How are we coping with the pandemic?

Mental health and resilience amid the Covid-19 pandemic in the EU
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This report reviews the scientific evidence regarding the mental health of different population groups amid the Covid-19 pandemic in the European Union (EU) and its influencing factors. Since the beginning of the pandemic, there has been extensive research on the psychosocial and mental health consequences, showing negative effects especially in the general population compared to before. On the other hand, there is also evidence of resilient responses as the pandemic progressed, that is, the maintenance or recovery of mental health. However, these findings are limited to the first wave or shortly thereafter.

This report primarily allows conclusions to be drawn regarding the first wave of the Covid-19 pandemic. Several risk factors were identified, with a need for more research on protective factors. Based on the available data, no reliable conclusions regarding the mental health impact of Covid-19 policy responses – containment and support measures – can be drawn. Finally, the study outlines a set of policy options relevant to addressing the mental health challenges during the Covid-19 pandemic and similar future situations.
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Executive summary

This report reviews the scientific evidence available up to March 2021 regarding the impact of the Covid-19 pandemic on the mental health of European Union (EU) citizens. The report presents the main results of the study, including the policy options derived. More detailed results and the study methodology are presented in two separate annexes (Annex 1 – Methods, Annex 2 – Results), respectively.

1.1. Introduction and aims

Psychological resilience is the maintenance or swift recovery of mental health during or after adversities (Kalisch, 2015). The Covid-19 pandemic and its related stressors, including disease-related threats and containment measures (e.g., home confinement, school closures, travel-related controls), present considerable adversity for the general population and various sub-populations (e.g., patients, employees, children and adolescents). Any maintenance or recovery of good mental health during the pandemic can therefore be considered as demonstrating resilience during the Covid-19 pandemic.

This report reviews the psychosocial and mental health effects of the Covid-19 pandemic and of the associated containment and support measures in the EU. It also investigates risk factors for mental problems as well as protective factors for good mental health at country, population, and individual levels. Finally, policy options are derived for the European Parliament and other actors at EU and national levels.

To date, no synthesis of evidence on the mental health consequences of the pandemic has solely focused on the EU. Moreover, the question of how to foster Europeans' resilience in the face of the coronavirus crisis based on, for example, known protective factors for mental health, has not yet been addressed.

1.2. Methods

The report includes four methodological pillars, each of them using systematic methods of identifying and summarising research and evidence-based information:

1) identification of Covid-19 policy responses in the EU Member States and the United Kingdom (UK);

2) identification of previous literature reviews on the psychosocial and mental health effects of the Covid-19 pandemic;

3) identification of studies measuring mental health either before and during the Covid-19 pandemic, or at several time points during the pandemic; and

4) identification of existing (policy) recommendations at the level of European (mental health) organisations and in the scientific literature.

A comprehensive literature search in 11 scientific databases was carried out in March 2021, covering the period from 2020 onwards. The conclusions of this report are mainly based on the primary studies identified in pillar 3. The findings of previous literature reviews are examined to identify (dis-)agreements, to put the findings of this report into context, and to derive implications for future research and policy action. The policy options are developed based on the synthesis of information from pillars 1-4.
1.3. Results
The literature search identified 90 studies on mental health, comprising evidence for 14 EU Member States and the UK, dating from January 2020 to December 2020, with the majority of studies being carried out between spring and summer 2020 (April to May 2020).

Policy responses: containment and support measures
An analysis of the implemented containment and support measures shows consistently more severe restrictions in spring and summer 2020 – reflecting the rather homogeneous first surge and subsequent reduction in infections across Europe – followed by an autumn and winter in 2020 with a substantial variance in containment policies across the EU Member States. The containment measures implemented comprised mask-wearing, closures of schools, offices, businesses, institutions and operations, as well as gathering, domestic movement and international travel restrictions.

The most common support measures used to mitigate negative effects of the pandemic and of the containment policies were public information campaigns on the Covid-19 pandemic, paid sick leave/unemployment benefits, wage subsidies and income support. Several other financial, work-related, health system-related and psychological support measures were implemented in the EU Member States, such as social security contributions, training measures, healthcare insurance support and Covid-19 helplines.

Effects of the Covid-19 pandemic and of policy responses on mental health
The findings on mental health outcomes reported by the 90 observational studies, which were eligible for this report, were not consistent for each population group – at least if mental health was compared between an early phase of the pandemic (first wave or assessments in close relation to it) and the prepandemic situation. There was a consistent increase of stress-related mental symptoms (anxiety, depression, general psychological distress) in the general population during the pandemic compared to before, which is in line with previous research (literature reviews identified in this report). The available data for other population groups (e.g., various patients, employees, children and adolescents, and other age groups) are either limited, differ from the results of meta-analyses, or are not consistent for the before-during comparison. However, over the course of the pandemic, up to December 2020, especially during and after the first wave for which most data were available (April and May 2020), mental illness symptoms either remained stable or re-improved in most population groups, although there are no studies available for children and adolescents.

This means that the Covid-19 pandemic has caused an increase in mental illness symptoms and a deterioration in mental health in the general public compared to the prepandemic situation, especially during the first wave in spring 2020. In the further course of the first wave and afterwards, the mental burden remained stable at the higher level compared to before the pandemic or improved compared to the previously higher values from the pandemic. Conclusions regarding the extent of these mental health changes were not possible as part of this study because of the heterogeneity in the statistical analyses used in the scientific literature. Furthermore, based on the currently available data, no reliable conclusions can be drawn regarding the mental health impact of the coronavirus-related policy responses, including containment and support measures. To date, research has mostly focused on containment measures and their indirect consequences (e.g., loneliness, forced telework), while there is not enough systematic research on the potential impact of support measures on mental health. Finally, causality for the impact of support measures on mental health can hardly be claimed, as these measures might also have been a response to the particular pandemic burden in a country.
Risk and protective factors for mental health

Based on a country-level analysis, no clear tendency was observed that the citizens of any specific Member State(s) were more at risk for or more protected from a deterioration in their mental health. According to a comparison between all identified population groups, the general population was the most burdened group during the first wave compared to before the pandemic. In contrast to the general public, various patient populations seemed to cope better with the pandemic, with mostly no change in mental health symptoms compared to the pre-pandemic situation, although there was also a deterioration in mental health for several outcomes. Conclusions regarding other population groups are rendered difficult based on the limited available data (e.g., for employees). In the pandemic timeline, that is in the aftermath of the initial shock regarding the disease outbreak as a public health threat, none of the population groups seemed to be especially at risk of mental health problems.

The most common sociodemographic and psychological risk factors for a poorer mental health status at an individual level included female gender, a low socioeconomic status, loneliness and fear (of Covid-19). In contrast, social support, financial stability, being a healthcare worker (at least during the first pandemic wave), more physical/recreational activities and psychological resilience factors such as self-efficacy (i.e., the belief in one’s ability to succeed in a specific task) presented protective factors. A need for more research on protective factors remains, with research gaps concerning mainly social, work-, and pandemic-related factors.

1.4. Conclusions and limitations

Overall, this report primarily allows conclusions to be drawn regarding the first wave of the Covid-19 pandemic in the EU Member States and the UK, that is, short-term effects of the pandemic and its related stressors on mental health. Although underlying risk and protective factors might be similar in later stages of the pandemic, it is also conceivable that other dynamics come into play after one year of restrictions and crisis management, such as medium-term economic losses, a reappraisal of the coronavirus-related health risk following vaccination, or a general pandemic fatigue that may shift the pattern seen in earlier phases/2020. However, policy-makers at all levels might benefit from the sociodemographic and psychological risk and protective factors identified in this report and the policy options derived, to foster the resilience of their citizens. The report indicates the clear need for more research, especially on protective factors, the effects of policy measures, and interventions to foster resilience. High-quality longitudinal studies should be carried out in EU Member States, especially in those for which there is little or no research, for specific population groups (e.g., non-healthcare employees affected by remote working), and regarding protective factors at different levels.

1.5. Policy options

The report concludes by outlining four policy options, alongside detailed information on their relevance, based on the findings of this report, the actors to be involved at the European and national levels (e.g., European Parliament, European Commission, Member States, possible other European and national actors such as the Pan-European Mental Health Coalition, mental health organisations, research groups and experts in the field of mental health), as well as suggestions on how to implement each option.

Policy option 1: EU-wide mental health monitoring in the general population

- Monitor the prevalence of mental symptoms and clinical diagnoses of mental disorders in the EU through a long-term survey study across all EU Member States.
**Policy option 2: Awareness raising and interventions**
- Increase public awareness and that of policy-makers at the European and national levels about the mental health consequences of the Covid-19 pandemic, protective factors, and the efficacy of psychosocial and mental health interventions, through research activities such as longitudinal studies on specific population groups (e.g., non-healthcare employees, Covid-19 patients) and protective factors, as well as literature review projects.

**Policy option 3: EU-wide mental health services research study**
- Draw more reliable conclusions about the consequences of the Covid-19 pandemic on mental health services in the EU through EU-wide health services research (e.g., by using the European health data space infrastructure to share health data between EU countries).

**Policy option 4: Joint European emergency preparedness to counteract negative mental health consequences**
- Establish a European emergency preparedness and response strategy, focusing on psychosocial and mental health support as part of the European health union, to develop response mechanisms and provide psychosocial support resources (e.g., helplines, digital resources) for the general public and especially vulnerable groups (e.g., mentally ill patients) in the face of public health emergencies.
- Define criteria to ensure a sufficient supply of (critical) mental health services for the EU population during and after cross-border health crises such as the Covid-19 pandemic.
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<th>Description</th>
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<tbody>
<tr>
<td>Covid-19</td>
<td>Coronavirus disease 2019</td>
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<td>EC</td>
<td>European Commission</td>
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<tr>
<td>ECDC</td>
<td>European Centre for Disease Prevention and Control</td>
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<td>EEA</td>
<td>European Economic Area</td>
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<tr>
<td>e.g.</td>
<td>for example</td>
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<td>EP</td>
<td>European Parliament</td>
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<tr>
<td>EPPI Centre</td>
<td>Evidence for Policy and Practice Information and Co-ordinating Centre</td>
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<tr>
<td>ERIC</td>
<td>European Research Infrastructure Consortia</td>
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<tr>
<td>ESEMeD</td>
<td>European Study of the Epidemiology of Mental Disorders</td>
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<tr>
<td>etc.</td>
<td>et cetera</td>
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<tr>
<td>EU</td>
<td>European Union</td>
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<tr>
<td>EUPHA</td>
<td>European Public Health Association</td>
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<tr>
<td>H1N1</td>
<td>influenza A virus subtype H1N1 (Hemagglutinin Type 1 and Neuraminidase Type 1)</td>
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<tr>
<td>HERA</td>
<td>Health Emergency preparedness and Response Authority</td>
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<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
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<td>IASC</td>
<td>Inter-Agency Standing Committee</td>
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<td>ICU</td>
<td>intensive care unit</td>
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<td>ID</td>
<td>identifier</td>
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<td>i.e.</td>
<td>that is</td>
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<tr>
<td>IPD</td>
<td>individual participant data</td>
</tr>
<tr>
<td>k</td>
<td>number of studies</td>
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<tr>
<td>MEP</td>
<td>Member of the European Parliament</td>
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<td>MHE</td>
<td>Mental Health Europe</td>
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<tr>
<td>NA</td>
<td>not applicable</td>
</tr>
<tr>
<td>No.</td>
<td>number</td>
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<tr>
<td>NR</td>
<td>not reported</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
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<td>page</td>
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<tr>
<td>PHEIC</td>
<td>Public Health Emergency of International Concern</td>
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<td>PHSM</td>
<td>public health and social measures</td>
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<tr>
<td>PTSD</td>
<td>posttraumatic stress disorder</td>
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<tr>
<td>RQ</td>
<td>research question</td>
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<tr>
<td>SARS(-CoV)</td>
<td>Severe Acute Respiratory Syndrome coronavirus</td>
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<td>SARS-CoV-2</td>
<td>Severe Acute Respiratory Syndrome coronavirus type 2</td>
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<td>SMI</td>
<td>Support Measure Index</td>
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<td>STOA</td>
<td>Panel for the Future of Science and Technology (STOA)</td>
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<tr>
<td>TAG</td>
<td>Technical Advisory Group</td>
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<td>UK</td>
<td>United Kingdom</td>
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<td>vs.</td>
<td>versus</td>
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<td>WHO</td>
<td>World Health Organization</td>
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How are we coping with the pandemic? Mental health and resilience amid the Covid-19 pandemic in the EU

1. Introduction

1.1. Exposure to pandemic-related stressors

The ongoing coronavirus disease (Covid-19) pandemic, caused by the Severe Acute Respiratory Syndrome coronavirus 2 (SARS-CoV-2), is responsible for a worldwide burden on the general public. Among the EU Member States, several countries (e.g., France, Italy, Spain, Sweden) were heavily affected by the first wave of the Covid-19 pandemic. During late spring 2021, the incidence rates started to decline (WHO, 2021a, 2021b; Worldometer, 2021), but despite a considerable share of citizens being vaccinated, are currently (October 2021) rising again in most European countries.

The different pandemic-related stressors are strongly interrelated. First, there is an immediate threat from SARS-CoV-2 (i.e., infection risk) and direct health-related hazards (e.g., severe Covid-19 disease) for the general population within the very dynamic infection process in a country (e.g., SARS-CoV-2 infection rates, number of Covid-19 cases, number of intensive care unit (ICU) patients, coronavirus-related deaths).

