

The impact of E-mental Health Interventions on  
Access to mental Healthcare in the European  
Union

A realist review

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## Abstract

This realist review which is conducted after Pawson (2005) aims to provide an answer to the overarching review question *To what extent do e-mental health interventions improve the access to mental healthcare in the European Union?* Three sub-questions addressing relevant concepts contained in the overarching review question have been formulated examining the factors that support the implementation of e-mental health interventions in EU countries, the stakeholders affected by the implementation process and the possibilities of access to mental healthcare in the EU. Four programme theories addressing each of the four review questions have been constructed and refined by extracting data from scientific articles stemming from a pre-selected set of countries, namely the Netherlands, Germany and the United Kingdom. Due to the different levels of development and implementation of e-mental health interventions within EU member states an answer to the overarching review question cannot be given yet. However, this study found that albeit expectations concerning the outcomes achievable by e-mental health interventions are high concerns remain regarding the size of their potential target group, content quality and treatment appropriateness as well as patient data safety and confidentiality. The review is finalized by offering several policy recommendations and suggestions on further research.

## 1.0 Introduction

In this chapter the overarching research problem examined in this Bachelor Thesis is introduced and the review question as well as relevant sub-questions formulated to address said research problem are presented.

Although national healthcare systems in the European Union are often praised for their nearly universal coverage, as well as quantity and quality of services the majority of governments is struggling with reconciling the desire to reduce inequalities in health, namely to maintain both quality and universal access to healthcare services and the pressure to reduce the costs of healthcare services considering the impact of the last economic crisis and rising expenditures of public sectors all over the Union (WHO, 2016). Despite the fact that there have always been large variations in the levels and rates of growth of public spending on health across the Europe Union the beginning of the 2008 economic crisis caused a trend of considerably slower growth of overall health spending in all EU countries(OECD, 2014). When looking at access to healthcare many European Union member states are confronted with the challenge of providing the same level of access to healthcare in rural areas as in urban agglomerations. Although almost all EU countries have achieved universal or near-universal healthcare coverage reducing out-of-pocket medical expenditures for pharmaceutical products or curative care and exempting those in need, equal access to healthcare services is threatened by the uneven distribution of physicians in a number of member states. The biggest difference between rural and urban areas regarding the number of physicians per 1000 inhabitants can be observed in Greece, Czech Republic and Slovakia, where physicians are strongly concentrated in the countries capital areas. (OECD, 2014). A number of policy instruments could be of use when trying to make the rural areas more attractive for physicians and healthcare service providers, such as the enrolment of medical students from diverse social backgrounds and geographic areas, the decentralization of medical schools from metropolitan to provincial regions or the arrangement of financial incentives for physicians to open a practice in underserved areas (OECD, 2014). However, the overall problem of providing high-quality services while reducing costs and maintaining equal access to healthcare in the European Union remains. Thus another option, namely the reorganization of health service delivery and the development of new ways to improve access to healthcare can become a point of focus (OECD, 2014). Hence, innovative solutions combining new channels of service delivery with contemporary tools must be explored regarding their usefulness in solving the problem described above.

One of these innovative solutions is eHealth. In the *eHealth Action Plan 2012-2020* the European Commission states that information and communication technologies can increase efficiency, improve the quality of life and open the door to further innovations in the health market (European Commission, 2012). When looking at which diseases cause the greatest burdens to health and well-being in the European Union it becomes apparent that eHealth interventions could be highly effective in decreasing costs of and increase access to mental healthcare. Mental health problems account for approximately 20 per cent of the total burden of ill health in Europe, with one in four Europeans experiencing a significant episode of mental

illness during his or her lifetime (European Observatory on Health Systems and Policies, 2005). With depression being the most common disorder many Europeans encountering mental health problems face the threat of broken family and social relationships, unemployment, poverty, physical ill-health and stigmatization (European Observatory on Health Systems and Policies, 2005). Apart from social expenditure mental health problems are associated with high economic costs both inside and outside the health sector, being caused by unemployment, absenteeism or poor performance at work or premature retirement of people encountering mental health problems (European Observatory on Health Systems and Policies, 2005). Thus, e-mental health interventions could be one essential tool to control and decrease the economic and societal cost of ill mental health in the European Union. E-mental health interventions, interventions that use communication and information technologies to support or improve mental health and mental healthcare, are focusing directly on the mental well-being of the user. Thereby, current technological developments, such as apps or interactive online help sites can be utilized to respond to the challenges mentioned above, namely the growing demand for mental healthcare, the rising cost of the healthcare sector and to maintain or even improve access to mental healthcare (GGZ Nederland, 2013).

The advantages of e-mental health interventions could be their low-cost supply and accessibility, being provided online at any time and free of costs. Furthermore, consumers in societies associated with high levels of stigmatization of mental diseases can profit from remaining anonymous when using e-mental health interventions.

One of the most advanced EU countries in e-mental health are the Netherlands. With 87 per cent of the Dutch using the internet on a daily basis, approximately 1.8 Million people have visited an online help site for psychiatric or social problems in 2010 (GGZ Nederland, 2013). Although Dutch health (GGZ Nederland, 2013) authorities state that certain e-mental health interventions are cost-effective and successful in reaching a bigger target group it is not yet clear how e-mental health interventions affect the access to mental healthcare in the European Union. Albeit the Dutch example gives reason for faith in the symbiosis of ICT and mental healthcare the evolution of e-mental health interventions in the European Union has only just begun and thus scientific and societal relevance of these new tools in the quest for improving access to mental healthcare and reducing the cost of services is yet unclear. When looking at the scientific level it becomes clear that further research must be conducted, examining to what extent e-mental health interventions actually better the mental well-being of its consumers, if and where there are possibilities to blend or substitute the traditional provision of mental healthcare with e-mental health interventions and to what extent e-mental health interventions improve the access to mental healthcare. From a societal point of view research into e-mental health interventions must investigate how society, especially those members of society suffering from mental ailments and associated effects benefit from the use of e-mental health interventions. Thus, researchers should investigate the effectiveness of e-mental health interventions in helping consumers to master every-day private and professional life. In the years to come scientists might consider exploring the relationship between the use of e-mental health interventions and the level of

unemployment or poverty of its consumers. Consequently, the newness of e-mental health provides scientists with a broad new field for conducting research into the societal and scientific relevance of e-mental health interventions.

In order to make a contribution to this new field of research the goal of this bachelor thesis, which is conducted in the style of a realist review, is to answer the review question *To what extent do e-mental health interventions improve the access to mental healthcare in the European Union?* In order to arrive at a concise answer, addressing all the concepts within the review question properly, three sub-questions have been formulated, namely:

a) *What are the factors that support the implementation of e-mental health interventions in EU countries and*

b) *Who are the stakeholders affected by the implementation of e-mental health interventions and finally*

c) *What are the possibilities of access to mental healthcare in EU countries?*

An explanation as to why these specific sub-questions are addressed and how answering them supports the answer to the overall review question is given in Chapter 2.0.

Due to the complexity of the intervention under examination a choice has been made for a realist review, as designed by Pawson (2005). Thus, an answer will be provided to the review question mentioned above and an explanation regarding what works for whom, in what circumstances and in what respect (Pawson, 2005). Thus, this study is contributing mainly to the clarification of the effect of e-mental health interventions on access to mental healthcare in the European Union. Following the introduction of the research problem and the presentation of both the review question and sub-questions the subsequent chapter contains a detailed description of said sub-questions above. This description is succeeded by the introduction of four programme theories, each addressing one of the sub-questions and the overall review question. Consequently, this chapter also contains an explanation on how these programme theories have been constructed. Followed by a methodology chapter, portraying how the data presented in the data chapter has been extracted, the data chapter displays the data which is used to answer both the review question and the sub-questions. In the data analysis or results chapter data is synthesized to achieve a refinement of the four programme theories and find an answer to the review question. Finally, an answer to the review question as well as the sub-questions and some policy recommendations as to the effect of will be given in the conclusion chapter.

## 2.0 Sub-Questions

As elaborated in Chapter 1.0 this chapter presents a more detailed description of the sub-questions and why addressing them supports the answer to the overarching review question. After introducing the overall research problem a concise review question and three sub-questions which address all theoretical

constructs presented in the review questions, have been designed. Again, the review question is formulated as follows: *To what extent do e-mental health interventions improve the access to mental healthcare in the European Union?* A set of EU countries as units of analysis has been selected, namely the Netherlands, Germany and the United Kingdom. The motivation behind the choice for these countries is given in Chapter 3.0. The term *e-mental health* has been officially defined by GGZ Nederland as 'the use of information and communications technology (ICT) to support and/or improve mental health and mental health care. It is about interventions focusing directly on the mental well-being of the consumer.' (GGZ Nederland, 2013). *Interventions* in e-mental health focus directly on the mental well-being of the consumer and can thus be conceptualized as 'actions taken to improve a person's mental well-being'. The term *access to mental healthcare* is conceptualized as 'individuals who have been referred further to secondary line mental healthcare'. As announced above sub-questions have been formulated as to both define the research objective of this study, to clarify the effect of e-mental health interventions on access to mental healthcare in the European Union and in light of the generative model of causality, which is chosen over the successionist model of causality in the realist review. The generative model of causality states that, to infer a causal outcome (O) between two events (X/Y) the researcher must understand the underlying mechanisms (M) that connects the events and the context (C) in which the relationship occurs (Pawson, 2005). Thus, the descriptive sub-questions are formulated as follows:

#### Outcome (O)

To what extent do e-mental health interventions improve the access to mental healthcare in the European Union?

#### Mechanism (M)

1. What are the factors that support the implementation of e-mental health interventions in EU countries?
2. Who are the stakeholders affected by the implementation of e-mental health interventions in EU countries?

The first and second sub-question are addressed due to the underlying assumption that in order to investigate the effect of e-mental health interventions on access to mental healthcare a first idea about the driving factors behind the implementation of said interventions into the mental healthcare system and the stakeholders who are affected by this implementation should exist. Thus, finding answers to the first and second sub-question supports the answer of the overall review question by showing how the implementation of e-mental health interventions affects the mental healthcare system and those in it.

#### Context (C)

### 3. What are the possibilities of access to mental healthcare in EU countries?

Answering third and final sub-question supports the answer to the overall review question by examining the traditional possibilities of access to mental healthcare in Europe and can thus provide an estimation about the possible effects of e-mental health interventions on the access to mental healthcare in Europe. In terms of defining the most important concepts derived from the sub-questions, the word *implementation* is conceptualized as 'the process of putting e-mental health interventions into effect'. Finally, *possibilities of access to mental healthcare* is defined differently within the context of this sub-question than within the context of the overarching review question, namely as 'what channels, what ways can individuals use in order to access mental healthcare'.

With the sub-questions being elaborated on in more detail the introduction of the four programme theories follows.

#### 3.0 Theory

This theory chapter presents the four programme theories addressing both the review question and the three sub-questions. As this is a realist review after Pawson (2005) selection criteria and processes applied to find suitable articles for programme theory construction are presented in this section and are not retrospectively displayed in the methodology section below. In order to provide a thorough theoretical grounding to the four programme theories important elements of theory of policy implementation theory are displayed first. When looking at theories on policy implementation two main approaches stand out, namely the top-down rational systems approach and the bureaucratic street-level behavior model (Parsons, 1995). The first perceives policy implementation as a process of interaction between the settings of goals and actions geared to achieve a certain goal. Thereby, successful implementation strongly depends on fixed goals, clearly defined tasks and stringent chains of command and hierarchy. In the latter approach the relationship between policy-makers and policy deliverers is deemed highly important. Policy implementation is a process of negotiation and consensus-building between these two actors which operate in different organizational cultures, political environments and display diverse management skills (Parsons, 1996). However, since both models tend to oversimplify the sheer complexity of policy implementation a third approach, the so-called Lewis and Flynn's model has gained recognition. In this model implementation is viewed as action by individuals which is constrained by the world outside their organizations and the institutional context within which they endeavour to act (Parsons, 1995). Following this third approach to policy implementation which emphasises the interaction between policy and context four programme theories are constructed following the realist review design by Pawson (2005).

As already mentioned above a realist review as designed by Pawson (2005) will be conducted in order to make a contribution to the new field of e-mental health research by answering the review question *To what*

*extent do e-mental health interventions improve the access to mental healthcare in the European Union.* A choice for this relatively new type of review, as opposed to the more traditional Cochrane systematic review has been made for several reasons. Although both types of reviews address a clearly formulated review question, the Cochrane review is more strict in searching and collating primary research on the topic under investigation. Thus, stringent guidelines and criteria are set up in order to establish whether or not there is undeniable evidence about a specific treatment (Cochrane Community Site, 2014). Synthesis takes place by using strategies that limit bias and error, using explicit, reproducible criteria in the selection of studies for review (Cochrane Community Site, 2014). Consequently, a Cochrane review can be standardized and reproduced more easily than a realist review, which rather allows for mid-level generalizations (Pawson, 2005). However, the subjects or observations of Cochrane reviews are predominantly randomised-controlled trials or clinical controlled trials as opposed to complex service interventions (Cochrane Community Site, 2014). With e-mental health interventions being the observation under investigation a decision has been made for a realist review, which has been designed keeping in mind the active, changing nature of interventions, their complexity and their often non-linear development. Instead of using fixed, pre-set guidelines the realist review assimilates information more by note-taking and annotation than by extracting data as such (Pawson, 2005). Thus, the realist review method is more suitable to investigate which complex, changing intervention works for whom, under what circumstances, in what respect and why than the Cochrane review (Pawson, 2005). Following Pawson's (2005) arguments, a realist review can have four purposes, namely reviewing for theory integrity, to adjudicate between rival programme theories, to review the same theory in comparative settings and to review official expectations against actual practice. Out of the four purposes of review that have been described, this realist review aims at reviewing the official expectations associated with e-mental health interventions and their impact on the access to mental healthcare against actual practice in three different countries, namely the Netherlands, Germany and the United Kingdom. Following the logic of the generative model of causality, which is explained in its elements in Chapter 2.0, four different programme theories have been constructed in section 2.3. One programme theory addressing each of the three sub-questions and an overall programme theory addressing the general underlying expectations and assumptions about the outcomes e-mental health interventions are expected to achieve in terms of improving access to mental healthcare. However, before programme theories can be articulated, selection criteria and selection processes for choosing adequate literature must be elaborated on.

