



MasterMind

Deliverable D3.5

*Final Evaluation Report*

**MASTERMIND**

“Management of mental health  
diSorders Through advancEd  
technology and seRvices –  
telehealth for the MIND”

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## EXECUTIVE SUMMARY

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This document contains the final evaluation report for MasterMind. The report consists of the outcomes from the three trials in WP5, WP6 and WP7 based on data gathered from the pilots and data from the central database. It uses the approach based on MAST methodology.

The MasterMind project aims to make high quality treatment for depression more widely available for adults suffering from the illness through the use of ICT. A major cause of morbidity worldwide, depression is characterised by its high incidence and social cost, and the proven clinical effectiveness of ICT in its treatment.

The data in the report is based on both quantitative and qualitative data. The data provides the possibility to understand the meaning (qualitative) of the facts (quantitative) for patients, healthcare professionals and organisations, and the interplay of all stakeholders. Some of the data in the deliverable have been provided directly for the report, while other data are extracted from the project's central database (Arsenàl.IT, Veneto region). In addition, the report includes lessons learned and recommendations from all involved sites.

At the end of the project, 11,573 patients have received treatment using cCBT, ccVC or a combination of ccVC and cCBT. Information on 3,518 of these patients has been uploaded to the central database, and has been used for the data analysis in this report. Data on 9,703 healthcare professionals involved in cCBT, ccVC or a combination of cCBT and ccVC has also been uploaded to the central database, and provided the basis for background information about the professionals involved in the project. In addition, a number of health care organisations have provided data on organisational aspects.

Overall, the patients report a high perceived satisfaction with ccVC and cCBT, and the service is seen as well integrated. The majority of the patients report a high quality of the treatment, and that they have received the kind of treatment they wanted. The data shows that depending on the aim, positioning, and role of the services in the local healthcare system, the majority of patients' depressive symptoms decreased throughout the project period. Clearly, a steep learning curve for involved organisations in providing the services in a reliable and stable manner was visible, and an increase in favourable clinical outcomes was noted towards the end of the study period.

The majority of the health professionals were satisfied with the services and would use them again. A great part of the professionals report that the services meet their needs in the treatment of their patients. Mostly, the professionals indicate that the services are more appropriate to clients with mild to moderate symptoms, although the data show a large number of patients experiencing severe depression when entering the services. More research is needed to explain this discrepancy.

For the majority of the patients, cCBT and ccVC are acceptable and appropriate solutions. However; it is always important to meet the individual needs of the patients; for patients where cCBT and ccVC are not useful, it is important to have other solutions. In the treatment of depression, it is important to have a variety of solutions to ensure personalised treatment; this project demonstrates that cCBT and ccVC can be useful solutions.



A reliable and stable technical solution is one of the key issues for implementing cCBT and ccVC; it is very important to invest time in finding the right solution, and to align it with the individual needs of the organisation. It is recommended to establish continuous support and coordination when maintaining cCBT and ccVC in routine practice, including manuals, guidelines, and technical assistance, covering topics such as organisation, documentation, reimbursement, support, training, and technical issues.

It is important to involve the management of the organisation in the implementation of cCBT and ccVC; all interviewees underlined the importance of involving senior management throughout the process. Our data shows that there was no clear, recognisable, and shared implementation strategy in any site. As such, more emphasis should be placed on translating and operationalising decisions, management commitment and leadership into concrete implementation strategies and implementation interventions.



## TABLE OF CONTENTS

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<b>EXECUTIVE SUMMARY</b>	<b>3</b>
<b>TABLE OF CONTENTS</b>	<b>5</b>
1.1 PURPOSE OF THIS DOCUMENT	6
1.2 AIM OF MASTERMIND	6
1.3 STRUCTURE OF DOCUMENT	7
1.4 GLOSSARY	7
<b>1 STUDY DESIGN</b>	<b>8</b>
<b>2 GENERAL RESULTS – DOMAIN 1: HEALTH PROBLEM AND CHARACTERISTICS OF THE APPLICATION</b>	<b>10</b>
2.1 INTRODUCTION	10
2.2 PREVALENCE OF DEPRESSIVE DISORDER	10
2.3 INTERVENTIONS	10
2.4 NUMBER OF ELIGIBLE PATIENTS	12
2.5 RECRUITMENT	12
2.6 SUMMARY OF RESULTS	13
<b>3 DOMAIN 2 AND 3: SAFETY AND CLINICAL EFFECTIVENESS</b>	<b>15</b>
3.1 INTRODUCTION	15
3.2 SUMMARY OF RESULTS	15
<b>4 DOMAIN 4: PATIENT AND HEALTHCARE PROFESSIONAL PERSPECTIVES</b>	<b>19</b>
4.1 INTRODUCTION	19
4.2 SATISFACTION AND USABILITY - SUMMARY OF RESULTS	19
<b>5 DOMAIN 5: ECONOMIC ASPECTS</b>	<b>22</b>
5.1 INTRODUCTION	22
5.2 COST EFFECTIVENESS	22
5.3 BUDGET IMPACT ANALYSES – SUMMARY OF RESULTS	24
<b>6 DOMAIN 6: ORGANISATIONAL ASPECTS</b>	<b>27</b>
6.1 INTRODUCTION	27
6.2 ORGANISATIONAL ASPECTS – SUMMARY OF RESULTS	27
6.3 WP7	30
<b>7 DOMAIN 7: SOCIO-CULTURAL, ETHICAL, AND LEGAL ASPECTS</b>	<b>32</b>
7.1 WIDER IMPLICATIONS - SUMMARY OF RESULTS	32
<b>8 LESSONS LEARNED</b>	<b>34</b>
8.1 INTRODUCTION	34
8.2 LESSONS LEARNED - SUMMARY OF RESULTS	34
<b>9 TRANSFERABILITY ASSESSMENT</b>	<b>37</b>
<b>10 CONCLUSIONS</b>	<b>38</b>



## INTRODUCTION

### 1.1 Purpose of this document

This document contains the final evaluation report for the MasterMind project. The report consists of outcomes of results from the three trials work packages, WP5, WP6 and WP7, and is based on the following final trial reports:

- D5.5 Final Trial Evaluation 1<sup>st</sup> Wave (cCBT).
- D6.5 Final Trial Evaluation 2<sup>nd</sup> Wave (cCBT).
- D7.6 Final Pilot Evaluation (ccVC).

The report uses the approach based on MAST methodology, and includes the outcomes from the three reports mentioned above, based on data gathered from the pilots and data from the central database.

Highlights are presented in this report. For further information, details and a broad description of the involved pilot sites, we refer to the final trial reports for WP5, WP6 and WP7, D5.5, D6/5 and D7.6 respectively.

### 1.2 Aim of MasterMind

The MasterMind project aims to make high quality treatment for depression more widely available for adults suffering from the illness through the use of information and communication technologies (ICT). A major cause of morbidity worldwide, depression is characterised by its high incidence and social cost, and proven clinical effectiveness of ICT in its treatment.

The goal is to assess through implementation at scale (more than 5,000 patients overall) the impact of computerised Cognitive Behavioural Therapy (cCBT) and video conference for collaborative care (ccVC) and treatment for depression across 10 EU and associated countries.

Aims for the trials in WP5, WP6 and WP7:

- WP5 and WP6 aim to:
  - Deploy at scale cCBT services for depressed adults across a number of EU and associated countries in regions where cCBT has already been piloted.
  - Collect the values of the indicators specified by the trial protocol before, during and after the trials (see deliverable D3.1).
  - Identify issues that can impede and enable implementation.
  - Devise ways to overcome the impeding factors and exploit the enabling factors.
- WP7 aims to:
  - Deploy at scale video conference services and networks to support treatment of depression in relevant setups, including collaborative care.
  - Collect the values of the indicators specified by the assessment methodology before, during, and after the trials.
  - Provide guidelines to identify profiles of professionals who may benefit the most from the availability of videoconferencing and collaborative care.



The inclusion period started in January 2015 and is continuing for most trial sites even beyond the lifetime of the project.

### 1.3 Structure of document

Chapter 2 describes the study design.

Chapters 3 - 8 contain information on general results based on the MAST domains.

Chapter 9 contains information on lessons learned.

Chapter 10 contains information on the transferability assessment.

Chapter 11 contains the conclusions.

### 1.4 Glossary

<b>cCBT</b>	Computerised Cognitive Behavioural Therapy
<b>ccVC</b>	Video Conference for Collaborative Care and treatment of depression
<b>CSQ</b>	Client Satisfaction Questionnaire
<b>FTE</b>	Full Time Equivalent (for staff)
<b>iCBT</b>	Internet based Cognitive Behavioural Therapy
<b>ICT</b>	Information and Communication Technology
<b>MAST</b>	Model for ASsessment of Telemedicine
<b>SUS</b>	System Usability Scale
<b>VC</b>	Video Conference



# 1 Study design

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To evaluate the 15 implementation projects, a multi-level and mixed-methods assessment was undertaken using a process and pre-test-post-test study design. The evaluation assessed the viewpoints of three levels of stakeholders involved in the implementation projects: 1) patients; 2) healthcare professionals; and 3) mental healthcare organisations.