Second – although serving a higher purpose by preventing national health systems from becoming overloaded and sustaining health system capacity – the governmental responses to contain the Covid-19 pandemic present a substantial stressor. Depending on the country, these may include testing and tracing measures, home confinement, quarantine and (self-) isolation, workplace measures (e.g., workplace closures), measures implemented in the school setting (e.g., school closures), travel-related controls (e.g., international travel restrictions or bans, or both), as well as further restrictions and closures in different areas of life (e.g., closures of non-essential businesses). All these measures aim at reducing the growth rate of infections. In addition to these restrictive measures, governments also provided a variety of support measures to mitigate the burden associated with the pandemic. These supportive measures include financial support for different societal and occupational groups, short-time work, tax relief, legal adjustments (e.g., for telemedicine and therapy) and psychological services, among others.

Both the disease-related stressors and the policy measures to fight the pandemic impose tremendous challenges at different levels, including for individuals, organisations, healthcare systems, and societies all over the globe. Through contact restrictions, social distancing, and face mask regulations, the pandemic drastically affects our way of social interaction and, thus, our social life. Healthcare systems, including those in European countries (e.g., Italy, Spain, UK), have been overwhelmed, especially in the first wave of the pandemic, resulting in adverse effects for patients with other healthcare needs due to disrupted essential health services (e.g., postponed elective surgeries, fewer visits to emergency departments, decreased use of outpatient services, delay in cancer diagnoses and treatments; OECD, 2020a). The restructuring of school, university, and work life – partly based on legal obligations to remote work like in Germany – caused substantial stressors for students, employees, the self-employed as well as universities and organisations (e.g., Rigotti, 2021; Schröpfer, 2021). Finally, socio-economic stressors during the Covid-19 pandemic (e.g., global supply chain disruptions, reduced workforce across different industries, increased unemployment), are expected to have a long-lasting impact on the countries affected (e.g., future recessions; Nicola, 2020; Pak, 2020).

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1 These measures are often referred to as ‘lockdown measures’. However, given the inconsistent use of this term (e.g., media, scientific literature), we will avoid using it in this report and will refer to specific containment measures, as well as the corresponding terms (e.g., home confinement) instead. In a narrow sense, ‘lockdown’ also refers to stay-at-home orders for individuals, that is, they are ‘restricted from certain areas in an attempt to control the exposure or transmission of disease’ (Texas, Medical Center, 2020).
Overall, both the disease-related threat of SARS-CoV-2 and policy measures to fight the pandemic present **acute and long-term stressors**, in the face of which some population groups may be particularly vulnerable to developing mental health problems.

### 1.2. Potential population groups at risk

One 'occupational group in the spotlight during a pandemic' (Rigotti, 2021, p. 5) is certainly **healthcare workers**. Especially those working at the frontline with infectious patients, who are faced with multiple demands and risks for their own health and safety (e.g., time pressure, increased infection risk, triage decisions, exposure to suffering and death). With growing numbers of infections, workload and emotional demands in healthcare – already at high levels in general – became even more pronounced (e.g., Kisely, 2020; Lai 2020). Although there was a focus in the scientific literature on the mental burden of healthcare staff during the early phase of the Covid-19 pandemic, the current crisis may also affect **other (non-healthcare) employees and specific subgroups of working adults** (e.g., self-employed individuals, female employees, young adult workers, migrant workers, employees in specific sectors such as cultural and art sectors, gastronomy, and tourism), by threatening their career perspectives, professional status, and income (Giorgi, 2020; Hamouche, 2020; Holmes, 2020; Savolainen, 2021).

**SARS-CoV-2 infected individuals, patients with Covid-19** and other **patient populations** such as people with pre-existing conditions (e.g., patients with chronic health conditions, patients with mental disorders, geriatric patients, or a combination of these), and pregnant women may also be at increased risk of developing (stress-related) mental symptoms (Holmes, 2020; Vinkers, 2020; Wang, 2020; Yao, 2020). The negative mental health consequences of a SARS-CoV-2 infection and the resulting Covid-19 disease are becoming increasingly apparent, especially for those suffering from severe courses of disease or long-term consequences ('Long Covid-19'; National Health Service, 2020; Rogers, 2020; Szcześniak, 2021; Taquet, 2021).

The psychosocial and mental health effects of the pandemic might also differ depending on age. **Children and adolescents, their parents or caregivers** as well as **older adults** could be potentially vulnerable groups because of their exposure to various indirect stressors triggered by the measures to fight the pandemic (e.g., home-schooling, social isolation; Banerjee, 2020; Boldt, 2021; Calvano, 2021; Fegert, 2020; Markovic, 2021; Schlack, 2020). Furthermore, given that social contacts are various and essential in this phase of life and for the transition from adolescence to young adulthood, **university students** might be particularly burdened in the face of social distancing and contact restrictions which lead to social isolation (Browning, 2021; Dietz, 2021; Li, 2020b; Schröpfer, 2021).

Within the general population, **subgroups with particular risk exposure** such as family caregivers (Chan, 2020; Eckardt, 2020; Wang, 2020) might also show increased mental burden. Furthermore, international research – although substantially based on non-EU countries – indicates that people with low socioeconomic status might be hit harder by the Covid-19 pandemic (e.g., higher infection rates, less employment security, being more likely in jobs not allowing to work remotely etc.; Khalatbari-Soltani, 2020; Wachtler, 2020), with potential negative consequences for their physical and mental health.

### 1.3. Psychosocial and mental health effects in the pandemic course

Negative mental health effects of the Covid-19 pandemic may be **direct** consequences of the disease-related threat and the measures of containment as **primary stressors**. On the other hand, the negative impact of containment measures to protect public health, decided at a governmental
level, may be also mediated by **indirect or secondary stressors**, such as long-lasting social isolation due to contact restrictions, worrying about others (e.g., family members, friends), or financial problems because of a reduced income during the pandemic. International research (e.g., systematic reviews, meta-analyses, original primary research) on the Covid-19 pandemic and other epidemic or pandemic disease outbreaks provides evidence for an **increased mental burden** (e.g., feelings of loneliness, coronavirus-related fears and worries, general psychological distress) and **stress-related mental health problems** (e.g., symptoms of anxiety, depression, and post-traumatic stress disorder [PTSD]) for a broad range of population groups, including, for example, the general public (Luo, 2020; Krishnamoorthy, 2020; Kunzler, Röthke, 2021; Salari, 2020; Vindegaard, 2020; Xiong, 2020), healthcare workers (da Silva, 2020; Kisely, 2020; Krishnamoorthy, 2020; Lai, 2020; Vindegaard, 2020), and patient populations (Krishnamoorthy, 2020; Luo, 2020; Rogers, 2020; Vindegaard, 2020). Based on the experiences from previous infectious disease outbreaks, such as SARS (Severe Acute Respiratory Syndrome coronavirus), Ebola, and the 2009/2010 H1N1 influenza (influenza A virus subtype H1N1) pandemic, quarantine measures might especially favour the development of stress-related mental problems (Brooks, 2020; Henssler, 2020). For the Covid-19 pandemic, there is some evidence for a deterioration in mental health in relation to mandated lockdown periods (e.g., Gloster, 2020; Li, 2020a).

In contrast to public health measures to contain the pandemic, countries’ **support measures** that aim to buffer the negative impact of the Covid-19 pandemic in different areas of life (e.g., economic aids) might have **direct positive** mental health consequences. However, to the best of our knowledge, research on potential protective effects of these policy responses on mental health is still lacking.

To date, many observational studies have also examined potential **moderators** for the negative psychosocial and mental health impact of the Covid-19 pandemic at the individual level, including sociodemographic, psychosocial, health-related, occupational, and pandemic-related factors (e.g., Kisely, 2020; Krishnamoorthy, 2020; Luo, 2020; Preti, 2020; Vindegaard, 2020; Xiong, 2020). These factors might either work as **risk factors**, that is, increase the negative effects of disease-related threats and Covid-19-related containment measures on mental health. On the other hand, certain factors might also be **protective** by mitigating the negative mental health impact of disease-related threats and containment measures. For example, in a systematic review with meta-analyses comparing data of an early phase of the pandemic with prepandemic data, we repeatedly identified existing mental disorders, female sex, and concerns about getting infected with Covid-19 as risk factors for mental health problems across the general population, healthcare staff, and patient groups. Older age, a good economic situation, and a higher educational level, however, were found to be protective factors (Kunzler, Röthke, 2021).

None of the previous evidence syntheses has solely focused on the pandemic situation in European countries, specifically in the EU Member States, including potential risk and protective factors for mental health at the level of countries (e.g., EU Member States) and populations (e.g., age, occupation). Therefore, this report is the first research work to summarise the scientific evidence about the psychosocial and mental health effects of the Covid-19 pandemic on EU citizens. The analysis of the role of Covid-19 policy responses – measures of containment and support – for mental health in various population groups in the EU is unique and has not been performed to date.
1.4. Resilience perspective amid the Covid-19 pandemic

Given the already extensive research on negative psychosocial and mental health consequences of the pandemic, calls have been prompted by researchers to take a resilience perspective in coronavirus-related mental health research, by investigating protective factors that can strengthen mental health despite the adversities of the coronavirus crisis, as well as potential future pandemics (Gilan, 2020; Mancini, 2020; Veer, 2021; Vinkers, 2020).

In general, psychological resilience presents an important concept in health promotion and has stimulated extensive research, with the definition of resilience having substantially changed over the past decades. While resilience was initially seen as a stable personality trait (e.g., Wagnild, 1993), there is now growing consensus that it is a positive outcome after the successful adaptation to stressors. Resilience as an outcome is partially determined or predicted by the presence of various resilience or protective factors, including (neuro-) biological (e.g., age), psychological and cognitive (e.g., optimism, self-efficacy), and social factors (e.g., social support; Kalisch, 2015; see Figure 1).

**Psychological resilience**
- Maintenance or swift recovery of mental health during or after adversities
- Partially determined or predicted by protective (resilience) factors (e.g., social support)
- Resilience is viewed as dynamic over time and can be trained (e.g., by strengthening resilience factors).
  (Kalisch, 2015; Kalisch, 2017)

**Protective/resilience factors**
- Factors that positively affect and support coping with acute and chronic psychological stressors
- They can include (neuro-) biological, psychological, and social factors (e.g., age, genetics, optimism, social support).
This positive outcome is today viewed as **dynamic** over time, leading to two trajectories of resilience that can be differentiated: 1) resilience as maintained or undisturbed mental health during or after substantial stressors, or 2) resilience as the swift recovery of mental health after temporary mental dysfunction (Kalisch, 2015; Kalisch, 2017; Mancini, 2009). The understanding of resilience as a dynamic construct has resulted in the development of various resilience-training programmes, with evidence for positive effects in different population groups (e.g., Leppin, 2014; Kunzler, 2020).
Furthermore, it is important to note that protective factors promoting the demonstration of resilience can be found at different levels, within persons, as well as in their (social) environment. Consequently, resilience might not only be fostered by measures at the individual level (i.e., behaviour prevention approach; e.g., Leppin, 2014; Kunzler, 2020), but also by policy measures affecting the societal, community, and organisational level (i.e., environmental/setting-based prevention approach; e.g., Imperiale, 2021).

In any case, to be able to speak of resilience and to observe a resilient response (e.g., of individuals), the presence of a stressor is required (Earvolino-Ramirez, 2007; Masten, 2001). Therefore, in the context of the Covid-19 pandemic, the disease-related threats, the containment measures – as well as their indirect consequences – represent such stressors, with individuals who maintain or regain good mental health in the face of these adversities being considered as resilient. Simultaneously, the identification and targeted strengthening of protective factors for mental health in the EU population (or specific population groups) amid the Covid-19 pandemic may contribute to psychological resilience in the face of pandemic stressors.

A stronger focus on protective factors in view of the direct (i.e., disease-related threats, containment measures) and indirect (e.g., social isolation, economic burden) pandemic stressors seems also worthwhile as these factors were neglected in early studies during the first phase of the Covid-19 pandemic (Kunzler, Röthke, 2021). Finally, to date, the question of how to foster the resilience of Europeans in the face of the coronavirus crisis, for example, based on known protective factors for mental health, has not yet been addressed.

**Behaviour prevention**
- Prevention is an overarching term in the healthcare system for targeted measures and activities to prevent diseases or adverse health effects, to reduce the risk of the disease, or to delay its occurrence.
- Behaviour prevention refers directly to the individual person and their individual health behaviour.
- This includes, for example, measures that strengthen one’s own health literacy.
- The aim can be to reduce risk factors for physical health (e.g., malnutrition, lack of exercise, smoking, excessive alcohol consumption), but also psychological risk factors (e.g., maladaptive coping, negative thinking patterns).

**Environmental/setting-based prevention**
- Compared to behaviour prevention, it also considers, among other things, the living and working conditions of a person.
- This includes, for example, the living environment and other factors influencing health, such as income, education, or the social network.
2. Aims

With this report, we aim to summarise and to integrate the empirical evidence on mental health of citizens in the EU Member States during the Covid-19 pandemic as an indicator of resilience. Based on the systematic synthesis of the evidence on the mental health and psychosocial effects of pandemic stressors in the EU Member States, along with the identification of risk and protective factors for mental health, different policy options are derived. Concrete policy options are suggested that the European Parliament (EP) – in collaboration with other actors – could take during the ongoing Covid-19 pandemic and potential future public health emergencies (e.g., epidemic/pandemic outbreaks, financial crises, natural disasters), to protect vulnerable population groups and to ensure a resilient response of EU citizens.

This publication presents the underlying aims and research questions of the study, includes brief information on the study methodology, and contains the key findings for each research question, along with the policy options. Further details on the methodology and the results are included in separate documents: Annex 1 – Methods and Annex 2 – Results.

The report has three main objectives to support the work of the EP. It aims to examine:

1) the psychosocial and mental health effects related to the Covid-19 pandemic and various policy responses to it

2) risk factors for the development of psychosocial and mental health issues and protective factors that can strengthen the individual mental health of EU citizens amid the stressors of the Covid-19 pandemic, that is, psychological resilience.

The evidence on these topics is summarised to:

3) derive relevant implications for policy for the EP and other actors at the EU and national levels (e.g., European Commission [EC], national authorities in Member States).