### 3.1 Selection Criteria and Process

In order to limit the scope and quantity of the body of literature to be reviewed and to ensure a certain quality of the literature used for constructing programme theories a specified selection process is needed. After considering factors such as time, resources, knowledge and looking at previous realist reviews for typical selection criteria the following criteria and selection process have been chosen:



## Selection Criteria

Table A - Inclusion and Exclusion Criteria<sup>1</sup>

Inclusion Criteria	Exclusion Criteria
Scientific articles	Policy papers, government declarations, legal documents etc.
Articles stemming from a peer-reviewed scientific journal which is listed in the <i>SCImago Journal &amp; Country Rank</i>	Sources stemming from government/EU/NGO websites. Journals which are not listed in the <i>SCImago Journal &amp; Country Rank</i>
Articles published in the year 2000 and after	Sources published prior to the year 2000
Articles addressing the concepts of the (sub) review question under examination	Source not addressing the concepts of the (sub) review question under examination

As mentioned above a choice for scientific articles stemming from serious, peer-reviewed scientific journals listed in the *SCImago Journal & Country Rank* has been made in order to both ensure the quality of the data contained in the article and limit the scope of the sources eligible for programme theory construction, since time is a limited commodity. The decision to limit the pool of scientific articles to works published in the year 2000 or later has been taken in order to again, decrease the size of the sources eligible for programme theory construction, and due to the author's wish to use recent data. E-mental health interventions, as all technology and ICT related appliances, are developing at a high speed with interventions being modified according to new findings in research and environmental changes, as more and more healthcare providers decide to incorporate e-mental health interventions into previous models of care. Thus, data retrieved from articles stemming from the last millennium cannot correctly reflect the current state of knowledge about e-mental health interventions. Naturally, only articles addressing the concepts of the (sub) review question under examination are suitable for programme theory construction.

## Selection Process

Suitable Articles have been selected in four steps. The first step consisted of a keyword search in a search engine or database such as *Scopus*, *Google Scholar*, *PubMed*, *Sage Journals* and *JSTOR*. Thereby, various combinations of the keywords *E-mental health*, *interventions*, *online mental healthcare*, *benefits of e-mental health*, *healthcare technologies*, *ICT in mental health*, *factors promoting implementation of e-mental health interventions* and *stakeholders* have been used. In the second step results produced by the search engine or database were examined as to the selection criteria, thus being a scientific article stemming from a scientific, peer-reviewed journal, published in the year 2000 and after. Thirdly, the content of the article

<sup>1</sup> Afterwards referred to as Table A

was examined by reading the abstract or introduction if the abstract only contained keywords. Articles addressing the (sub) review question under examination were read and selected for programme theory construction. Furthermore a closer look was taken at the references depicted at the end of the article as to find further suitable sources for programme theory construction. Thus, the so-called snowballing technique is highly practical when searching for literature.

### 3.3 Programme Theories

As it is custom in the realist review the reviewer adopts a primary research to properly set the stage for the review. Therefore all programme theories are subject to second thought and are refined or changed further during the reviewing process (Pawson, 2005).

#### 3.3.1 Programme Theory 1 - Outcome (O)

After applying the selection criteria displayed in Table A and conducting the four steps of selection shown in section 3.1 a total of 15 articles were selected for the construction of a fitting programme theory addressing the underlying assumptions and expectations about the outcomes e-mental health interventions are expected to achieve in terms of improving access to mental healthcare.

All articles selected address four main assumptions and expectations about how e-mental health interventions are expected to work in terms of improving access to mental healthcare, namely **overcoming of barriers in accessing mental healthcare, patient education and empowerment, cost reduction of mental healthcare services** and **reduce workload of healthcare professionals**.

**The overcoming of barriers in accessing mental healthcare:** E-mental health interventions are expected to increase the convenience for patients in terms of time and location of the treatment (Musiat et al.,2014). Thus, they are highly useful in helping to overcome entry barriers for remote and poor populations by providing the potential for remote diagnosis, monitoring, treatment and and long-distance training for non-specialized healthcare workers (Farrington et al., 2014). Additionally e-mental health interventions can provide access to mental healthcare to patients who travel a lot or who are housebound due to family or other health issues (Musiat & Tarrier, 2014).

**Patient empowerment and education:** E-mental health interventions can make the delivery of mental healthcare easier by avoiding socio-cultural stigmas associated with mental health issues (Farrington et al., 2014). Those who are unwilling to make use of traditional mental health services are empowered to do so by using new way of access and thus the treatment rates for common mental disorders could be improved (Reynolds et al.,2015). Lal and Adair (2013) speak about the enabling and empowerment of mental health patients by e-mental health interventions, which extend ethics and equity in mental healthcare. Another aspect mentioned by Ybarra and Eaton (2005) is the possibility for the patient to pick and choose the e-mental health intervention he likes best and thus receive self-paced, tailored and individual care.

Additionally, patient choice increases the flexibility and integrity of intervention programmes (Ybarra &

Eaton, 2005). A final aspect described in the literature is that e-mental health interventions empower and educate patients by providing the possibility for inter-patient communication, meaning that patients can use online forums, newsgroups and internet tutorials to discuss individual interventions, what worked for whom and exchange valuable information (Christensen & Griffiths, 2003).

**Cost reduction of mental healthcare services:** With the majority of people being able to access the internet e-mental health intervention can reduce cost of mental healthcare services by being provided online and having the potential to supplement face-to-face therapy (Eichenberg et al., 2013 & Musiat & Tarrrier, 2014). Another argument by Musiat & Tarrrier (2014) is the reduction of demand on clinicians at lower costs. In line with Musiat & Tarrrier (2014) Vis et al. (2015) claims that the delivery of effective and efficient mental healthcare can be achieved by the smart use of ICT solutions. Thus, e-mental health interventions can mean the more efficient use of mental health resources (Vis et al., 2015). Lower overall delivery costs can also benefit the patient by lowering the costs of access to mental healthcare services (Schmidt & Wykes, 2012).

**Reduce workload for healthcare professionals:** E-mental health interventions allow clinicians time to provide intense care to those who require it, namely patients with heavy mental disorders demanding face-to-face treatment (Reynolds et al., 2015). Griffiths et al. (2007) add that by empowering patients with the offer of additional and convenient services clinician's time can be freed up so they can focus on the more complex and creative aspects of their employment. Furthermore demands on the clinical workforce can be reduced by distributing services online (Til & Wykes, 2012).

### 3.3.2 Programme Theory 2 - Mechanism (M)

After applying the selection criteria presented in Table A in section 3.2 and running the four steps of selection a total of 13 articles was eligible for programme theory construction. However, it must be mentioned that searching for factors that support the implementation of e-mental health interventions was quite difficult due to the limited amount of suitable sources.

After conducting an extensive literature review the factors supporting the implementation of e-mental health interventions presented in the articles can be grouped into five categories which are **technology, organizational culture, society, research and funding and marketing/promotion**.

**Technology:** While Jorm et al. (2013) mention the technological development of new devices and the establishment of electronic health records to foster the implementation of e-mental health interventions Christensen and Petrie (2013) stress the integration of ehealth technologies into current mental health practices. In line with that statement Christensen and Hickie (2010) advises for the development of highly interactive web-based technologies. Finally, Reynolds et al. (2015) perceive the development of online clinics as beneficial for the implementation of e-mental health interventions

**Organizational culture:** Changes in professional roles and new types of mental health workers and new ethical regulatory frameworks are required for the proper implementation of e-mental health interventions (Jorm et al., 2013). Furthermore current practice, bureaucracy and professional ownership should not

stymied opportunities created by e-mental health interventions (Christensen & Petrie, 2013). Thus, a positive innovation climate within organisations and healthcare professions together with renewed ethical and legal aspects such as a change in clinical guidelines promote the implementation of e-mental health interventions (Vis et al., 2015). Another beneficial development is the endorsement of e-mental health services by government entities and the education of healthcare professionals about e-mental health interventions (Batterham et al., 2015). Establishing liaisons to gain hospital administrative support and achieve cooperation between technical and medical professionals is advised by Kao et al. (2006). A final point mentioned by Reynolds et al. (2015) is the development of clearly differentiated, flexible models of practice which can be used in different organizational contexts.

**Society:** Christensen & Hickie (2010) state that a change must take place in community attitudes towards help-seeking for mental health problems while Meurk et al. (2016) add that community education in forms of information materials and training in the use of e-mental health interventions must take place in order to support the implementation of e-mental health intervention. Furthermore, users must know about service providers (Meurk et al., 2016).

**Research and Funding:** The demand for new funding models (Jorm et al., 2013) and research on access, utilization and interests in mobile technologies, determining what type of services would be acceptable and of greatest interest to consumers (Ben-Zeev et al., 2012) is advocated for by many authors. Furthermore, more evidence about the efficacy of e-mental health interventions (Meurk et al., 2016) and the development of translational-focused activities in research (Batterham et al., 2015) are factors that support the successful implementation of e-mental health interventions.

**Marketing/Promotion:** One of the most important factors to support the implementation of e-mental health interventions is marketing. Thus, Dirmaier et al., (2016) strongly advocate for internet and social media marketing, campaigning and targeting potential users as well as the publication of research on e-mental health interventions. As already stated above Meurk et al. (2016) deem community education using information materials and training sessions in the use of e-mental health interventions as highly beneficial when it comes to the implementation of said applications. Furthermore, web-site utilization must be promoted by using tailor-made messaging and social networking. This can also help to characterize reach rates and minimize attrition (Bennett & Glasgow, 2009).

### 3.3.3. Programme Theory 3 - Mechanism (M)

Having applied the selection criteria displayed in Table A and conducting the four steps of selection shown in section 3.2 a total of 11 articles were selected for the construction of a fitting programme theory examining the stakeholders who are affected by the implementation of e-mental health interventions in EU countries. Thereby, these stakeholders can be divided into three groups, namely **healthcare consumers**, **healthcare providers** and **research and information technology staff**.

**Healthcare consumers:** Healthcare consumers affected by the implementation of e-mental health interventions are racial and ethnic minorities (Yellowlees et al., 2013), who do not access traditional mental health services due to stigmatization or cultural barriers. Also children and youth encountering mental health issues are affected consumers. With the internet being an integral part of the lives of young people, delivering care online and via applications youths use on a day-to-day basis e-mental health interventions can become a substantial alternative to traditional mental health services (Boydell et al., 2014). Another type of healthcare consumer mentioned by several sources is the patient living in a rural community, unable to access traditional mental health services due to an unbridgeable geographic distance to the next provider (Boydell et al., 2014 & Yellowlees et al., 2013).

**Healthcare providers:** Providers affected by the implementation of e-mental health intervention are healthcare insurance companies (Moock, 2014), as well as healthcare professionals such as general physicians and clinicians (Meurk et al., 2016 & Reynolds et al., 2015). Other providers named in a number of articles are pharmacists and mental health specialists such as psychologists (Reynolds et al., 2015 & Younes et al., 2015). Also community mental health and national health services are healthcare providers referred to when investigating for the stakeholders who are affected by the implementation of e-mental health interventions (Schmidt & Wykes, 2012 & Bennett et al., 2010). Other authors mention national governments and health policy makers (Meurk et al., 2016 & Younes et al., 2015). Additional providers named by some sources are business organizations and marketing professionals (Ybarra & Eaton, 2005). Thereby, authors emphasize that these organizations must not only facilitate the provision of e-mental health interventions by promoting interventions and educate potential consumers about their use, but also by assessing consumer's needs and desires before designing said interventions (Ybarra & Eaton, 2005).

**Research and Information Technology Staff:** Several articles chosen for constructing this programme theory mention mental health researchers and information technology staff as both being affected and necessary for the implementation of e-mental health interventions (Ybarra & Eaton, 2005 & Bennett et al., 2010). Thus, web development staff is responsible for the security and mission-critical delivery of its servers and softwares as well as the development, design and successful delivery of web-based e-mental health interventions (Bennett et al., 2010). Mental health and clinical researchers are in the duty of providing evidence-based content for e-mental health interventions, addressing correctly the disorder covered by the intervention and thus are responsible for the quality of information and services provided by e-mental health interventions (Ybarra & Eaton, 2005 & Meurk et al., 2016).

#### 3.3.4 Programme Theory 4 - Context (C)

Having administered the selection criteria displayed in Table A and having conducted the four steps of selection shown in section 3.2 a total of 15 articles were selected for the construction of a fitting programme theory shedding light on the possibilities of access to mental healthcare in European Union countries. Again, the possibilities of access to mental healthcare in the EU mentioned in the selected

articles can be assigned to three groups, i.e. **primary-care settings**, **specialist-care settings** and **alternative settings**.

**Primary-care settings:** The possibility of access to mental healthcare most frequently mentioned in the 15 articles selected for constructing this programme theory is the general practitioner or family practitioner (Thornicroft, 2008 & Cunningham, 2009 & Jones et al., 2014). He is described as the first reference point for individual experiencing mental health issues when looking for advice or referral to a specialist. Other possibilities for accessing mental healthcare within the primary-care setting are non-emergency hospital admissions (Cunningham, 2009), nurses operating in general hospitals or community health centres (Reiss-Brennan, 2014) and community councillors (McCabe & Leas, 2008).

**Specialist-care settings:** Individuals being referred to specialised care or experiencing a more serious mental disorder can access mental health care via mental health specialists such as psychiatrists (Thornicroft, 2008 & McCabe & Leas, 2008), occupational therapists or psychiatric nurses (McCabe & Leas, 2008 & Hickie & McGorry, 2007). Psychiatric hospitals (Dunn et al., 2012) and community mental health centres (Jones et al., 2014) are also mentioned as possibilities to access mental healthcare by a number of articles. So called mental health link-workers have been named as beneficial in bridging the gap between primary-care providers and specialist services when it comes to delivering mental healthcare. Thus, the mental health link-worker provides psychological therapy within a general practitioner's praxis and raises awareness among the practitioners staff by actively discussing mental health policy and clients' cases (Evans et al., 2014).

**Alternative-care settings:** Outside primary- and specialist-care settings possibilities of access to mental healthcare can be alternative medical providers (Thornicroft, 2008), welfare and pastoral care or youth services (Rickwood et al., 2007). Friends and family, as well as school teachers and counsellors can function as facilitators when accessing mental healthcare (Rickwood et al., 2007). According to Rickwood et al., (2007) youths often seek help within their social environment when first encountering mental health issues. Thus, a friend or family member can be supportive in setting up an appointment with a general practitioner or community mental health centre (Rickwood et al., 2007). With the rise of ICT, web-based and mobile communication devices have become feasible possibilities of access to mental healthcare within European Union countries (Burns et al., 2010 & Rickwood et al., 2007 & Farrington et al., 2014).

With four suitable programme theories addressing the review question as well as the relevant sub-questions data must be extracted to populate these theoretical frameworks with evidence and thus achieve theory refinement and find answers to all four (sub)review questions during the synthesis stage. But before data extraction can begin this realist review's methodology must be addressed in a separate chapter.<sup>2</sup>

#### 4.0 Methodology

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<sup>2</sup>A summary table of all four programme theories can be found in the appendix as 'Summary Table 1 – Programme Theories'

In this chapter the necessary steps and tools, which must be undertaken and applied in order to extract data to populate the four theoretical frameworks presented in the section above are displayed. Following the logic of Pawson's (2005) realist review the content of the articles pre-selected in light of the selection criteria, methods and processes lined out below, will be evaluated regarding relevance and rigour and a final selection for data extraction will be made. Furthermore data extraction templates will be developed and data to populate the four programme theories with evidence will be presented. Finally, a description of the cases, namely the EU countries Germany, the Netherlands and the United Kingdom, chosen as units of analysis will be given in the section below.