A mixed-methods approach was employed to provide a good understanding of what the implementation projects had achieved (quantitative results), and how or why these outcomes had occurred (qualitative results). Using qualitative methods of data collection provided good insights into unintended consequences, and provided lessons for improvement of both interventions and the implementation and up-scaling interventions into routine practice.

The evaluation was structured according to the Model for Assessment of Telemedicine (MAST) in which seven highly interrelated domains were assessed:

1. Client and care profiles.
2. Safety of patients.
3. Clinical change in depressive symptoms.
4. Implementation related costs.
5. Patient and professional perspectives towards cCBT and ccVC.
6. Organisational aspects.
7. Social, legal and ethical issues related to employing cCBT and ccVC in routine practice.

For these seven MAST domains, the following seven objectives have been derived:

- To identify the factors which promote or hinder the implementation of cCBT and ccVC for treating depression in routine practice.
- To assess change of patients' depressive symptoms when treated with cCBT and ccVC in routine practice.
- To assess the costs associated with implementation and large-scale uptake of cCBT and ccVC for treating depression in routine practice.
- To assess patients' safety in terms of their mental health when provided with cCBT and ccVC in routine practice.
- To assess the perceived satisfaction and perceived usability of cCBT and ccVC in:
  - Patients when treated for depression;
  - Healthcare professionals when treating patients suffering from depression;
  - Healthcare professionals when using ccVC in a collaborative care setting.
- To identify the reach of cCBT and ccVC in routine practice through assessing general patient characteristics.
- To identify how to implement cCBT and ccVC at a large scale in routine practice in different care contexts.



Routine practice is our laboratory, thus the measurements do not interfere with the object of our study. Therefore, the study outcomes are based on data already available in routine care, such as information on the reduction of depressive symptoms. In addition, short self-report questionnaires have been used to measure satisfaction with and usability of cCBT and ccVC, as this information was not available in routine focus group interviews with a limited group of healthcare professionals; structured interviews with representatives from the involved healthcare organisations were undertaken to gain a better understanding of the process that led to implementation success or failure.

The primary focal points of interest are reach, clinical effect, acceptability, appropriateness, implementation costs, and sustainability of the interventions in practice.

The resulting summative evaluation provides valuable insights into the factors that influence the implementation and up-scaling of cCBT and ccVC in a variety of real political, social, economic and clinical contexts. It provides insights into the perspectives of involved stakeholders, and results in concrete recommendations for implementing and up-scaling cCBT and ccVC for depression in different mental healthcare contexts.



## 2 General results – Domain 1: Health problem and characteristics of the application

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### 2.1 Introduction

Domain 1 addresses the health problem, description of involved pilot sites and interventions, and the general characteristics of the patients, healthcare professionals, and organisations involved. It results in a profile of the average patient, average healthcare professional, and organisation providing the services. The patient profiles contain information on basic demographics (age, gender, education, employment, etc.) and health status. The profiles of the healthcare professionals include demographic information as well as professional experience in the field of mental healthcare and with the services.

### 2.2 Prevalence of depressive disorder

Unipolar depressive disorder is currently one of the most prevalent mental disorders worldwide, and is predicted to be the number one overall cause of disability by 2030 for citizens of higher income countries (World Health Organisation 2008; Mathers & Loncar 2006). Depressive disorders can lead to reduced quality of life, impaired social and personal relationships, and disturbed professional life. They are often accompanied by other psychiatric disorders (e.g. anxiety disorders, substance abuse) and a variety of physical health problems. A depressive disorder may start early in life, and its course is often recurrent (Bijl & Ravelli 2000; Barney et al. 2006; Titov 2011). Therefore, depressive disorders are associated with substantial economic and societal costs, such as cost of treatment, loss of work productivity, absenteeism, early retirement, and premature death (Ferrari et al. 2013; Wittchen et al. 2011; Gustavsson et al. 2011).

Despite the availability of effective treatments, the number of people that actually receive treatment for depressive disorders is not optimal. Care utilisation rates for adults with depression range from 35% to 45% in higher income countries (Andrews et al. 2001; Spijker et al. 2001). Suggested barriers that contribute to these low rates include: fear of or perceived stigmatisation (Hengartner 2012kp; VanVoorhees 2012kc); lack of adequately trained therapists; and the costs associated with healthcare delivery (Kazdin & Blase 2011; Wittchen et al. 2011). Also, the often mono-diagnostic nature of interventions available might limit treatment options for patients with mixed symptoms; including the relatively high comorbidity among psychological disorders or interpersonal differences in patients (Emmelkamp 2013fn; VanVoorhees 2012kc).

### 2.3 Interventions

#### 2.3.1 Interventions implemented for cCBT (WP5, WP6)

Within MasterMind, the participating healthcare organisations have implemented evidence-based cCBT interventions in routine mental healthcare practice. The cCBT interventions are evidence-based, as there is clinical evidence from randomised controlled trials demonstrating that the underlying therapeutic principles contribute to improvement of depressive symptoms and health related outcomes.



The exact treatment and service modalities depend on the type and structure of the technical cCBT platform used, the individual needs of patients, and the actual care setting. For all implementation sites, the treatment protocols and technological solutions adhere to the multidisciplinary NICE clinical guidelines for depression developed by the National Institute for Care and Excellence in the UK (NICE 2009). The core components of all cCBT treatments are:

- 1) psycho-education;
- 2) cognitive restructuring;
- 3) behavioural activation; and
- 4) relapse prevention.

These components are delivered over a number of sessions, either online (with minimal guidance), or via a combination of face-to-face sessions with a mental healthcare professional, alternating with online sessions in which the CBT components are described and practised.

Patients for whom CBT treatment is indicated, and who have difficulty for example visiting the clinic, have been offered video supported cCBT treatment. The online sessions are delivered through a secure web-based online treatment platform. The internet platforms include a web-based interface providing patients with access to: cCBT therapy modules; a digital workbook; and a secure communication channel for both therapists and patients.

### 2.3.2 Interventions implemented for ccVC (WP7)

The aim of WP7 in MasterMind was to assess the impact of video conference services and networks applied in relevant setups, including collaborative care and direct treatment, in the treatment of depression while providing patients with high-quality treatment in their immediate environment. The project aimed to develop clinical pathways for the use of video conference in treatment for depression based on the relevant applications and setups across the trial sites. Many European countries have already invested in VC equipment and infrastructure. In the project, this investment was further capitalised on through greater use.

By using video conference services and networks, the course of treatment is carried out as a cooperation between different healthcare providers. By implementing video conference services and networks in the treatment of depression, including collaborative care, this intervention aims to ensure the appropriate balance between specialisation and proximity in order to provide the best care and treatment possible. Further, the use of video conference in this context results in a more efficient utilisation of specialist resources, and serves as a learning experience, e.g. for the GP, who can benefit from experiencing how the specialist deals with the patient.

Video conference services and networks are used to treat patients and to improve collaborative care between healthcare professionals, as well as to facilitate sharing of competence between healthcare workers.

With video conference services and networks, we refer to the technical infrastructure, security measures, and the procedures, guidelines, and competences needed to operate and utilise the video conferencing technology to the benefit of treating depressive disorders.



The pilots are classified into the following groups, depending on their focus. Note that there is some overlap of pilot sites between groups, as some pilots implemented several solutions.

- Group A is treatment for depression facilitated by video conference between specialists and/or GPs / other healthcare professionals without the patient. The purpose of these meetings is that the specialist guides other healthcare professionals in the use of cCBT, or that they together assess a patient’s medication, plan treatment, etc.
- Group B is treatment for depression facilitated by video conference between specialist and GP with the patient present. The purpose of the meeting is to provide specialist support directly at the moment of treatment.
- Group C is follow-up or outpatient care of the patient at home. In this case, the healthcare worker communicates with the patient, who is at home. The healthcare worker can be either a GP, a specialist, or other healthcare professional depending on the location. This can be as a follow-up to cCBT treatment, or face-to-face treatment, etc.
- Group D is acute care. This is a video conference from the acute ward to a specialist. Together with the patient, they make a plan for the patient, e.g. decide if admission is necessary. By reducing unnecessary admissions, we save both resources in the healthcare system, and avoid an extra burden on the patient.

Table 1 shows to which group(s) the different pilots belong:

**Table 1: Pilot grouping in WP7**

Group	Pilots
A	NST, RSD, AHP, ULSS9, PHB, ASL TO3, OSAKIDETZA, SERGAS, SALUD, BSA
B	NST, BSA, AHP, PHB, ASL TO3, SERGAS
C	NST, SCHOEN, GiG, ASL TO3, SALUD, RSD, BSA
D	NST, ASL TO3

## 2.4 Number of eligible patients

All sites in the MasterMind project have provided an estimate of the eligible patients for each region. This number is based on the local or national prevalence for depression and the population of the region. Most trial sites did not try to reach all eligible patients, as there are also other care options for these patients, and capacities at the trial sites were limited. However, the numbers indicate the number of patients who could possibly benefit of treatment. There is a great variation in the number of eligible patients between the sites, from 546,000 in Germany to 3,500 in Norway. The derivation of the number of eligible patients varies; for example, Germany included all patients possible referring themselves to the service, while Norway only reported the eligible patients in the direct target area Midt-Troms, whereas here self-referral is also a valid option.