The policy options under aim 3) serve to inform Members of the European Parliament (MEPs) and policy-makers about possible ways to address the mental health challenges during the coronavirus crisis and similar future situations.

2.1. Research questions

Based on the above-mentioned study aims, five research questions (RQs) were addressed:

- **RQ1.** Which policy responses have been implemented in the EU Member States during the Covid-19 pandemic?
- **RQ2.** What are the psychosocial and mental health effects of the Covid-19 pandemic, including the identified policy responses, in different population groups in the EU Member States?
- **RQ3.** Which (country-level, population-level, and individual) risk factors favour the development of psychosocial and mental health issues in different population groups in the EU Member States?
- **RQ4.** Which (country-level, population-level, and individual) protective factors foster resilient responses (i.e., stable or fast recovery of mental health despite the pandemic stressors) in different population groups in the EU Member States?
- **RQ5.** What are current policy recommendations and (evidence-based) guidelines regarding mental health in the EU Member States?
3. Methods

We used a broad methodological approach to identify the relevant literature, with a focus on the 27 EU Member States and the UK. The UK was also considered for this report given its long-lasting status as EU Member State, the similarities with other EU countries (e.g., social, cultural, economic structures) as well as the large number of UK-based primary studies on Covid-19-related mental health research.

3.1. Method generation

To select the underlying methods for this study, a simplified logic model regarding the effects of the Covid-19 pandemic and related policy responses has been generated (see Figure 2). Based on their experiences with Covid-19-related mental health research and the methodology of systematic reviews, the research team defined different outcomes of interest to investigate the psychosocial and mental health impact of the coronavirus crisis (see Annex 1 – Methods). We considered loneliness or feelings of isolation and various mental health outcomes (e.g., symptoms of anxiety, depression, or stress).

In addition to being affected by the immediate disease-related threats of Covid-19 and the infection process in each country (e.g., number of SARS-CoV-2 infections), the model assumed that mental health outcomes are influenced by policy responses at the governmental level.

With respect to the potential negative effects of disease-related threats and measures of containment on mental health, the model also included potential moderators for the impact of these pandemic stressors. At the level of EU citizens, various individual risk and protective factors (e.g., demographic, psychological) might increase or mitigate (‘buffer’) the effects of the pandemic on mental health. At the country and population level, mental health effects might differ between different EU Member States and possibly different regions within EU countries or between different population groups. Considering the interaction between these different elements seems important for the management of psychosocial and mental health consequences of the pandemic, and for selecting appropriate responses of the competent authorities.

Based on this model, various pilot searches in electronic databases (e.g., PubMed) were conducted to develop the final methodological approaches (see Annex 1 – Methods). Furthermore, previous experiences with machine learning concerning study identification and data extraction were integrated.
How are we coping with the pandemic? – Main report

Figure 4 - Model for the effects of the Covid-19 pandemic

**Pandemic situation**

- **Disease-related threats:**
  - Infection risk, health-related hazards (e.g., severe Covid-19 infection)
- **Covid-19 situation:**
  - SARS-CoV-2 infection rates, number of Covid-19 cases, number of intensive care patients, Covid-19-related deaths

**Stressors**

- Containment measures:
  - Contact restrictions
  - Hygiene measures
  - (Home) confinement, (self-) quarantine, (self-)isolation
  - Measures implemented in school setting
  - Travel-related control measures
  - Further restrictions and closures

- Financial/economic
- Work-related
- Health systems
- Social
- Psychological

**Support measures**

Source: Self-developed simplified logic model regarding the effects of the Covid-19 pandemic and related policy responses.

**Moderators**

- **EU Member State**
- **Population group**
- **Individual risk factors**
  - Sociodemographic
  - Psychological
  - Social
  - Health-related
  - Work-related
  - Pandemic-related
- **Individual protective factors**

**Outcomes**

- Loneliness
- Mental health
- Anxiety symptoms/worrying
- Depressive symptoms
- (Perceived) stress
- Sleep problems/quality
- Psychological distress
- Peri-/posttraumatic stress symptoms
- Substance abuse/substance use disorder
- Self-harm/suicidal ideation/suicidality
- Well-being/life satisfaction/quality of life

Note. Disease-related threats: These can include the infection risk for the general population and physically/mentally vulnerable groups, but might also contain the specific health-related hazards for patients who have/had infected themselves with SARS-CoV-2 and suffer/suffered from coronavirus disease (e.g., risk of severe course of disease, long-term consequences of disease). For this study, we differentiate between the general population (and other groups), SARS-CoV-2 infected individuals, and Covid-19 patients (as a subgroup of patients). However, all three groups are considered for the analysis of psychosocial and mental health effects of the pandemic and the policy responses.
3.2. Four methodological pillars of the report

The execution and writing of this study were based on the following four methodological pillars, each of them using systematic methods of identifying and summarising relevant studies and evidence-based information. Different types of scientific studies and reviews mentioned throughout this report are briefly explained in the text box on page 12.

1) Identification of Covid-19 policy responses in the EU Member States and the UK, by searching for the following kinds of containment and support measures:\(^2\):

   a) Containment measures:
      i) Testing and contact tracing
      ii) Hygiene measures (e.g., face mask regulations, rules of social physical distancing)
      iii) Measures of (home) confinement, (self-)quarantine\(^3\), (self-)isolation\(^4\)
      iv) Measures implemented in the workplace (e.g., workplace adaptation like implementing sanitary measures, workplace closures and/or working from home for some sectors/categories of workers or for all-but-essential services such as pharmacies)
      v) Measures implemented in the school setting (e.g., school closures, organisational measures to reduce transmission like masks or cohorting\(^5\), structural/environmental measures like improving air circulation, surveillance and response measures to detect SARS-CoV-2 infections such as testing and isolation)
      vi) Travel-related control measures
         o Restrictions on internal movement
         o Restrictions on international travel (e.g., closure of national borders to entry or exit, or both; international travel restrictions or bans, or both; entry and exit screening at national borders; quarantine or isolation of travellers; combination of these measures)
      vii) Closures of and containment measures (e.g., face coverings) in non-essential businesses and public spaces (e.g., closure of public transport)
      viii) Restrictions on gathering size or cancellation of public events and gatherings.

   b) Support measures:
      i) Financial/economic measures (e.g., income support, deferral of tax prepayments, debt/contract relief for households, fiscal measures, bonus payments, investments)
      ii) Work-related measures (e.g., adaptation of workplace like teleworking, employment retention, and short-time work)

\(^2\) The categories of support measures were pre-defined by the research team based on preliminary searches on the dashboards and websites of institutions (e.g., Our World in Data, World Bank, WHO) that were used for pillar 1 (for details, see Annex 1 – Methods).

\(^3\) (Self-)quarantine: temporary isolation of someone suspected of being infected (e.g., after potential exposure to contagious disease to see if they become sick) or who may be carrying or shedding the virus; self-quarantine: quarantine on a voluntary basis.

\(^4\) (Self-)isolation: separates sick people with a contagious disease from people who are not sick; self-isolation: isolation on a voluntary basis.

\(^5\) Cohorting in schools: “creating groups of students that are separated from other groups by at least 6 feet throughout the entire day” (CDC, 2021).
How are we coping with the pandemic? Mental health and resilience amid the Covid-19 pandemic in the EU

iii) Measures in the health systems (e.g., public information campaigns, investment in Covid-19 vaccination programmes)
iv) Social measures (e.g., childcare provision, free transport/accommodation/parking)
v) Psychological measures (e.g., helplines, well-being support or mental health initiatives).

2) **Umbrella review**: Identification of systematic reviews and meta-analyses on the effects of the Covid-19 pandemic on various psychosocial and mental health outcomes

3) Identification of **primary quantitative (longitudinal studies, repeated cross-sectional studies)** on the effects of the Covid-19 pandemic on various psychosocial and mental health outcomes

4) Identification of **existing (policy) recommendations** at the level of European (mental health) organisations and in the scientific literature.
**Systematic review**
- “[…] type of research synthesis that are conducted by review groups with specialized skills, who set out to identify and retrieve international evidence that is relevant to a particular question or questions and to appraise and synthesize the results of this search to inform practice, policy and in some cases, further research” (Munn, 2018; p. 2)
- Based on international standards for performing and reporting systematic reviews, they mainly comprise:
  - a literature search in scientific databases using a pre-defined search strategy
  - the screening and study selection based on pre-specified inclusion/exclusion criteria by two independent reviewers
  - the data collection from eligible studies by two independent reviewers
  - a quality assessment of eligible studies
  - the systematic analysis and presentation of data from eligible studies in text and tabular form
  - and possibly a meta-analysis, depending on the available studies and data.

**Meta-analysis**
- **Statistical combination** of the results from two or more separate studies that are sufficiently comparable (e.g., concerning study design, outcomes measured; Deeks, 2021)
- Examples of use: comparison of data between two groups (e.g., values in mental health variables before vs. during the Covid-19 pandemic) or pooling the findings across multiple studies.

**Umbrella review**
- Literature review summarising evidence from multiple systematic reviews on a similar topic (e.g., Covid-19 mental health research)
- It is conducted according to international standards for systematic reviews (i.e., including a systematic search in scientific databases, study selection, data collection, and analysis).

**Primary study**
- Research in which data are collected directly (e.g., in surveys, measurements, or experiments)
- “The term primary study is sometimes used to distinguish it from a secondary study (re-analysis of previously collected data), meta-analysis, and other ways of combining studies (e.g., economic analysis or decision analysis).”
  (Cochrane Collaboration, 2005)

**Quantitative study**
- A study collecting and analysing numerical data (e.g., using standardised questionnaires that contain items to be answered on a numerical scale)

**Cross-sectional study**
- Study measuring the outcomes of interest (e.g., mental health) **at a single time point** in a specific group of people.

**Longitudinal study**
- Study including **repeated measurements** of the same outcomes at several time points **in the same individuals** (e.g., mental health is assessed before and after the Covid-19 outbreak and at both time points, the same group of individuals is surveyed regarding their mental health).

**Repeated cross-sectional study**
- Study including **repeated measurements** of the same outcomes at several time points, **but in different individuals** (e.g., mental health is assessed before and after the Covid-19 outbreak, but at each time point, different individuals are surveyed regarding their mental health).
The concept for carrying out this report in Figure 3 outlines the relationship between the four methodological pillars and how they will contribute to answer the five RQs as well as to derive the relevant policy options.

Based on the available literature, several clusters of potential risk and protective factors were considered for RQ3 and RQ4, including the respective EU Member State, the population group, and different individual factors at the level of EU citizens, such as demographic aspects (e.g., age), disease-related factors (e.g., individual infection risk), and psychosocial factors (e.g., coping strategies). To derive relevant policy options at the EU level, the answers to the RQs 1–5 using the four methodological pillars were used.

The methods for each of the four pillars are presented in detail in Annex 1 – Methods. Overall, within each study pillar, the following methods were used:

1) Definition of the eligibility criteria (i.e., inclusion/exclusion criteria) for the selection of the relevant research (e.g., systematic reviews, primary studies), respectively

2) Development of a search strategy and execution of systematic searches (search on institutions’ dashboards and websites for pillar 1 and 4; search in bibliographic databases for pillars 2, 3, and 4)

3) Study selection by two researchers working independently

4) Data extraction of the included studies based on a pre-defined customised data collection form

Source: Self-developed model.
5) Systematic analysis and synthesis of the respective findings (e.g., in tabular and text form); for RQ2–RQ4, the data were summarised by different population groups (i.e., general population, patient populations, employees, different age groups like children/adolescents, young to middle-aged individuals, older adults).

Since the primary studies (pillar 3) had to be performed in an EU Member State to be considered for this report (see Annex 1 – Methods), they offer a more precise picture of the current state of research on mental health consequences of the pandemic in the EU than previous evidence syntheses, which might only include a limited number of EU-based survey studies. Therefore, the conclusions of this report regarding RQ2–RQ4 are mainly based on the identified primary studies (see sections 4.3 and 4.4). Nevertheless, we have also summarised the findings of previous systematic reviews in this field and identified agreements and disagreements between the primary studies and these evidence syntheses to put our findings in the context of previous research. Especially the identification of disagreements between the primary studies identified in this report and previous systematic reviews (see sections 5.1.2 and 5.2.2) also allowed us to derive implications of this report for future research and respective policy actions (see sections 5.6 and 6.2).

3.3. Developing policy options

Based on the synthesis of information to answer RQ1–RQ5, relevant policy options for the European Parliament and other actors (e.g., national authorities in EU Member States) were developed. The derivation of policy options rested on two steps. First, when answering RQ2, we tried to establish links between actual Covid-19 policy responses on the one hand and changes of mental health and well-being in different sub-populations on the other. For the latter, we considered changes of mental health before versus (vs) during the Covid-19 pandemic as well as trajectories of mental health across different time points in the pandemic timeline (i.e., only during). Second, we considered the recommendations made by European (mental health) organisations and in the scientific literature. Based on this, we formulated policy options, keeping in mind the competences of the EU and its Member States, as well as the relevant ongoing actions and initiatives at the EU level.
4. Results

4.1. Covid-19 policy responses in the EU Member States and the UK

The results presented in this section address RQ1 and pillar 1 regarding the identification of Covid-19 policy responses implemented in the EU Member States and the UK.

4.1.1. Containment measures

Based on the approach of the WHO Regional Office for Europe to monitor and analyse public health and social measures (PHSM) in the context of the Covid-19 pandemic (WHO, 2020a), Figure 4 presents the implementation of different measures of containment in the 27 EU Member States and the UK in the pandemic timeline between December 25, 2019 and May 10, 2021 (WHO, 2021b) based on the PHSM Severity Index.

Using the WHO-collected information on Covid-19 cases and this index, we also determined the stage of pandemic during the survey periods that were covered by the included primary studies to answer RQ2 (see 4.3).