#### 4.1 Selection Criteria, Selection Process and Method

In order to limit the scope and quantity of the body of literature eligible for data extraction, selection criteria, process and methods had to be lined out. As can be seen below, Table A of Section 3.1 has been amended by one row, indicating that only articles addressing the programme theory under examination in one of the three countries are suitable for pre-selection and data extraction. For reasons of continuity and consistency in quality and age of the data retrieved from the articles previous inclusion and exclusion criteria remain.

Table B - Inclusion and Exclusion Criteria for Articles eligible for data extraction<sup>3</sup>

Inclusion Criteria	Exclusion Criteria
Scientific articles	Policy papers, government declarations, legal documents etc.
Articles stemming from a, peer-reviewed scientific journal which is listed in the <i>SCImago Journal &amp; Country Rank</i>	Sources stemming from government/EU/NGO websites. Journals which are not listed in the <i>SCImago Journal &amp; Country Rank</i>
Articles published in the year 2000 and after	Sources published prior to the year 2000
Articles addressing one of the four programme theories in Germany, the United Kingdom and the Netherlands	Articles addressing one of the four programme theories in Germany, the United Kingdom and the Netherlands

#### Selection Process and Method

Suitable Articles for data extraction have been selected in a process similar to that described in section 3.1. The first of the four steps consisted of a keyword search in a search engine or database such as *Scopus*, *Google Scholar*, *PubMed*, *Sage Journals* and *JSTOR*. Fitting keywords were identified by brainstorming as well as by skimming articles addressing e-mental health for suitable keywords. Thus, short and concise

<sup>3</sup> Afterwards referred to as Table B

keywords such as *telemedicine*, *online intervention* and *ehealth* could be classified. In the second step results produced by the search engine or database were examined as to the selection criteria described in Table B. Thirdly, the content of the article was examined by reading the abstract or introduction. Articles addressing one or more of the four programme theories in Germany, the United Kingdom or the Netherlands were read and pre-selected for data extraction. Finally, the pre-selected articles were examined with regards to relevance and rigour. Hereby, relevance was determined by thoroughly reading each selected article and assessing the extent to which it is addressing one of the four programme theories as well as its contribution to previously gained knowledge. Rigour was ensured by only selecting articles published in peer-reviewed journals. Having received a positive assessment an article was eligible for data extraction. A total of 39 articles were eligible for data extraction. Thereby, 13 addressed programme theory 1, 10 programme theory 3 and eight articles each programme theories 2 and 4. The same selection method as described in section 3.1, namely the so-called snowballing technique was used to find additional articles. No limits were encountered due to language barriers, as only articles published in languages the researcher has at least an advanced knowledge of, namely German, English and Dutch were selected. This decision resulted in the advantage of an increased pool of eligible articles since some sources are published in their original version only.

#### Relevance and Rigour

The realist review rejects the hierarchical approach of the Cochrane review due to its goal of exploring complex areas of a highly diverse subject matter (Pawson, 2005). Thus, the realist review appraises the quality of evidence due to relevance and rigour. Thereby the realist reviewer cuts directly to the judgement (Pawson, 2005). The first stage, relevance, is not about whether the study covered a particular topic, but whether it addressed the theory under test. In the second stage of rigour, the reviewer assesses whether a particular inference drawn by the original researcher of the article has sufficient weight to make a methodologically credible contribution to the test of a particular intervention theory (Pawson, 2005). However, due to the complexity of most intervention theories relevance and rigour are not absolute criteria on which to accept or reject an article, but dimensions of 'fitness of purpose' for a synthesis (Pawson, 2005).

#### Data Extraction Templates

As mentioned in the introduction to this methodology section one of the most crucial steps conducted in this realist review is the extraction of data to populate the four programme theories with evidence. Thus, a single data extraction template for each of the four programme theories was developed. To provide a concise picture of eligible articles certain basic information regarding each source have been included as standard categories in each template, namely country, author (year), study design/type of article, types of interventions addressed and limitations. The category types of Interventions addressed is hardly applicable



when extracting data to populate programme theory 4 with evidence. Since this programme theory attempts to describe the possibilities of access to mental healthcare, the articles selected for data extraction do not necessarily address e-mental health interventions. Therefore, when no e-mental health intervention is mentioned in the article under examination the cell is to be filled with the term 'not applicable'. The final category limitations has been included into each template with the goal of adding more weight to the dimension of rigour, meaning the assessment of a particular inference drawn by the original researcher of the article and whether it has sufficient weight to make a methodologically credible contribution to the test of a particular intervention theory. Furthermore, limitations to research design and data collection mentioned by the original researchers or authors of an article can shed more light on the quality of the data, statements and conclusions presented in the work. Following the logic of Pawson (2005), the first programme theory addressed the underlying assumptions/expectations about the outcome that e-mental health interventions are expected to achieve in terms of improving access to mental healthcare. Consequently, data extracted regarding the different types of outcomes named in eligible articles is extracted, to populate programme theory 1 with evidence. In order to prevent an overlap of data between programme theory 3, addressing the stakeholders who are affected by the implementation of e-mental health interventions and data extracted in light of programme theory 4, aiming to describe the possibilities of access to mental healthcare eligible articles providing data for both programme theories have been excluded. With the majority of eligible articles containing data for the population of evidence of more than one programme theory it was decided to include these articles in the data extraction process in order to prevent a lack of data. However, since programme theory 3 and 4 are closer in content a decision has been made to not use the same sources of data for these two programme theories.

#### Programme Theory 1 – Outcome (O)

Country	Author (Year)	Study Design/ Type of Article	Type(s) of intervention(s) addressed	Assumptions/Expectations about the outcome of e-mental health interventions mentioned in the article	Component(s) of Theory 1 addressed	Limitations

#### Programme Theory 2 – Mechanism (M)

Country	Author (Year)	Study Design/ Type of Article	Type(s) of intervention (s) addressed	Factors that support the implementation of e-mental health	Component(s) of Theory 2 addressed in the article	Limitations

				interventions mentioned in the article		
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Programme Theory 3 – Mechanism (M)

Country	Author (Year)	Study Design/ Type of Article	Type(s) of intervention (s) addressed	Stakeholders who are affected by the implementation of e-mental health interventions mentioned in the article	Component(s) of Theory 3 addressed in the article	Limitations

Programme Theory 4 – Context (C)

Country	Author (Year)	Study Design/ Type of Article	Type(s) of intervention (s) addressed	Possibilities of access to mental healthcare mentioned in the article	Component(s) of Theory 4 addressed in the article	Limitations

4.2 Case Description

Germany, the United Kingdom and the Netherlands have been chosen as fitting cases in this empirical inquiry that investigates a contemporary phenomenon within its real-life context (Yin, 1994) for three primary reasons. Firstly, all three countries are member states of the European Union and as the review question *To what extent do e-mental health interventions improve the access to mental healthcare in the European Union* implies this realist review wants to investigate what is it about e-mental health interventions that works for the European Union and in what circumstances and why (Pawson, 2005). Secondly, although the limited amount of time to write this realist review speaks against an embedded multiple-case study design a choice has been made for this design as its evidence is considered to be more compelling and multiple units of analysis (e-mental health interventions) are addressed by the review question (Yin, 1994). Thirdly, the three cases have been selected due to being rather different from each other in their level of development and implementation of e-mental health interventions than similar (Yin, 1994). Even though all rank as high income countries and had roughly the same per capita expenditure on health in 2013 (Germany: 5006\$, Netherlands: 6145\$, United Kingdom: 3589\$) as well as a comparable mental health expenditures (Netherlands: 10,65% and Germany: 11% of total health budget) some

similarities which have a profound impact on the integration of e-mental health interventions into their national health systems remain (WHO, 2013). Although the German Ministry of Health declared the implementation of an E-Mental Health Program in 2011 (Bundesministerium für Gesundheit, 2011), legal barriers inhibit the implementation and use of e-mental health interventions as stand-alone treatments in Germany and thus their full integration into German mental healthcare. While medical therapists are prohibited to execute treatment exclusively via internet by the so-called *Fernbehandlungsverbot* (prohibition of remote treatment) psychological therapists are allowed to include e-mental health interventions into treatment (Maercker et al., 2015). However, the professional code for psychological therapists contains strict regulations regarding the use of e-mental health interventions in psychotherapy, which may only be applied concomitantly to standard face-to-face treatment (Maercker et al., 2015). While the legal position of e-mental health interventions within the German healthcare system is still restricting full implementation the Netherlands and the United Kingdom have already achieved a thoroughly legal integration of e-mental health interventions in their healthcare systems (Maercker et al., 2015). In the United Kingdom, the Mental Health Network as part of the NHS began developing a two-stage E-Mental Health Framework in 2013, containing a comprehensive mapping exercise to establish what technology is currently used by the public, professionals and providers and a broad engagement process to design a comprehensive national framework for e-mental health by collectively assessing what people's aspiration are around making use of technology to improve mental health (NHS Mental Health News & Martine, 2013). Thorough implementation and use of e-mental health interventions seem to take place in the Netherlands, where two out of three Dutch mental healthcare institutes apply e-mental health in their care provision and communication with patients (GGZ Nederland, 2013). Choosing cases displaying different levels of development and implementation of e-mental health interventions will help to paint a realistic picture about e-mental health interventions and their effect on access to healthcare. However, the choice for the three cases will influence the amount of data and evidence generated by the extraction process as well as the overall results. Germany's slower development in e-mental health could result in a shortage of articles addressing the four programme theories could occur. Thus, the final pool of evidence used to answer the review questions could be biased, as there are fewer articles and therefore less data stemming from Germany. Therefore, the effect of e-mental health interventions on access to healthcare in the European Union might be perceived more positively than it is in reality. Having elaborated on the necessary steps and tools which must be undertaken on the way to the data extraction process, namely the pre-selection of articles under certain selection criteria, methods and processes, the evaluation of articles due to dimensions of relevance and rigour, development of four data extraction templates, each addressing one of the four programme theories and finally, the description of the three selected cases i.e. The Netherlands, the United Kingdom and Germany the next section. Chapter 5.0 Data presents a summary of the data extracted in the data extraction process.

## 5.0 Data

This chapter contains a summary of four extensive tables, each addressing one of the four programme theories, displaying data extracted from eligible scientific articles. This data will be used in the synthesis process to achieve programme theory refinement and answer each of the four review questions. The tables, namely Table 1: Programme Theory 1 – Outcome (O)<sup>4</sup>, Table 2: Programme Theory 2 – Mechanism (M)<sup>5</sup>, Table 3: Programme Theory 3 – Mechanism (M)<sup>6</sup> and Table 4: Programme Theory 4 – Context (C)<sup>7</sup> can be found in the Data Appendix under the same titles. They are hereafter referred to as Table 1 to Table 4. The summaries present information as to the number of articles used per data extraction process, the most predominate type of article or study design, the most common type of intervention addressed in the articles (not applicable for the summary of Table 4) and finally the component of the programme theory most often addressed in the articles.

### 5.1 Table 1: Programme Theory 1 -Outcome (O)<sup>8</sup>

Table 1 presents data extracted from 13 eligible scientific articles addressing programme theory 1. Out of these 13 articles five articles are stemming both from Germany and the Netherlands while three are addressing programme theory 1 in the British context. The most predominant type of article is the (systematic) literature review. When primary data was collected most researchers used a qualitative study design. Information about e-mental health interventions are sometimes rather descriptive and of general fashion, spanning every intervention from mental health information websites to apps preventing depression relapse, however, the most common type of intervention mentioned in the articles are sms-based or online therapy interventions addressing depressive disorders, anxiety disorders or alcohol abuse disorders in adults. As discussed in Chapter 3, Section 3.3.1 programme theory 1 addresses the underlying assumptions and expectations about the outcomes e-mental health interventions are expected to achieve in terms of improving access to mental healthcare. Thereby, programme theory 1 contains four main assumptions and expectations about how e-metal health interventions are expected to work in terms of improving access to mental healthcare, namely **overcoming of barriers in accessing mental healthcare, patient education and empowerment, cost reduction of mental healthcare services and reduce workload of healthcare professionals**. In the data extraction process these four main assumptions are referred to as components of theory 1. The component for which the most data could be extracted from the 13 eligible articles is **patient education and empowerment** with nine out of 13 articles containing data addressing this theory component, followed by **overcoming barriers in accessing mental healthcare** being addressed seven times. Data for the component **cost reduction of mental healthcare services** could only be extracted three

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<sup>4</sup> See Appendix Table 1: Programme Theory 1 – Outcome (O)

<sup>5</sup> See Appendix Table 2: Programme Theory 2 – Mechanism (M)

<sup>6</sup> See Appendix Table 3: Programme Theory 3 – Mechanism (M)

<sup>7</sup> See Appendix Table 4: Programme Theory 4 – Context (C)

<sup>8</sup> See Appendix Table 1: Programme Theory 1 – Outcome (O)

times, while no data was found supporting the existence of component **reduce workload of healthcare professionals**.

### 5.2 Table 2: Programme Theory 2 – Mechanism (M)

Table 2 contains data arising from eight eligible scientific articles addressing programme theory 2. Four of the eight articles address said programme theory in the British context, while three articles have been written by Dutch researchers and only one source stemming from Germany. Although not scoring highly on the dimension of relevance, a decision has been made to include the article due to a high lack of eligible articles addressing programme theory 2 in Germany. The most predominant type of study design used in the 8 eligible scientific articles addressing programme theory 2 are qualitative (case study) designs. Types of e-mental health interventions under examination in several articles are internet self-help programmes for battling depression, anxiety and alcohol-abuse disorders. Other interventions under investigation in the articles are mobile phone technology-based interventions for psychosis and video-conferencing technologies to hold therapeutic sessions online. Chapter 3, Section 3.3.2 contains a detailed description of programme theory 2, addressing the factors supporting the implementation of e-mental health interventions. Thereby, the factors discovered during the first literature search in light of the programme theory construction process could be grouped into five factor categories, namely, **technology, organizational culture, society, research and funding and marketing/promotion**. Again in the data extraction process these factor categories are referred to as components of theory 2. Remarkably, no data could be extracted from the eight eligible scientific articles addressing programme theory 2 to support the existence of components **society** and **marketing/promotion**. The component for which the most data could be extracted from seven out of the eight articles mentioned above is component **organizational culture**, followed by component **technology**, addressed by four out of eight articles and finally component **research and funding** for which data could be extracted from three of the eight eligible articles.

