACP -Increase of patient's competences to make end-of-life/care-related decisions 	<p>A key driver towards integration and the engagement of third sector in the provision of integrated care has been the projected increase in demand for health and social care as a result of an increasingly ageing population, in particular those who will be aged 75 and older. [...] Integration across the health, social, housing and third sector is seen as a way to make more efficient and effective use of limited resources and is believed to be central to the challenge of improving outcomes for patients and service users.</p>	<p>Innovation is the key to delivering a new model of healthcare that meets the challenges and expectations of the modern society. [...] When properly targeted and applied, innovative ideas and technologies can transform patient care within the NHS and other stakeholders involved. As such, innovation helps to deliver patient care while simultaneously improving quality and efficiency, releasing savings through increased productivity.</p>	<p>Introduction of ICT solutions, including eHealth services is the key to delivering a new model of healthcare that meets the challenges and expectations of the modern society. [...] When properly designed and applied as routine care, ICT solutions and eHealth services can transform patient care in the Region. As such, implementation of eHealth solutions helps to deliver patient care while simultaneously improving quality and efficiency, releasing savings and demands through increased productivity.</p>

Concept Problem	Case 1 Puglia	Case 2 Basque Country	Case 3 Third sector Scotland	Case 4 Scotland IM	Case 5 Norrbotten
		<p>R1: “[...]” this kind of sharing and collaboration, it helps you to reflect on many things you are doing, and what other regions are doing with the same issue.</p> <p>R1: “In my case what we need if we go to the region, probably we are quite good at structuring things, saying what regulations are what the managers consider. I am not sure that we are good at what is more soft.”</p>			
Receiving region 1	Scotland described in their action plan the challenge of “the mainstreaming of technology enabled care initiatives into the routine care. And that Scotland is very keen to explore and	Norrbotten indicated in the action plan that their “ambition is to design a common system for advanced care planning where patients can take an active role and communicate with	In the action plan of Puglia, the challenge was indicated as “health and social care seem to be often fragmented, with services based on professional and institutional	For Norrbotten the challenge remaining as described in the action plan was “how to address a gap between emerging innovations and its implementation, monitoring and evaluations. As such,	The challenge for the receiving region Olomouc as written in the action plan is that: “the role of ICT as an enabler of service redesign is not well recognised and digital healthcare services are

Concept Problem	Case 1 Puglia	Case 2 Basque Country	Case 3 Third sector Scotland	Case 4 Scotland IM	Case 5 Norrbotten
	<p>learn [...] in the area of adoption of technological solutions in the routine care.”</p> <p>S1: “In Scotland we have services that use telemonitoring, but we don’t have well developed services for hospital at home.”</p> <p>S2: “In Scotland we have services that use telemonitoring, but we don’t have well developed services for hospital at home. And it really got us thinking around that is our next priority area. [...] I think if we haven’t come on this visit, we might not have reached that point. So it really helped my</p>	<p>healthcare professionals as required. Furthermore, they described that current systems need to be changed and redesign in order to offer patients the possibility to receive a safe and coordinated healthcare, across the organisational boundaries and where the patients are seen as an obvious part in planning of care process that concern them. Social care, health care and rehabilitation models need to be changed to accommodate citizens' needs and wishes.”</p>	<p>boundaries rather than being co-ordinated around the needs of citizens. A number of policy initiatives in Puglia have been designed to tackle this fragmentation, however integration of health and social care still remains a challenge. And that one of the three main barriers to integration is lack of engagement of the “Third Sector” in participating in the delivery of integrated care services.”</p> <p>A respondent provided a statement reviewing the problem:</p> <p>P1: “From my point of view, we already</p>	<p>there is a real opportunity to learn from other regions and organisations in Europe how to manage innovation processes better and more effectively.”</p> <p>R2: “In terms of innovation management I think there are certain things were I see you come further, were we really want to work and improve and that is not that cohesive, much more of a cohesive process in Scotland in terms of innovation management. Mandate, clear mandates and roles, such an important aspect, of course funding is also important but just to have that, in Scotland you have 8 innovation</p>	<p>not developed. Some progress has been made though for example by preparing a new Electronic Health Act, concept of sharing of health data and eHealth strategy (2016). [...] The major issue for the Olomouc Region is to recognise the widespread of eHealth services as a routine part of the healthcare delivery and patient journey, wider Czech Republic the progress in this area has been made mostly on the voluntary basis of involved stakeholders. There is no ICT infrastructure to allow electronic exchange of data, including access to electronic health records. In addition, legislation is lacking to</p>

Concept Problem	Case 1 Puglia	Case 2 Basque Country	Case 3 Third sector Scotland	Case 4 Scotland IM	Case 5 Norrbotten
	thinking forward.”		knew something about the general framework and legislation in Scotland because we have been working quite a lot together. And we wanted just the confirmation whether legislation for integration is important and whether it can make a difference, and I now have the confirmation that it would make a difference in Puglia.”	centres with different responsibilities, in Norrbotten we do have different innovation centre, one joint with municipality and university. We all invested money into it, so were ploughing money into it but have a very unclear mandate. Very unclear.”	support a wider implementation of eHealth services in the Region.” CR2: “Importance of shared electronic health record and associated organisation measures, which I can explain. These are the aspects how to actually introduce the electronic health records, the shared electronic health record in environment that we have. That means with many health care providers different owners and also with their diverse information systems. And will need really stronger reflection in either legislation in the new eHealth law, which is to be

Concept Problem	Case 1 Puglia	Case 2 Basque Country	Case 3 Third sector Scotland	Case 4 Scotland IM	Case 5 Norrbotten
					prepared soon. Or in other legislative documents. Because without it would be really difficult to build any integration care or to do integration care as such in health care. Because sharing the information is essential. It is one of the key points we learned here [...]"
Receiving region 2	For Olomouc, the challenge was described in the fact that “the role of ICT as an enabler of service redesign is not well recognised and digital healthcare services are not developed.” [...] Hence the opportunity to learn about these features and their potential transferability to Olomouc region.”		In the action plan of Basque country the problem was described as: “The Third Social Sector (TSS) in the Basque Country and the public sector collaborate in the provision of social services of general interest, however, the public sector needs to contemplate new forms of relationship		