Figure 4 indicates heterogeneity between the EU Member States concerning the enforcement of containment measures in different phases of the Covid-19 pandemic (see also Annex 2 – Results). During the first wave, which started relatively consistently across the different countries (March 2020 to May 2020; see Annex 2 – Results), most Member States (e.g., Belgium, Estonia, France, Italy, Portugal, Spain) imposed stricter measures. In some countries (e.g., Finland, the Netherlands, Sweden), however, relatively few restrictions were implemented, with the least stringent measures being introduced in Sweden (e.g., mask-wearing only after January 2021). From June 2020 onwards, that is, during summer 2020 which was characterised by few daily new cases of Covid-19 in the EU, the containment measures were eased by most governments until the number of cases raised again in September/October 2020.

Subsequently, most EU Member States experienced two further infection waves that were characterised by much higher infection rates compared to the first wave across all countries. Despite these similarities, the further course of the pandemic differed between the countries. For example, there were two distinct peaks in the number of infections in autumn/winter 2020 and spring 2021 in some Member States (e.g., Bulgaria, Croatia, Greece, Hungary, Poland), while either the second or the third wave were not as pronounced in other countries (e.g., Austria, Belgium, Denmark, Estonia, Ireland, Lithuania). Some Member States experienced more than three waves of the pandemic (e.g., the Netherlands, Spain).

Given these differences in the pandemic timeline, the severity of policy responses to fight the pandemic from the first wave onwards did also substantially vary between the EU countries, with more severe measures between autumn 2020 and spring 2021 in some countries (e.g., France, Greece, Romania) compared to others (e.g., Finland, Luxembourg, Sweden).

Overall – based on the number of daily new confirmed cases and Covid-19-related deaths – several EU countries were heavily affected (≥10,000 daily cases and/or ≥200 daily deaths) by the pandemic (Belgium, the Czech Republic, France, Germany, Italy, the Netherlands, Poland, Portugal, Spain, the...
UK), with Spain and the UK being the most affected, which was also reflected in the respective restrictions. Across the 27 Member States and the UK, certain containment measures were implemented rather permanently (e.g., mask wearing, gathering restrictions), particularly in the context of the second wave. On the other hand, some restrictions such as school closures and domestic movement restrictions varied more, also within a country (see Annex 2 – Results).

Figure 9 - Measures of containment in 27 EU Member States and the UK, cross-country comparison of timing and severity

Source: WHO Regional Office for Europe

Note. PHEIC: Public Health Emergency of International Concern; PHSM: public health and social measures. Darker colors indicate more severe measures. Five different colours (taken from WHO website) to present all 27 EU Member States and the UK in one graph in alternating colours. The date range can be set flexibly on the WHO website; however independent of the start date (for which we chose December 25, 2019), the first measures of containment have only been implemented in March 2020. The end date (May 10, 2021) is the date of search for containment measures in the EU Member States for the purpose of this study.
4.1.2. Support measures

The measures to contain the Covid-19 pandemic potentially had a wide range of negative consequences (e.g., psychological, social, economic), which lead to the necessity of EU governments to implement a broad range of support measures to mitigate these effects.

Based on five categories of support measures, that had been pre-defined by the research team (financial/economic, work-related, health systems, social, psychological; see 3.2), the identified support measures across the EU Member States and the UK are presented in the Gantt chart in Figure 5.

For example, with respect to financial/economic measures, cash-based transfers referred to family support in form of cash payment for every child eligible for family allowance in Austria. Social services, as implemented in Spain, included social services in-kind support with a focus on older people and dependents. Utility and financial support included tenant support via a rent rebate scheme as in Sweden, for example. Further financial/economic measures referred to the postponement of social contributions (e.g., in Poland) as well as pensions (e.g., supplementary earning for pensioners in Germany). Food vouchers and school feeding were also classified as financial measures for this report and were implemented in some Member States (e.g., Bulgaria, Cyprus).

Among work-related measures, nearly all EU Member States and the UK (except for Croatia) provided paid leave/unemployment (e.g., Covid-19-related sick leave covered by government in Denmark). Public work programmes were not implemented in any EU Member State during the pandemic and are thus not presented in Figure 5. However, several countries invested in education, training, and skill development, for example, to counteract Covid-19-related unemployment (e.g., Ireland). In addition to labour regulation (e.g., profit sharing and incentive schemes in France), more than 50% of the EU Member States allowed shorter work times and remote working (e.g., Greece). Income support (covers > 50% of lost salary) was provided by 25 EU Member States.

With respect to health systems, some governments also provided health insurance support (e.g., suspension of scheduled increase in healthcare payment in Cyprus). Coordinated public information campaigns on the Covid-19 pandemic were implemented in all Member States, while there was more variance regarding vaccination policies and the prioritisation of certain population groups.

Psychological measures comprised psychological helplines to support the citizens’ mental health, either by Covid-19 specific helplines or the access to general services. Except for food vouchers and school feeding, that could also be viewed as a social (family-/child-oriented) measure, we identified no support measures which could be classified as social measures.

Across the different categories of support measures, public information campaigns on the Covid-19 pandemic (28 countries), paid sick leave/unemployment benefits (27 countries), wage subsidies (26 countries), and income support (25 countries) were most frequently implemented, while rather few EU Member States provided pensions (10 countries), in-kind schemes/school feeding (9 countries), and healthcare insurance support (5 countries) (see Figure 5).

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6 This information was provided by The World Bank (2021; real-time review), Our World in Data (2021), the Oxford Covid-19 Government Response Tracker (2021), and Mental Health Europe (2021). In addition, if necessary, we cross-checked the data with those provided by the OECD (2020b) and governmental websites (e.g., the Netherlands).
Figure 11 - Support measures in different categories in the EU Member States and the UK (self-developed Gantt chart)

<table>
<thead>
<tr>
<th>EU Member States &amp; the UK</th>
<th>Financial/economic</th>
<th>Work-related</th>
<th>Health systems</th>
<th>Psychological</th>
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<tbody>
<tr>
<td>Social security contributions (a)</td>
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<tr>
<td>Utility and financial obligation support (b)</td>
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<tr>
<td>Debt or contract relief (c)</td>
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<td>Cash-based transfers (b)</td>
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<tr>
<td>Pensions (a)</td>
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<tr>
<td>In-kind food/voucher schemes &amp; school feeding (b)</td>
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<tr>
<td>Shorter work time (c)</td>
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<tr>
<td>Income support (c)</td>
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<tr>
<td>Wage subsidies (d)</td>
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<tr>
<td>Paid sick leave/unemployment benefits (a)</td>
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<tr>
<td>Training measures (d)</td>
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<td>Labor regulation (d)</td>
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<tr>
<td>Healthcare insurance support (a)</td>
<td></td>
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<tr>
<td>Public information campaign (e)</td>
<td></td>
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<tr>
<td>Vaccination policy (All vulnerable groups) (f)</td>
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<tr>
<td>Vaccination policy (Vulnerable groups + some others) (f)</td>
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<tr>
<td>Vaccination policy (Universal) (f)</td>
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<tr>
<td>Covid-19 helplines (g)</td>
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<tr>
<td>Other mental health services (g)</td>
<td></td>
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</tbody>
</table>

Note.

Grey bar illustrates that the respective support measure was implemented in the EU Member State or the UK.

(a) Social insurance programmes (The World Bank, 2021), May 14, 2021; (b) Social assistance measures (The World Bank, 2021), May 14, 2021; (c) Income support and debt relief (Our World in Data based on Oxford Covid-19 Government Response Tracker), June 1, 2021; (d) Active labor market programmes and labor regulations (The World Bank, 2021), May 14, 2021; (e) Public information campaigns (Our World in Data based on Oxford Covid-19 Government Response Tracker), June 1, 2021; (f) Vaccination policy (Our World in Data based on Oxford Covid-19 Government Response Tracker), June 1, 2021; (g) Helplines and services to support mental health during Covid-19 (Mental Health Europe, 2021).
4.2. Results of the searches for systematic reviews/meta-analyses and primary studies

To answer the RQs 2–4 (pillar 2 and 3), we screened 7596 studies at the level of study titles/abstracts. Out of these, for 537 records, the eligibility was assessed at the full-text level (see Figure 6).

The literature searches for this study took place in March 2021 and covered the articles published in the period from 2020 onwards. Twenty-seven systematic reviews/meta-analyses (see Table 1) investigating loneliness or mental health were included in the umbrella review (pillar 2). Most of the reviews on mental health focused on mixed populations7 (9 reviews), followed by the general public (6 reviews), healthcare workers (4 reviews), pregnant and postpartum women (4 reviews), and children/adolescents (2 reviews). One systematic review targeted mental health outcomes of the Covid-19 pandemic in young to middle-aged individuals (Batra, 2021) and patients with pre-existing conditions (mental illness; Neelam, 2021), respectively. However, other populations, such as non-healthcare employees, older individuals, or groups with particular risk exposure have been neglected. Only three reviews on mixed populations specifically examined the effects of containment measures (Castaldelli-Maia, 2021: national government physical distancing measures; Cavicchioli, 2021: quarantine; Panda, 2021: lockdown and quarantine measures). None of the systematic reviews in other population groups investigated the effects of measures of containment.

7 Mixed populations: several population groups were investigated (e.g., general population, healthcare workers, and patients).
The EU-based primary studies included in the previous evidence syntheses covered a time frame from March to July 2020 (see Table 1).

Based on our searches in March 2021, we included 90 primary (observational) studies which assessed mental health in various population groups in 14 EU Member States and the UK (pillar 3). The 90 relevant studies covered a time period from January to December 2020 (average survey period across the included studies: April to May 2020).

Table 1 - Summary of the 27 included systematic reviews and meta-analyses

<table>
<thead>
<tr>
<th>Review IDs</th>
<th>No. included studies in reviews (range) total/EU</th>
<th>EU countries investigated in the reviews</th>
<th>Population; pooled sample sizes (range) among included studies total/EU</th>
<th>Survey periods covered by included studies total/EU</th>
</tr>
</thead>
<tbody>
<tr>
<td>General population</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bueno-Niño et al. 2020; Cooke 2020; Melo-Oliveira 2021; Salani 2020; Santabárbara 2021; Xiong 2021</td>
<td>Total: 8(8) – 43(44); EU: 3(3) – 12(13)</td>
<td>Austria, Cyprus, Denmark, Germany, Greece, Ireland, Italy, Portugal, Spain, UK</td>
<td>General population (e.g., community samples); Total: 7051 – 16156; EU: 1771 – 4696</td>
<td>Total: 7 Jan – 9 May 2020; EU: 11 Mar – 4 Apr 2020</td>
</tr>
<tr>
<td>Al Maqbali 2021; Busch 2021; Serrano-Ripoll 2020; Sirois 2021</td>
<td>Total: 61(61) – 107(107); EU: 7(7) – 21(21)</td>
<td>Multinational including EU, Austria, Croatia, France, Germany, Greece, Ireland, Italy, Poland, Portugal, Spain, UK</td>
<td>Healthcare workers exposed to/taking care of patients infected with Covid-19 (and other epidemics/pandemics) and/or working in high-risk settings; Al Maqbali 2021: nurses; Total: 75991 – 120711; EU: 2231 – 14221</td>
<td>Total: Jan – Sep 2020; EU: Mar – Jul 2020</td>
</tr>
<tr>
<td>Jones 2021; Nearchou 2020</td>
<td>Total: 12(12) – 16(16); EU: 3(3)</td>
<td>Germany, Italy, Poland, UK</td>
<td>Jones 2021: only adolescents; Total: 12262 – 40076; EU: 570 – 959</td>
<td>Total: 30 Jan – May 2020; EU: 2 Mar – 20 Apr 2020 (only reported for Nearchou 2020)</td>
</tr>
<tr>
<td>Batra 2021</td>
<td>Total: 27(27); EU: 3(3)</td>
<td>France, Greece, Italy</td>
<td>Total: 90879; EU: 1598</td>
<td>NR</td>
</tr>
<tr>
<td>Mixed populations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arora 2020; Castaldelli-Maia 2021; Cenat 2021; Jahrami 2021; Luo 2020; Panda 2021; Wang 2020; Yuan 2021</td>
<td>Total: 12(12) – 68(68); EU: 3(3) – 14(14)</td>
<td>Multinational including EU, Austria, France, Germany, Greece, Ireland, Italy, Slovenia, Spain, UK</td>
<td>General population, healthcare workers, workers, high-risk or vulnerable patients (e.g., with pre-existing conditions), confirmed or suspected Covid-19; (university/college) students, children/adolescents (with/without pre-existing behavioural abnormalities) and their caregivers; Total: 22996 – 288830; EU: 4408 – 80716</td>
<td>Total: Only reported for Castaldelli-Maia 2021: 24 Jan – 31 May 2020; EU: 10 Mar – 10 May 2020</td>
</tr>
</tbody>
</table>

Note: e.g.: for example; ID: identifier; No.: number; NR: not reported; pooled sample size: indicates the total number of people that have been investigated across the primary studies included in a review; range: indicates the range (i.e., variation) between the pooled sample sizes of the reviews; sample: group of people investigated in a study; survey period: indicates the time period in which the respective study was carried out; total/EU: results are reported with regard to all included studies (total) and the included EU-based studies (EU); *N=4586 included in meta-analysis in Fan 2021.
4.3. Psychosocial and mental health effects of the Covid-19 pandemic and related policy responses

The 90 primary studies, as identified in pillar 3, were used to answer RQ2 regarding the psychosocial and mental health effects of the Covid-19 pandemic, including the Covid-19 policy responses (see RQ1) in different population groups in the EU Member States and the UK. We used the identified 27 systematic reviews and meta-analyses (pillar 2) to compare the results of the 90 primary studies with the findings of evidence syntheses, to interpret the findings of this report, and to put them into context of previous research (see section 3.2).