## 2.5 Recruitment

In total, 11,573 patients were included in the project, covering both cCBT and ccVC.

**WP5:**

Information has been uploaded to the database for 7,430 patients who received computerised Cognitive Behavioural Therapy (cCBT) for treatment of depression in the MasterMind project's first wave; this has been included in the data analysis. 3,050 healthcare professionals were recruited, and nine organisations provided data on the organisational aspects of the project, although the actual number of involved organisations was higher.

**WP6:**

Information has been uploaded to the database for 1,550 patients who were recruited for cCBT treatment in the project's second wave; this has been included in the data analysis. Information on 281 healthcare professionals has been gathered from second wave sites, while 14 organisations belonging to the cCBT trial sites provided information on their demographic characteristics.

**WP7:**

Information has been uploaded to the database for 723 patients who received treatment using ccVC or a combination of ccVC and cCBT; this has been included in the data analysis. Data from 187 healthcare workers who were involved with ccVC has been collected. Between one and three organisations were involved for each partner.

Not all recruited patients have been part of the database; this explains variations between the numbers recruited and the database numbers.

## 2.6 Summary of results

### 2.6.1 Wave 1 - cCBT

Across the five first wave cCBT trial sites, the mean age of participating patients was 39 years, and 67% were female, presenting a data set representing depressed populations similar to other research projects and population studies. 28% of all participants received up to secondary education, and 61% received higher education, which indicates a highly educated data set in comparison to the general population.

In total, information on 3,050 healthcare professionals was gathered within the cCBT first wave sites. Within the reported core data set sample, 66% were female, and 76% were GPs. Taking a closer look at the data, we see that only a lower percentage of the reported cases are actually adding information to most of the analysis. Therefore, closer attention should be paid to the sub-data sets, excluding cases not providing information for the specific analyses. Few professionals report to have actually received training specifically on the provision of cCBT, and they were in general pretty inexperienced with offering these services. This is not so surprising, as all services were comparably new, or at least new in the specific setting.

Nine organisations provided information on their characteristics within the cCBT trial sites. The organisations have been founded on average within the preceding ten years, and cover between one to 16 units. Some trial sites combined information on multiple clinics working under one head organisation (e.g. Schoen and GGZ), others provided implementation site specific information (e.g. NHS).



### 2.6.2 Wave 2 - cCBT

The average age of participants is around 42 in most sites, with the exception of Turkey, Estonia and Wales, where patients are considerably younger; 25, 33 and 38 respectively. The proportion of females is considerably higher in all sites, and the educational level is primarily university, excluding Aragón and Badalona, where there is a greater number of patients with secondary studies. Immigrants represent a very low percentage of the sample. Employees are more than 50% of the total.

The demographic characteristics of healthcare professionals show that most of them are women (71%) and GPs (54%). A high percentage of the professionals were experienced in the mental health field, most of them with more than 10 years (47%) or less than 3 years (23%). Experience in providing cCBT service is less than five times (54%). This is understandable, because the second wavers were regions with no previous experience in the provision of cCBT services.

The age, size and composition of the healthcare organisations involved were considerably different, with between one to 1,250 units.

### 2.6.3 ccVC

The average age of the patients was 50 years, and both younger and older patients have been enrolled in WP7 across the sites. More women (65%) were enrolled in WP7, and the patients were characterised by having secondary education (40%) or higher education (41%).

Healthcare professionals were recruited and trained at the individual sites before the trials started. The type and specialisations of the involved professionals were highly dependent on the local institutional setups and reference pathways, and differed between sites. The professionals in WP7 include psychologists, medical doctors, GPs, nurses, psychiatrists, and mental healthcare workers. Of the healthcare workers involved, 58% are female and the majority of the healthcare professionals involved in WP7 are characterised by having more than 10 years of professional experience.

The number of registered organisations for each partner is between one and three. Both the number of units and the number of FTEs employed vary greatly. The majority of the organisations have an annual turnover of over €50 million. Two thirds of the organisations have a waiting time below four weeks.



## 3 Domain 2 and 3: Safety and clinical effectiveness

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### 3.1 Introduction

The data within the context of domains 2 and 3 establish information on safety and the clinical effectiveness of the services in real-world settings. The data for safety focus on suicidality, drop-outs, and treatment attrition, together with safety issues as perceived by the healthcare professionals. In terms of clinical effectiveness, the variables included address the symptoms and methods for establishing symptoms, referral modalities, quality of life, access to the systems, and reasons for drop-outs and attrition rates.

Data for these domains are both quantitative and qualitative, and are used to answer the project objectives around:

- Barriers and facilitators that influence the implementation of cCBT and ccVC for treating depression in routine practice.
- Clinical change of patients' depressive symptoms when treated using cCBT and ccVC in routine practice.
- Patients' safety in terms of their health when provided with cCBT and ccVC in routine practice.
- Transferability of implementation and up-scaling of cCBT and ccVC in routine practice in different care contexts.

Together with domains 1 and 4, these results enable drawing conclusions in terms of the acceptability and appropriateness of the services in alleviating depressive symptoms.

### 3.2 Summary of results

#### 3.2.1 WP5

With respect to safety, we can summarise that no patient attempted suicide. The difference between trial sites with regard to information available on suicidal ideation varies greatly; this can partly be explained by differences in the data gathering process. Therefore, we conducted qualitative interviews directly with the healthcare professionals providing the service, in order to obtain more comparable information. Here, the importance of a valid suicidality diagnostic has become clear, as well as the elaborate decision if an eHealth intervention is sufficient for the specific patient. Additionally, the importance of support mechanisms in case of emergencies has been highlighted, especially in unguided treatments.

For clinical effectiveness, looking at the change happening during treatment by calculating difference scores between the symptom severity before and after treatment, we can see that in total 29% of patients were reported to experience a reduction in depressive symptoms, 16,6% by one and 12,4% by two categories. 12,1% deteriorated, and 58,8% showed no change between the start and the end of cCBT treatment. Again, large differences can be seen between the trial sites, but all in all we can say that the treatments seem to be effective under routine care conditions at most of the trial sites.



On the measures of quality of life and satisfaction with mental health, we can also see an improvement between pre-treatment and post-treatment assessment. Pre-treatment, in total 5.2% of patients reported that their satisfaction with life “could not be worse”, 18.8% stated that they were “displeased” and 18.8% reported to be “mostly dissatisfied” with their life. 38% reported mixed feelings about their life, while 14% were “mostly satisfied”, 4.8% were “pleased” and 0.4% reported that it “couldn’t be better”. After the treatment, 1.6% of patients reported that their satisfaction with life “could not be worse”, 6.7% stated that they were “displeased” and 9.1% reported to be “mostly dissatisfied” with their life. 30.6% reported mixed feelings about their life, while 26.9% were “mostly satisfied”, 23.1% were “pleased” and 1.9% reported that it “couldn’t be better”.

The appropriateness of the cCBT treatments with regard to the symptom severity of the patients was a topic extensively discussed in the healthcare professional focus groups. Qualitative data evaluation shows that this topic also concerns the correct inclusion and exclusion criteria. The majority of discussions on symptom severity indicated that the cCBT services were mostly appropriate for those who have the expectation that psychological therapy will provide learning tools and skills to cope with low mood and anxiety. Those who are experiencing more mild symptoms of depression or anxiety are considered appropriate for and seem most interested in using cCBT services. The main group of patients discussed as being not appropriate for referral to cCBT services was those who are experiencing more severe and enduring symptom presentations.

With respect to the topic of engagement with the treatment, the main advantage of the cCBT solution is the reduction of waiting time. Another crucial point is the information patients receive before deciding to engage in eHealth treatment. Unrealistic expectations are reported to be a potential barrier, and should therefore be reduced as early as possible. It was stated that it is important to have confidence, not just in the platform, but also in the infrastructure behind it, including adequate administration cover and ICT support.

From the focus groups interviews, it appeared that various factors are relevant to:

- a) appropriateness of the service in alleviating the needs of the patients;
- b) the decision to engage with the cCBT service;
- c) adherence to cCBT treatment; and
- d) safety of the service.

For instance:

- Clinical symptoms in terms of symptom severity and further goals other than treating depressive disorder.
- Context of the patient, referring to social embeddedness and functioning of the patient, activities such as work, and roles and responsibilities.
- Skills, personality traits, and attitude concern the ability of the patient in terms of ICT literacy, capability to express oneself in writing, and attitude towards commencing cCBT treatment.
- Treatment delivery modalities, including referral processes, availability of alternatives, role of support, and blended form of cCBT service delivery.
- Access to treatment and alternatives, including the availability of the required technical infrastructure, ICT literacy, waiting times and alternatives to cCBT treatment.
- Awareness of the the existence of the service.