### 5.3 Table 3: Programme Theory 3 – Mechanism (M)

Table 3 displays data extracted from 10 eligible scientific articles addressing programme theory 3. Four articles out of these 10 articles are stemming each from the Netherlands and Germany, while two articles have been written by British researchers addressing stakeholders who are affected by the implementation of e-mental health interventions in the British context. The most predominant type of article is the (systematic) literature review. Articles containing primary data mostly used a randomized controlled-trial or qualitative (case study) research design. The most common types of intervention mentioned in the 10 scientific articles are again online self-help websites or portals for depression, anxiety and alcohol-abuse disorders in adults, followed by videophone/telemedicine or sms-based monitoring interventions. As mentioned in Chapter 3, Section 3.3.3 the third programme theory examines the stakeholders who are affected by the implementation of e-mental health interventions in EU countries. After the construction of

programme theory 3 these stakeholders could be divided into three groups, namely **healthcare consumers**, **healthcare providers** and **research and information technology staff**. Similarly to Sections 5.1 and 5.2 the three groups are referred to as components of programme theory 3 during the data extraction process. Regarding the frequency of components mentioned in the 10 eligible scientific articles the components **healthcare consumers** and **healthcare providers** have both been addressed with equal frequency in all 10 articles. Data for the third and final component **research and information technology staff** could be extracted out of two articles.

#### 5.4 Table 4: Programme Theory 4 – Context (C)

Table 4 presents data arising from eight eligible scientific articles addressing programme theory 4. Three of the eight articles address said programme theory in the British context, while another three articles have been written by German researchers and only two source stemming from the Netherlands. The most predominant type of study design used in the 8 eligible scientific articles addressing programme theory 4 is the qualitative (single) case study design, with the most popular type of article being the literature review. As already mentioned above in the introduction to this chapter the category types of e-mental health interventions as displayed in the data extraction templates is not applicable when extracting data to populate programme theory 4 with evidence since this theory addresses the possibilities of access to mental healthcare in the European Union and thus articles examining these possibilities do not necessarily contain data on e-mental health interventions. Chapter 3, Section 3.3.4 describes the construction of programme theory 4 which aims at investigating the possibilities of access to mental healthcare in European Union countries. With the theory construction phase being finished the resulting possibilities of access could be assigned to three groups, namely **primary-care settings**, **specialist-care settings** and **alternative settings**. As mentioned several times in sections 5.1 to 5.3 these groups or categories are now referred to as components of programme theory 4. Thus, the component for which the most data could be extracted from the 8 eligible scientific articles is component **specialist-care settings** with seven out of eight articles. Second in rank is component **primary-care settings**, for which data could be extracted out of six articles. However, no data could be extracted for the third component **alternative settings**.

This summary of four extensive tables, each addressing one of the four programme theories, displaying data extracted from eligible scientific articles to populate the four theoretical frameworks with evidence, presents the basis for the next step in the realist review as designed by Pawson (2005). Therefore, the following chapter, Chapter 6.0 Results, is dedicated to the synthesis of the data presented above in order to achieve the refinement of the four programme theories and provide an answer to the four review questions.

## 6.0 Results

In this chapter and its subsequent sections the data summarized above and presented in more detail in Table 1 to Table 4 in the data appendix is synthesized in order to achieve the refinement of the four programme theories. This is done to provide an answer to the overarching review question and its three sub-questions and to answer the question behind every realist review which is *What works for whom in what circumstances in what respect and how?* As Pawson (2005) states in his introduction to realist synthesis the process of synthesizing data is to make sense of the different contributions of the extracted data. Thus, during the synthesis the researcher spells out the reasons for being cautious about A because of what he has learned from B and what was indicated by C and therefore finally creates a chain of reasoning (Pawson, 2005). Thereby, the researcher conducts a final quality appraisal of the studies or articles that he has chosen as sources for the data to synthesize (Pawson, 2005). Remembering, that the realist review seeks to explore complex areas of reality by tailoring its methods eclectically to its highly diverse subject matters, there is no definite approach used to conduct data synthesis (Pawson, 2005). Hence, each researcher has to devise his own method of data synthesis. Keeping in mind not only the nature of the intervention he is examining but also the underlying model of causality his research is following as well as the purpose of the review he is conducting. Chapter 2.0 Sub-questions states that the underlying model of causality followed in this realist review is the so-called generative model of causality. This model states that, to infer a causal outcome (O) between two events (X/Y) the researcher must understand the underlying mechanisms (M) that connects the events and the context (C) in which the relationship occurs (Pawson, 2005). In order to adhere to this model of causality the overarching review questions as well as the three sub-questions have been phrased according to outcome (O), mechanism (M) and context (C) as is seen in chapters one, two and three. Due to the complex nature of the intervention under examination, i.e. e-mental health interventions, mechanism (M) is addressed by two review questions. As stated in chapter two and three each of the four review questions is addressed by one programme theory. Recalling the purpose of the review, which is described in Chapter 3.0 Methodology, this synthesis aims to review official expectations associated with e-mental health interventions and their impact on the access to mental healthcare against actual practice in three different countries, namely the Netherlands, Germany and the United Kingdom. Thus, following both the generative model of causality and fulfilling the purpose of this synthesis, data synthesis can be displayed in a table as follows:

Table C – Data Synthesis<sup>9</sup>

	<b>Outcome</b> Programme = Theory 1	<b>Mechanism 1</b> Programme + Theory 2	<b>Mechanism 2</b> Programme + Theory 3	<b>Context</b> Programme Theory 4
Netherlands	Data	Data	Data	Data
Germany	Data	Data	Data	Data
United Kingdom	Data	Data	Data	Data

Column one of Table C shows the three cases or countries, namely the Netherlands, Germany and the United Kingdom which have been chosen as sources for eligible scientific articles that address one or more of the four programme theories in their respective national context. Columns two to five present the four programme theories, starting with programme theory 1 addressing the underlying assumptions and expectations about the outcomes of e-mental health interventions are expected to achieve in terms of improving access to mental healthcare in the EU and ending with programme theory 4, shedding light on the possibilities of access to mental healthcare in European Union countries. Starting the synthesis process for Programme Theory 1 – Outcome (O) the researcher needs to return to Table 1 in the data appendix and carefully examine the extracted data, scanning for similarities, differences or even contradictory findings and statements concerning the underlying assumptions and expectations about the outcomes of e-mental health interventions are expected to achieve in terms of improving access to mental healthcare in the EU. Hereby, attention should be paid to the limitations to research results and study design voiced by primary authors, as that gives an indication about the quality of the data to be synthesized and therefore on the validity of the evidence generated by the data synthesis process. The evidence generated by the data synthesis process is used to populate the first programme theory with evidence and thus refine it. As mentioned above in Chapter 5.0 Data, no data supporting the presence of the component **reduce workload of healthcare professionals** could be extracted for any of the cases. In light of this first finding, Programme Theory 1 – Outcome (O) will benefit from further refinement during data synthesis. Having completed this sequence of data synthesis for every programme theory an answer to the overarching review question as well as each of the three sub-questions can be provided. To create a final chain of reasoning to answer the overarching review question behind every realist review, i.e. *What works for whom in what circumstances, in what respects and how* the programme theories in Table C have been assigned to their respective positions within the generative model of causality.

<sup>9</sup> Hereafter referred to as Table C



## 6.1 Data Synthesis and Programme Theory refinement

This section of chapter six presents the four refined programme theories after data synthesis has taken place <sup>10</sup>.

### 6.1.1 Programme Theory 1 – Outcome (O)

As can be read in more detail in Section 3.3.1 of the third chapter, programme theory 1 was constructed to address the underlying assumptions and expectations about the outcomes e-mental health interventions are expected to achieve in terms of improving mental access to healthcare. Thereby, four main assumptions or expectations about said outcomes could be identified, namely **overcoming barriers in accessing mental healthcare, patient education and empowerment, cost reduction of mental healthcare services** and **reduce workload of healthcare professionals**.

**The overcoming of barriers in accessing mental healthcare:** Studies published in the German context agree that e-mental health interventions have the clear advantage of having a great range of accessibility, being flexible in use, can be used anonymously due to being provided via the internet and have the potential to bridge treatment gaps (Bauer et al., 2005 & Wolf, 2011). However, concerns regarding their suitability for more severe mental disorders such as schizophrenia are high (Bauer et al., 2005) Although being deemed beneficial in early detection of mental disorders (Bauer et al., 2005) further questions regarding proper quality appraisal mechanisms, quality standards, data safety and patient confidentiality remain unanswered (Bauer et al., 2005 & Eichenberg & Brähler, 2013). Another point to consider when discussing the potential of e-mental health intervention in overcoming barriers in accessing mental healthcare is that smartphone-based interventions such as apps might only be suitable for young people already utilizing smartphones and the internet and thus not an option for older adults suffering from a mental disorder (Apolinario-Hagen & Tasseit, 2015). Thus, although half of the German internet users would use e-mental health interventions, especially online information websites and self-help groups, the population must be informed about the advantages and disadvantages of e-mental health (Eichenberg & Brähler, 2013). Dutch researcher Heleen Riper (2011) is on one line with Bauer et al. (2005) as she claims in her research that online interventions are not practical for patients with severe mental disorders and people who are not computer literate. Another problem addressed by her are the high drop-out rates of online programme participants and the low therapy regime (Riper, 2011). However, internet interventions for depression management and relapse prevention can offer a high degree of anonymity and user convenience and provide timely help to their users (Riper, 2011). Smeets et al. (2014) who conducted research on Dutch internet self-help programmes addressing alcohol-abuse and mood disorders has found that these disorders can be effectively treated by online self-help programmes and that the programmes for alcohol-abuse disorder are also cost-effective. Thus, e-mental health can be integrated into standard care (Smeets et al., 2014). Researchers Karasouli &

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<sup>10</sup> A summary Tables of all four refined programme theories can be found in the appendix under Summary Table 2 – Refined Programme Theories

Adams (2014) state that the evidence base that supports the use of e-resources in mental healthcare is still in its infancy in the United Kingdom. Additionally, the availability of e-resources that can be publicly accessed without any quality appraisal or evidence of effectiveness is worrisome. Therefore, similarly to the German researchers mentioned above, Karasouli & Adams stress the importance of testing the usability and acceptability of e-resources in mental healthcare (Karasouli & Adams, 2014).

**Patient education and empowerment:** Expectations regarding an improved education and empowerment of patients by using e-mental health interventions are quite high. Thus, Apolinario-Hagen & Tasseit (2015) state that e-mental health interventions improve a patient's self-management skills and can change and improve the traditional communication between patient and physician outside the practice. In line with this statement is Eichenberg (2011), who found in her research that e-mental health interventions have the potential to reach new focus groups who do not use traditional care. Furthermore e-resources in mental healthcare could foster destigmatization (Eichenberg, 2011). Although she perceives e-mental health interventions as a possible medium for increased research in psychotherapy their effect on the traditional relationship between professionals and patients is not yet clear (Eichenberg, 2011). The effect of e-mental health interventions on the relationship between clinician and patient is also addressed by Wolf (2011), who states that e-mental health interventions can enhance the virtual communication between the two, which he perceives as a positive development. Furthermore, the interactive nature of e-mental health interventions can result in patient empowerment by facilitating the patient's disease management skills. Addressing the relationship between therapist and patient within the Dutch context are Bockting et al. (2011) who state that sms-based monitoring make it easier for both patients and therapists to detect relapse early. Another empowerment effect of e-mental health interventions is the increased possibility of self-management by the patient as he can create his own disease prevention program (Bockting et al., 2011). Over time the overall therapist involvement might be reduced and the patient can execute the program to his convenience at any venue (Bockting et al., 2011). Another patient empowerment process made possible by e-mental health interventions in the Netherlands is the exchange of information, finding recognition with peers by sharing experiences and managing one's own disorder (Aardom et al., 2014). In the United Kingdom Palmier-Claus et al. (2013) found that mobile-phone based assessments can facilitate earlier and more effective interventions, which results in an increased level of perceived control, autonomy and self-esteem in service users of e-mental health interventions. Additionally sms-based assessment can facilitate better communication between users and clinicians (Palmier-Claus et al., 2013). However, Palmier-Claus and his fellow researchers do not perceive e-mental health interventions as a substitute for human care even though they have the potential to empower patients in their disease-management. Contrary to this statement Bell (2007) claims that the mental health information patients and help-seeking individuals suffering from a mental disorder access online is often low-standard and of poor quality. High-drop out rates of self-help interventions for depressions such as MoodGYM and the inadequate confidentiality and privacy of patient data speaks against the argument of patient education and empowerment (Bell, 2007)

However, the researcher perceives the high levels of information exchange and user participation generated by the use of e-mental health interventions as a positive development in patient education (Bell, 2007). Finally, he advises for minimal prompts of therapists to reduce the high drop-out rates of e-mental health programs.

**Cost-reduction of mental healthcare services:** While this component is not addressed in the German and the British context Dutch researchers have made claims about the potential of e-mental health interventions to reduce cost of mental healthcare services. Elgermas et al. (2011) states that e-mental health programmes are cheap and available on a large scale. However, their effectiveness seems to depend strongly additional factors such as the support of a therapist, which involves further costs due to the hours a therapist is spending on attending the intervention and his online patients (Elgersma et al., 2011). Riper (2011) agrees with her colleagues that e-mental health interventions are cost-effective and could be the answer to strongly rising costs of mental healthcare in the Netherlands. However, not all mental disorders can be addressed by e-mental health interventions and thus the amount of mental healthcare services that can be offered online is limited (Riper, 2011). In line with Elgermas et al. (2011) and Riper (2011) Smeets et al. (2014) emphasize that the cost-effectiveness of online-based programs is not yet assessed for all mental disorders. While online-based programmes addressing alcohol-abuse disorder seem to be effective and could thus reduce the costs of mental healthcare services catering to this disorder, less evidence exists for interventions targeting anxiety (Smeets et al., 2014).

**Reduce workload of healthcare professionals:** No eligible scientific articles stemming from either of the three cases, namely the Netherlands, Germany and the United Kingdom addressing the fourth and final component of the first programme theory could be found. This outcome could be explained by either the lack of existing research regarding this expected outcome of e-mental health interventions in general, or that none of the articles addressing the reduction of workload of healthcare professionals by e-mental health interventions fulfilled all the selection criteria. However, since no evidence supporting the existence of this component of programme theory one could be synthesized from the extracted data it is excluded.

#### 6.1.2 Programme Theory 2 – Mechanism (M)

As elaborated in Section 3.3.2 of the third chapter, programme theory 2 was constructed to address the the factors supporting the implementation of e-mental health interventions. Having done so, the factors found in the eligible articles can be grouped into five categories which are **technology, organizational culture, society, research and funding and marketing/promotion**.

**Technology:** While a number of British researchers have elaborated on technology as a factor supporting the implementation of e-mental health interventions no eligible scientific article elaborating on the relationship between technology and implementation of e-mental health interventions stemming from a German or Dutch source could be identified. The article of Renz et al. (2005) does not address the implementation of e-mental health interventions and thus scores very low on the dimension of relevance.