Detailed characteristics and findings of the eligible reviews and primary studies, depending on the population group, are presented in Annex 2 – Results. The following sections present the key findings regarding the psychosocial and mental health impact in each group based on the included primary studies. The results of the 90 primary studies have been summarised narratively, clustered by the assessment period (i.e., before vs during the Covid-19 pandemic or trajectories of mental health during the pandemic), the severity of containment measures and potential changes in the survey period (i.e., weak, moderate, severe, weak/moderate-to-severe, severe-to-moderate/weak) based on the PHSM Severity Index (see 4.1.1 and Annex 1 – Methods), the population group, and the outcome. The analysis has been performed based on the number of reported comparisons (pre vs during the pandemic; at different time points in the pandemic timeline; see Annex 2 – Results). If available, the effect sizes found in each primary study are also presented in Annex 2 – Results. Section 5.1.2 presents the agreements and disagreements between the primary studies and previous systematic reviews that also included EU-based studies.

### 4.3.1. General population

**Before vs during Covid-19 pandemic:**

When comparing the situation on mental health during the pandemic with prepandemic data, there was a consistent increase of mental symptoms, specifically symptoms of anxiety and depression, (perceived) stress, and general psychological distress. The results were mixed for loneliness, substance use, and well-being, with stable values as well as an increase and decrease found for these outcomes. From the 20 available comparisons of mental health outcomes before vs during the pandemic, a deterioration of mental health was identified in 15 comparisons, while mental health remained stable or improved in five comparisons.

**Trajectories during Covid-19 pandemic:**

During the Covid-19 pandemic, most mental health outcomes remained stable or re-improved (loneliness, anxiety, depression, sleep problems, psychological distress, posttraumatic stress symptoms, well-being). Stress symptoms and self-harm were found to increase. Substance use was not assessed. From the 70 available comparisons of mental health outcomes in the pandemic timeline, a deterioration of mental health was identified in 18 comparisons, while mental health
remained stable or improved in 52 comparisons. Overall, if available, the reported effect sizes were mostly small (i.e., small changes in mental health outcomes; see Annex 2 – Results).

4.3.2. Patient populations

Before vs during Covid-19 pandemic:

When comparing the situation on mental health during the pandemic with prepandemic data, mostly stable or improved values were found for symptoms of anxiety and self-harm. The results were mixed for loneliness, depressive symptoms, sleep problems, general psychological distress or mental health, and well-being, with a relative balance between a deterioration and stability/improvement of these outcomes. From 40 available before-during comparisons of mental health outcomes, a deterioration of mental health was identified in 14 comparisons, while mental health remained stable or improved in 26 comparisons.

Trajectories during Covid-19 pandemic:

During the Covid-19 pandemic, several mental health outcomes were consistently stable or improved (anxiety symptoms, depressive symptoms, stress, sleep problems, posttraumatic stress symptoms, self-harm, well-being). Mixed findings were identified for loneliness (Madsen, 2021). From the 33 available comparisons of mental health outcomes in the pandemic timeline, a deterioration of mental health was identified in three cases while it remained stable or even improved in 30 comparisons. Overall, effect sizes were mostly not reported (if available, small to moderate; see Annex 2 – Results).

4.3.3. Employees (healthcare and non-healthcare)

Before vs during Covid-19 pandemic:

A comparison between mental health before vs during the Covid-19 pandemic in this population group was only possible for general psychological distress and substance use, with an increase of psychological distress, while there was no change in alcohol use.

Trajectories during Covid-19 pandemic:

We found stable (one comparison; depressive symptoms) or better mental health (six comparisons), with a large decrease of anxiety symptoms and stress, a small decrease of depressive symptoms, and a decrease of sleep problems (effect size not reported).

4.3.4. Children and adolescents

Before vs during Covid-19 pandemic:

When comparing the situation on mental health during the pandemic with prepandemic data, there were mixed results with stable as well as worse mental health outcomes for most outcomes assessed (anxiety and depressive symptoms, psychological distress, well-being). We identified stable values for posttraumatic stress. From the 12 available comparisons of mental health outcomes, a deterioration of mental health and stable values were identified in six comparisons, respectively.

Trajectories during Covid-19 pandemic:

None of the included primary studies investigated mental health changes during the Covid-19 pandemic.
4.3.5. Young to middle-aged individuals

Before vs during Covid-19 pandemic:

When comparing the situation on mental health during the pandemic with prepandemic data, several mental symptoms either remained stable or decreased (loneliness, sleep problems, general psychological distress, substance use). While stress symptoms increased and well-being was reduced, mixed results were found for symptoms of anxiety and depression. From the 17 available comparisons of mental health outcomes, a deterioration of mental health was identified in nine comparisons, while mental health remained stable or improved in six and two comparisons, respectively.

Trajectories during Covid-19 pandemic:

During the Covid-19 pandemic, mental health mostly remained stable or improved for loneliness, symptoms of anxiety and stress, and self-harm/suicidal ideation. Mixed findings were identified for depressive symptoms, sleep problems, psychological distress, and well-being. From the 25 available comparisons of mental health outcomes in the pandemic timeline, a deterioration of mental health was identified in seven comparisons, while mental health remained stable or improved in 18 comparisons. If reported, the effect sizes for mental health changes were mostly small to moderate (see Annex 2 – Results).

4.3.6. Older individuals

Before vs during Covid-19 pandemic:

When comparing the situation on mental health during the pandemic with prepandemic data, mixed findings with stable values and worse mental health were reported for loneliness and well-being. There was an increase of anxiety symptoms and a reduction of general mental health. Depressive symptoms and sleep problems were found to remain stable. From the 12 available before-during comparisons of mental health, a deterioration and stability were identified in six comparisons, respectively.

Trajectories during Covid-19 pandemic:

Stable values were found in symptoms of anxiety and depression, while loneliness decreased, and mixed findings were reported for well-being. From the seven available comparisons, a deterioration of mental health was identified one time, while mental health remained stable or improved in six comparisons. If reported at all, the effect sizes for mental health changes were small to moderate (see Annex 2 – Results).

4.3.7. Individuals with particular risk exposure

Among the 90 included studies, we identified seven primary studies in individuals with particular risk exposure, such as family caregivers (e.g., dementia caregivers, parents of children with disabilities), working parents, or professional athletes. However, due to the heterogeneity between study participants represented within this subgroup (e.g., rather different stressors during the pandemic), this report focused on the six main population groups mentioned above. Detailed findings regarding mental health effects in this subgroup are presented in Annex 2 – Results. However, the studies in this subgroup were also considered for the investigation of mental health effects of containment and support measures or the general interpretation of the report findings (see 5).
4.3.8. Effects of containment and support measures on mental health

Based on a narrative synthesis (see Annex 1 – Methods), the impact of containment and support measures implemented in the Member States and the UK on mental health was explored. For the analysis regarding support measures, we used the self-developed Support Measure Index (SMI) score. It is restricted to those primary studies that reported separate data for specific EU Member States, meaning that multinational studies (i.e., performed in several EU countries, but not reporting separate data for each country) were excluded.

The detailed observations are presented in Annex 2 – Results.

Overall, no clear tendency for an association between implemented measures of containment (PHSM Severity Index) or support (level of total score or SMI subscores) on the one hand and changes in mental health on the other could be demonstrated based on the included primary studies, neither for pre-during comparisons nor for trajectories of mental health during the pandemic. Potential reasons (e.g., limited variance of support measures between the Member States) for the lack of an association between Covid-19 policy responses and mental health outcomes are discussed in section 5.4.2. These measures might have important negative (containment measures) or positive effects (support measures) on mental health amid the pandemic, and were therefore examined in this report (see 3.1). Despite the limited findings, especially the investigation of support measures could be more relevant for later stages of the pandemic (see 5.6).

4.4. Risk and protective factors for mental health

4.4.1. EU Member States as moderator

The following sections present the results to answer RQ3 and 4 regarding country-level risk/protective factors, that is, whether the respective EU Member State a primary study has been carried out in, does affect the impact of the Covid-19 pandemic on mental health. A narrative synthesis (see Annex 1 – Methods) was carried out and presented in text and tabular form (see Annex 2 – Results). It is restricted to those primary studies that reported separate data for specific EU Member States, meaning that multinational studies (i.e., performed in several EU countries, but not reporting separate data) were excluded.

An analysis across the EU Member States indicated no clear tendency that the citizens of any specific country were more at risk for or more protected from a deterioration of mental health, either when comparing mental health outcomes between before and during the Covid-19 pandemic or between different time points during the pandemic.

4.4.2. Population group as moderator

Based on a narrative synthesis (see Annex 1 – Methods), the role of the population group as a moderator for the mental health impact of the Covid-19 pandemic was explored (RQ3 and 4; see Annex 2 – Results).

Compared to prepandemic values, the mental health deterioration caused by the pandemic (first wave) was most evident in the general population. In contrast to the general public, various patient...
populations seemed to cope better with the pandemic, with mostly no change in mental symptoms compared to the prepandemic situation, although there was also a deterioration of mental health for several outcomes. Conclusions regarding other population groups are rendered difficult (see 5.4.2). In the pandemic timeline, there was no clear indication that any of the population groups was especially at risk of mental health problems.

4.4.3. Individual risk/protective factors

The following sections present the results to answer RQ 3 and 4 regarding individual risk and protective factors that have been reported in the 90 primary studies (pillar 3). Table 2 presents the key findings, with the risk and protective factors most frequently reported for each population group. Again, the findings of the primary studies are contrasted with previous research based on the systematic reviews and meta-analyses identified for this report (see 5.2.2).

Risk factors. The majority of primary studies identified female gender, a lower socioeconomic level, loneliness, and fear (of Covid-19) as relevant risk factors across all population groups.

Protective factors. Based on the included primary studies, social support, financial stability, being employed in the healthcare sector (at least during the first pandemic wave), more physical as well as recreational activities, and psychological resilience factors (e.g., self-efficacy, positive coping, emotional stability) account for the most consistently stated protective factors for mental health across all population groups.

Self-efficacy
- “an individual’s subjective perception of his or her capability to perform […] or to attain desired results […]” (APA, 2020)

(Positive) Coping
- Coping: “[…] use of cognitive and behavioural strategies to manage the demands of a situation when these are appraised as taxing or exceeding one’s resources or to reduce the negative emotions and conflict caused by stress.” (APA, 2020)
- Positive coping during the pandemic may comprise staying confident to overcome the crisis, staying active (e.g., sporting), and actively maintaining contacts with friends (Pan, 2021)
Table 2 - Key findings regarding individual risk/protective factors

<table>
<thead>
<tr>
<th>General population</th>
<th>Risk factors*</th>
<th>Protective factors*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociodemographic: female gender (though not entirely consistent as risk factor); younger age (not consistent); lower socioeconomic background or financial problems; living alone</td>
<td></td>
<td>Social: social support/social contacts</td>
</tr>
<tr>
<td>Psychological: loneliness; worries about/fear of Covid-19</td>
<td>Work-related: work in essential profession regarding Covid-19 pandemic (e.g., as healthcare worker)</td>
<td></td>
</tr>
<tr>
<td>Social: lack of social support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health-related: pre-existing mental health conditions; pre-existing physical health conditions or high vulnerability to Covid-19; having Covid-19 symptoms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work-related: unemployment or job loss</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patient populations</th>
<th>Risk factors*</th>
<th>Protective factors*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociodemographic: low income; immigrant background; very high levels of education; living in Belgium compared to other considered countries (e.g., Denmark, Italy, UK); older age; not having children; living with a partner and/or children (vs alone)</td>
<td>Psychological: positive coping; perceived mastery</td>
<td></td>
</tr>
<tr>
<td>Psychological: loneliness; passive coping; neuroticism; Covid-19-related fear and stress; perceived impact of pandemic on disease course and well-being; avoidant attachment style; childhood trauma</td>
<td>Social: social contacts</td>
<td></td>
</tr>
<tr>
<td>Health-related:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Patients with mental health conditions: lower severity of disease; no/few diagnoses of mental disorder; eating disorder</td>
<td>Health-related:</td>
<td></td>
</tr>
<tr>
<td>o Individuals with (cured) Covid-19: previous mental health disorder</td>
<td>o Patients with mental health conditions: higher severity and number of mental disorders</td>
<td></td>
</tr>
<tr>
<td>o Individuals with diabetes mellitus: Type II diabetes (vs type I)</td>
<td>o Individuals with diabetes mellitus: more diabetes complications</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employees</th>
<th>Risk factors*</th>
<th>Protective factors*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociodemographic: female gender; younger age; financial insecurity</td>
<td>Sociodemographic: older age; higher income</td>
<td></td>
</tr>
<tr>
<td>Psychological: psychological distress, neuroticism, cynicism; perceived loneliness; technostress; fear to be infected and to infect others; work or emotional exhaustion</td>
<td>Psychological: verbalization of emotions; self-efficacy; psychological capital; conscientiousness</td>
<td></td>
</tr>
<tr>
<td>Social: being in a social media information bubble (for healthcare and non-healthcare workers)</td>
<td>Social: social support/contacts (even in remote setting)</td>
<td></td>
</tr>
<tr>
<td>Work-related: remote working; cyberbullying; victimization at work</td>
<td>Health-related: healthy diet; water intake; physical and recreational activities</td>
<td></td>
</tr>
<tr>
<td>Pandemic-related: spending a lot of time on childcare or home-schooling</td>
<td>Work-related: being a nurse specialist; working in educational or health sector; breaks between work shifts; recreational activities</td>
<td></td>
</tr>
<tr>
<td>Pandemic-related: rejecting information on Covid-19 from unreliable sources</td>
<td>Pandemic-related: rejecting information on Covid-19 from unreliable sources</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Children &amp; adolescents</th>
<th>Risk factors*</th>
<th>Protective factors*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociodemographic: lower educational level; migration background; small living space</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychological: excessive concerns about health; sleep problems; feelings of frustration about cancellations; frequent boredom; fear of contagion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Only the direction of the association between a specific factor and mental health is presented, as reported in a primary study. This means that if a factor has been shown to be a risk factor (e.g., younger age, low income), the opposite manifestation of this factor (e.g., older age, high income) could also be considered a protective factor for mental health (see Annex 2 – Results).
### Risk factors