- Consent and referral procedures concern the process and manner through which a patient is guided to the service.
- Expectations and needs in terms of reasons for clarity on expectations, and potential benefits and limitations of the treatment.
- Applicability of content, as in whether or not the therapeutic content is applicable and recognisable to a patient and his/her condition.
- Attractiveness of content and design relates to the extent to which a patient feels comfortable with engaging with the system.
- Changes in clinical symptoms that occur in the patient during treatment, including positive and negative changes, and the patient's response to these changes.
- Motivational aspects, including the compatibility of symptoms of depressive disorder with completing treatment online, and the patient's attitude in terms of willingness to change.
- Practical arrangements, including the flexibility the services offer in terms of the time and place a patient chooses to engage with the online modules, and in terms of treatment protocol.
- Technical aspects and user-friendliness, as in stability of the technical platform and accessibility of the therapeutic content.

### 3.2.2 WP6

Approximately 60% of the patients improve after receiving cCBT. Approximately 65% of patients with severe or very severe symptoms improve their mental health status, and the number with moderate depression is significantly decreased.

Note that the proportion of chronic patients is high, which can affect the clinical responsiveness, since this type of depression is often resistant to treatment.

Based on the results on access to the service, the use of a personal location is predominant. It could be interesting to promote the use of public or community settings, which might augment the access rate.

The number of sessions completed could be considerably improved. Strategies to boost patients completing the treatment are clearly needed, which will probably result in better clinical effectiveness.

The reasons for not completing the treatment are very diverse, since numerous options were offered to patients, complicating the corresponding analysis. However, it can be concluded that most patients chose options related to poor skills in managing technology, or problems with limited connectivity.

Note that clinical effectiveness is biased, since patients who never initiated the cCBT or did not complete any session were included in the analysis (80 in the Basque Country, 2 in Aragón, 22 in Galicia, 2 in Piemonte, 40 in Treviso, and 1 in Estonia). This number is the 57% of all drop outs (146 out of 254). These patients abandoned the treatment and the study for diverse reasons. Therefore, the real clinical effectiveness of the therapy is underestimated.



### 3.2.3 WP7

For WP7, it is important to note that not all pilots have data on clinical effectiveness, as some pilots did not include patients directly in the VC sessions, but have implemented collaborative care without patients.

The numbers for WP7 show a decrease in both very severe and severe symptoms (respectively 3.8% to 0.9%, and 16.5% to 9.8%). The number of patients with no symptoms has increased from 2.6% to 32.5%. This shows that the patients who have received care overall have improved their condition.

In the focus groups, the clinical safety of the patients and the confidentiality in their data were discussed only briefly, indicating that professionals are less concerned about patient safety and confidentiality. However, the most important topic emerging from the discussions was ensuring the technological and confidential security. It was argued that patients in general do not experience much difficulty with privacy. However, professionals should remain alert to the environment in which the patient resides during consultations through video conferencing equipment.

Of the 526 patients for whom data have been uploaded to the database, 94% have been thinking lately to end his/her life and one patient (0.2%) has attempted to commit suicide. Video conference has been used in a close collaboration between healthcare professionals and patients in WP7. Whenever the healthcare professionals have had doubts about the safety of using the service, they have had the possibility of converting to face-to-face treatments. Because of the close contact, the professionals have been able to use their clinical judgement throughout the treatment, and to ensure the patients a high level of safety. It has been possible to combine both video conference and face-to-face treatment in the most appropriate way.

Pre-treatment, 3.9% reported that their satisfaction with life “could not be worse” and 3.4% stated to be “pleased with life”. After treatment, 1% reported that their satisfaction with life “could not be worse” and 14.8% stated to be “pleased with life”. There is an improvement between pre-treatment and post-treatment in almost all categories. This indicates the success of using VC, and that patients are not getting worse through the use of VC.



## 4 Domain 4: Patient and healthcare professional perspectives

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### 4.1 Introduction

This domain addresses the perceived satisfaction and usability of both patients and healthcare professionals. Through validated self-reported measures (CSQ-8/3 and SUS), the perspectives were measured, and provide an indication of the acceptance and appropriateness of the services in addressing the depressive disorder. The data on satisfaction includes variables on quality, type, needs, complexity and overall satisfaction. Data on usability describes usage, complexity, consistency, confidence, and level of integration.

Domain 4 aims to answer the following research objectives:

- To identify the barriers and facilitators that influence the implementation of cCBT and ccVC for treating depression in routine practice.
- To assess the perceived satisfaction and perceived usability with cCBT and ccVC.
- To assess the transferability of implementation and up-scaling of cCBT and ccVC into routine practice in different care contexts.

Together with domains 1, 2, 3, and 5, these results enable drawing conclusions in terms of the acceptability and appropriateness of the services in alleviating depressive symptoms.

The data is based on both quantitative and qualitative data, and provides the possibility of understanding the meaning (qualitative) of the facts (quantitative) for the healthcare professionals and organisations, and the interplay of both stakeholders.

### 4.2 Satisfaction and usability - summary of results

#### 4.2.1 WP5 – cCBT wave 1

With regard to the patients' perceived satisfaction with the services, quantitative analysis has shown that overall 69% of patients reported to have been satisfied with the treatment, and in the matter of system usability, the approval within the ten categories varies between 92% and 55% approval.

Within the reported data of 147 professionals, the overall perceived satisfaction with the treatment varies between 100% (Denmark) and 44% (Scotland). In total, 41% of healthcare professionals would say that the treatment meets the needs of the patients treated, 63% would say that they are generally satisfied with the service, and 88% would use the service again.

In addition to the quantitative data, focus groups also indicated that there is still room for improvement: the system can be made more attractive and easier to use, and for example include options for therapists to see the content of a certain module before assigning it to the patient. While the options of including varying therapy content, documenting functionalities, and the possibilities to send voice messages through the platform are welcomed by healthcare professionals, as this can provide more flexibility in using the cCBT



solution and tailoring it to the characteristics of both the professional and the patient, this can also produce more complexity and a reduction in acceptability. The ability to offer a range of treatment options to patients, rather than just face-to-face therapy (once the only treatment option), also enhanced the professionals' satisfaction with the treatment. On a more critical perspective, healthcare professionals stated that they could be even more satisfied with the services if it was ensured that the correct patients were referred to the services. Also, it satisfies professionals to see that patients are actually getting better. Higher completion rates were perceived as indicative of patients' benefits, and hence can lead to greater clinician satisfaction with the service.

#### 4.2.2 WP6 – cCBT – wave 2

In total, over all items, 77% of patients reported to have been satisfied with their treatment.

Regarding the perceived usability by patients, more than 70% of patients will use the cCBT service again if needed, with the exception of Wales and Piemonte that present lower percentages. Most of the patients asked (84%) believe that the platform is not complex to handle, and many of them (more than 64%) believe that the treatment is easy to use and apply.

Satisfaction with regard to the integration of functionalities is around 50% in Wales and Estonia, while the rest of the sites show much higher satisfaction.

The final score obtained in the SUS questionnaire reflects that patients of most sites consider the cCBT service of high usability (score > 68). There are two sites with diametrically opposed results: Treviso shows a very low score, and Turkey presents a considerably higher mark.

The overall perceived satisfaction with the treatment varies between regions: 17% in Estonia, 25% in Basque Country and Wales, and 87% in Treviso. The satisfaction with patient treatment varies as well, from 23% in Wales, to 100% in Aragón. 67% of Wales' professionals would use these services again, but in Aragón, Treviso and Turkey it goes to 100%.

Professionals of most sites are willing to provide the cCBT treatment frequently, reaching 80% of professionals in Aragón. Yet, lower percentages can be observed in Wales (15%) and Piemonte (13%).

#### 4.2.3 WP7 - ccVC

Overall, patients report a high perceived satisfaction with ccVC, and consider the service to be well integrated. The majority of patients report a high quality of treatment, and that they have received the kind of treatment they wanted. A great part of the patients would recommend the service to others, and are very satisfied with the help provided.

The majority of health professionals are satisfied with the service, and would use it again. 73% of the professionals report that the service meets their needs in the treatment of patients. This demonstrates that for the majority of patients, VC is a suitable solution. It is always important to meet the individual needs of patients, and for patients where VC is not useful, it is important to have other solutions. In the treatment of depression, it is important to have a variety of solutions to ensure personalised treatment, and this project demonstrates that VC can be a useful solution.



The decision-making process of professionals to engage in the ccVC service, and apply it in their routine care provision, is focused on the expectations and actual needs of professionals in the field. In terms of needs, the focus groups clearly indicated that time, or rather lack of it, was an important factor in determining whether to engage. In terms of support, the professionals indicated that dedicated ground support is an important prerequisite for a professional to engage with the system. Quick-start materials, training, and gaining experience with the system are also important factors that can contribute to engaging in the ccVC service. Technological reliability and usability of the service were considered of primary importance for professionals to engage and remain engaged in the services. Some professionals reported that the technologies used up until now were considered not satisfactory in terms of usability and reliability.