However a decision has been made to include this article into the data extraction process for programme theory 2 due to the provision of insights of technological innovations into the German healthcare system. Renz and his colleagues state that for the implementation of technological innovations into the German healthcare system implementers must assure the comparability between sending and receiving system on different levels, as well as conceptual comparability, meaning that software producers agree on a common standard (Renz et al., 2005). British scientists Palmier-Claus (2013) and Jones and Ashurst (2013) claim that e-mental health technology must not only be user-friendly and hassle-free but must also appeal to users by establishing familiarity (Palmier-Claus, 2013). Furthermore, both researchers advise for the provision of training and guidelines for implementation in a combination with a high level of assistance and encouragement in early stages of technological integration (Jones & Ashurst, 2013 & Palmier-Claus, 2013). In line with the argument of assistance and encouragement in the early stages of technological integration Takian et al. (2012) deems the education of practitioners and users in the use of e-mental health interventions highly important. Thus, implementers must strive not only for a user-centred design of interventions but also provide the adjustment and training of computer literacy and ability to access technology of users as well as medical staff (Takian et al., 2012). Another important point mentioned by Takian et al., (2012) is the safety of e-mental health technology which must be ensured prior to implementation in order to provide confidentiality of patient data.

**Organizational culture:** While no suitable scientific article addressing the component organizational culture within the German context could be identified a number of adequate sources from Dutch and British researchers addressing said component was found. Smeets and his colleagues (2014) state the in order to professionally integrate e-mental health into Dutch primary-care a group of GGZ institutions to connect knowledge, experience and programmes regarding e-mental health interventions should be set up (Smeets et al., 2014). Furthermore, the Trimbos Institute is advised to set up special projects to integrate programmes such as Kleurjeleven into primary by training general practitioners in the use of e-mental health interventions (Smeets et al., 2014). With Smeets et al. (2014) specifically addressing Dutch healthcare authorities Voodrouw et. al. (2008) more generally describe the essential role of good communication between the scientific community, administration and praxis with adequate resources in the implementation of e-mental health interventions. Thereby, they see a long-term vision and actuation of rural and local authorities in order to reach realistic goals and activate the necessary human and financial support as important factors supporting the implementation of e-mental-health interventions (Voodrouw et al., 2008). Van der Krieke and colleagues (2013) who have investigated the use of a web-based information and decision tool by Dutch clinicians and their patients have found that a positive attitude of both clinicians and users towards the utilization of the decision aid as well as an interest into shared medical decision-making is highly beneficial when trying to implement said e-mental health interventions. An active clinical and administrative staff is also mentioned by British researcher De Weger and colleagues in 2013 when assessing the impact of organizational culture on the implementation of e-

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mental health interventions. De Weger et al. (2013) state that not only consultation between staff and service users prior to implementation but also a transparent feedback process so that staff and consumers can inform change to the implementation must exist. Furthermore, a clear understanding of the local service context, as different ehealth approaches are needed for different contexts, is key to the implementation process, which benefits from investigating technical and organizational issues that could hinder implementation prior to the start of the process (De Weger et al., 2013). Adding to this argument are Jones and Ashurst (2013) who state that local evaluation before adopting e-health services in order to assess contextual specificities and stakeholders concern is of high importance when implementing e-mental health interventions into the British healthcare system.

**Research and Funding:** This component of programme theory 2 is examined by a variety of Dutch and British researchers, resulting in a number of scientific articles eligible for data extraction. However, no German source addressing said component could be identified. Returning to Smeets et al. (2014) and Voordrouw et al. (2008) who agree that the use and implementation of e-mental health interventions in the Netherlands is stimulated by new ways of financing that involves no costs for the patient and which must be discussed and communicated between the financiers of interventions as early as possible. Similarly to the Dutch researchers De Weger et al. (2013) address the issue of communication. Thereby, they emphasize that a clear understanding of the local (British) service context is of high importance when implementing e-mental health interventions, since there is no such thing as one approach or strategy of financing that works for all e-mental health interventions in all contexts (De Weger et al., 2013). As referred to in Section 5.2 of Chapter 5.0 Data no data could be extracted from the eligible articles addressing programme theory 2 to support evidence of the existence of components **society** and **marketing/promotion**. Thus, in the spirit of programme theory refinement the two components have been removed from the remodelled theoretical framework addressing the factors that support the implementation of e-mental health interventions.

### 6.1.3 Programme Theory 3 – Mechanism (M)

As mentioned in Section 3.3.3 of the third chapter of this realist review the third programme theory examines the stakeholders who are affected by the implementation of e-mental health interventions in EU countries. After the construction of programme theory 3 these stakeholders could be divided into three groups, namely **healthcare consumers**, **healthcare providers** and **research and information technology staff**.

**Healthcare consumers:** Two groups of healthcare consumers have been mentioned by German researchers when investigating the stakeholders who are affected by the implementation of e-mental health interventions, namely patients and individuals who are using mental health information websites and apps to search for medical advice (Apolinario-Hagen & Tasseit, 2015 & Bauer et al., 2005 & Eichenberg, 2011 & Laszig & Eichenberg, 2003). Similarly to the healthcare consumers described within the German context Dutch scientists have named patients, with a special emphasis on patients suffering from mild to moderate

symptoms of depression or anxiety (Kleiboer et al., 2015) as healthcare consumers who are affected the most by the implementation of e-mental health interventions (Bockington et al., 2011 & Riper, 2011 & Smeets et al., 2014). Looking towards the United Kingdom, a similar picture of the healthcare consumers affected by the implementation of e-mental health interventions can be drawn. Thus, British scientists describe said healthcare consumers primarily as mental healthcare patients or users (Jones & Ashurst, 2013 & May et al., 2003).

**Healthcare providers:** Comparable to component healthcare consumers German, Dutch and British researchers have enumerated similar healthcare providers in their respective scientific articles when elaborating on the stakeholders affected by the implementation of e-mental health interventions. Thus, German scientists Apolinario-Hagen and Tasseit (2015) and Bauer et al. (2005) name e-mental health developers and researchers as well as health insurance companies as one of the main healthcare providers affected by the implementation of ehealth interventions. Furthermore, therapists, general practitioners and family members of individuals suffering from mental disorders are healthcare providers who are expected to be affected by the implementation of e-mental health interventions (Apolinario-Hagen & Tasseit, 2015 & Bauer et al., 2005 & Eichenberg, 2011.) A final affected stakeholder mentioned within the German context is the Federal Chamber of Physicians (Bundesärztekammer), an oversight authority which represents but also controls the quality of work of physicians within Germany (Laszig & Eichenberg, 2003). In the Netherlands the Trimbos Institute, the GGZ and the Ministry of Public Health, Well-being and Sports are healthcare providers and important institutions affected by the implementation of e-mental health interventions (Bockington et al., 2011 & Riper, 2011 & Smeets et al., 2014). In line with the healthcare providers identified by German researchers Dutch scientists elaborate on the role of therapists, researchers, general practitioners (Bockington et al., 2011 & Smeets et al., 2014) as well as online coaches/professional respondents (accompanied interventions) and private (health insurance) companies when discussing stakeholders affected by the implementation of e-mental health interventions into Dutch mental healthcare (Riper, 2011 & Kleiboer et al., 2015). Other affected medical stakeholders elaborated on exclusively by British authors are community psychiatric nurses, psychologists and psychiatrists as well as clinicians (Jones & Ashurst, 2013 & May et al., 2001).

**Research and Information Technology Staff:** While no eligible scientific articles addressed the component **research and information technology staff** within the German context Dutch researchers Kleiboer et al., (2015) exclusively mention the Medical Ethics Committee as a stakeholder affected by the implementation of e-mental health interventions in the Netherlands. Another ethics committee named as an affected stakeholder in the United Kingdom is the Research Ethics Committee (May et al., 2001). Managers involved in the service provision of e-mental health interventions and technical experts are only mentioned within the British context (May et al., 2001).

#### 6.1.4 Programme Theory 4 – Context (C)

Section 3.3.4 of Chapter 3 Theory describes the fourth and final programme theory which is shedding light on the possibilities of access to mental healthcare in European Union countries. Again, the possibilities of access to mental healthcare in the EU mentioned in the selected articles can be assigned to three groups or named components of programme theory 4, i.e. **primary-care settings, specialist-care settings and alternative settings.**

**Primary-care settings:** As mentioned in Section 5.4 of the fifth chapter data supporting the existence of this theory component could be extracted from the majority of eligible scientific articles. Although the healthcare systems of Germany, the Netherlands and the United Kingdom differ in their organizational make-up, provision of healthcare insurance and public/private financing the general or family physician takes up a dominant and central role within primary-care. Thereby, individuals living in Germany and the Netherlands are legally obliged to register with a general practitioner when moving to one of the respective countries. The same holds true for individuals living in the United Kingdom, where healthcare is provided within the NHS (NHS, 2016). Once a suitable general practitioner is found the individual must formally register with his or her practice (NHS, 2016). In all three countries examined within the frame of this realist review general practitioners are often the first address of patients encountering mental health problems. They are a source of advice, provide education on mental health and refer their patients to further specialist treatment as they see fit or if the patient asks for a referral (not possible in the United Kingdom). Thus, in Germany mental healthcare in the outpatient sector is mainly covered by general practitioners who refer their patients to further specialist or inpatient care (Gäbel, 2013 & Gäbel & Zielsek, 2012). A second initial point of contact to psychiatric or psychotherapeutic services is provided by referral of a paediatrician should mental health problems be encountered by a child or adolescent (Stengler et al., 2011). Similarly to Germany, Dutch researchers name the referral by a general practitioner to a specialist as the most common possibility of access to mental healthcare within the Netherlands (Hermens et al., 2014 & Piek et al., 2011). Other possibilities of access to Dutch mental healthcare within the primary-care sector can be community nurses, social workers who work independently or are associated with a general practitioners and finally, community counsellors who may not provide referral to specialist care but can function as a source of advice for further steps to take by a prospective patient (Piek et al., 2011 & Hermens et al., 2014). Docherty & Thornicroft (2015) state that the referral by general practitioners to specialist care provided mostly by NHS Service-Staff is the most common possibility of access to British mental healthcare within primary-care settings. Thus, primary-care providers act as gatekeepers to specialist mental healthcare and care service (Lester et al., 2004). Practice nurses associated with a general practitioner may also be a first point of reference for an individual encountering mental health problems (Lester et al., 2004).

**Specialist-care settings:** When looking at the data extracted from the eight eligible scientific articles addressing the possibilities of access to mental healthcare in the three selected countries a high accordance of said possibilities of access within specialist-care settings could be found. As mentioned above specialist

mental healthcare services in all three countries are primarily accessed upon referral by a general practitioner. In the United Kingdom a referral by a general practitioner is mandatory to access specialist services. Hereby, the general practitioner may only issue a referral as he establishes a clinical necessity and not upon request by the patient. In Germany, specialist mental healthcare in the outpatient sector is often provided by psychiatrists, physicians specializing in psychiatry/psychotherapy, neurologists and specialist for somatic medicine (Gäbel et al., 2013 & Gäbel & Zielsek, 2012). Another option is a psychotherapeutic or psychiatric contact person (Stengler et al., 2011). Within the inpatient sector specialized clinics or mental hospitals may provide treatment for patients suffering from more severe mental disorder such as suicidal depression (Gäbel & Zielsek, 2012). A comparable set of actors is active within the Dutch outpatient and inpatient sector of mental healthcare. Psychotherapists, psychiatric nurses as well as psychologists and therapists are providing mental healthcare within the outpatient sector (Hermens et al., 2014 & Piek et al., 2011). Again, most specialist services are accessible upon referral by a general practitioner, however, psychotherapeutic services can often be accessed directly by the patient. With the Netherlands having a very high amount of psychiatric beds, 139 beds per 100 000 population (OECD, 2011) mental healthcare services within the inpatient sector are provided by mental healthcare institutions such as specialised mental clinics and assisted living facilities (Soffers et al., 2014). Lester et al., (2004) refers to community mental health teams as possibility of access to specialised British mental healthcare within the outpatient sector. As is the case in Germany and the Netherlands most specialised services are accessible upon referral by a general practitioner and are provided within the NHS (Docherty & Thornicroft). Contrary to Germany and the Netherlands no data could be extracted supporting the argument that British individuals suffering from a mental disorder are accessing specialist mental healthcare via inpatient services such as mental institutions or care homes. The absence of data and the resulting lack of evidence might be explained by the low number of psychiatric beds in the United Kingdom, which is below the OECD average of 68 beds at 54 beds per 100 000 population (OECD, 2011).

**Alternative settings:** As referred to in Section 5.4 of Chapter 5.0 Data no data could be extracted from the eligible articles addressing programme theory 4 to support evidence of the existence of component **alternative settings**. Thus, in the spirit of programme theory refinement the component has been removed from the remodelled theoretical framework examining the possibilities of access to mental healthcare within the European Union.

## 6.2 Answers to the overarching review question and its sub-questions

Based on both the evidence generated from the data extracted in Chapter 5.0 Data, and the thereof resulted refinement of the four programme theories an answer to the overarching review question as well as its sub-questions is provided in this section of Chapter 6.0 Results. Beginning with the three sub-questions, the answer to each of the four review questions is provided by carefully summing up and examining the four refined programme theories component by component, keeping in mind the influence



of context and contradictory evidence. However, the answer to the question guiding every realist review independently from the intervention or policy under investigation, namely *What works for whom, in what circumstances and in what respect?* is given in the final chapter of this realist review, i.e. Conclusion.