<table>
<thead>
<tr>
<th>Young to middle-aged individuals</th>
<th>Older individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social:</strong></td>
<td><strong>Sociodemographic:</strong></td>
</tr>
<tr>
<td>worsening of relationships with parents; family stress; problems with parental homework supervision</td>
<td>higher income before the pandemic; studying at private business school; university year</td>
</tr>
<tr>
<td><strong>Psychological:</strong> psychological inflexibility; distraction and denial; blaming; perceived stress; depressive mood, Covid-19-related worries and risk perception; loneliness</td>
<td><strong>Sociodemographic:</strong> living with others; higher income before pandemic</td>
</tr>
<tr>
<td>self-isolation</td>
<td><strong>Psychological:</strong> good sleep quality; well-being; emotional stability; Covid-19-related societal worries</td>
</tr>
<tr>
<td></td>
<td><strong>Social:</strong> social distancing; social support</td>
</tr>
<tr>
<td></td>
<td><strong>Health-related:</strong> physical activity</td>
</tr>
<tr>
<td></td>
<td><strong>Work-related:</strong> full-time employment</td>
</tr>
</tbody>
</table>

### Protective factors

<table>
<thead>
<tr>
<th>Young to middle-aged individuals</th>
<th>Older individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sociodemographic:</strong> female gender (not thoroughly consistent); pre-pandemic economic problems; not having access to a garden; living alone; lower educational background: medical students or non-psychology students</td>
<td><strong>Sociodemographic:</strong> higher income before the pandemic; studying at private business school; university year</td>
</tr>
<tr>
<td><strong>Psychological:</strong> distraction and denial; blaming; perceived stress; depressive mood, Covid-19-related worries and risk perception; loneliness</td>
<td><strong>Psychological:</strong> resilience factors (e.g., orientation towards experience, problem-solving, trait mindfulness, trait resilience)</td>
</tr>
<tr>
<td><strong>Health-related:</strong> pre-pandemic difficulties accessing mental health services; sedentary behaviour; suspected or confirmed Covid-19 diagnosis</td>
<td><strong>Health-related:</strong> relaxing activities</td>
</tr>
<tr>
<td><strong>Work-related:</strong> working in healthcare sector or other essential positions</td>
<td><strong>Work-related:</strong> working in healthcare sector or other essential positions</td>
</tr>
</tbody>
</table>

### Note

NA: not applicable; *General population: factors were reported as statistically significant factor in at least \( k = 3 \) studies (for risk factors) or \( k = 2 \) studies (for protective factors); patient populations, employees, children and adolescents, young to middle-aged individuals: factors were reported as statistically significant factor in at least \( k = 1 \) study for risk and protective factors (limited number of studies reporting risk and protective factors in these groups); older adults: factors were reported as statistically significant factor in at least \( k = 2 \) studies (for risk factors) or \( k = 1 \) study (for protective factors).*

*Attachment style:* "the characteristic way people relate to others in the context of intimate relationships, which is heavily influenced by self-worth and interpersonal trust […]" (APA, 2020); *neuroticism:* personality trait "characterized by a chronic level of emotional instability and proneness to psychological distress" (APA, 2020); *obsessive-compulsive disorder:* mental disorder characterised by 'recurrent, persistent obsessions or compulsions. Obsessions are the intrusive ideas, thoughts, or images that are experienced as senseless or repugnant […]' (Cochrane Common Mental Disorders, 2021); *technostress:* stress "[…] associated with information and communication technologies such as the internet, mobile devices, and social media […]" (APA, 2020).

### 4.5. Identification of policy recommendations and (evidence-based) guidelines

This section reports the findings to answer **RQ5** concerning pre-existing policy recommendations and (evidence-based) guidelines (pillar 4).

Based on our literature search for the identification of policy recommendations and (evidence-based) guidelines in PubMed, we included 234 studies. The findings of the primary studies, which referred to different topics (e.g., healthcare services and hospital safety, changed health behaviours, trust and knowledge) are presented in detail in *Annex 2 – Results*, along with details of the study selection. Based on this database search in PubMed, we identified **no policy recommendations or evidence-based guidelines**. Nevertheless, the results of the 234 included studies still provide...
important information and demonstrate multiple healthcare, health-related, and societal changes in the EU Member States during the Covid-19 pandemic which might also have an important impact on the populations' mental health.

The studies showed that the coronavirus crisis did put a large burden on healthcare systems and healthcare services. Across different medical fields, there was a significant decrease in emergency hospital visits. Furthermore, the pandemic changed the way various patients (e.g., patients with chronic health conditions such as mental disorders or cancer, patients with strokes and heart attacks) were able to seek healthcare advice from healthcare professionals and how healthcare services and medical interventions were provided (e.g., examination delays and postponed treatment such as surgical procedures). This also applied to mental health services which is in line with previous surveys that demonstrated disruptions of critical mental health services by the pandemic, including the European region (Rojnic Kuzman, 2021; WHO, 2020b). For various patient groups, the disrupted healthcare might have contributed to increased psychological distress. On the other hand, the use of telemedicine (e.g., for check-ups and consultations) has been found to partially offset the negative effects of disrupted healthcare during the pandemic, with good acceptance by most patients. As it enabled professional consultations while still adhering to social distancing regulations, telemedicine was even preferred by some patients. Therefore, it might also be a valuable tool to ensure mental health services amid the Covid-19 pandemic and potential similar crisis situations.

With respect to attitudes towards Covid-19-related policy measures, the primary studies found differences depending on, upon others, country, demographic factors, and health status. For example, a deterioration of mental health was found to be associated with an increase in difficulty to adhere to Covid-19-related social distancing rules (Frissen, 2020). As a consequence, by ensuring the provision of mental health and psychosocial support services at a distance (e.g., digital interventions, teletherapy), the acceptance of Covid-19 policy responses and the compliance to health behaviours (e.g., hygiene, social distancing) might also be positively affected.

The recommendations made by the authors of the 27 systematic reviews and meta-analyses as well as the policy recommendations of different (European) mental health organisations, as identified for this report (pillar 4), are presented in Annex 2 – Results.
5. Conclusions and limitations

The present report primarily included a synthesis of observational studies on mental health outcomes, along with an umbrella review of previous systematic reviews and meta-analyses to compare the findings of the identified studies with previous research.

5.1. Psychosocial and mental health effects of the pandemic and of Covid-19 policy responses

5.1.1. Main conclusions

The findings on mental health outcomes reported by the 90 observational studies that were eligible for this report, were not consistent for each population group – at least if mental health was compared between an early phase of the Covid-19 pandemic (first wave or assessments in close relation to it) and the prepandemic situation. The primary studies indicated a consistent increase of stress-related mental symptoms (e.g., anxiety, depression) compared to before the pandemic in the general population, which is in line with previous research based on the evidence syntheses identified as part of the umbrella review in this report (pillar 2). For patient populations (mostly patients with pre-existing chronic health conditions), employees, children and adolescents, young to middle-aged individuals, and older adults, the available data were either limited to only a few studies, differed from the results of previous meta-analyses (e.g., since they focused on different subgroups), or were not consistent for the before-during comparison. In the pandemic timeline up to December 2020, especially during and after the first wave for which most data were available (April and May 2020), mental symptoms either remained stable or improved in most population groups, with no available data for children and adolescents. This means the Covid-19 pandemic caused an increase in mental symptoms and a deterioration in mental health in the general public compared to the prepandemic situation, especially during the first wave in spring 2020. In the further course of the first wave and shortly afterwards, the mental burden remained stable at the higher level compared to before the pandemic, or improved compared to the previously higher values from the onset of the pandemic. It is not possible to draw conclusions regarding the extent of mental health changes (i.e., effect sizes) (see 5.4.2).

This report can make no reliable conclusions regarding the mental health impact of Covid-19 policy responses. The partly missing difference between various severities of containment measures (e.g., weak vs moderate in the general population) if mental health was compared to prepandemic data, might be explained by the already high overall burden due to the pandemic (e.g., coronavirus-related fears), possibly limiting the additional impact of the severity of policy responses on mental health. Most evidence of mental health outcomes referred to data from the UK, Italy, Spain, Germany, Denmark, and the Netherlands, that is, countries that were in part heavily affected by the pandemic. Another possible explanation for the missing association between the severity of containment measures and mental burden might be an increased sense of safety among EU citizens consequent to these policy responses. During the first wave, the fear of a Covid-19 infection was found to be a considerable risk factor for mental health problems (Kunzler, Röthke, 2021), while the containment measures (e.g., quarantine) aimed at reducing the risk of contagion, severe illness, and death. Therefore, contrary psychological effects of these measures – an increased mental burden through social isolation and other drastic life changes because of the restrictions on the one hand, but also a reduced burden due to feelings of safety on the other – might explain that no consistent association between measures of containment and mental health outcomes could be detected. Furthermore, causality for the impact of support measures on mental health can hardly be claimed, as these measures might also have been a response to the pandemic burden in a country.
5.1.2. Contextualisation of the findings with previous research

Since the 27 systematic reviews and meta-analyses identified in the umbrella review (pillar 2) mainly considered cross-sectional studies during the first pandemic wave, a comparison between the primary studies identified under pillar 3 and these evidence syntheses was only possible for mental health changes between before and during the Covid-19 pandemic. Comparable to reviews, stress-related symptoms like anxiety and depressive symptoms were also the most frequently investigated mental health outcomes in primary studies.

The pooled prevalence reported in previous meta-analyses for the different adult population groups was compared with the prepandemic prevalence of mental symptoms in the general population (representative surveys; see Annex 2 – Results). The same procedure was applied to children and adolescents (see Annex 2 – Results). When comparing the pandemic prevalence rates based on the identified evidence syntheses, the Covid-19 pandemic is likely to have increased the level of mental symptoms, especially of anxiety and depressive symptoms, in the following population groups compared to before the pandemic:

- general population: anxiety, depression, psychological distress
- pregnant/postpartum women: anxiety, depression, psychological distress
- Covid-19 patients: sleep problems
- employees (healthcare staff): anxiety, depression
- young to middle-aged individuals: anxiety, depression

For children and adolescents, a likely increase compared to the pre-pandemic situation was also found for symptoms of anxiety and depression. There was a tendency for an increase in psychological distress and behaviour problems, while the values for sleep problems were mostly similar to before the pandemic.

General population. Based on the above-mentioned findings of evidence syntheses, the results of the primary studies found in this report regarding an increase of symptoms of anxiety, depression, and general psychological distress during the pandemic compared to before were in line with previous research.

Patient populations. The findings of systematic reviews/meta-analyses and primary studies in this group are rather inconsistent, which might be mainly due to the different patient groups investigated in each case. While reviews mainly focused on pregnant/postpartum women, demonstrating a deterioration in mental health during the pandemic compared to before, the primary studies reported mixed findings for most outcomes, with the majority of studies being performed in patients with pre-existing chronic health conditions (e.g., mental disorders).

Employees. A comparison of the findings of evidence syntheses with those of primary studies was not possible, since the few survey studies identified for employees in this report did not assess the same outcomes. Furthermore, the primary studies also included working adults from sectors other than the healthcare sector.

(Pooled) Prevalence

- Prevalence: describes the ‘proportion of a population who have a specific characteristic in a given time period’ (National Institute of Mental Health, 2018) (e.g., percentage of people in a city who have a certain disease or who smoke) (Cochrane Collaboration, 2005)
- Pooled prevalence: describes the summarised prevalence resulting from a meta-analysis including the individual data of at least two primary studies.

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9 The comparison data was searched by the authors of this report as an additional step in the analysis.
How are we coping with the pandemic? Mental health and resilience amid the Covid-19 pandemic in the EU

Children and adolescents. While the few available systematic reviews/meta-analyses indicated an increase in anxiety and depressive symptoms in children and adolescents during the pandemic compared to before, the findings from the small number of primary studies were inconsistent.

Young to middle-aged individuals. Whereas previous systematic reviews/meta-analyses indicated an increase in anxiety and depressive symptoms in young to middle-aged individuals (including university students) during the pandemic compared to before, the eligible primary studies rather reported stable or improved mental health for most outcomes.

Older adults. No systematic reviews/meta-analyses were available for this population group.

Overall, most agreements regarding mental health effects between the findings of identified primary studies and of previous evidence syntheses, which also covered EU-based studies, were found for the general population. While the pooled prevalence from previous meta-analyses indicated a consistent and considerable increase in the prevalence of mental symptoms (e.g., anxiety symptoms) during the pandemic compared to the pre-pandemic situation in various other population groups, this result could not be confirmed as consistently by the primary studies.

5.2. Risk and protective factors for mental health

5.2.1. Main conclusions

The analysis of EU Member States as a country-level moderator demonstrated no clear tendency for any specific citizens of EU countries to be more at risk for, or more protected from, a deterioration in mental health. The comparison between all population groups demonstrated the most consistent decline in mental health in contrast to before the pandemic for the general population. However, none of the other population groups seemed to be especially at risk of mental health problems.

At an individual level, female gender, low socioeconomic status, loneliness, and fear (of Covid-19) were risk factors for a poorer mental health status. On the other hand, protective factors comprised social support, financial stability, being employed in the healthcare sector (at least during the first wave), more physical as well as recreational activities, and resilience factors like self-efficacy. Employment in the healthcare sector as a protective factor during an early phase of the pandemic might be explained indirectly by additional (individual-level) protective factors for healthcare workers compared to other population and occupational groups (e.g., office workers). Given the high workload and the chronic stressor exposure in this subgroup – even under non-pandemic conditions – healthcare staff might have learnt better strategies and be more confident in coping with problems (i.e., self-efficacy) in general, which also enabled them to deal with the (new) stressors at an early stage of the pandemic. Furthermore, the perceived meaning of their work and also partly societal support from the media and public could explain this finding.