Regarding satisfaction and usability of the service, focus groups reported that the technology should be more robust and mature in order to be usable. In addition, it was argued that it is very important that the quality of the sound and the image is high. In addition, patient satisfaction is regarded as a key factor for professionals to be satisfied with the systems themselves. Satisfaction and usability were regarded to depend on factors related to the treatment pathways and processes. Here, participants indicated that VC can significantly enhance communication and collaboration between professionals, facilitating shared decision-making and efficiency. However, one should be aware of practical arrangements such as scheduling appointments. In terms of service delivery outcome, professionals indicated the ccVC service to be useful in empowering the patient and making them more aware of their mental health status and wellbeing.



## 5 Domain 5: Economic aspects

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### 5.1 Introduction

This domain addresses the economic aspects of the cCBT and ccVC interventions.

Domain 5 aims to answer the following research objective:

- To assess the costs associated with implementing and large-scale uptake of cCBT and ccVC for treating depression in routine practice.

All domains, including domain 5, aim to address following research objective:

- To identify barriers and facilitators that influence the implementation of cCBT and ccVC for treating depression in routine practice.

Together with domains 1, 2, 3, and 4, these results lead to conclusions in terms of the acceptability and appropriateness of the services in alleviating depressive symptoms.

The data was collected by means of both questionnaires and semi-structured interviews.

### 5.2 Cost-effectiveness

An economic evaluation, sometimes referred to as cost-effectiveness analysis, is defined as “the comparative analysis of alternative courses of action in terms of both their costs and their consequences” (Drummond et al. 2005). Therefore, an economic evaluation requires a comparison of two or more treatment alternatives, and the consideration of both costs and health outcomes in the analysis.

MasterMind does not include a control group, as this is outside the summative evaluative nature of the project. The scope of the economic analysis is thus focused on the implementation costs, the recurring costs of the implemented cCBT and ccVC services, and potential savings derived from the use of the technologies under evaluation. As a consequence, budget impact analyses are performed on the basis of quantitative data and semi-structured interviews which include a series of questions regarding implementation and maintenance costs. The summative evaluation took place in routine practice in real world conditions, limiting the possibilities to issue additional standardised questionnaires. Therefore, the economic analysis is limited, and further limited due to the following:

- The heterogenetic nature of the regions, and the lack of a control condition, inhibit the possibility of making a sensible comparison.
- An in-depth budget impact analysis was limited by the fact that not all regions have been able to provide the data required for an analysis of the cost of the MasterMind services at this stage of the implementation process.
- As the implementation processes for a number of regions are still in the start-up phase (MasterMind data covers a maximum of two years of implementation evaluation), not all regions have been able to collect data on a sufficient number of patients to give a reasonable estimate of the cost.



For indicative purposes, and with the limitations described above taken into account, average costs of achieving a reduction of depressive symptoms (1 level) per patient are given in the table below. In the calculation, only regions with full data set of more than 20 patients and all economic data available have been included.

The cost per depression level reduction is calculated as the total cost of providing the service to all patients divided by the net number of change in depression level (total number of reduction levels minus number of deterioration levels).

**Table 1: cCBT budget impact**

Region	Aragón	Badalona	Galicia	Piemonte	Treviso, Veneto	Scotland	Netherlands	Germany
Number of patients	32	74	37	116	92	5,371	247	280
Number of one unit reductions in depression level	37	57	41	91	106	933	283	280
Cost per reduction	€623	€1,917	€1,032	€428	€165	€320	€385	€843

This way of representing the cost-effectiveness has been selected as it is the best way to estimate the cost and effect of daily operation after the implementation and investment costs.

There is a relatively large variation in the cost per reduction for cCBT, from €165 to €1,917. The difference can reflect the difference in structure and regional cost models. The difference in cost can also be a consequence of volume, and how well established in daily operation the services are.

For the future deployment of the service, it would be relevant to compare the cost-effectiveness of the Treatment As Usual (TAU) with the cost-effectiveness of cCBT in regions that are considering implementation of cCBT services. The E-COMPARED project ([www.e-compared.eu](http://www.e-compared.eu)) is currently finalising a true clinical and cost-effectiveness study of blended cCBT versus TAU in nine European countries. A final conference is scheduled for June 2017, and results will be published in the second half of 2017.

With regard to ccVC (in various modalities), it has only been possible to calculate the budget impact for three regions (due to the reasons described above). As shown in the table below, there is a large variation in costs, and the solution seems to be more costly than cCBT. However, this conclusion has to be treated cautiously, as it is based on a small number of patients, the services have only been available for a relatively short time, and it might reflect that the service is still under implementation.

**Table 2: ccVC budget impact**

Region	Germany	Badalona	Piemonte
Number of patients	56	78	50
Number of one unit reductions in depression level	66	45	40
Cost per reduction	€2,459	€2,311	€220



Despite these reservations, the indications found in MasterMind might prove a helpful starting point in regions' future decision processes, and can provide a basis for starting a comparison of costs and budgets with existing treatment models in routine practice in real world conditions.

## 5.3 Budget impact analyses – summary of results

### 5.3.1 WP5 – cCBT wave 1

#### Method

The analysis of the economic aspect of the service implementation is based on responses to questionnaires which preceded the semi-structured interviews with healthcare organisations. These questionnaires included a series of questions regarding implementation and maintenance costs. The semi-structured interviews collected relevant views in terms of potential savings and a potential business case for initiating and retaining the interventions according to directors or owners of the healthcare organisations participating in MasterMind.

#### Summary of results

There is a wide variation in the responses regarding the economic aspects of the implementation of the services. Initial investment in material and ICT infrastructure varied from €35,000 to €600,000, in Germany and Denmark respectively. Most regions required support staff to implement the services, with a mean FTE of one person. Every region required initial training and supervision for staff, in most cases involving technical aspects on how to use the platform and on the therapeutic elements that are included in the platform. The direct cost for one session was not provided by a number of regions. Among those that provided this information, the cost varied from €20 to €188 for cCBT, and between €70 and €188 for the combination with ccVC. The most common reimbursement modality is the Public Health System (Scotland, Denmark, and Norway; in the latter a proportion of the cost is reimbursed by the patient) and health care insurers (Netherlands and Germany).

Regarding the qualitative analysis, the economic aspects of the implementation of cCBT were analysed taking into account the reports of interviews from Scotland, Denmark, the Netherlands and Germany. Data from Norway was not available for analysis.

### 5.3.2 WP6 – cCBT wave 2

#### Method

The analysis of the economic aspect of the service implementation is based on responses to questionnaires which preceded the semi-structured interviews with healthcare organisations. These questionnaires included a series of questions regarding implementation and maintenance costs. The semi-structured interviews collected relevant views in terms of potential savings and a potential business case for initiating and retaining the interventions according to directors or owners of the healthcare organisations participating in MasterMind.



### Summary of results

There is a wide variation in the responses regarding the economic aspects of the implementation of the services. Initial investment in material and ICT infrastructure varied from reuse of existing infrastructure with no direct cost for the service upto €70,000, in Wales and the Basque Country and Aragón respectively. Most regions required support staff to implement the services, with a mean FTE of one person. Almost every region required initial training and supervision for staff, which in most cases involved technical aspects on how to use the platform and on the therapeutic elements that are included in the platform. The direct cost for one session was not provided in a number of regions. Among those that provided this information, the cost varied from reuse of existing infrastructure with no direct cost for the service up to €348 for cCBT. Most regions reported that the service is not reimbursed structurally, with the exception of two organisations, one in Galicia and one in Wales reporting a public health system reimbursement modality; Turkey reported “other” type of reimbursement modality.

### 5.3.3 WP7 - ccVC

#### Method

The analysis of the economic aspect of the service implementation is based on responses to questionnaires which preceded the semi-structured interviews with healthcare organisations. These questionnaires included a series of questions regarding implementation and maintenance costs. The semi-structured interviews collected relevant views in terms of potential savings and a potential business case for initiating and retaining the interventions according to directors or owners of the healthcare organisations participating in MasterMind.

#### Summary of results

There is a wide variation in the responses regarding the economic aspects of the implementation of the services. Initial investment in material and ICT infrastructure varied from reuse of existing infrastructure with no direct cost for the service up to €600,000. Most regions required support staff to implement the services, with a mean FTE of one person. Almost every region required initial training and supervision for staff, which in most cases involved technical aspects on how to use the platform and on the therapeutic elements that are included in the platform. The direct cost for one session was not provided in a number of regions. Among those that provided this information, the cost varied from €20 to €374 for ccVC. With respect to the modality of reimbursement, nine organisations reported public health system reimbursement, five were reimbursed by healthcare insurers, six reported that the service is not reimbursed structurally, and one reported “other” type of reimbursement.

Regarding the qualitative analysis, the economic aspects of the implementation were analysed taking into account the reports of interviews from Aragon, Badalona, Basque Country, Piemonte, Treviso, Wales, Scotland, Denmark, the Netherlands and Germany. Data from Norway, Galicia and Greenland were not available for analysis. The questionnaires were also not available for Greenland.

With the available data, it has not been possible to analyse separately the perceptions of the economic aspects of ccVC and cCBT. Most of the reports from the interviews did not provide separate responses for each intervention.



The quantity and quality of the information included in the qualitative reports were highly variable. In this sense, the quotations in D5.5, D6.5 and D7.6 may not be representative of the interest in the topics.