Concept Problem	Case 1 Puglia	Case 2 Basque Country	Case 3 Third sector Scotland	Case 4 Scotland IM	Case 5 Norrbotten
	<p>One respondent indicated about the problem:</p> <p>C1: “This is not only the practice as such but also some idea for our environment, our context in the Czech Republic. What we can do as this quite critical to do the changes in our system which is quite rigid. Quite resistant to any kind of change, of that kind, that means integration of various levels, of integration of social care. That means that this was a very good experience here and also make use of all the opportunities to get more information how it is done.”</p>		<p>with civil society that allow progress in a model of open administration and participatory governance and society.” [...] “there is a need to involve the Third Social Sector in the provision of integrated care [...], in particular in relation to financial sustainability of the services and lack of resources.”</p> <p>ES3: “From my point of view with the community at local level, this experience has helped me to realise that we shouldn’t make so much effort in trying to people participate in our initiatives. What we think is good for the community.</p>		

Concept Problem	Case 1 Puglia	Case 2 Basque Country	Case 3 Third sector Scotland	Case 4 Scotland IM	Case 5 Norrbotten
			Rather than watch and see where they are participating, where are they putting their interest, and try to facilitate their involvement in those activities.”		

Appendix I Type of knowledge mobilisers and receivers and type of knowledge transferred or needed during the KT activities of SCIROCCO.

*Categories retrieved from Ward et al (2012;2017): *Categories for type of knowledge donor/receiver*: Professional knowledge producers who produce empirical and/or theoretical knowledge and evidence (**KPs**), Frontline practitioners and service providers responsible for delivering services to members of the public (**Pra**), Members of the public acting as or on behalf of their communities and people in receipt of services (**SUs**), Decision makers responsible for commissioning services and/or designing local/ regional/national policies and strategies + policy makers (**DMs**), Product and programme developers responsible for designing, producing and/or implementing tangible products, services and programmes (**Dev**). *Categories for the type of knowledge*: Scientific / factual knowledge - research findings, quality and performance data, population data and statistics, evaluation data (**Sc**), Technical knowledge - practical skills, experiences and expertise (**T**), Practical wisdom - professional judgments, values, beliefs (**Wi**).

	Transferring region	Receiving regions	
Case 1	Puglia	Scotland	Olomouc
Context			
Not feasible to transfer		Information & eHealth, Finance & Funding	
Feasible but with lots of efforts		Removal of Inhibitors (Professional context: Recruitment of GPs remains a big challenge [...]), Citizen Empowerment, Evaluation Methods (Professional context: [...]) The resistance of healthcare professionals to share data needs to be better addressed as well.)	Readiness to Change (Professional context: However, awareness raising activities may active a change and the need for change has already been recognised by many experts and managers actively participating in health and social care.) , Structure & Governance, Information & eHealth (Organisational context: There are plans on the national level to develop solutions and platforms to allow information

	Transferring region	Receiving regions	
			sharing. However, this is a very challenging issue due to fragmentation of care providers who own the ICT systems [...]) , Standardisation & Simplification, Finance & Funding, Removal of Inhibitors (Professional context: There are essentially no recognised barriers on professionals' side (managers, medical) to introduce innovations such as this Good Practice but the healthcare system is strongly based on fee-for-service scheme), Breadth of Ambition, Innovation Management
Feasible with some/certain/further efforts		Standardisation & Simplification, Population Approach	Population Approach, Citizen Empowerment, Evaluation Methods, Capacity Building (Professional context: There is training of healthcare professionals in place, even though some Curricula should be upgrade)
Feasible with no need for major adaptation		Readiness to Change, Structure & Governance, Breadth of Ambition, Innovation Management, Capacity	

	Transferring region	Receiving regions	
		Building	
Knowledge (data retrieved from action plans, focus groups and study visit programmes)			
Type of knowledge donors (transferring region) and type of knowledge receivers (receiving regions)	Pra & Dev (P1: “we involved clinicians, nurses, technicians, also, company that implemented the technology”) DMs (P1: “[...] our policy maker that attended the meeting [...]”), (“[...]I could see today from the directors that were really surprised and happy that we managed to get to the point to becoming interesting for other countries.)”	Dev & DMs (S5: “Well we approached people that we knew about telemonitoring from a policy and implementation perspective.”) (i.a. Service Development Manager, Head of International Engagement, International Engagement Manager Scottish Government TEC and Digital Health and Care Division)	Pra (C1: “We took our clinicians together, that means to have a medical arm, to understand the visit from their point of view and it was very useful.”) Dev (Project Manager for International Projects)
Type of knowledge (offered by transferring region and needed by receiving region) (data retrieved from action plans, focus groups and study visit programmes)	Sc (-The analysis of data related to the monitoring of about 100 patients allows better understanding of the effectiveness of the remote monitoring system and to what extent it improves the quality of care for patients. -There is evidence that the GP is economically viable, and it brings benefits to the target group.) T (S3: “I think the wealth of and generosity of sharing this information as you would say, the challenges, your whole experience, your generosity of	Adaptation of the features in Scotland: Sc (Evaluation methods: Improve publishing of evaluation data and demonstrate the impact, Improve real-data collection) T (Citizen empowerment: Embed the education about the importance of citizen empowerment and active participation in schools” curricula) Wi (Removal of inhibitors: Improve flexibility of engaging with GPs on the individual basis; there is no “one size fits all approach”,	Adaptation of the features to Olomouc’s local context: T (Readiness to change: Introduce new legislation related to digital healthcare and integrated care; development of strategy of integrated care is currently on-going, Finance and Funding: Promote multi-sourced and coordinated funding which would include investment in technologies, updates of the reimbursement schemes [...]) Wi (Readiness to change:

	Transferring region	Receiving regions	
	<p>sharing all of that amongst us all is very much appreciated.”)</p> <p>Wi (S2 about the practical site visit: “And that there were so many people there, the general practitioners, the consultants, nursing staff and technical staff, that showed that this was really a collaboration and we felt that.”)</p>	<p>Encourage learning about the ways of how to engage with general practitioners and promote GPs nationally and beyond to facilitate scaling-up of successful stories),</p> <p>Citizen empowerment: (Increase public awareness about the benefits of technology enabled care solutions)</p>	<p>Organise information campaigns to raise awareness about the benefits of the GP for the stakeholders involved, policy-makers and healthcare professionals in particular,</p> <p>Encourage new way of working; a need for improved collaboration and partnerships-building among stakeholders involved)</p>
Case 2	Basque Country	Norrbottn	
Not feasible to transfer		<p>Structure & Governance (Professional context: It would also need professionals who are motivated and have clear leadership in place who have knowledge of the benefits of more involved patients),</p> <p>Finance & Funding, Removal of Inhibitors</p>	
Feasible but with a lot of efforts		<p>Readiness to Change (Professional context: It is necessary to have a legal framework for integrated care solutions and ethics committees in place in order to ensure that new methods are in line with</p>	

	Transferring region	Receiving regions	
		Norrbottn's values and professional ethical codes for employees [...] , Standardisation & Simplification (Organisational context: The advanced care plan needs to be adapted in order to have homogeneous technical standards throughout the different organisations involved. The document needs to be accessible by patients and all healthcare professionals involved.), Evaluation Methods, Capacity Building (Organisational context: The need for continuous learning needs to be embedded in the routine practice.)	
Feasible with some/certain/further efforts		Citizen Empowerment, Breadth of Ambition, Innovation Management	
Feasible with no need for major adaptation		Information & eHealth (Organisational context: There is an integrated infrastructure in place to allow sharing of clinical information between the different levels of care in Norrbotten. There is also integrated electronic health record in place.) Population Approach	

	Transferring region	Receiving regions	
Knowledge			
Knowledge donors/receivers	KPs (Research & Development Coordination Manager) Pra (Medical Doctor and Nurse) Dev (Project Manager, Procurement and Insurance Directorate, Quality and Health Information System) DMs (Head of Integrated care and Chronicity Service and Director of Kronikgune)	Dev (N6: “[...] she works with the development and very close to the clinical site, also much closer than we do, [...].) (Project Director of the Development department, Improvement Strategic Officer, Business developer) Pra (N6: “[...]she is a registered nurse and she works for a palliative care team”)	
Type of knowledge	Sc (The GP has not yet been formally evaluated. Nonetheless, taking into considerations the views and perceptions of participants in the ACP (patients, families, GPs and community nurses), it seems that the Practice has proven to be invaluable.) T (N4: “I think that expectations has been fulfilled, it was a really great opportunity to get here and to see in real life how it works and like this team plan today with the patient and doctors.”) Wi : (N5: “And it is really interesting to hear also from the receiving region	Adaptation of the features to Norrbotten's context T (Readiness to change: Develop Implementation Plan for the adoption of GP, Support the need for a change with empowering of healthcare professionals to implement ACP GP through training and education. eHealth Services: There is a need for a development of new Health and Social Care Plan and the documentation system [...]) Wi (Readiness to change: Raise awareness about the benefits of the GP approach to GP leaders and	

	Transferring region	Receiving regions	
	that like it is not the document itself, that is the most important. It is the process of talking with your family about these issues.”)	implementers.)	
Case 3	Scotland	Basque Country	Puglia
Context			
Not feasible to transfer		Finance & Funding	
Feasible but with lots of efforts		Population Approach, Citizen Empowerment, Evaluation Methods, Innovation Management, Capacity Building	Readiness to Change, Structure & Governance, Information & eHealth, Standardisation & Simplification
Feasible with some/certain/further efforts		Readiness to Change, Structure & Governance, Standardisation & Simplification	Removal of Inhibitors (Professional context: There is a need for continuous training sessions for the stakeholders involved in the third sector. Information campaigns about the role and benefits of involving third sector in the care provision should be promoted) , Population Approach, Citizen Empowerment, Evaluation Methods, Innovation Management (Professional context: Continue with the training programmes for all stakeholders involved in the

	Transferring region	Receiving regions	
			delivery of health and social care, including third sector.)
Feasible with no need for major adaptation		Information & eHealth, Removal of Inhibitors (Professional context: Some improvements need to be done around the implementation and change of culture) , Breadth of Ambition	Finance & Funding, Capacity Building (Organisational context: There is already an organisational structure in place to facilitate the training)
Knowledge			
Knowledge donors/receivers	Pra (S1: “We primarily focused on the voluntary organisations. We tried to give the picture of the national versus what is happening at the local level or in practice.”) DMs (i.a. Policy and Development Officer, Coalition of Care and Support Providers) Dev (i.a. Service Development Manager) SUs (Site visit to GRACE and Carr Gomm)	Dev & DMs (ES1: “What we tried to involve people from different specialities that hold the social and health system need. People from the social system, from the health system and the coordination of the health system. ES2: Concretely from community level, social level and the innovation level.”) (i.a. Head of Integrated care and Chronicity Service and participants working for the Basque Government.) KPs: (One participant worked at Basque Foundation for Health Innovation & Research)	Dev & SUs (I1: “[...]we wanted to involve the innovation level which is the agency represented by us. And also, health programming point of view, and the other hand is social programming view. And the civic presentation, which is for us really important, their point of view.”) DMs (i.a. Social Programme Development Unit, Puglia Government.)
Type of knowledge	Sci (In principle, the success of engagement of the third sector is	Adaptation of features to the Basque Country’s context	Adaptation of features to Puglia’s context