5.2.2. Contextualisation of the findings with previous research

Based on the umbrella review, loneliness, worries in relation to Covid-19, a history of mental illness, poor self-rated health, pre-existing chronic illness, unemployment, and quarantine presented risk factors for psychological burden in the general population (identified in at least two reviews). For other population groups, however, no consistent risk factors for mental health problems or factors protecting mental health amid the pandemic could be identified in previous reviews. In several groups (e.g., non-healthcare employees, patients with chronic health conditions), potential risk/protective factors were rarely or not investigated.

10 Part of the synthesis of primary studies.
**General population.** With respect to risk factors, many of the primary studies’ findings were in line with previous systematic reviews/meta-analyses (e.g., loneliness, unemployment). Except for social contacts, comparisons between the primary studies and previous research for protective factors were rendered difficult because of the different factors investigated and the limited number of protective factors examined in primary studies.

**Patient populations.** Due to the focus of reviews on pregnant/postpartum women, the comparability of identified risk and protective factors with primary studies that also considered other patient groups, is limited. The finding of social contacts as a protective factor is in line with a previous systematic review.

**Employees.** A comparison between the findings of previous reviews and the identified primary studies was hardly possible since the reviews focused solely on healthcare staff and did not examine any protective factors. Although the primary-study finding that female gender is a risk factor for mental health problems was in line with one review, it differed from two meta-analyses which did not report evidence for the role of gender as a risk factor.

**Children and adolescents.** Neither previous reviews nor the 10 primary studies identified in this report investigated any protective factors in children and adolescents. A comparison regarding risk factors was not possible due to the different factors examined.

**Young to middle-aged individuals.** The finding of female gender as a risk factor, as demonstrated in the primary studies, was in line with a single review available for the group of young to middle-aged individuals. While previous systematic reviews did not assess any protective factors in this age group, the 12 primary studies reported a range of sociodemographic, psychological, health-related, and work-related factors favouring mental health amid the Covid-19 pandemic.

**Older individuals.** No systematic reviews/meta-analyses were available for this population group.

Again, most agreements – at least for risk factors for mental health issues – between the findings of identified primary studies and of previous evidence syntheses that also covered EU-based studies, were found for the general population. Otherwise, there were several discrepancies regarding risk/protective factors for mental health (e.g., female gender not a consistent risk factor in systematic reviews vs in several primary studies).

### 5.3. Strengths of this report and of the synthesised evidence

This report has several methodological strengths, including the comprehensive search strategy (11 literature databases), the search period from January 2020 onwards, and the use of machine-learning approaches to ensure an efficient study selection process. The search in Covid-19 specific databases (e.g., LitCovid), living evidence syntheses (e.g., EPPI Centre’s living systematic map of the evidence), and Microsoft Academic Graph particularly ensures the identification of the most relevant Covid-19 mental health research. To the best of our knowledge, this is the first review exclusively focusing on the EU and its Member States. In contrast to previous reviews, we investigated the mental health impact of the Covid-19 pandemic, as well as of the policy measures of containment and support implemented at a governmental level to fight the pandemic, to maintain public health, and to support EU citizens amid this crisis. For this purpose, data on loneliness and mental health outcomes in different population groups were combined with information on the corresponding time point in the pandemic timeline (e.g., wave based on number of daily Covid-19 cases according to the WHO dashboard), the severity of containment measures based on WHO data, as well as whether the Member State had introduced support measures or not. Overall, however, no strong conclusions were possible based on the current research (see 5.4.2). In addition to identifying risk factors, the report focuses exclusively on the EU Member States and takes a ‘resilience perspective’ by investigating protective factors for mental health amid the stressors of the Covid-19 pandemic.
5.4. Limitations of this report and of the synthesised evidence – What do we not know?

5.4.1. Limitations of the report

Nevertheless, a number of limitations should be highlighted in this review. First, the data extraction has not been performed in duplicate, given the large amount of identified eligible reviews and primary studies and since we performed this report to respond to the needs of Members of the European Parliament and policy-makers at the European level during the current pandemic. Second, due to the clinical and methodological heterogeneity between the primary studies (e.g., outcomes, survey periods), we did not carry out meta-analyses, but used narrative (vote counting) and graphical analysis of the results. This form of analysis may have limitations compared to meta-analysis, such as that we could not always provide information on the magnitude of effects, the analysis does not account for differences in the relative sizes of studies, or it may lead to different results (e.g., because of included primary studies that were statistically underpowered; McKenzie, 2021). For the primary studies in the general population, that were considered for this report, this limitation might not be so pronounced, as we only included studies with a sample size of at least 1 000 participants (McKenzie, 2021).

5.4.2. Limitations of synthesised primary studies

The limitations of the identified primary studies particularly reveal various evidence gaps in Covid-19 related mental health research.

For all population groups, the primary observational (longitudinal and repeated cross-sectional) studies primarily investigated the first wave of the Covid-19 pandemic in the respective EU Member States or the UK. We can therefore only make statements regarding the short-term mental health impact early in the pandemic. The data identified for this report do not allow conclusions to be drawn concerning the long-term effects of the Covid-19 pandemic. The results of future research investigating mental health at later stages of the pandemic (e.g., second, third wave etc.) in the EU Member States or the UK might therefore differ from the findings of this report.

In addition, the primary studies of the general population were in particular not all representative of the population in the respective EU country. The study samples of the studies included might include citizens who were especially motivated to participate in the scientific investigation (e.g., because they felt particularly burdened by the pandemic or, on the contrary, felt better able to cope with it). As a consequence, a selection bias – systematic differences in characteristics between those individuals who were selected to participate in an observational study and those who were not – cannot be excluded. Reliable conclusions regarding the role of the severity of containment measures for mental health can hardly be drawn.

In general, compared to the general population (28 studies) and various patient groups (24 studies), the number of primary studies available was limited for employees (5 studies), children and adolescents (10 studies), older adults (10 studies), and young to middle-aged individuals (12 studies). More specifically, evidence is lacking on the mental health of Covid-19 patients and

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11 Across the different population groups, we identified 90 primary studies. Since 5 studies investigated several population groups simultaneously, the number of studies analysed for this report comprised 98 studies when being considered for
survivors or patients suffering from post-acute Covid-19 syndrome (Nalbandian, 2021), individuals with disabilities, employees – especially in the non-healthcare sector and those affected by remote working, but also unemployed people – children and adolescents, young to middle-aged individuals, and older adults. Conclusions about mental health changes, between-group comparisons as well as the assessment of the impact of containment measures were rendered difficult by the lack of data for these population groups. Furthermore, for several groups (e.g., general population, patients, young to middle-aged individuals), the available mental health data were also restricted for some outcomes (e.g., psychological distress, loneliness). In general, loneliness and several other outcomes (e.g., self-harm) have rarely been assessed, with loneliness being considered as a risk factor at most.

Given the restriction of the primary studies to certain EU Member States and the lack of research in others, the generalisation and applicability of the findings to all EU countries might also be restricted. In 13 EU Member States, no primary studies on mental health using a longitudinal or repeated cross-sectional design have been carried out so far. Most of the evidence on the mental health effects of the Covid-19 pandemic referred to data from the UK, Spain, Italy, and the Netherlands (i.e., countries in part heavily affected by the pandemic).

The primary studies included used various statistical analyses to examine changes in mental health and also reported inconsistent effect measures for mental health effects. Therefore, conclusions about the extent of mental health changes from before to during the pandemic, or over the course of the pandemic (i.e., effect sizes), were rendered difficult for all population groups. Overall, the heterogeneity observed between the primary studies (e.g., various mental health data and outcome measures) led us to the decision not to summarise quantitative data across the eligible primary studies in meta-analyses for this report.

Given the lack of available mental health data for different severities of policy responses to fight the pandemic in all population groups, we could only assess the impact of containment measures on mental health with difficulty, and no clear tendency was detectable. For example, in older adults, before-during comparisons of mental health were limited to no/weak containment measures. In patient populations, there was also limited variability in the severity of these policy responses during the pandemic. In children and adolescents, the available data from primary studies were mainly limited to periods with weak containment measures. Robust conclusions regarding the mental health impact of the severity of containment measures (or their reinforcement/relaxation) in the EU Member States, including home confinement and the possibly resulting social isolation, are not possible based on the currently available data. The same applied to support measures, with a limited variance between the Member States in the implementation of these policy responses. Furthermore, single measures of containment and support (e.g., individual movement restrictions, wage subsidies) might have been defined differently by different organisations and by the EU Member States, which also renders making concrete conclusions difficult.

Data on risk/protective factors for changes in mental health from before to during the pandemic or over the course of the pandemic were also restricted by the survey periods of observational studies identified for this report. Because of the limitation to the first wave or measurements in proximity to the first wave, conclusions about the potential role of EU Member States (country-level factor), population groups, and individual risk/protective factors for long-term mental health effects are limited. Although underlying risk and protective factors might be similar in later stages of the pandemic, it is also conceivable that other dynamics come into play after one year of restriction and crisis management, such as medium-term economic losses, a reappraisal of the each population group separately. In addition to the 89 studies mentioned here, we identified 7 studies in individuals with particular risk exposure and 2 studies in mixed samples not assignable to a specific group.
coronavirus-related health risk following vaccination, or a general pandemic fatigue that may shift
the pattern seen in earlier phases/2020.

Based on the limited available data for these countries, the investigation of the EU Member States
as country-level risk, or protective factor, for before-during and/or peripandemic mental health
changes was limited for Austria, Belgium, Czechia, Denmark, Finland, France, Ireland, the
Netherlands, Poland, Portugal, Spain, and Sweden. Furthermore, we cannot make any statements
regarding the risk/protective factor status of those 13 EU Member States for which we identified no
mental health data at all (e.g., Bulgaria, Croatia). Compared to the general population and given the
already limited available data on mental health changes, potential risk and protective factors have
also been less investigated in Covid-19 patients and survivors, non-healthcare employees,
children and adolescents, young to middle-aged and older adults. Except for a few population
groups, little information on social, work-, and pandemic-related risk and protective factors has
been reported. Overall, there was heterogeneity between the primary studies that investigated
potential moderators of mental health changes at the individual level. For example, in the general
population, younger age and female gender could not be consistently demonstrated as risk factors,
but were found to be relevant in at least three studies. The investigation of protective factors has
been neglected across all population groups (i.e., only 31 of the eligible primary studies
investigating factors favouring mental health).

5.5. Agreements and disagreements with previous research and potential reasons for contradictions

Several reasons might explain the discrepancies between the key findings of the primary
studies and previous evidence syntheses, either regarding the mental health changes or
risk/protective factors. First, the comparison between the pooled prevalence of mental symptoms
from meta-analyses found in the umbrella review (pillar 2) and pre-pandemic data was performed
as an additional step in the analysis by the authors and not as a main component of this report. Thus,
the pre-pandemic data on the prevalence of mental symptoms and mental disorders have not been
identified systematically and can therefore only provide a rough picture of the pre-pandemic mental
health situation.

Second, although all reviews identified for our umbrella review had to meet the criterion of
including at least three studies in EU Member States or the UK (for healthcare staff: at least five
studies), the number of EU-based studies in meta-analyses was partly very limited or even
unclear. Therefore, in contrast to the primary studies that were selected based on their execution
in EU Member States or the UK, conclusions regarding the EU based on previous evidence syntheses
can only be made with caution.

Third, compared to the longitudinal and repeated cross-sectional studies directly identified for this
report (pillar 3), the previous reviews and meta-analyses mainly considered cross-sectional primary
studies, rendering any causal conclusions regarding the impact of the Covid-19 pandemic on mental
health difficult. EU-based studies including a comparison with pre-pandemic data or that
investigated the trajectories of mental health over several time points in the pandemic timeline
were missing in the reviews. Although most of the survey studies included in previous reviews
focused on the first wave, the exact survey periods were often inadequately described. Therefore,
it is unclear to which period in the pandemic timeline (e.g., infection rates, with/without
containment measures), the pooled prevalence refers to, respectively. This may have led to
ambiguity regarding the pandemic-related risk/protective factors found in reviews.

In general, comparisons between the findings of the primary studies and previous reviews were only
possible for before-during changes in mental health. In contrast to reviews, the 90 primary studies
included mainly focused on the assessment of mental health during the pandemic.
(158 comparisons) compared to pre-during comparisons (106 comparisons). This circumstance might also explain the rather heterogeneous picture of mental health changes based on the primary studies. In addition, there was also considerable heterogeneity between the studies of previous reviews, meaning that participants, contexts, or measurement instruments, for example, were actually probably too different to perform meta-analyses. Even within the same systematic review, findings on the role of variables as a potential risk/protective factor for mental health were rather inconsistent.

Finally, the 90 primary studies differed from previous research by investigating different subgroups of populations (e.g., patients: pregnant/postpartum women in reviews vs patients with chronic health conditions) or population groups which had been neglected in previous evidence syntheses (e.g., non-healthcare employees, children/adolescents, older adults), restricting possible comparisons.

5.6. Implications for the future

Based on the evidence gaps identified in the synthesis of observational studies, the umbrella review, and disagreements between the primary studies and previous systematic reviews, this report has several implications for future research. First, based on systematic reviews and primary studies, it lacks evidence on the mental health in specific population groups, such as non-healthcare employees, especially those affected by remote working; unemployed individuals or those affected by financial problems due to the pandemic; further patient populations (e.g., Covid-19 patients/survivors or patients suffering from post-acute Covid-19 syndrome, individuals with disabilities); and different age groups (children and adolescents, young to middle-aged individuals, older adults). Although this population group has not been investigated in detail in this report due to heterogeneity within it, more research on individuals with particular stressor exposure (e.g., family caregivers, working parents of school-age children) is also urgently needed.