Topics related to cost saving identified during the qualitative interviews included:

- An overall perception of lack of resources in mental health services.
- The need of more elaborate and comparable budget-impact evaluations.
- Some participants stated that they were unable to observe any savings due to the complexity of the financial systems and service delivery structures involved.
- Time was the most mentioned resource needed. Time was needed both for patients and for eHealth professionals to gain experience and understanding of the services, and to keep up-to-date.
- Reliable technological resources and infrastructure were also needed. Participants stated that in some cases practical issues such as room availability and Wi-Fi were an obstacle to implementation, as well as technical integration with existing health information systems and other clinical service delivery systems.



## 6 Domain 6: Organisational aspects

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### 6.1 Introduction

As stated in deliverable D3.1, Scientific Study Protocol, domain 6 aimed to provide insights into the organisational aspects and perspectives of implementing and up-scaling the cCBT and ccVC services into routine practice. Variables included quantitative information on the organisation profile (as part of domain 1), and estimates of case load, and qualitative information retrieved via focus group discussions and semi-structured interviews on issues of:

- leadership engagement, in terms of commitment and implementation strategies;
- resources (time and savings);
- perceived factors for implementation success; and
- innovation climate, including information on knowledge and beliefs about the services, self-efficacy in using the services, individual state of change, identification with the organisation, support and awards, and relative priority.

Findings were triangulated between both quantitative and qualitative data, and between healthcare professionals and organisational perspectives (organisations).

The analyses performed at the end of the study period aimed to give answers to the research questions:

- 1: To identify barriers and facilitators that influence the implementation of cCBT and ccVC to treat depression in routine practice.
- 3: To assess the costs associated with implementation and large-scale uptake of cCBT and ccVC to treat depression in routine practice.
- 5: To assess the perceived satisfaction and perceived usability with cCBT and ccVC.
- 7: To assess the transferability of implementation and up-scaling of cCBT and ccVC in routine practice in different care contexts.

Findings from domain 6, together with domains 1-5 and 7, provide insights into the acceptability and appropriateness from the perspective of healthcare professionals, and the sustainability of the services in routine practice as seen from the viewpoint of the organisations.

### 6.2 Organisational aspects – summary of results

#### 6.2.1 WP5 – cCBT wave 1

Within this section on the organisational aspects of the implementation, qualitative and quantitative data have been gathered from participating healthcare professionals and organisational representatives. These data have been evaluated in the results section separately and are discussed briefly separately, and then integrated in a convergent design. Topics discussed include access to the innovative solutions, referral and treatment processes, the technology needed, the solution's evidence base, and information, training and educational procedures, as well as collaboration and support. Implementation



strategies and rationales, and the involved parties' commitment, as well as decision making processes in the organisations, have been discussed. Other topics were the efficacy of the treatment solutions, leadership engagement, staff availability and resources, and the healthcare professionals' attitude towards the organisation.

When interpreting the quantitative results on the organisational domain, for some trial sites, only a small percentage of involved healthcare professionals have provided data on the different themes. This is due to the data collection process which was connected to the participation in the focus group interviews. On the other hand, this allows for a coherent interpretation of the convergent observation within the quantitative and qualitative data.

In total, the trial sites' participating healthcare professionals reported to have had enough time to implement the new service into their daily routine, and that they found the treatment to be an effective way to treat patients. In all trial sites, the leadership engagement of the participating organisations was high, with a tendency to agree that supervisor engagement with the use of the implemented service was high. The perception of the existence of a clear implementation strategy is a little more inconsistent, as it was not a project requirement, and has not been measured. The majority of participants agree that there were sufficient staff and other resources made available for the implementation of the new service. Overall, the participating healthcare professionals stated to be committed to the organisational goals, and were strongly loyal to the organisation. An interesting discussion point is whether more loyal employees are more interested in trying out a new treatment, or if the implementation started in organisations with highly committed employees; but this question cannot be answered from the available data.

By the end of the project, the overall majority of participants had already integrated the work into their routine treatment of patients. The majority felt supported by the organisation, and felt recognised for the implementation work they were doing. With regard to the appreciation experienced, the results were more mixed, which depicts an interesting difference between being recognised for one's work, and feeling appreciated for it. Overall, they were enthusiastic, and set a high priority on the implementation work. These factors have been considered important prerequisites for successful implementation, and all five trial sites seem to have been successful in providing healthcare professionals with organisational conditions supporting the implementation process. The data does not show whether less satisfied healthcare professionals were less willing to participate in the interviews.

#### *Convergent interpretation and discussion of results*

Integrating the three data sources on organisational aspects of the cCBT implementation reveals that most of them are supporting each other. The majority of healthcare professionals and organisational representatives considered the decision-making process to be top down. The healthcare professionals were profiting from the positive innovation climate the organisations were trying to provide for the implementation. The organisational responsibility was mostly placed at the top-level management, which may also have helped the healthcare professionals feel recognised and supported. On the other hand, it was stated that the middle-management and other therapists often were not as supportive of the implementation; this might be an important optimisation point for the future. Committed healthcare professionals and 'champions' within work forces have been considered important, and data indicates that they have been present within the MasterMind project. On the other hand, organisational leaders seem to have regarded the implementation of cCBT as an additional burden for the therapists, and therefore seemed able to provide them with enough time and resources so that the majority of involved



healthcare professionals were able to state that they were satisfied with the availability of time and resources. Interestingly, the healthcare professionals put focus on the evidence-base of the treatment, and also within the organisational data; the collaboration with researchers was regarded as important. The scientific support of an implementation could be an important fostering factor for the implementation of a new service. It could be hypothesised that this process also could help to inform and convince lesser involved parties or 'doubters'. Moreover, the information processed, and the content-focused nature of information, have been discussed as important, and could also be integrated in this line of thought in the way that the implementation processes of new cCBT solutions could be accompanied by research on the efficacy under the trial sites routine care conditions, as well as the treatment mechanisms at work for specific treatment content and patient populations.

Combined, the data suggest a number of factors required for an environment to be favourable to the successful implementation of the cCBT service. What is needed is an environment where the therapeutic team is willing to implement the solution, and suggest it themselves, while being backed up by a strong team of organisational leaders as well as top-level management. Top-level management should have the decision power at the beginning; during the processes it should shift to a more participatory approach. At all times, the roles should be clear for all involved parties, and the parties involved should communicate well.

### 6.2.2 WP6 – cCBT wave 2

Data from both healthcare professionals and organisational representatives have been gathered regarding the organisational aspects and the implementation processes. A qualitative (semi-structured interviews and focus group) and quantitative analysis approach has been carried out.

In total, 92 professionals have reported information, most of them GPs. The information was gathered in focus groups. Of these 27% believe that they have enough time to make their service a daily care practice. The number seems not to be very promising. However, it is necessary to take into account that the professionals of most sites have a very high number of consultations per week (103 Basque Country, 173 Galicia), making the uptake of new care processes more complex.

Most of the professionals (63%) feel that supervisors are highly engaged in promoting the use of the cCBT services. Besides, 52% of the professionals recognise that there is a visible and accessible strategy for the implementation of the service. The majority of them feel confidence in their ability to use the service in treating patients, most of them feeling supported by their organisation. Although 67% of professionals feel enthusiastic about using the therapy in their daily practice, only 29% give a high priority to its implementation.

When asked about experiences with and perspectives on the concrete implementation of the various services in practice, participants of the focus groups discussed various factors that need to be taken into account. Topics discussed included factors related to access, referral, and the provision of the services. Healthcare professionals struggle with a lack of time and resources. Professionals asked for the tool to be easily accessible at all times, and underlined the importance of face-to-face support.



### *Healthcare organisations*

A series of semi-structured interviews were carried out with organisational representatives who had a certain level of decision-making power in the organisation, and/or a leading role in the implementation processes involved. Despite the problems involving tools, lack of time and resources, the majority were very committed and enthusiastic about the project.

The main factors that might have hindered the success of the tool were reported at the various study sites, such as the application not working, insufficient technical assistance, and not enough professionals. Professionals who perceive themselves as part of the project seem to work more eagerly towards the goal of the project. The involvement of stakeholders, directors and management staff is also mentioned as a key to achieving implementation goals.

## **6.3 WP7**

### **6.3.1 WP7 - ccVC**

Data from both healthcare professionals and organisational representatives have been gathered, regarding the organisational aspects and the implementation processes. A qualitative (semi-structured interviews and focus group) and quantitative analysis approach has been carried out.

#### *Implementation*

When asked about experiences with and perspectives on the actual implementation of the various ccVC services in practice, participants of the focus groups discussed various factors to be taken into account. Topics discussed included: factors related to implementation processes; referral; the provision of the services; and the technology applied. Information about and training and education in the service was noted as relevant.

Regarding implementation processes, professionals see implementation as feasible, and not requiring much investment. However, it is important to have clear leadership and management support to ensure the innovation is implemented and maintained. Also, time as a resource was mentioned: professionals experience the lack of time as a barrier, for example, to helping patients install the programme. Professionals also noted that it takes time for them and for patients to get used to and comfortable with videoconferencing facilitated mental healthcare services.