	Transferring region	Receiving regions	
	<p>measured by its contribution to National Health and Wellbeing Outcomes Framework)</p> <p>T (ES3: “And I am sure we can take bits from the GRACE experience that we can take the most out of them within our environment and with our culture.”)</p> <p>Wi (I1: “Personally, I really liked that they involved us directly to transfer us the real meaning and the importance of what they do in the social service to inclusion. They made us play with iPad, it couldn’t be a better strategy because we had fun but at the same time, we truly got the message.”)</p>	<p>Sci (Evaluation Methods: [...]) Therefore, one option of how to improve evaluation of the third sector activities would be the creation of a working group [...]. The objective of this group would be to identify a set of indicators to measure participation of the TSS in the provision of integrated care which could be then included in the Osakidetza's Framework Contract.)</p> <p>T (Structure and Governance: The objective of the Directorate is to: - develop integrative mechanisms between professionals in order to direct and coordinate the commission of health and social care in each Integrated Care Organisation. -direct, promote and coordinate social and citizen participation in health and social care and thus enhancing citizens” co-responsibility and self-management of their health. Innovation management: A possible action is to reinforce the Euskadi Lagunkoia initiative (aims to</p>	<p>T (Readiness to Change: Embed Third Sector reorganisation in the regional policies and planning. Structure and Governance: Develop a roadmap for a change programme to unify social and health funding in order to deliver tailored solutions for chronic complex citizens. Breadth of Ambition: Need to adapt and reform third sector legislation in order to remove an organisational and financial fragmentation and deliver full integrated services.)</p> <p>Wi (Readiness to Change: Foster voluntary workers involvement in institutional initiatives and in decision making in order to facilitate and favour cultural change.)</p>

	Transferring region	Receiving regions	
		encourage the participation of older people and the general public to improve neighbourhoods and environments in the municipalities of Euskadi in order to continue living active life as we age.) in the three Basque provinces [...])	
Case 4	Scotland	Norrbottn	
Context			
Not feasible to transfer		Structure & Governance, Finance & Funding, Removal of Inhibitors (Professional context: [...] The dedication and continuous training of healthcare professionals seem to be crucial inhibitor in the Norrbotten's local context.)	
Feasible but with lots of efforts		Readiness to Change, Evaluation Methods, Capacity Building (Organisational context: The need for continuous learning needs to be embedded in the routine practice.)	
Feasible with some/certain/further efforts		Standardisation & Simplification (Organisational context: The innovation management plan needs to be adapted in order to be compatible with technical standards of all organisations involved),	

	Transferring region	Receiving regions	
		Citizen Empowerment, Innovation Management	
Feasible with no need for major adaptation		Information & eHealth, Population Approach, Breadth of Ambition (Organisational context: There is an integration between primary and hospital care levels established in the region.)	
Knowledge			
Knowledge donors/receivers	KPs (Head of Planning and Performance, Digital Health and Care Institute) DMs (i.a. Strategic partnership Director, Digital Health and Care Institute, Design Director, Digital Health and Care Institute, CTO Digital office and GCC.) Dev (i.a. International Engagement Manager, Head of Planning and Performance, Digital Health and Care Institute)	Dev (N2: "The three of us work for the development department, innovation is our responsibility. It is our area, to support research, innovation, improvement and eHealth development". i.a. Project Manager, Innovation Developer, Improvement Strategic Officer) Pra (N4: "I have been part of the working group of the SCIROCO project, I ended up there because I was working with integrated care as a nurse and have experience in development, implementation and maintenance.")	
Type of knowledge	T (presentations i.a. on Introduction to Digital Health and Care Institute, DHI Innovation model and	T (Readiness to Change: Develop implementation plan for the adoption of innovation, endorsed by	

	Transferring region	Receiving regions	
	methodology, Innovation management in Scotland, Involvement of regional health and social care authorities, universities and private sector companies and other sectors in the innovation process (i.e., “open innovation”) and creating the culture of change)	the policy-makers, including the clear assignments of roles and leaderships of all stakeholders involved in the implementation of new innovation processes. Innovation management: Develop instruments to support innovations.) Wi (Innovation management: Raise awareness about the need for innovation and new way of working. Readiness to Change: Raise awareness about the benefits of innovations to leaders and implementers.)	
Case 5	Norrbottn	Olomouc	
Context			
Not feasible to transfer			
Feasible but with lots of efforts		Readiness to Change (Professional context: [...] However, awareness raising activities may active a change and the need for change has already been recognised by many experts and managers actively participating in health and social care.), Structure & Governance (Professional context: The first step	

	Transferring region	Receiving regions	
		to be introduced can be around the awareness raising about the need and benefits of eHealth services) , Information & eHealth, Standardisation & Simplification, Finance & Funding, Removal of Inhibitors, Breadth of Ambition, Innovation Management	
Feasible with some/certain/further efforts		Population Approach, Citizen Empowerment, Evaluation Methods, Capacity Building (Professional context: There is training of healthcare professionals in place, even though some Curricula should be upgrade. There is a lot of ad hoc education at the pilot phase which should be expanded to continuous learning and training)	
Feasible with no need for major adaptation			
Knowledge			
Knowledge donors/receivers	KPs (CEO, Luleå University of Technology.) DMs (i.a. Deputy Regional Director) Dev (E-health Strategist) Pra (Chief physician, surgery, Reg. Nurse and Head of a primary care unit)	Pra (Medical doctor) Dev (i.a. Project Manager for International Projects.) DMs (Head of Heart Failure Department)	

	Transferring region	Receiving regions	
Type of knowledge	<p>T (i.a. presentations on Introduction to eHealth in Region Norrbotten, Introduction to eHealth in Region Norrbotten, Infrastructure for sharing health data between various healthcare providers, Qualifications of personnel in telemedicine services.)</p> <p>Wi (CR4: “I came here to get some practical information for telemedicine for especially heart failure patients, so were looking forward today to see the real practice in hospital. So, it was a little bit, I haven’t seen so much as I expected, but what I appreciate is how the system is done here in Sweden, I liked the electronic health record and the information from the patients is available to everyone, this was very...”)</p>	<p>Adaptation of features to Olomouc” local context</p> <p>T (eHealth services: -Develop mechanisms to reduce the complexity of introducing the concept of eHealth services. The ICT solutions to allow information sharing between various healthcare providers are expected to be soon developed. -Develop mechanisms to improve the communication and collaboration of key stakeholders by creating a joint committee between Ministry of Labour and Social Affairs and the Ministry of Health in order to better coordinate implementation of ICT solutions and raise awareness about the need to extend the sharing of health data to social care providers. This is currently not envisaged in eHealth strategy. -Develop mechanisms to enhance citizens empowerment and proactive approach of citizens to manage their own health and self-care. Changes in the reimbursement system and payment schemes can</p>	