### 6.2.1 Sub-questions

#### Mechanism (M)

1. What are the factors that support the implementation of e-mental health interventions in EU countries?

Of the five original factors proposed in the first version of programme theory 2 addressing the factors that support the implementation of e-mental health interventions in EU countries programme theory refinement in Section 6.1.2 of this chapter has led to the elimination of two components, namely **marketing and promotion** and **society**. For the remaining three original components, i.e. **Technology**, **organizational culture** and **research and funding** sufficient evidence for their existence within the theoretical framework addressing this sub-question and their influence on the implementation of e-mental health interventions in EU countries could be generated. Starting with component **technology** which is perceived as supporting the implementation of e-mental health interventions in EU countries by generating hassle-free, user-friendly interventions that appeal to users due to its user-centred design and familiarity. However, the supportive effect of **technology** in implementing e-mental health interventions also depends on the termination of safety and privacy issues surrounding e-mental health interventions such as the lack of the confidentiality of patient data. Since evidence in favour of **technology** as a factor supporting the implementation of e-mental health interventions could only be extracted from data by British researchers it is unclear to what extent **technology** is supporting e-mental health intervention implementation in Germany and the Netherlands. Thus, the validity of this component within the theoretical framework of programme theory 2 is questionable. Evidence for **organizational culture** as a factor supporting the implementation of e-mental health interventions in the European Union could be extracted from data stemming from the United Kingdom and the Netherlands. Again, no complete data set including all three cases could be designed. Both British and Dutch researchers state that in order to integrate e-mental healthcare into traditional mental healthcare good communication between administration, medical praxis and the scientific community is key to successful implementation. Thereby, they see a long-term vision and actuation of rural and local authorities in order to reach realistic goals and activate the necessary human and financial support as a catalyst of implementation of e-mental health interventions. Finally, a positive attitude of both patients/users and practitioner/clinicians towards the use of e-mental health interventions and a thorough understanding of the local context surrounding interventions is highly beneficial in implementing e-mental health interventions. Thus, the supportive effect of **organizational culture** on the implementation of e-mental health interventions depends strongly on the cooperation, communication, exchange of knowledge and assessment of context as well as on the positive attitude towards e-mental

health interventions within this organizations. The third and final factor supporting the implementation of e-mental health interventions is **research and funding** which again is examined by a variety of Dutch and British researchers but no German source addressing said component could be identified. Thus, the evidence generated for this component must be viewed in the light of an incomplete data set. The supportive effect of **research and funding** primarily depends on the ability of e-mental health intervention developers, financiers and governments to create interventions that involve no costs for the patient. Therefore, founding must be communicated and discussed as early as possible prior to implementation as service contexts and interventions are diverse and thus demand different strategies of financing. Based on the refined programme theory 2 addressing the factors that support the implementation of e-mental health interventions within the context of Germany, the Netherlands and the United Kingdom the factors supporting the implementation of e-mental health interventions are **technology, organizational culture and research and funding**.

2. Who are the stakeholders affected by the implementation of e-mental health interventions in EU countries?

All of the three stakeholders proposed in the original formulation of programme theory 3 addressing the stakeholders that are affected by the implementation of e-mental health interventions in EU countries are supported in their existence within the theoretical framework addressing sub-question 2. Thus, programme theory 3 and its three components, namely **healthcare consumers, healthcare providers and research and information technology staff** remain within the refined programme theory 3. Evidence for an effect of the implementation of e-mental health interventions on **healthcare consumers** could be gathered from data stemming from all three countries. Thus, descriptive statements about **healthcare consumers** affected by the implementation of e-mental health interventions can be based on a complete data set. The stakeholders affected by the implementation of e-mental health interventions are first and foremost patients suffering from a mental disorder and individuals utilizing e-mental health interventions to collect information about certain mental disorders or to find out how and where professional help can be accessed. A special emphasis on patients suffering from depression, anxiety and alcohol-abuse disorders is made by several Dutch and British scientists. An emphasis on these specific disorders might be made as a variety of e-mental health interventions addressing depression, anxiety or alcohol-abuse disorders have already been implemented in the Netherlands and the United Kingdom. Comparable to component healthcare consumers German, Dutch and British researchers have enumerated similar **healthcare providers** when elaborating on stakeholders affected by the implementation of e-mental health interventions in their respective scientific articles. Again, a complete data set is in place when describing the **healthcare providers** that are affected by the implementation of e-mental health interventions. Within the medical sector general practitioners, clinicians, psychotherapists, psychologists and community (psychiatric) nurses are the stakeholders which have been described the most when assessing the

stakeholders affected by the implementation of e-mental health interventions. Outside the medical sector a number of institutions, ranging from health insurance companies to national ministries of health have been named as affected stakeholders. For the third and final component, namely **research and information technology staff** no complete data set exists, as no data addressing this component of programme theory 3 could be identified within the German context. However, Dutch researchers mention the Medical Ethics Committee and British scientists the Research Ethics Committee as stakeholders affected by the implementation of e-mental health interventions in their countries. Committees like these are assessing the possible impact of e-mental health on the traditional relationship between patient and physician as well as how a patient's/user's safety and confidentiality of data is affected by online interventions. Based on the (hardly) refined programme theory 3 addressing the stakeholders that are affected by the implementation of e-mental health interventions within the context of Germany, the Netherlands and the United Kingdom the stakeholders affected by the implementation of e-mental health interventions are **healthcare consumers, healthcare providers and research and information technology staff**.

### Context (C)

#### 3. What are the possibilities of access to mental healthcare in EU countries?

As referred to in Section 6.1.4 of this chapter no data could be extracted from the eligible articles addressing programme theory 4 to support evidence of the existence of component **alternative settings**. Thus, the refined programme theory 4 only contains two components, namely **primary-care settings** and **specialist-care settings**. Complete data sets could be generated for both components, which will result in valid and reliable statements about possibilities of access to mental healthcare in EU countries. Starting with **primary-care settings** it can be stated that although the healthcare systems of Germany, the Netherlands and the United Kingdom differ in several aspects the general practitioner or family physician takes up a dominant role within primary-care. In all three countries examined regarding their possibilities of access to mental healthcare general practitioners are often the first address of patients encountering mental health problems. While the majority of patients in all three countries is referred to a mental health specialist by a general practitioner, either upon clinical necessity or patient request, the general practitioner has a special gate-keeping function in the United Kingdom, as referral by patient request is not possible. A second initial contact point within primary, outpatient care are paediatricians as mental health problems are encountered by children or adolescents. Other possibilities to mental healthcare within primary-care settings are community nurses, independent or associated social workers and community counsellors. However, these possibilities have only been mentioned within the Dutch context and thus might not apply for the United Kingdom or Germany. Looking at **specialist-care settings** a high accordance of possibilities of access within these settings could be found. As mentioned above specialist mental healthcare in all three countries are primarily access upon referral by the general practitioner. Thereby, a distinction must be made

between inpatient and outpatient mental healthcare. In the outpatient sector services are mostly provided by psychiatrists, physicians specializing in psychiatric/psychotherapeutic treatment, psychiatric nurses and therapists. Another outpatient mental healthcare provider mentioned in the British context are community mental health teams. Within the inpatient sector specialized clinics, mental hospitals or special care homes provide treatment for patients suffering from more severe or violent mental disorders. However, possibilities of access to mental healthcare within the inpatient sectors were only addressed by German and Dutch context and not within the British. This lack of evidence might be explained by the relatively small British inpatient sector which, when measured in the number of psychiatric beds per 100 000 population appears very modest compared to its Dutch and German equivalent. Based on the refined programme theory 4 addressing the possibilities of access to mental healthcare in EU countries within the context of Germany, the Netherlands and the United Kingdom the possibilities of access to mental healthcare in EU countries are **primary-care settings** and **specialist-care settings** with possibilities within **primary-care settings** functioning as a point of onward referral or in the British case as a gatekeeper to **specialist-care services**.

### 6.2.3 Overarching review question

Having provided an answer to the three sub-questions representing mechanism (M) and context (C) an answer to the overarching review question representing outcome (O) in the model of generative causality underlying this research design must be given. Thereby, the answer provided to this overarching review question is based both on insights generated by answering the three sub-questions as well as the refined programme theory 1 addressing the underlying assumptions and expectations about the outcomes of e-mental health interventions are expected to achieve in terms of improving access to mental healthcare. A start is made by summarizing the insights gained during the refinement process of programme theory 1.

#### Outcome (O)

To what extent do e-mental health interventions improve the access to mental healthcare in the European Union?

As described in more detail in Section 6.1.1 of this chapter three main assumptions or expectations about the outcomes e-mental health interventions are expected to achieve in terms of improving access to mental healthcare could be identified after programme theory refinement. **Overcoming barriers in accessing mental healthcare, patient education and empowerment** as well as **cost reduction of mental healthcare services** have remained as valid components of programme theory 1. **Reduce workload of healthcare professionals** has been excluded as no data set addressing this component could be generated. Regarding component **overcoming barriers in accessing mental healthcare** a complete data set could be designed. Overall, researchers from all three countries agree that e-mental health interventions have the clear advantage of having a great range, high accessibility and flexibility in use, provide a degree of anonymity to the user and have the potential to bridge treatment gaps. However, several concerns are voiced regarding

their suitability for patients suffering from more severe mental disorders and users who are older and thus might not be computer literate or familiar with using a smartphone. Thus, e-mental health interventions might only help to overcome barriers in accessing mental healthcare for young and computer literate patients, suffering from milder mental disorders. Another problem named are the high user drop-out rates related to a low therapy regime. British researchers are concerned about the lack of quality appraisal or evidence of effectiveness of many interventions. Similarly to the German researchers they stress the importance of testing the usability and acceptability of e-resources in mental healthcare. Proceeding to component **patient education and empowerment** another complete data set could be generated. Evidence stemming from all three countries suggest that expectations regarding an improved education and empowerment of patients by using e-mental health interventions are quite high. Thus, it is stated that e-mental health interventions improve a patient's self-management skills, with continuous electronic monitoring making it easier for both patient and physician to detect and prevent a relapse. Additionally, the use of e-mental health interventions might reduce therapist involvement and thus give space to a more patient-centered recovery plan. Interventions can also change and improve traditional communication between patient and physician outside the practice and foster the exchange of support between patients. However, the effect of e-mental health interventions on the communication between patient and physician is not yet fully assessed. Although the overall expectations regarding patient education and empowerment are vastly positive most researchers in Germany and the United Kingdom do not perceive e-mental health interventions as a proper substitute for traditional face-to-face care. The mental health information patients and help-seeking individuals access online are often of low-standard and poor quality, which speaks against the argument of patient education and empowerment by the use of e-mental health interventions. For the third and final component, namely **cost-reduction of mental healthcare services** no complete data set could be generated as this component was not addressed in the German and British context. Thus, statements made about the effect of e-mental health interventions on the costs of mental healthcare services are solely based on evidence generated from Dutch sources and should therefore be perceived as referring to the case of the Netherlands only. Although evidence suggests that e-mental health interventions in the Netherlands are cheap and available on a large scale and could thus be an answer to the rising cost of Dutch mental healthcare their effectiveness seems to depend strongly on additional factors such as the support of a therapist. While the effectiveness of e-mental health interventions might increase through the support of a therapist or online coach further costs due to the hours a therapist is spending on attending the intervention and his online patients would be generated. Another argument that speaks against the expectation that the implementation of e-mental health interventions will result in a cost-reduction of mental healthcare services is the fact that said interventions can only be provided for certain mental disorders and thus the range of services that can be offered online is limited. Having summed up the most important insights derived from the refined programme theory 1 observations and insights generated by answering the three sub-questions must be brought into the process of providing an

answer to the overarching review question *To what extent do e-mental health interventions improve access to mental healthcare in the European Union?* Based on the refinement of programme theory 4 and said insights delivered to the surface by answering the three sub questions the overarching review question can be answered as follows:

The extent to which e-mental health interventions improve the access to mental healthcare in the European Union depends strongly on the environment in which they are operating and in which they have to be integrated and implemented first. The evidence populating programme theory 1 shows that the expectations about the outcomes that e-mental health interventions are expected to achieve in terms of improving access to mental healthcare are relatively similar in all the three countries. Although overall positive and optimistic about the prospective advantages and the potential of e-mental health interventions, three main concerns which could hinder a successful implementation remain. Firstly, researchers are concerned that e-mental health interventions might only improve the access to mental healthcare in the EU for young, computer-literate patients who own and use a smartphone on a daily basis. This would exclude older patients who are not used to smartphone and computer technology. Furthermore, online interventions are not suited for every patient, as mental disorders vary in their nature and severity. While evidence from the Netherlands and United Kingdom shows that the use of e-mental health interventions can improve the access to mental healthcare for patients suffering from alcohol-abuse disorders, social anxiety disorders and mild forms of depression patients suffering from more severe and violent mental disorders are less likely to benefit and receive adequate care by utilizing e-mental health interventions. Therefore, the extent to which e-mental health interventions improve the access to mental healthcare depends strongly on the severity of the mental disorder the patient accessing care via the intervention is suffering from. Secondly, no EU wide quality appraisal mechanism, ensuring the correctness of information on mental health and the appropriateness of treatment offered by apps and other e-mental health interventions exists. Thus, although some interventions are endorsed by prestigious institutions such as the Trimbos Institute in the Netherlands, a guarantee that treatment provided via e-mental health interventions is adequate and based on scientific evidence cannot be given for the majority of mental health information websites and apps. Thirdly, a great concern remains regarding the protection of patient information and data confidentiality. Although one of the arguments in favour of using e-mental health interventions is the presumed privacy and anonymity of online patients one must keep in mind that the internet is neither private nor safe. In times of big data a patient must weight the burden of not knowing what happens to his or her personal data when using e-mental health interventions against the chance of improved access to mental healthcare. These factors which are potentially hindering the implementation of e-mental health interventions into European healthcare could be resolved by creating an appropriate organizational culture with stakeholders ,including research and information technology staff, healthcare consumers and healthcare providers, communicating and cooperating in a transparent and understandable implementation process. By establishing quality standards and technical safeguards protecting patient data

the three main concerns mentioned above could be albeit not fully, but partially dissolved. Assessing the influence of context when examining the extent to which e-mental health interventions do improve the access to mental healthcare in the EU it must be said that although the possibilities and steps in accessing mental healthcare are extremely similar in all three countries inspected other contextual factors such as legal barriers and openness towards innovations and new ways of providing care are of extreme importance. Thus, the extent to which e-mental health interventions do improve the access to mental healthcare does not depend on the possibilities of access to traditional mental healthcare but on the existing legal and cultural framework mental healthcare is embedded in. Comparing Germany and the Netherlands provides a fitting examples for this argument. The referral system and the steps in accessing traditional mental healthcare are very similar and both countries feature strongly in the fields of ICT and medicine. However, legal barriers in Germany make it impossible to establish e-mental health interventions as a stand-alone treatment and although most Germans use the internet on a daily basis only a minority would use the internet and online or app-based interventions when treating mental health issues. The Netherlands on the other hand do not have such legal barriers and can thus fully implement e-mental health intervention into their mental healthcare services. Furthermore, a greater openness towards the use of e-mental health interventions seem to exist which could be the result of the promotion and endorsement of such interventions by prestigious institutions such as the Trimbos Institute or the GGZ .

When examining the combined evidence provided by the four refined programme theories of this realist review as well as the insights generated by the answers provided to the three sub-questions the overall answer to the review question *To what extent do e-mental health interventions improve the access to mental healthcare in the EU* must be that although the general potential of e-mental health interventions to improve access to mental healthcare within the EU is great, a proper assessment regarding the size of this improvement cannot yet be undertaken. For one, legal barriers and a scepticism towards the use of e-mental health interventions are hindering full implementation and thus the full development of a measurable effect on access to mental healthcare in countries such as Germany and secondly the example of examining a small set of three countries has shown the discrepancy of EU members in the development, implementation and endorsement of e-mental health interventions. While the extent to which e-mental health interventions do improve the access to mental healthcare might be measurable in the Netherlands it is hardly measurable in Germany. Therefore, a general and overarching answer to the review question *To what extent do e-mental health interventions improve the access to mental healthcare in the EU* cannot yet be given.