Regarding referral and treatment processes, it was stated that especially when the services reduce case-load, use in practice most likely will increase. Professionals also indicated to have good experiences with patients when the service is offered at no cost. For proper referral, it was noted that patients should not be urged to make a decision for treatment at the first consultation.

Participants in the focus groups discussed barriers and facilitators to implementing ccVC in routine practice, indicated that the VC technology is currently experienced as a barrier. This includes not just the technology used, but also the availability and adequacy of the infrastructure on which the services are running, such as internet connection, PCs, cameras, etc. Professionals indicated they were not knowledgeable enough to use the programme and to guide the patients in using ccVC services. Limitations in basic ICT skills, and having the right equipment, are also important factors to take into account when implementing



these services in routine practice. Information and training need to be provided to inform the professionals on what to use ccVC for, and how to operate it.

#### *Leadership management*

All trial sites conducted semi-structured interviews with representatives of the organisations that implemented the ccVC services in routine practice. The representatives who were interviewed had a certain level of decision making power in the organisation, and/or a leading role in the implementation processes involved.

One of the themes discussed was the engagement and commitment of the organisation's leadership in implementing the services. All interviewees indicated the perception that senior management is very committed to getting ccVC implemented. This commitment was shown in various ways, including providing resources for training and information sessions for professionals, and time to gain support. Interviewees indicated that it proved to be a difficult task, and depended heavily on individuals. Management found it useful to raise awareness among health professionals to be part of a wider and innovative European ICT-based project, and involve them in the various phases of the project.

The decision making processes before and during the implementation work were also discussed. Interviewees reported that in general, decision making processes are top-down, or in some instances, participatory. Regarding the existence and use of explicit implementation strategies, interviewees acknowledged the relevance of strategies, but strikingly at the same time reported that there was no explicit strategy developed and used.

#### *Perspective on implementation (Organisation)*

From the perspective of the organisation, participants in the semi-structured interviews identified various factors that should be taken into account when implementing ccVC in routine practice. First, there are aspects related to the needs and perspectives of both management and professionals that should be taken into account. Interviewees indicated that in general, the implementation of ccVC was regarded as a success when the service is offered as standard for certain clinical populations. However, other interviewees did not report an explicit expected outcome in order to regard the work to implement ccVC in routine practice as a success.

Regarding facilitating factors in terms of organisational strategies and priorities, interviewees indicated that the commitment to a certain higher level goal such as collaborative care, quality improvement, or a better understanding of disease, are important drivers for prioritising implementation of the ccVC services. Representatives of the organisations indicated that technology and guidance in its use are important factors to take account of. Often, issues with technology often lead to disapproval by professionals very quickly.



## 7 Domain 7: Socio-cultural, ethical, and legal aspects

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Domain 7 is concerned with the broader context of the implementation. In MasterMind, it is concerned with two issues: responsibilities and public image. Although more topics were identified in the design phase to discuss with both professionals in the focus groups and with organisation's representatives in the interviews, none of the focus groups and none of the interviews reported specifically on professional liability when delivering computerised mental health services and on using ICT for benchmarking purposes within an organisation or across organisations. This is noteworthy, as these topics thus seem not to be important at this moment.

### 7.1 Wider implications - summary of results

#### 7.1.1 WP5 and WP6 – cCBT waves 1 & 2

Concerning the topic of public image, interviewees clearly indicated that they expected the MasterMind services to contribute to a positive image of psychiatry in general, and the service provider specifically. Reasons for this positive image would include being able to treat patients more efficiently, increase accessibility of mental healthcare, and the flexibility the cCBT services offer.

Regarding potential impact of the MasterMind services on benchmarking, responses were low, concluding that benchmarking within and across organisations does not cater for including ICT mediated service delivery.

The results show that the public image of an organisation is a driving factor in the decision to implement cCBT solution, while the improvement of mental healthcare might only be the second biggest motivator. In combination with chapter 7 of this report, we could conclude that there are two agendas here: promoting the organisation as being innovative, and actually providing better healthcare. These do not necessarily have to compete, but might lead to obstacles in the implementation process. Meanwhile, an organisation being regarded as innovative might attract more innovative professionals and increase the feeling of belonging for innovative employees. It seems that professionals engaging in the use of cCBT feel responsible for their doing so, and thus were likely to have gone through a complex decision process of whether engage or not. Here, the role of their colleagues, and the support by the organisation, seem to play an important role. As stated in chapter 7, professionals want official guidelines and rules with regard to cCBT interventions. Lacking these, they start to make their own decisions, and take responsibility as an individual.

#### 7.1.2 WP7

Regarding responsibilities, the focus groups with healthcare professionals indicated that it is important to have clear definitions on roles and responsibilities. Concerning the topic of public image, interviewees clearly indicated that they expected the MasterMind services to contribute to a positive image of psychiatry in general, and the service provider specifically.

#### 7.1.3 Summary

- In offering ccVC services, healthcare professionals indicated that it is important to (re)define responsibilities in, for example, tackling technical issues, and who is responsible for treatment.



- Representatives of the involved service providing organisations indicated that they expected that Mastermind services will positively impact the organisation's public image. Reasons for this contribution to a positive public image include increased treatment efficiency, enlarged accessibility, and treatment flexibility. In addition, this image might attract health professionals who want to drive this further forward.



## 8 Lessons learned

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### 8.1 Introduction

All pilot sites in MasterMind have filled in a questionnaire about their lessons learned in the project. Highlights are presented below. For further information, and a broad description of the replies, please see the final trial reports for WP5, WP6, and WP7.

The questions about lessons learned were provided as an opportunity for the sites to share their experiences. The following questions were asked:

- What are the main lessons learned regarding implementation and organisation of the pilot, including facilitators and barriers for implementation?
- Please elaborate on any issues that have been of importance, and please also elaborate with respect to the following categories:
  - Engaging healthcare professionals and providers;
  - Setting up the technical services;
  - Patient recruitment;
  - Organisational issues;
  - Finance.
- What main problems did you experience, and how did you solve them?
- What are the experiences of the healthcare workers?
- What are the experiences of the patients?
- What recommendations do you have for others starting ICT based services in this area?
- What are your comments on your numbers of patients / participants reached in MasterMind and completing treatment?

### 8.2 Lessons learned - summary of results

All sites have learnt some very valuable lessons for the future work with implementation and sustainability of the cCBT and ccVC services; the majority of the sites have also experienced some kind of challenges to a greater or lesser extent during the project.

The challenges are mainly related to implementation, engaging healthcare professionals, ethical approval, procurement activities, and the technical solutions. These issues also affect recruitment of participants, and are important to address. All sites have worked hard to meet these challenges; the most important corrective actions have been information and continuous training activities to make professionals involved, and support for GPs in order to help and collaborate with them.

A well-functioning technical solution is one of the key issues for implementing cCBT and ccVC services; it is very important to invest time in finding the right solution, and align it with the individual needs of the organisation. Many of the sites have experienced technical difficulties and problems in finding the optimal solution. The challenge of finding the right



technical solution has been underestimated for many of the sites, and this has been a delaying factor.

It is important that the technical solution is user-friendly for all users, patients, GPs and specialists. It is recommended to establish solutions for support, and develop local guidelines for running cCBT and ccVC. These guidelines must cover topics such as organisation, documentation, reimbursement, support, training, and technical issues. Some of the issues include for example the optimal size for the screen of the video conferencing system, and how to communicate in the room when using videoconferencing systems.

A clear strategy is required so that all those involved know the plans and are able to work in the same direction. A clear strategy also helps to address any negative attitudes towards cCBT and ccVC. It is important to involve the management of the organisation in the implementation of cCBT and ccVC, and involve the stakeholders (patients, GPs, technical staff, etc) at the planning stage, and frequently throughout the implementation. This commitment has been energised in various manners, including providing resources for training and information sessions for professionals, and time in gaining support. It is important to invest resources in various types of information material for the patients, both online and in paper form. A strategic and dedicated approach to marketing can help the engagement of participants.

Implementing ccBT and ccVC causes a change in the normal routines for both healthcare professionals and patients. It is important to be aware that any change will affect the organisation. More of the sites have met this with a high level of information, involving the management level, and training sessions.

Overall, the sites experience a high level of satisfaction among patients. They value the high level of privacy, that staying at home makes them feel less ill, that it is free, and that there is no waiting time; one feedback from the patients is that the quality of the ccVC is no less than having a face-to-face consultation, and that everything could be done that would be done in a face-to-face consultation. Patient recruitment depends on several points: patient's mobility; ICT literacy / computer skills; willingness to use ICT; and age. It is important to take these issues into account.

The majority of health professionals are satisfied with the services, and give a positive picture of working with cCBT and ccVC. Some advantages are the ability to save travel time and costs, and to be able to treat more patients for less money. Some sites also highlight the reduced need for referrals with the system in place. ccVC enables support for other health professionals in an appropriate way, and to encourage collaboration.