	Transferring region	Receiving regions	
		<p>be seen as one of the incentives.)</p> <p>Wi (eHealth services Raise awareness and promote the benefits of eHealth services in order to speed up the implementation of new national eHealth strategy.)</p>	

Appendix J Type of Intervention, including responsible actors and Use of knowledge as indicated by the receiving regions

Intervention	Receiving regions	
Case 1	Scotland	Olomouc
Intervention		
Clarifying the type of intervention to be used (information management, linkage, decision/ implementation support, capacity development)	<p>Capacity development and Linkage Engagement with GPs: Objective of this action is to increase the engagement of general practitioners in the delivery of technology enabled care solutions, promoting the real benefits and opportunities of these solutions.</p> <p>Public awareness and engagement of citizens in service redesign: Objective of this action is to organise and promote awareness-raising sessions about the benefits of active engagement of citizens in the service redesign. This includes engagement with educational sector and embedment of the citizen empowerment in teaching's curricula.</p> <p>Information management Systematic evaluation and data collection: The objective of this action is to support publishing of evaluation data in the right time in order to demonstrate the value and impact of technology enabled care services. This also includes the quality of data collection in the real-life settings and better use of data collection infrastructure.</p> <p>S1: "Well I think we spoke quite a bit about data and data collection and what the opportunities might be to</p>	<p>Capacity development and Linkage Awareness raising campaigns: Increase awareness about the need for integrated care and its benefits for stakeholders involved.</p> <p>Create conditions to support a change towards more connected and coordinated health and social care services.</p> <p>Influence the planning and design of integrated care concept.</p> <p>Create a shared vision for integrated care:</p> <p>Raise awareness about a new way of working; partnership-building approach and its benefits.</p> <p>Capacity development and Decision and implementation support Create a shared vision for integrated care:</p> <p>Use of European Regional Development Fund (ERDF) to develop and implement a complex strategy for</p>

	improve that because it plays such a key role.”	<p>integrated care and digital healthcare.</p> <p>Information management</p> <p>“C1: When we were sitting here, and doing the exercise with the scirocco tool we predesigned a GP. [...] good basis for a new project that would integrate care of the cardiologists, that are not within the hospitals and are somewhere in the regions, and also the general practitioners that take care of the particular patient, how was in care of our hospital. That means to extent the information about the care that was given to the patient in the hospital also to specialist, cardiologist for example and general practitioner, which is associated with the patients.”</p>
Responsible actors	A total of 9 responsible actors were listed including e.g. the government, partnerships and NHS	No specific responsible actors were indicated. C1: “[...] We are preparing proposals for this including technical specification and other necessary documents that would specify in price, the equipment, we know how to do it and we know we can estimate that it will be done in outline. We have direct access to decision-makers.”
Use		
Deciding how the knowledge will be used: knowledge was used in a	Knowledge will be used conceptually	Knowledge will be used conceptually and politically

range of different ways: directly (i.e. with little modification), conceptually (i.e. to change opinions) or politically (i.e. to confirm or challenge practices or policies) (Weiss,1979).		
Knowledge used politically	Policy implications: a total of four existing programmes, plans and strategies were described which support the priority actions in Scotland.	There has been a new strategy developed for integrated care at national level in Czech Republic in August 2018. New models of care are introduced and piloted across the country. As such, there is an opportunity to feed the learning about Hospital@Home GP rather than reinvent the wheel.
<p>Practicalities of use / why knowledge is being mobilised?</p> <ul style="list-style-type: none"> • To develop local solutions to practice-based problems (So) • To develop new policies, programmes and/or recommendations (Po) • To adopt / implement clearly defined practices 	<p>The learning about the Hospital@Home GP showed clear similarities of Puglia Region and Scotland's vision of how to transform care delivery. The main focus in both regions is to look for the primary care led solutions which would help to shift the balance of care from hospital to community settings, increase capacity and reduce the demands on health and social care services. A number of opportunities were identified in Scotland, namely:</p> <ul style="list-style-type: none"> -Opportunity to improve engagement of GPs in the delivery of technology enabled care solutions. [...] - Opportunity to improve the funding of care transformation. [...] -Opportunity to better promote benefits and impact of technology enabled care solutions in order to facilitate their “buying”. [...] -Opportunity to 	<p>[...] would contribute to the improvement of a number of outcomes:</p> <ul style="list-style-type: none"> -Decreased a need for hospital beds -Improved care of chronically ill, including those discharged from hospital -Reduced number of reduce the number of unstable patients with chronic diseases. • To develop local solutions to practice-based problems (So) •To (further) develop new policies, programmes and/or recommendations (Po)

and policies (Imp) • To change practices and behaviours (Ch) • To produce useful research / scientific knowledge (Know)	better target citizens who would benefit most from technology enabled care solutions. [...] • To (further) develop new policies, programmes and/or recommendations (Po) • To change practices and behaviours (Ch)	• To adopt / implement clearly defined ideas of transferring regions on practices and policies (Imp)
Case 2	Norrbotten	
Clarifying the type of intervention to be used	<p>Information management R5: “I think I reflected with the other participants yesterday about this as she is not here today. We said that one thing we take with us, but that is maybe not doable right now, is that the timeline which you had in your journal (sort of electronic care plan) that also contained information from other care givers as well, that was like a really wow we would love to have it.”</p> <p>Decision and implementation support and Linkage <u>Develop an implementation plan for the ACP:</u> Introduce new way of working that extends the current organisational barriers, including responsible actors, leadership, processes and anticipated duration.</p> <p><u>Introduce a new Health and Social Care Plan:</u> Improve citizen empowerment and engagement in the decision-making processes in the planning and implementation of health and social care interventions.</p> <p>Capacity development and Linkage <u>Improve education of healthcare professionals:</u></p>	