This chapter has presented the four refined programme theories. Furthermore, an answer was provided to each of the three sub-questions as well as the overarching review question. As already mentioned above the next and final chapter of this research paper, namely Chapter 7.0 Conclusion elaborates on the underlying review question behind Pawson's (2005) realist review i.e. *What works for whom, in what circumstances and in what respect?*

## 7.0 Conclusion

The final chapter of this bachelor thesis is divided into four sections. In the first section the theoretical and practical implications which can be derived from the answers provided to the overarching review question as well as its sub-questions are discussed. Hereby, implications are discussed answer by answer. The second section contains the final answer to the underlying review question, namely *What works for whom, in what circumstances and in what respect? Strengths* and limitations to this study are presented in the third section. In the fourth and final section, this bachelor thesis which is conducted in the style of a Pawson (2005) realist review is finalized by the proposal of both policy recommendations and recommendations for further research.

## 7.1 Discussion

Starting with the answer to sub-question 1 which states that although user-centered technology, a positive and communicative organizational culture and patient-friendly research and funding are indeed supporting the implementation of e-mental health interventions some concerns remain regarding the privacy and confidentiality of patient data within e-mental health interventions. In practical terms these findings imply that in order to ensure a successful implementation and integration of e-mental health interventions into national mental healthcare systems problems regarding patient privacy and data confidentiality must be resolved as soon as possible. A theoretical implication generated from this discovery is that scientists should examine the ethical treatment of patient data and should be more careful when announcing the safety of online-based mental health interventions. The answer provided to sub-question two showed that patients suffering from a mental disorder or information-seeking individuals are the main healthcare consumers to be affected by the implementation of e-mental health interventions. Healthcare providers and research and information technology staff which are affected the most by said implementation are general practitioners, clinicians and psychiatric nurses followed by medical ethics and research committees. A theoretical implication that can be derived from these findings is that irrespectively from the national context or the state of implementation of e-mental health interventions into national mental healthcare services the stakeholders affected by this process remain the same. Practically speaking, the process of implementation could be supported and accelerated by conducting more research into the particularities and needs of each stakeholders in order to create tailor-made stakeholder and context specific implementation strategies. Looking at the answer to sub-question three it becomes apparent that although healthcare systems differ the steps or possibilities of accessing mental healthcare remain very similarly. Thus, the general practitioner or paediatrician is the first to examine a patient and upon request or clinical necessity refers the patient to specialised care. However, differences remain between the size and services of national inpatient care sectors. A theoretical implication drawn from this discovery is that the importance of primary-care settings must be considered more strongly when establishing implementation strategies for e-mental health



interventions. In practical terms such strategies could incorporate the training of primary-care actors in the use and promotion of e-mental health interventions. In the answer provided to the overarching review question it is stated that e-mental health interventions might only support young and computer literate patients in overcoming barriers in accessing mental healthcare. A lack of quality appraisal mechanisms and evidence regarding the effectiveness of e-mental health interventions might have a negative effect of the expected outcome of patient education and empowerment. Thus, while expectations regarding the general outcomes of e-mental health interventions are high not all countries perceive online interventions as a possible replacement for face-to-face care. Although Dutch researchers provide evidence that e-mental health interventions are cheap and available on a large scale for certain disorders their effectiveness depends strongly on additional factors such as therapist support. However, an answer to the overarching review question on EU-level cannot yet be given as countries differ too extremely in their speed of implementation of e-mental health interventions. A theoretical implication derived from these findings is that the extent to which e-mental health interventions do improve the access to mental healthcare depends strongly on the existing legal and cultural framework mental healthcare is embedded in. The development of more context specific e-mental health interventions as well as the formulation of contextual goals deriving from the cultural and legal framework of a country is a practical implication generated from this finding.

## 7.2 Answer to *What works for whom, in what circumstances and in what respect?*

As mentioned in the introduction to this chapter the second section presents an answer to the underlying review question behind every Pawson (2005) realist review, namely *what works for whom, in what circumstances and in what respect?* Therefore, the researcher is returning to the underlying model of generative causality followed by this research. Said model of causality states that to infer a causal outcome (O) between two events (X/Y) the researcher must understand the underlying mechanism (M) that connects the events to the context (C) in which the relationship occurs (Pawson, 2005). As elaborated on in the introduction to Chapter 6.0 Results the review-question and its sub-questions have been formulated following the generative model of causality. In order to provide a clear and concise answer to the aforementioned review question the results generated by this realist review are assigned to their proper position within the relationship between outcome (O), mechanism (M) and context (C). This relationship is displayed in table below:

Table D – Relationship between Outcome (O), Mechanism (M) and Context (C)<sup>11</sup>

<b>Outcome</b>	<b>Mechanism 1</b>	<b>Mechanism 2</b>	<b>Context</b>
Programme Theory 1 =	Programme Theory 2 +	Programme Theory 3 +	Programme Theory 4
Young and computer literate patients suffering from a mild or moderate mental disorder overcome barriers in accessing mental healthcare and educate and empower themselves by using interventions of great accessibility but whose content is often of low quality due to the absence of data safety and quality appraisal mechanisms	User-friendly and safe technology Communicative and cooperative actors in a positive organizational culture Adequate funding and no cost-involvement for the patient	Healthcare consumers suffering from a mild to moderate mental disorder and information-seeking individuals Healthcare providers from the medical and non-medical sector Research and information technology staff in Medical Ethics and Research Ethics Committees	Well-functioning primary-specialized care referral system embedded in a cultural framework open towards the implementation and use of e-mental health interventions in the absence of legal barriers

Having assigned the results generated by the realist review to their respective positions within the relationship between outcome (O), mechanism (M) and context (C) the underlying review question, namely *What works for whom, in what circumstances and in what respect* can be answered as follows:

User-friendly and safe e-mental health interventions which involve no costs for their users support young and computer literate patients suffering from mild to moderate mental disorders (*what works for whom*) within a positive organizational culture embedded in a well-functioning primary-specialized care referral system which is anchored in a cultural framework open towards the the implementation of e-mental health interventions and in the absence of legal barriers (*in what circumstances*) in overcoming barriers in accessing mental healthcare and educate and empower themselves by their great accessibility, however low quality content and the absence of data safety and quality appraisal mechanisms remain a concern (*in what respect*).

<sup>11</sup>Hereafter referred to as Table D

### 7.3 Strengths and limitations to this realist review

As elaborated on in more detail in Chapter 3.0 Theory the realist review in itself offers several strengths. Its main strength however is its design and structure which keeps in mind the active, changing nature of policy theories such as e-mental health interventions, their complexity and their often non-linear development. Furthermore, fixed, pre-set guidelines are mostly abandoned as the realist review assimilates information more by note-taking than by extracting data as such. Therefore the question *what works form whom, under what circumstances and in what respect* can only be answered by a realist review suitable to investigate complex, changing interventions. When examining this particular realist review two main strengths become apparent. Firstly, as mentioned more clearly in Section 4.2 although all three cases display a similar per capita total expenditure on health (3598\$-6145\$) and spend about 11 percent of their total health budget on mental health (WHO, 2013 & WHO,2011) the countries display dissimilar levels of implementation of e-mental health interventions. Looking at these dissimilarities in three high income countries with roughly the same spending on mental healthcare generates a realistic, detailed and differentiated reflection of the current state of e-mental health within different cultural contexts and legal environments. Secondly, by addressing a wide range of aspects surrounding the implementation of e-mental health interventions and their effect on access to mental healthcare this realist review sheds light on the influence of organizational endorsement, legal barriers and cultural openness towards the use of e-mental health interventions on their integration into national mental healthcare systems. Proceeding to the limitations of the realist review as such it becomes apparent that the achieved results only allow for medium-level generalizations due to their highly subjective and context-bound nature. In the absence of fixed, pre-set guidelines specific techniques and steps taken to arrive at the answer of one review question can hardly be replicated to answer another. This limitation is also present in this particular realist review where the researcher has designed her own sequence of steps, selection criteria and data extraction method within the design of Pawson's (2005) realist review to arrive at the answer of her self-designed review question. Another limitation to this study is the choice and the size of the set of countries to function as pool for suitable scientific articles to extract data from. To make an assumption about the extent e-mental health interventions improve the access to mental healthcare in the European Union, each EU member state should be examined to increase the validity of the results generated by this study. However, due to the limited amount of time available to conduct this study, a choice was made for a set of three countries. Even though an argumentation as to why this particular country set was chosen is made at several points within this study it remains a subjective decision and is naturally prone to critique.

### 7.4 Policy recommendations and recommendations for further research

In this final section of Chapter 7.0 Conclusion policy recommendations as well as recommendations for further research are suggested. Concise and feasible policy recommendations are formulated addressing

the most pressing problems surrounding an intervention. As elaborated on in more detail in Section 6.2.3

Overarching review question a successful implementation of e-mental health interventions into mental healthcare in the European Union is potentially hindered by three main concerns. Thus, e-mental health interventions might only improve access to mental healthcare for young, computer-literate patients suffering from a mild to moderate mental disorder. Furthermore, no EU-wide quality appraisal mechanism ensuring the correctness of information on mental health and the appropriateness of treatment offered by apps and other e-mental health interventions can be identified. Therefore, no guarantee regarding the adequacy and effectiveness of treatment provided by e-mental health interventions can be given. Finally, concerns remain regarding the protection of patient information and the confidentiality of patient data and privacy. Regarding the first of the mentioned concerns computer-literacy training with a special emphasis on the use of online- and app-based e-mental health interventions could be provided by local general practitioner practices or community nurses offering the use of such interventions. This policy could increase the potential target group of e-mental health interventions by showing their utilization in a local environment within a professional training. While potentially effective in an ehealth friendly environment such a policy might only have a limited effect in Germany, where the use of e-mental health interventions is strongly limited by legal barriers that constrain the utilization of e-mental health interventions as stand-alone treatment. Thus, the policy of educating patients in the use of e-mental health interventions by primary-care physicians is not implementable in all national contexts. Although researchers are recommended to explore effectiveness and potential of e-mental health interventions for combating more severe mental disorders their scope of application will remain limited as some medical conditions simply require face-to-face treatment. A policy addressing the second concern might not yet be possible on EU level. As this study has shown member states differ strongly in the development and implementation of e-mental health interventions. Thus, until member states are on a more equal level of provision and application of e-mental health interventions quality appraisal mechanisms and a quality seal for content and treatment adequacy could be provided on a national level. A policy of national guidelines could be formulated by important national stakeholders. In the Netherlands this has already been achieved by the Trimbos Institute, the GGZ as well as the Ministry of Health, Welfare and Sport and patient associations. Again, the size and nature of such a policy is strongly shaped by a country's legal environment. While the British Ministry of Health might follow the Dutch example and develop an extensive national quality appraisal mechanism in cooperation with the NHS a nationwide quality seal for German e-mental health interventions might not yet be feasible due to legal barriers both forbidding the use of e-mental health interventions as stand-alone treatment and limiting the medical personal who can legally offer said interventions, which has resulted in a much smaller number of available interventions in Germany. A consequent recommendation for further research could be to investigate what attributes such a quality appraisal mechanism must contain, how implementation can be successful and what alternatives are feasible in restraint legal environments. The third and final concern named could be approached by a policy

of mandatory technical standards and data safety requirements an interventions has to fulfil before it can be launched. In a cooperation between ICT experts, intervention developers and important national stakeholders a document containing said minimum requirements could be formulated and applied as tool to assess and test the level of patient data safety and confidentiality ensured by every e-mental health intervention. This policy could be implemented independently form legal barriers, the number of e-mental health interventions available and the extent to which are offered as treatment as the safety of patient data will remain paramount in any case. Accordingly, researchers are recommended to first investigate into the nature and necessity of potential technical standards and data safety requirements.

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Summary Table 1 – Programme Theories

<b>Programme Theory 1</b>	<b>Programme Theory 2</b>	<b>Programme Theory 3</b>	<b>Programme Theory 4</b>
Assumptions/expectations about how e-mental health interventions are expected to work in terms of improving access to mental healthcare	Factors supporting the implementation of e-mental health interventions	Stakeholders affected by the implementation of e-mental health interventions in EU countries	Possibilities of access to mental healthcare in European Union countries
Overcoming barriers in accessing mental healthcare, patient education and empowerment, cost reduction of mental healthcare services, reduce workload of healthcare professionals	Technology, organizational culture, society, research and funding, marketing/promotion	Healthcare consumers, Healthcare providers, Information technology staff	Primary-care settings, specialist-care settings, alternative settings

Summary Table 2 – Refined Programme Theories

	<b>Programme Theory 1</b>	<b>Programme Theory 2</b>	<b>Programme Theory 3</b>	<b>Programme Theory 4</b>
<b>Cases/Countries addressing theory component(s)</b>	Assumptions/expectations about how e-mental health interventions are expected to work in terms of improving access to mental healthcare	Factors supporting the implementation of e-mental health interventions	Stakeholders affected by the implementation of e-mental health interventions in EU countries	Possibilities of access to mental healthcare in European Union countries
Netherlands	Overcoming barriers in accessing mental healthcare patient education and empowerment cost reduction of mental healthcare services	Organizational culture research and funding	Healthcare consumers healthcare providers research and information technology staff	Primary-care settings specialist-care settings
Germany	Overcoming barriers in accessing mental health, Patient education and empowerment	-	Healthcare consumers, healthcare providers	Primary-care settings, specialist-care settings
United Kingdom	Overcoming barriers in accessing mental health patient education and empowerment	Technology, organizational culture, Research and funding	Healthcare consumers, healthcare providers, research and information technology staff	Primary-care settings, specialist-care settings

Table 1: Programme Theory 1 – Outcome (O)

Case/Country	Author (Year)	Study Design/ Type of Article	Type(s) of intervention(s) addressed	Assumptions/Expectations about the outcome of e-mental health interventions mentioned in the article	Component(s) of Theory 1 addressed in the article	Limitations
Netherlands	Aardoom et al., 2014	Study Cross-sectional design	Pro-recovery website and e-community for eating disorders	Empowering process by exchanging information, finding recognition, sharing experience and managing one's eating disorder problems,	Patient education and empowerment	Selection bias, Small sample size, Recall bias
Germany	Apolinario-Hagen & Tasseit, 2015	Literature Review	E-mental health interventions in general	New way of consumer participation, and empowerment, Improvement of patients self-management skills, E-mental health changes traditional communication between patient and physician, E-mental health interventions might only be suitable for young people owning a smartphone or using the internet	Overcoming barriers in accessing mental healthcare, Patient education and empowerment	None
Germany	Bauer et al., 2005	Literature Review	Online/Offline interventions, sms-based interventions, Online Therapy	Clear advantages of e-mental health interventions are accessibility, range, flexibility of use, anonymity of the internet, cost-effectiveness, ability to bridge treatment gaps,	Overcoming barriers in accessing mental health, Patient education and empowerment	None