In summary, recommendations and lessons learned include:

- It is important to have a well-functioning technical solution that meets the needs of the patients and professionals. Good network connections are needed.
- It is important to perform some laboratory testing before deploying the solution in real life, in order to avoid problems.
- It is important to have close contact and cooperation with the involved team, including physicians, nurses, GPs, technical staff and management.
- Preparatory planning is essential, together with a clear development plan before starting implementation.



- It is important to ensure continuous follow up of the implementation from management.
- Ensure that confidentiality issues are addressed early in the project, as this can cause delays in implementation.
- Staff and technicians must be sufficiently trained. Training sessions take time, and must be planned and scheduled carefully.
- It is important to introduce patients and relatives to the technical solution, and to support the patient in using it.
- Information for patients and partners is a key issue.
- National guidelines are needed, e.g. with respect to law: what is allowed, and what is required for the use of VC to patients at home.

Motivation is a key issue for making a successful implementation of cCBT and ccVC, and it is important to focus on factors that encourage this throughout the process.



## 9 Transferability assessment

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In the MasterMind project, a large amount of data and knowledge has been collected, and is made available for other European regions in their work with implementation and up-scaling of eMental services. As part of the reporting of the results, the MasterMind project provides two approaches to transferability assessment.

The first is the transfer of the knowledge of the implementation process and organisation of services. This information is primarily made available in the evaluation of domain 6 (Organisation) in the MAST model, the tools and process applied in the Marketplace concept described in D5.6, and in the deployment plans in D3.6. Processes, experiences, and methods from this work have been validated by the advisory boards and external experts, and can be transferred to other regions.

The second approach to transferability is to look at the specific outcomes for the domains in the MAST model based on the demographic characteristics of a specific region wanting to implement the service.

It is possible to assess the transferability of results, i.e. determining whether particular demographics, clinical, organisational, or economic aspects have affected the outcome, and to what extent the results can be transferred to e.g. a larger patient group or other organisations.

This could include assessment of:

- Comparison of demographic characteristics with national or regional data.
- Widening of inclusion criteria and the inclusion of other types of patients.
- What would it take to scale up the intervention to other areas.

This should be based on the MAST model, and include the assessment of scalability and generalisability of the domains in the MAST model. The MAST model also contains a guideline for the statistical methods that should be used to transfer results between regions or patient groups.

To create a transferability assessment, a specific region or patient groups is required in order to estimate the expected outcome. In the MasterMind project, we did not have access to this information, and a specific analysis lies outside the scope of the project.



## 10 Conclusions

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These conclusions are based on the outcomes of results from the three trials in WP5, WP6 and WP7.

At the end of the project, 11,573 patients have received treatment using cCBT, ccVC or a combination of ccVC and cCBT. Information on 9,703 of these patients has been uploaded to the central database, and has been part of the data analysis in this report. In addition, data on 3,518 healthcare professionals involved in cCBT, ccVC or a combination of cCBT and ccVC, has been uploaded to the database, and provided the basis for background information about professionals involved in the project. A number of healthcare organisations have provided data on the organisational aspects.

The numbers of eligible patients indicate that a great number of patients could possibly benefit from the treatment provided in MasterMind. However, there is a great variation in the number of eligible patients between the sites, from 546,000 in Germany to 3,500 in Norway.

Across the five cCBT trial sites in WP5, the mean age of participating patients was 39 years; 67% were female. 28% of all participants received up to secondary education, and 61% received higher education, which indicates a highly educated data set in comparison to the general population.

For WP6, the average age of participants was around 45. The proportion of females was considerably higher in all sites, and the educational level is mainly university.

For WP7, the mean age of the patients is 50 years, though both younger and older patients have been enrolled in WP7 around the sites. More women have been enrolled in WP7, and the patients are characterised by having secondary education or higher education.

Healthcare professionals were recruited and trained at the individual sites before the trials started. The type and specialisations of the involved professionals are dependent on the local institutional setups and reference pathways, and differ between sites. The professionals in MasterMind include psychologists, medical doctors, GPs, nurses, psychiatrists, and mental healthcare workers.

Patient safety has been an important focus area throughout the project, and has been monitored closely. Both cCBT and ccVC have been used in close collaboration between healthcare professionals and patients. Whenever the healthcare professionals have had doubts about the safety of using the service, they have had the possibility of converting to face-to-face treatments. Because of the close contact, the professionals have been able to use their clinical judgement throughout the treatment, and to ensure the patients have a high level of safety.

Overall, patients report a high perceived satisfaction with ccVC and cCBT, and see the service to be well integrated. The majority of patients report a high quality of treatment, and that they have received the kind of treatment they wanted. The data shows that the patients overall have improved their condition throughout the project period. The discussions of the healthcare professionals related to symptom severity indicated that the cCBT services were mostly appropriate to those who have the expectation that psychological therapy will provide learning tools and skills to cope with low mood and



anxiety. Those who are experiencing more mild symptoms of depression or anxiety are considered appropriate for and seem most interested in using cCBT services.

With respect to engagement with the treatment, the main advantage of the cCBT solution is the reduction in waiting time. Another crucial point is the information patients receive before deciding to engage in an eHealth treatment. Unrealistic expectations are reported to be a potential barrier, and should therefore be reduced as early as possible. From the focus groups interviews, it appeared that various factors are relevant in: a) appropriateness of the service in alleviating the needs of the patients; b) the decision to engage with the cCBT service; c) adherence to cCBT treatment; and d) safety of the service.

The majority of the health professionals are satisfied with the services, and would use them again. Most of the professionals report that the service meets their needs in the treatment of patients.

In addition to the quantitative data, the focus groups indicated that there is room for improvement: the services can be made more attractive and easier to use, for example including options for therapists to see the content of a certain module before assigning it to a patient.

Throughout the pilot sites, the feedback from healthcare workers is mostly positive, and gives a positive picture of working with videoconferencing; some of the advances described are:

- GPs feel more confident assuming more competences when they have the appropriate support.
- Specialists are keen to help because they know it will mean avoiding the mild cases and reducing their waiting lists.

Another advantage described is the ability to save travel time and costs, and to be able to treat more patients for less money. Some sites also highlight the reduced need for referrals with the system in place.

There is a wide variation in the responses regarding the economic aspects of the implementation of the services. Initial investment in material and ICT infrastructure varied among all sites.

The direct cost for one session is not provided by a number of regions; among those that provided this information, the cost varied from €20 to €188 for cCBT, and between €70 and €188 for the combination with ccVC. The most common reimbursement modality is the Public Health System (Scotland, Denmark, and Norway; in the latter, a proportion of the cost is reimbursed by the patient) and health care insurers (Netherlands and Germany).

However, it was highlighted that the cost of the service is not too high, and it provided the possibility to treat more patients. It underlines a more modern and accessible psychiatry where you have the possibility of offering a variety of different ways of achieving treatment. This is in line with the strategies of several countries of having a dedicated focus of the individual needs of patients.

In the MasterMind project the cost effectiveness have been addressed by estimating the cost of reducing the depression level for one person from for instance very severe to severe or from severe to no symptoms. This can be use are a guideline for other regions that wants to implement the services.



For the majority of the patients, cCBT and ccVC are suitable solutions. It is always important to meet the individual needs of the patients, and for patients where cCBT and ccVC are not useful, it is important to have other solutions. In the treatment of depression, it is important to have a variety of solutions to ensure personalised treatment; this project demonstrates that cCBT and ccVC can be useful solutions.

A well-functioning technical solution is one of the key issues for implementing cCBT and ccVC, and it is very important to invest time in finding the right solution and aligning it with the individual needs of the organisation. It is recommended to establish support for solutions, and develop local guidelines for running cCBT and ccVC. The guidelines must cover topics such as organisation, documentation, reimbursement, support, training, and technical issues.

It is important to involve the management of the organisation in the implementation of cCBT and ccVC; all interviewees underlined the importance of involving senior management throughout the process. This commitment has been energised in various ways, including providing resources for training and information sessions for professionals, and time in gaining support.

MasterMind has provided all sites with some very valuable experiences with respect to VC, and all sites have succeeded in implementing the technical solution, the recruitment of patients and professionals, and implementing the service. All sites have experienced some kinds of challenges with respect to ccVC during the process, but also learnt some very valuable lessons for the future work with implementation and sustainability of the VC service.

Some of the lessons learnt are:

- It is important to have a well-functioning technical solution that meets the needs of patients and professionals. Good network connections are needed.
- It is important to perform some laboratory testing before deploying the solution in real life, in order to avoid problems.
- It is important to have close contact and cooperation with the involved team, including physicians, nurses, GPs, technical staff and management.
- Preparatory planning is essential, together with a clear development plan before starting implementation.
- Staff and technicians must be sufficiently trained. Training sessions take time, and must be planned and scheduled carefully.
- It is important to introduce patients and relatives to the technical solution, and to support the patient in using it.
- Information for patients and partners is a key issue.
- Implementation is a time-consuming process.
- National guidelines are needed e.g. with respect to law: what is allowed, and what is required for the use of VC to patients at home.

The results from MasterMind demonstrate that cCBT and ccVC can be used as tools in connection with treatment of depression, and that eHealth solutions can be very well considered in the area of mental health.