	Join the efforts in providing the same level of education and training to all healthcare professionals involved.	
Responsible actors	Not indicated in action plan, but in focus groups. R6 indicated: “Expect to our daily work we have a local steering group, which has some of the decision-makers which are also responsible for regional wide decision. They have the responsibility, from our steering group, to bring that further. So, we report to them, we give them suggestions, and we say these are the actions we need to take. And this will also be part, as we report to them, what we do in the project. [...] From this best practice, this is also, in terms of the analyses and what we should do from now on, we also recommend these steps within this area, and then they are responsible for actually handling these results.”	
Deciding how the knowledge will be used: knowledge was used in a range of different ways - directly (i.e. with little modification), conceptually (i.e. to change opinions) or politically (i.e. to confirm or challenge practices or policies) (Weiss, 1979).	Knowledge will be used directly, conceptually (i.e. to change opinions) and politically	
Knowledge used	In order to implement the ACP GP, the following policy	

politically	<p>actions need to be considered:</p> <ul style="list-style-type: none"> -the GP needs to be embedded in the existing policies and strategies related to integrated care and digital healthcare in order to secure the leadership for its implementation. The new way of working could be well integrated into the operating care model in Norrbotten Region and as a part of new Strategy for Future Health Care. -Adaptation of the Advanced Care Plan to comply with the technical standards across the different organisations. New guidelines and standards are required for the entire nation, to facilitate regional decisions on changing methods. -Adaptation of the funding system to support the time release of healthcare professionals. Current system is based primarily on the number of visits needs to change to calculate the value for the patient. This is a system shift that takes time in a hierarchical organisation. [...] 	
<p>Practicalities of use / why knowledge is being mobilised?</p> <ul style="list-style-type: none"> • To develop local solutions to practice-based problems (So) • To develop new policies, programmes and/or recommendations 	<p>The adoption of Advance Care Planning (ACP) GP in Norrbotten Region would enhance a new way of working in planning and implementation of health and social care interventions for patients in a need for advanced care planning. It would improve the opportunities for the patients to make their own decisions on care, including end-of-life care. This approach would complement new Strategy of Norrbotten Region: The Road to the Future Health and Care which outlines a paradigm shift for healthcare from citizens” perspective. The approach will</p>	

<p>(Po)</p> <ul style="list-style-type: none"> • To adopt / implement clearly defined practices and policies (Imp) • To change practices and behaviours (Ch) • To produce useful research / scientific knowledge (Know) 	<p>change working methods and create new services that shape a new care delivery; a healthcare that meets the needs of each person on equal basis. The new ways of working will also facilitate the provision of new skills required for such a change.</p> <ul style="list-style-type: none"> •To change practices and behaviours (Ch) •To (further) develop new policies, programmes and/or recommendations (Po) •To adopt / implement clearly defined ideas of transferring regions on practices and policies (Imp) 	
Case 3	Basque Country	Puglia
<p>Clarifying the type of intervention to be used These included information management (e.g. gathering, sharing and packaging information), linkage (e.g. bringing people together or facilitating dialogue), capacity development (e.g. learning from the KE process and ensuring sustainability) and</p>	<p>Capacity development and Linkage Strengthen the representation of the third sector in various participation bodies at Integrated Care Organisations (ICOs)” level: Encourage the third sector to participate in decision making processes, regarding population’s care in the area where the ICOs operate.</p> <p>Information management and Linkage Include indicators on participation of third sector in the provision of integrated care into the Osakidetza's Framework Contract and the Preferred Offer of ICOs: Promote communication between the ICOs and the third sector, agree common objectives and involve the third sector as an active agent in the provision of integrated care.</p> <p>ES3: “And I am sure we can take bits from the GRACE</p>	<p>Decision and implementation support Reform of the third sector at a regional level: Embed third sector collaboration in the regulation and policies related to health and social care service delivery.</p> <p>Information management, Capacity development and Linkage Reform of the third sector at a regional level: Map and coordinate third sector initiatives including at a regional level and thus facilitate the partnership building in order to systematically share strategies and co-design the Action Plans.</p> <p>Capacity development and Decision and implementation Integration of funding system: Overcome the fragmentation of funding for</p>

decision and implementation support (e.g. advising as a critical friend/outsider).	<p>experience that we can take the most out of them within our environment and with our culture. And also, we have to see how the structure, the governmental structure as department of health, department of social and research innovation, how all the blocks are put together to make it easy for implementation in the local level.”</p> <p>Decision and implementation support and Linkage</p> <p>Reinforce the Euskadi Lagunkoia initiative in the three Basque provinces and extend Adinberri Gipuzkoa to the whole Basque Country: To extend an innovative initiative that encourages the participation of all the actors involved in the care continuum of older people, promotes and environment of cooperation towards the common objectives.</p>	<p>integrated care service</p> <p>Promote the scaling up of existing pilots (e.g. Buoni Servizio) carried out in Puglia on the definition of “Health and Social Care Pathways” (PDTA) and related co-payment system “concept” to be shared between health and social sector (integration of funds)</p> <p>Information management and Capacity development</p> <p><u>Improved data collection and information sharing</u></p> <p>Make possible the full implementation of the concept of personalise medicine and “big data” in order to inform the definition of the Health and Social Care Pathways and protocols (PDTA). Accelerate the integration of ICT platform in order to share data (across health and social care settings)</p> <p>Information management and Linkage</p> <p>I1: “Yes, certainly this self-directed support is something I will bring back home and discuss with my directors.”</p>
Responsible actors	Department of Employment and Social Policies, Formal Deputations of the three provinces, Department of Health, Osakidetza's Executive.	The regional Agency for Health and Social Service (ARESS), Department for Health Promotion, Social Affair and Sports for all.
Deciding how the	Knowledge will be used conceptually and politically	Knowledge will be used conceptually and politically