				However, threat to data safety, confidentiality, competency of the provider of the intervention, and their contents, Not suitable for all mental disorders, but beneficial in early detection		
United Kingdom	Bell, 2007	Literature Review	Online therapy for depression and anxiety 'MoodGYM', Health information websites	Mental health information on the internet is often low standard and of poor quality, High drop-out rate in MoodGYM, however, online mental health groups have a high level of information exchange and participant activity, Minimal prompts of therapists reduce drop-out rates, Internet rarely afford privacy or adequate confidentiality for the patient	Patient education and empowerment	None
Netherlands	Bockting et al., 2011	Study Randomized-controlled Trial	SMS-based monitoring intervention Mobile Cognitive Therapy Depression Free	SMS-based monitoring makes it easier for patients/therapist to detect relapse early, Patient self-management is increased by creating own disease prevention program, Overall therapist involvement might be	Patient education and empowerment	None

				reduced, Program can be execute at any venue of convenience to the patient		
Germany	Eichenberg, 2011	Research Article	Mental health information websites, Online therapy, Chats	Lack of quality management of web information and contents, E-mental health interventions are reaching new focus groups who do not use traditional care and foster destigmatization Relationship between professionals /consumers is affected by new interventions, E-mental health devices can be a medium for increased psychotherapy research	Overcoming barriers in accessing mental healthcare, Patient education and empowerment	None
Germany	Eichenberg & Brähler, 2013	Qualitative Study	Internet-based self-help groups, Apps, Games, Information websites	Half of German internet users would use e-mental health applications, especially online information website and self-help groups, Population must be informed about the advantages and disadvantages of e-mental health E-mental health needs quality appraisal mechanisms and set standards	Patient education and empowerment	None
Netherlands	Elgersma et al., 2011	Research Article	Internet-based cognitive behavioural therapy	E-mental health programs are cheap and available on a large scale ,	Cost-reduction of mental health services	None

				They are fast, anonymous, accessible, Internet-based cognitive therapy can be effective in treating anxiety and depression but effectiveness seems to depend on conditions such as support of a therapist, Internet as a means to relapse prevention is insufficiently examined		
United Kingdom	Karasouli & Adams, 2014	Systematic Literature Review	Self-management e-resources for bipolar disorder, depression, Prevention aid, recovery oriented applications	Evidence base supporting the use of e-resources is in its infancy, Availability of e-resources that can be publicly accessed without any quality appraisal or evidence of effectiveness is worrisome Testing e-resources usability and acceptability is important	Overcoming barriers in accessing mental healthcare	Results cannot be generalized
United Kingdom	Palmier-Claus et al., 2013	Qualitative Study, Cross-over design	Mobile-phone technology, Smartphone software & sms-based interventions	Mobile-phone based assessment can facilitate earlier and more effective interventions, Promote self-monitoring strategies, engage in informal support, Increased level of perceived control, autonomy, self-esteem in service	Patient education and empowerment	Small sample size, Results cannot be generalized, Time, context and population-specific results

				users, Ability to foster better communication between users and clinicians, No substitute for the human element of care		
Netherlands	Riper, 2011	Research Article	Online short-term self-help interventions for depression	Cost-effectiveness of e-mental health can be an answer to strongly rising costs of mental health care, Evidence for effectiveness of online interventions for depression has increased and anchored, Internet depression interventions can offer a high degree of anonymity and user convenience, Provide timely help, Online interventions are not practical for patients with severe mental disorders, and people who are not computer literate, High drop-out rates and low therapy regime	Overcoming of barriers in accessing mental healthcare, Cost reduction of mental healthcare services	Small number of available studies has implications on validity and reliability of results
Netherlands	Smeets et al., 2014	Research Article	Websites for depression, alcohol-abuse disorder, anxiety for adults/adolescents and family members of patients with mental disorders	Mood disorders can be effectively treated by internet self-help programmes, Patients suffering from alcohol-abuse disorders drink less and stay within the norm when using	Overcoming barriers in accessing mental healthcare, Cost-reduction of mental health service	None

				internet self-help and online treatment, Online-based programmes for alcohol-abuse disorder are cost-effective, less evidence for anxiety interventions, E-mental health can be integrated into direct patient care,		
Germany	Wolf, 2011	Overview	SUMMIT for recurrent depression	Internet-based supportive monitoring has a wide range, is accessible, flexible, can enhance virtual communication between patient and clinician, is interactive, can result in patient empowerment, can facilitate disease management and can bridge treatment gaps, Question in the development of SM is the need for proper screening and monitoring instruments and the timing and frequency of measuring points,	Overcoming barriers in accessing mental healthcare, Patient education and empowerment	None

Table 2: Programme Theory 2 – Mechanism (M)

Case/Country	Author (Year)	Study Design/Type of Article	Type(s) of Intervention(s) addressed	Factors that support the implementation of e-mental health interventions mentioned in the article	Component(s) of Theory 2 addressed in the article	Limitations
United Kingdom	De Weger et al., 2013	Literature Review	Video conferencing	Clear understanding of the local service context as different ehealth approaches are needed for different contexts, Active clinical and administrative staff, Involvement in the planning and development of ehealth technologies, Consultation between staff and service users prior to implementation, Find out organizational/technical issues that could hinder implementation, Keep transparent feedback process so that staff/consumers can inform changes to the implementation	Organizational change, Research and funding	None
United Kingdom	Jones & Ashurst, 2013	Research Article, Qualitative cross-sectional study	Computerized cognitive behavioral therapy for depression , discussion forums, lifestyle change websites, videophone, email, Map of Medicine	More evidence of effectiveness of the intervention, Training and guidelines for implementation, Address stakeholders concerns, Research needs to find more effective arguments/methods of dissemination to make the evidence of their studies about e-mental health interventions more persuasive, Further local evaluation before adopting e-health services	Technology, research and funding, Organizational culture	Self-selected study participants might be more e-literate than average, pre-specified discussion topics may limit the range of discussion
United Kingdom	Palmier-Claus, 2013	Research Article, Qualitative Study	Mobile-phone technology, Smartphone software & sms-based interventions	Collaborative enterprise between users/promoters, presence of a clear organisational and technical arrangement, for adoption of	Technology, organizational culture	Small sample size, Results cannot be generalized, Time, context and



				technology, User-friendly, hassle-free technology, Appeal and ability to establish familiarity by users, Provision of a high level of assistance and encouragement in the early stages of technological integration		population-specific results
Germany	Renz et al., 2005	Research Article	Information systems in healthcare	Comparability between sending and receiving system on different levels, Conceptual compatibility, meaning that software producers need to agree on a common standard, Terminological compatibility	Technology* <sup>12</sup>	None
Netherlands	Smeets et al., 2014	Research Article	Websites for depression, alcohol-abuse disorder, anxiety for adults/adolescents and family members of patients with mental disorders	Set up professional group of GGZ institutions to connect knowledge, experience and programmes (goal: 60-70% of client use e-mental health interventions in 3 years time) Stimulate use of e-mental health interventions by new ways of financing that involve no costs for the patient, Specific implementation projects by Trimbos to integrate Kleurjeleven into primary-care, Training for general practitioners in the use of e-mental health interventions,	Organizational culture, Research and funding	None
United Kingdom	Takian et al., 2012	Research Article, Case study	Electronic health record software	Identify stakeholders prior to planning and implementation of EHR, Adjust and train computer literacy and ability to access technology of users/medical staff, Ensure user-centered	Technology, Organizational culture	Results are not generalizable since only one mental hospital was examined

<sup>12</sup> Article scores low on the dimension of relevance since it does not address factors that support the implementation of e-mental health interventions. However, due to its insight of implementation of technological innovations in healthcare it was included into this data extraction process

				design of EHR, Educate practitioners with regards to transparency and observing confidentiality of patient notes Safety of EHR systems needs to be ensured prior to implementation		
Netherlands	Van der Krieke et al., 2013	Mixed-methods study , randomized-controlled trial	Web-based information and decision tool,	Positive attitude of clinicians towards the use of the decision aid, Patients being interested in shared medical decision-making , Offer possibility to use decision aid and treatment evaluation to all patients	Organizational culture	Weak implementation of study protocol and low response rate
Netherlands	Voodrouw et al., 2008	Research Article	Inter-base self-help programs, i.e. Kleurjeleven, Grip op je dip, Op zoek naar zin for depression	Good cooperation between the scientific community, administration and praxis with adequate resources to realize implementation, Discussion of finances and communication between financiers of depression prevention interventions, Long term vision and actuation of the rural authority in order to reach realistic goals and to activate the necessary human and financial support	Organizational culture, Research and funding	None

Table 3: Programme Theory 3 – Mechanism (M)

Case/Country	Author (Year)	Study Design/Type of Article	Type(s) of Intervention(s) addressed	Stakeholders who are affected by the implementation of e-mental health interventions mentioned in the article	Type(s) of stakeholder(s) mentioned in the article	Limitations
Germany	Apolinari-Hagen & Tasseit, 2015	Literature Review	E-mental health interventions in general	Therapists, Patients, People looking for medical advice, E-mental health intervention developers, Researchers, Health insurance companies, General Practitioners	Healthcare consumers, Healthcare providers	None
Germany	Bauer et al., 2005	Literature Review	Online/Offline interventions, sms-based interventions, Online Therapy	People searching for information/help, Therapists, Family members of patients, Health insurance companies, Research centres, Specialist mental health clinics	Healthcare consumers, Healthcare providers	None
Netherlands	Bockington et al., 2011	Study, Randomized-controlled trial	S MS-based monitoring intervention Mobile Cognitive Therapy Depression Free	Patients, Therapists, Researchers, Trimbos Institute, General Practitioners	Healthcare consumers, Healthcare providers	None
Germany	Eichenberg, 2011	Research Article	Mental health information websites, Online therapy, Chats	Therapists, patients, People searching for medical advice	Healthcare providers, Healthcare consumers	None
United Kingdom	Jones & Ashurst, 2013	Research Article, Qualitative cross-sectional study	Computerized cognitive behavioral therapy for depression , discussion forums, lifestyle change websites, videophone, email, Map of Medicine	Mental health professionals, Clinicians, Therapists, Mental healthcare users/patients	Healthcare providers, Healthcare consumers	Self-selected study participants might be more e-literate than average, pre-specified discussion topics may limit the range of discussion
Netherlands	Kleiboer et al., 2015	Study Randomized-	Internet-based PST with varying	Online coaches/therapists,	Healthcare consumers,	Limited statistical

		controlled trial	levels of support via chat or email Allesondercontrole,	Patients suffering from mild to moderate symptoms of depression/anxiety, Medical Ethics Committee	Healthcare providers, Information and technology staff	power of study, Results might not be generalizable due to clinical setting of study
Germany	Laszig & Eichenberg, 2003	Literature Review	E-mental health interventions in general	Therapists, Patients, Bundesärztekammer (Federal Chamber of Physicians)	Healthcare consumers, Healthcare providers	None
United Kingdom	May et al., 2001	Ethnographic study	Videophone/telemedicine systems	Patients, General Practitioners, Psychiatrists, Clinicians, Psychiatric outpatient clinics, Technical experts, Research Ethics Committee, Managers involved in the telepsychiatry service, Community psychiatric nurses, Psychologists	Healthcare consumers, Healthcare providers, Information and technology staff	None
Netherlands	Riper, 2011	Research Article	Online short-term self-help interventions for depression	Patients, Coaches/professional respondents (accompanied interventions), Private companies, Health insurance companies, Trimbos Institute, Ggz Breburggroep, Ggz Westelijk Noord-Brabant, Vital Health	Healthcare consumers, Healthcare providers	Small number of available studies has implications on validity and reliability of results
Netherlands	Smeets et al., 2014	Overview	Websites for depression, alcohol-abuse disorder, anxiety for adults/adolescents and family members of patients with mental disorders	Patients, General physicians, Primary-care institutions, GGZ, Ministry of Public Health, Well-being and Sports, Trimbos-Instituut	Healthcare consumers, Healthcare providers	None

Table 4: Programme Theory 4 -Context (C)

Country	Author (Year)	Study Design/Type of Article	Type(s) of Intervention(s) addressed	Possibilities of access to mental healthcare mentioned in the article	Component(s) of Theory 4 addressed in the article	Limitations
United Kingdom	Docherty & Thornicroft, 2015	Literature Review	Not applicable	Referral by general practitioners to specialist care provided mostly by NHS Service Staff	Primary-care settings, Specialist -care settings	High heterogeneity of sources, Varied time frame used for the data sources
Germany	Gäbel et al., 2013	Literature Review	Not applicable	Common ways of accessing mental healthcare: Primary care physician/ other specialist in somatic medicine (no onward referral/referral to specialist) Physician specializing in psychiatry/psych otherapy, (no onward referral/referral to psychiatric department)	Primary-care settings, Specialist-care settings	None
Germany	Gäbel & Zielsek, 2012	Literature Review	Not applicable	Mental healthcare in the outpatient sector is mainly covered by general practitioners, psychiatrists, neurologists, specialists for psychosomatic medicine, psychological psychotherapists, Referral by the general practitioner to a specialist, Inpatient service conducted in mental hospitals	Primary-care settings, Specialist-care settings	Predictive power of performed care analysis is low, Unknown validity, reliability of the practices
Netherlands	Hermens et	Research Article,	Not applicable	Referral by	Primary-care	Small study

	al., 2014	Explorative Study		general practitioners to specialists, Psychotherapists, (Psychiatric) Nurses, Social workers, Psychologists	settings, Specialist—care settings	sample of only 6 GP practices Lack of quantitative data on care consumption in selected practices
United Kingdom	Lester et al., 2004	Discussion paper	Not applicable	Referral by a general practitioners to specialists (primary mental healthcare as gatekeeper for specialist care services), Community mental health teams, Practice nurses Family members (as unpaid caretakers)	Primary-care settings, Specialist-care settings	None
Netherlands	Piek et al., 2011	Research Article, Observational study	Not applicable	Referral by general practitioners to specialists, Psychologists, Psychiatric nurses, Social workers affiliated with a GP, Psychiatrists, Psychotherapist Counsellor	Primary-care settings, Specialist-care settings	Non-generalizable of results due to singularity of Dutch referral system, Missing data on diagnoses in 30% of GP practices
Germany	Stengler et al., 2011	Qualitative case study	Not applicable	Initial contact to psychiatric-psychotherapeutic services via referral of general practitioner or paediatricians , Majority of participants (77%) sought first professional help from a psychiatric-psychotherapeutic contact person, (23%) other went	Primary-care settings, Specialist-care settings	Selection bias as study took place in an OCD clinic for adults with disorder-specific special outpatient services

				to their GP		
Netherlands	Soffers et al., 2014	Research Article Single case study	Not applicable	Mental healthcare institutions, Assisted living facilities, Outpatient/inpatient mental healthcare	Specialist -care settings	Non-replicable results due to single case study design, Limited external validity