knowledge will be used: knowledge was used in a range of different ways - directly (i.e. with little modification), conceptually (i.e. to change opinions) or politically (i.e. to confirm or challenge practices or policies) (Weiss,1979).		
Knowledge use politically	<p>Policy implications.</p> <ul style="list-style-type: none"> -It will be necessary to extend health strategic lines of both the Department of Health and Osakidetza's Health Plan, to involve third sector's representatives in the Osakidetza's ICOs. -It will be necessary to reinforce transversal evaluation to fortify horizontal integrated care and strengthen the coordination between stakeholders involved. -It will be necessary to extend innovation in the health sector to include the Third Social Sector (TSS) organisations. 	<p>The regional Agency for Health and Social Service (ARESS) provides the technical support for Department for Health Promotion, Social Affair and Sports for all.</p> <p>The Agency main role is to foster health and social Innovation processes in the region.</p> <p>As such, the Agency will be involved in developing these priority actions further, e.g. by forecasting the skills, competences and knowledge needed for their implementation, including the development of feasibility study and SWOT analysis</p> <p>As a result, the Agency might consider useful to propose to the Department for Health Promotion, Social Affair and Sports for all to develop a Memorandum of Understanding with Scotland as a coaching region in order to support the transferability, adaptation and embedment of this</p>

		successful experience of Scotland in engaging the third sector in the provision of integrated care.
<p>Practicalities of use / why knowledge is being mobilised?</p> <ul style="list-style-type: none"> • To develop local solutions to practice-based problems (So) • To develop new policies, programmes and/or recommendations (Po) • To adopt / implement clearly defined practices and policies (Imp) • To change practices and behaviours (Ch) • To produce useful research / scientific knowledge (Kno) 	<p>There is a clear need to create a framework that defines the relationship between the health, social and third sectors in the Basque Country, including:</p> <ul style="list-style-type: none"> -Agreement on common objectives and creating a vision of “working together” -Prioritisation of activities -Involvement of sectors in the decision-making bodies related to integrated care -Identification of added value of “working together” approach and breaking down the silos -Promotion of intersectoral communication and collaborations -Promotion of citizen participation in health matters. <p>Involving the third sector in the provision of integrated care would guarantee the most appropriate response to the needs of citizens at a right time; providing the citizens with resources and capacity to make and act upon their own decisions.</p> <p>In addition, involving the third sector in the provision of integrated care would also mean greater efficiency and use of resources and capacities in the Basques society.</p> <p>The Third Social Sector benefits from a better knowledge of people needs due to its proximity, empathy and active listening of citizens and promoting their active</p>	<p>In Puglia, there are several third sector organisations (TSOs), however, their activities seem to be rather fragmented and not strongly aligned with a common integrated care vision. Scotland” s experience can help the Puglia Region to systematise the activities of the third sector by creating a more homogeneous regulatory and organisational framework in order to improve the involvement of TSOs.</p> <p>In Scotland there are many TSOs working in social care, providing support for vulnerable and marginalised groups who frequently face poverty, social care needs and poor health. There are also organisations working in prevention, particularly in the area of food and healthy eating initiatives. Working closely with communities is a key remit of the third sector approach. In many case, organisational structure and aims are defined by the needs of a particular community in order to fill the gaps in the service provision. Third sector initiatives are very often are based on the development of social networks which are very powerful tool to improve social capital and reduce isolation. This in turn results in the improvement of health outcomes.</p>

	<p>participation in the society. In turn, this would mean bringing citizens closer to the administration which would potentially lead to an improvement in the provision of coordinated and integrated care.</p> <ul style="list-style-type: none"> • To develop new policies, programmes and/or recommendations (Po) • To change practices and behaviours (Ch) 	<p>There is now a consensus that health and social care services in Puglia Region need urgent attention. Knowledge and ability to respond to this need is often hampered due to complicated communication channels. As organisations embedded in service users' communities, TSOs are often able to overcome these communication barriers. This Action Plan will aim to demonstrate that TSOs have the potential to meet the growing needs and positively contribute to the improvement of integrated care services in Puglia region.</p> <ul style="list-style-type: none"> • To develop new policies, programmes and/or recommendations (Po) • To change practices and behaviours (Ch) • To adopt / implement clearly defined ideas of transferring regions on practices and policies (Imp)
Case 4	Norrbotten	
<p>Clarifying the type of intervention to be used</p> <p>These included information management (e.g. gathering, sharing and packaging information), linkage (e.g. bringing people</p>	<p>Decision and implementation support and Linkage</p> <p>Develop an implementation plan for innovation management: Stimulate innovations that extend the current organisational barriers, including organisation of responsible actors, leadership, processes and anticipated duration.</p> <p>Capacity development and Linkage</p> <p>Improve education of leaders: Join the efforts in</p>	

together or facilitating dialogue), capacity development (e.g. learning from the KE process and ensuring sustainability) and decision and implementation support (e.g. advising as a critical friend/outsider).	<p>providing the same level of education to all leaders involved in innovation management.</p> <p>Visualise good examples of innovation to workforce and wider citizens: Improve citizen empowerment and engagement in the decision-making processes in the planning and implementation of health and social care interventions.</p> <p>R2: “In terms of innovation management I think there are certain things where I see you come further, where we really want to work and improve and that is not that cohesive. Much more of a cohesive process in Scotland in terms of innovation management. Mandate, clear mandates and roles, such important aspects.”</p>	
Responsible actors	<p>Not mentioned, but in focus group R2 mentioned: “I think both, within the project and outside, because we have a steering group that is responsible for the regional results. They are also responsible for handling the suggestions, actions we suggest. Beside of that our development department we have the role and responsibility of supporting innovation management. There are things we can already point out to our director of development what see needs to bring forth to the table to take decisions on.”</p>	
Deciding how the knowledge will be used: knowledge was used in a range of different ways -	Knowledge will be used conceptually and politically	

directly (i.e. with little modification), conceptually (i.e. to change opinions) or politically (i.e. to confirm or challenge practices or policies) (Weiss, 1979)		
Knowledge use politically	<p>In order to improve innovation management, the following policy actions need to be considered:</p> <ul style="list-style-type: none"> -Guidelines and a strategy for innovation management needs to be embedded in the existing policies and strategies related to development of methods and technologies in order to secure the leadership for implementation. The innovation management could be integrated as a part of new Strategy for Future Health Care in Region Norrbotten. -Adaptation of the innovation management at a regional level. New guidelines and standards are required for the entire nation, to facilitate regional decisions on implementation of innovation management. Strategies and guidelines for training on the use of innovative methods need to be developed and implemented in e-learning platforms. -Documents and policies that statutes how the dissemination of innovative solutions need to be visualised. 	

<p>Practicalities of use / why knowledge is being mobilised?</p> <ul style="list-style-type: none"> • To develop local solutions to practice-based problems (So) • To develop new policies, programmes and/or recommendations (Po) • To adopt / implement clearly defined practices and policies (Imp) • To change practices and behaviours (Ch) • To produce useful research / scientific knowledge (Kno) 	<p>[...] The need for innovation and innovative solution of working are greatly recognised as a priority for the Norrbotten's healthcare system. The region is very much mature in innovation and its spread is encouraged at every level of health and social care. However, the overall strategy and plan how to manage the innovation and scale-up innovative solutions on large scale remains a challenge. Improved innovation management can lead to a number of benefits for Norrbotten's healthcare system including:</p> <ul style="list-style-type: none"> -Improved access to care that is tailored to the individual needs of citizens; -Improved efficiency of working methods and workforce organisation; -Improved cost-effectiveness and cost-efficiency of health and social care. • To change practices and behaviours (Ch) • To develop new policies, programmes and/or recommendations (Po) 	
Case 5	Olomouc	
<p>Clarifying the type of intervention to be used</p> <p>These included information management (e.g. gathering, sharing and packaging</p>	<p>Capacity development</p> <p>Improved awareness and recognition of the need for eHealth services: The objective of this action is to increase awareness of the key stakeholders of the benefits of eHealth services in order to speed up the adoption of new eHealth strategy.</p>	

information), linkage (e.g. bringing people together or facilitating dialogue), capacity development (e.g. learning from the KE process and ensuring sustainability) and decision and implementation support (e.g. advising as a critical friend/outsider).	<p>Inform about new technology enabled care services: The objective of this action is to raise awareness about new technology enabled care services and their benefits, e.g. video-conferencing system.</p> <p>Position the role of the University Hospital Olomouc (UHO): The objective of this action is to raise the profile of the UHO in developing ICT infrastructure for information sharing.</p> <p>CR3: “The shared documentation I think it can be a great benefit for all the doctors, maybe the communication with patients, we do conference, is something which is not widely accepted in our country. But maybe for some kind of patients it could be real advantage not to go to hospital because of age and comorbidities and so on. For sure, there was a number of situation or points which are useful which are inspiration for the modification in our approaches for our country.”</p>	
Responsible actors	[...] the coordination and clear definition of responsibilities of various stakeholders involved in the implementation process need to be addressed in order to manage this change effectively. This in particular involves the collaboration of four key stakeholders: Ministry of Health, insurance companies, healthcare providers and medical societies.	
Deciding how the knowledge will be used: knowledge was used in a range of different ways -	Knowledge will be used conceptually and politically	

directly (i.e. with little modification), conceptually (i.e. to change opinions) or politically (i.e. to confirm or challenge practices or policies) (Weiss, 1979)		
Knowledge use politically	<p>Positioning of eHealth agenda in Olomouc Region and wider Czech Republic is a very complex and long process. The main issue remains political sensitiveness of this agenda which strongly affects the allocation of budget and planned investments in this area. [...]</p> <p>However, the introduction of new eHealth strategy in 2016 as a legal framework for the implementation of ICT solutions may help to address this issue. The University Hospital Olomouc plays a very active role in contributing to the implementation of strategy and is one of the key players that can help to implement the priority actions defined in this plan.</p>	
<p>Practicalities of use / why knowledge is being mobilised?</p> <ul style="list-style-type: none"> • To develop local solutions to practice-based problems (So) • To develop new policies, programmes 	<p>A number of opportunities for improvement of eHealth services in Olomouc Region and the Czech Republic were identified at both strategic and implementation level.</p> <p>Electronic exchange of health information between a variety of healthcare providers is an inherent part of implementation of eHealth services in Norrbotten Region as well as across Sweden. As the implementation of this concept in Olomouc Region does not progress sufficiently, compared to other EU countries, further</p>	

<p>and/or recommendations (Po)</p> <ul style="list-style-type: none"> • To adopt / implement ideas and policies (Imp) • To change practices and behaviours (Ch) • To produce useful research / scientific knowledge (Kno) 	<p>efforts will need to be made around the promotion of benefits of using eHealth services as part of the routine operation of all healthcare providers. As a result, both the healthcare system as well as patients will benefit from this opportunity in terms of accessing the accurate health data in the right time and right place.</p> <p>The study visit to Norrbotten Region inspired the visiting clinicians which suggested to promote and inherit this concept of data exchange in order to improve current workflow. This new concept should be tested in Moravia in Olomouc Region for the patients with advanced heart failure. In addition, the University Hospital in Olomouc Region is planning to upgrade its ICT system and introduce a concept of data exchange. Outcomes of the twinning activities with Norrbotten Region will directly inform these developments.</p> <ul style="list-style-type: none"> • To change practices and behaviours (Ch) • To develop new policies, programmes and/or recommendations (Po) • To adopt / implement clearly defined ideas of transferring regions on practices and policies (Imp) 	
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