Furthermore, more research should be performed in those EU Member States for which no observational studies could be identified in this report, including Bulgaria, Croatia, Cyprus, Estonia, Greece, Hungary, Latvia, Lithuania, Luxembourg, Malta, Romania, Slovakia, and Slovenia.

Although we were able to derive several protective factors from our analyses, both the umbrella review and the synthesis of observational studies indicate the need to further explore protective factors to foster a resilient response among EU citizens amid the Covid-19 pandemic and possible similar public health crises. Especially social, work-, and pandemic-related (risk and) protective factors have been neglected so far.

Given the previous focus on measures of containment and their impact on mental health, future research should concentrate more on support measures and their potential mental health effects. Despite the limited possible conclusions of this report regarding the mental health impact of support measures for the above-mentioned reasons (see 5.4.2), future primary studies might provide clearer evidence for a potential protective role of these policy responses in the EU. Since the Covid-19 pandemic is likely to have enormous medium- and long-term consequences in different areas (e.g., economic, mental health, social) – which are insufficiently covered by this report due to the focus of primary studies on the first wave – the further investigation of support measures and their mental health effects seems worthwhile from a resilience perspective. Based on a consistent definition of support measures across the EU countries, future Europe-wide studies measuring mental health outcomes at later stages of the pandemic and potentially upcoming waves will provide further insights about how negative consequences of the pandemic and of containment measures might have been buffered by governmental action to support EU citizens.

Although the 90 primary studies identified for this report were already of high quality compared to the studies included in previous reviews (e.g., longitudinal or repeated cross-sectional design), both
the umbrella review and the synthesis of primary studies indicate the need for improved study design. Researchers and policy-makers at the EU and national level might benefit from an EU-based mental health monitoring study, which provides representative data for each country and uses homogeneous and valid measurements of mental health as well as risk/protective factors across the EU Member States. This monitoring would facilitate comparisons between EU countries regarding peripandemic mental health trajectories and potential influencing factors. To date, observational studies in all population groups primarily used screening scales for mental health assessment and allowed conclusions to be drawn about potential changes in the extent of mental symptoms before versus during the pandemic, or over the course of the pandemic. Only a few of the identified studies reported changes regarding clinical diagnoses of mental disorders (e.g., using clinical interviews; Gómez-Ramiro 2021; Winkler 2020) or used health data such as hospital data (e.g., mental health-related admissions to acute unit), or primary care data (e.g., electronic health records; Grimshaw 2021; Kyle 2021; Williams 2020). As a consequence, future research, including an EU-wide monitoring study, would considerably benefit from the assessment of diagnoses of mental disorders and a European health data access that ensures an efficient exchange and direct access to different health data (e.g., electronic health records, data from patient registries).

Finally, further research on later stages of the pandemic (e.g., second, third, or even more waves) in the EU Member States will be needed to make conclusions about the medium- and long-term psychosocial and mental health consequences, as well as to clarify the potential moderating role of containment and support measures.
6. Policy options

Based on the findings of this report, as well as in view of the EU competences in public health and research, we derived several policy options.

6.1. Previous mental health-related actions of the EU

Previous actions in general

Before the Covid-19 pandemic, the EU had already taken several steps to promote public (including mental) health. These include, for example, a **joint action on mental health and wellbeing**, resulting in the European framework for action on mental health and wellbeing, as well as the EU compass for action on mental health and well-being.\(^{12}\) Annual reports (e.g., EU compass annual activity reports) regularly monitor the progress made by the Member States in the field of mental health promotion. Based on funding from Horizon 2020,\(^{13}\) the largest EU research and innovation programme (€80 billion of funding) over 2014-2020, important programmes for mental health promotion and the prevention of mental disorders in different settings have been initiated, such as the RECOVER-E project (‘Large-scale implementation of community-based mental health care for people with severe and enduring mental illness in Europe’)\(^{14}\) or H-WORK (‘Mental health in the workplace’).\(^{15}\) These activities have laid important foundations for mental health promotion in the face of the Covid-19 pandemic.

Previous action in the context of the Covid-19 pandemic

Since the outbreak of SARS-CoV2 in December 2019, further policy action has already been performed at the European level. For example, the EU4Health programme (2021-2027),\(^{16}\) launched in March 2021, aims to improve and to promote health in the EU, to fight cross-border health threats, to make (crisis-relevant) medicinal products and devices available and affordable for the EU countries, and to strengthen health systems (e.g., by implementing EU health legislation and by integrating the work of national health systems). Furthermore, research projects to be funded under Horizon Europe (2021-2027)\(^{17}\) will provide key findings to support the recovery of the European population from the Covid-19 pandemic and its challenges (e.g., economic, social). The calls within the health work programme (2021-2022),\(^{18}\) with priority topics such as mental health and resilience, digitalisation and health data use, as well as artificial intelligence solutions for treatment and care, will particularly contribute to preparing healthcare systems for potential future public health emergencies and inform further policy actions at the European and national levels. Through its **health communication** activities, the **European Centre for Disease Prevention and Control (ECDC)** generally provides evidence-based information within the EU and the European Economic Area (EEA), and supports countries and the respective public health professionals in sharing knowledge, promotes health communication skills, and supports the Member States in providing consistent health communication that also integrates behaviour change and risk communication strategies. During the Covid-19 pandemic, the ECDC\(^{19}\) has also provided a variety of

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\(^{12}\) EU Compass for action on mental health and well-being

\(^{13}\) Horizon 2020

\(^{14}\) RECOVER-E project

\(^{15}\) H-WORK

\(^{16}\) EU4Health Programme (2021–2027)

\(^{17}\) Horizon Europe (2021–2027)

\(^{18}\) Health Work Programme (2021–2022)

\(^{19}\) ECDC
communication material on Covid-19 transmission and vaccination. This information policy, by providing timely, easily accessible, and evidence-based information and by combatting misinformation, may reduce uncertainties about the disease and Covid-19 (or vaccination-related) concerns as a risk factor for mental health in the general population (see 4.4.3).

Recently, a European health emergency preparedness and response authority (HERA) has been proposed as one key initiative of a European health union, in which all EU countries would prepare and respond together to health crises, and which would seek to improve the resilience of Europe’s health systems. Specifically, HERA should aim at ensuring the development, production, and procurement of medical countermeasures (e.g., vaccines and therapies) for health emergencies. The newly formed Pan-European Mental Health Coalition, launched on 30 September 2021 by the WHO/Europe, also aims at promoting mental health by focusing on the transformation of mental health services and the integration of mental health into emergency response and recovery efforts, as well as on promoting mental health and preventing mental illness across the life course.

Concerning the activities of the European Parliament in particular, in a July 2020 resolution on the EU’s public health strategy post-coronavirus, the Parliament recognised mental health as a fundamental human right and called for a 2021-2027 EU action plan on mental health. Moreover, even before the Covid-19 pandemic, some Members of the European Parliament with a particular interest in mental health had joined forces, for example, by establishing the Coalition for Mental Health and Wellbeing in the EP (a group amplifying the voices of people with mental health problems and advocating for a coordinated response on the determinants of mental health) and the MEP Alliance for Mental Health (a platform bringing Members and stakeholders together to promote EU policies in the field of mental illness).

6.2. Overview of policy options

This report looked at specific areas that require policy-makers’ attention at the level of the EU and its 27 Member States, and identified four overarching policy themes (see Figure 7). We assume these themes to be relevant for the management of the ongoing Covid-19 pandemic and future crisis situations in Europe, as well as to sustain and promote EU citizens’ mental health amid such public health emergencies. The four themes have been chosen based on the European Parliament’s possibilities to intervene. In addition, we consider the role of other actors at the European (e.g., European Commission, Pan-European Mental Health Coalition) and national levels (Member States and institutions such as mental health organisations), as well as that of researchers and experts in the field of mental health. Further necessary research activities were derived based on the evidence gaps shown in this report (see 5.6). Various researchers and scientific groups with expertise in the field of resilience and mental health (e.g., psychology, psychiatry, public health) and specific methodological approaches (e.g., big data management, evidence synthesis methods, health services research), for example, members of the Technical Advisory Group (TAG) for mental health impacts of Covid-19 in the WHO European Region, could contribute to these activities. Calls for research proposals, for example within Horizon Europe, will be needed to address all relevant groups, to create EU-wide research consortia, and to coordinate the scientific projects across the EU.
Figure 15 – Summary of policy options for the European Parliament derived from this report

I. EU-wide mental health monitoring (general population)

Aim: Monitor the prevalence of mental symptoms and clinical diagnoses of mental disorders in the EU

What: Observational study (longitudinal or repeated cross-sectional) across all EU Member States over longer period (e.g., at least 5 years)

II. Awareness raising and interventions

Aim: Increase awareness of public and policy-makers at EU and national levels for mental health consequences of Covid-19 pandemic, protective factors, and efficacy of mental health services

What: • Longitudinal observational studies on specific population groups • Research activities with resilience perspective investigating protective factors • Systematic reviews and meta-analyses (including IPD meta-analyses) on the efficacy of mental health interventions

III. EU-wide mental health services research study

Aim: More reliable conclusions on consequences of Covid-19 pandemic on mental health services in the EU to support policy option 4

What: European mental health services research study (e.g., using the infrastructure of the European Health Data Space for health data sharing between EU countries)

IV. European emergency preparedness for mental health

Aim: European emergency preparedness and response strategy focusing on psychosocial and mental health support

What: Initiate mental health preparedness and response strategy as part of European Health Union to develop response mechanisms and provide psychosocial support services for the general public and vulnerable groups in the face of health crises; definition of criteria for sufficient supply of EU population with mental health services

Most important actors:

- **EP:**
  - recommendations to EC and Member States (II-IV)
  - promote the establishment of funding programmes (I-IV)

- **EC:**
  - promotion of European Health Data Space (III)

- **Further actors:**
  - European actors: e.g., WHO, WHO Regional Office for Europe, Pan-European Mental Health Coalition, Mental Health Europe (I, III, IV)
  - National actors: for example,
    - Ministries of Health and Research (I, III, IV)
    - national institutes of epidemiology and public health (I, III, IV)
    - health insurance companies, (mental) healthcare providers (III)
  - **Researchers** with expertise in the fields of:
    - resilience and mental health, such as psychology, medicine, public health (I-IV)
    - observational (longitudinal) studies (I-III)
    - big data management/analysis (I, III)
    - evidence synthesis methods (II)
    - health services research (III)
    - prevention and intervention programmes for mental health (II, IV)

*Note.* IPD: individual participant data.
6.2.1. Policy option 1 – EU-wide mental health monitoring in the general population

What? Given the evidence gaps derived from this report (see 5.4.2), a (longitudinal or repeated cross-sectional) monitoring study across all EU Member States and over a longer period (e.g., at least five years) is needed to monitor the prevalence of mental symptoms and of clinically relevant diagnoses of mental disorders in the European population.

Why? Based on representative data from the general population in each EU Member State, this continuous monitoring will make it possible to better assess mental health changes in the EU and to investigate the mental health impact of the Covid-19 policy responses as well as of the long-term socioeconomic consequences of the pandemic (e.g., unemployment, financial losses). For example, a project such as the 'European Study of the Epidemiology of Mental Disorders (ESEMeD)' in the context of the Covid-19 pandemic could be initiated and supported. By the use of consistent and standardised study methods in a joint European monitoring study, the comparability of mental health data across the Member States would be improved, in contrast to the current state of research which is very heterogeneous (see 5.4.2). Furthermore, policy responses to fight the pandemic as well as support measures should be consistently defined using the same criteria, to increase comparability when examining the mental health impact of these government actions. An EU-wide monitoring study will also provide mental health data for those EU Member States which have been neglected to date.

Who? The European Parliament could recommend the initiation of a European mental health monitoring project (e.g., as an infrastructure project such as the European Research Infrastructure Consortia, ERIC) to the European Commission and the Member States, and promote the establishment of the necessary funding programmes to realise this monitoring, for example, within a call under Horizon Europe (estimated funding sum: €3 million for setting up the infrastructure, followed by additional funding to carry out the monitoring in the respective countries). In the conceptualisation of the study, different European and national actors could be involved. At the European level, the WHO Regional Office for Europe, the Pan-European Mental Health Coalition, and non-governmental organisations (e.g., Mental Health Europe) could participate in the study, for example. Relevant partners at the national level would comprise public (mental) health institutions in each Member State (e.g., respective Ministries of Health and Research, and national institutes of epidemiology and public health such as, for example, the Robert Koch Institute in Germany). The monitoring study should be coordinated by a consortium of relevant research institutes in the field of resilience and mental health research (e.g., psychology, medicine, sociology, neuroscience, public health, and other health sciences), which have (methodological) expertise in organising and coordinating large longitudinal studies (e.g., in the context of the Covid-19 pandemic), as well as in the management and analysis of big data. The selection of respective institutes could be based on existing monitoring projects regarding coronavirus-related mental health consequences (e.g., EU-funded RESPOND and DYNACORE-L projects). In addition, leading experts who already contributed to previous policy recommendations (e.g., from the WHO TAG for mental health effects) could be involved.

How? First, a conceptualisation phase would serve to define the research questions, study concepts, relevant mental health outcomes and outcome measures (e.g., survey including questionnaires on mental health in combination with clinical interviews to assess potential changes in the diagnosis of mental disorders), as well as the detailed methodological procedures (e.g., coordination of

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25 *European Study of the Epidemiology of Mental Disorders (ESEMeD)*
26 RESPO**nad project** on “Preparedness of health systems to reduce mental health and psychosocial concerns resulting from the Covid-19 pandemic” (2020-2023)
27 *DYNACORE*: worldwide EU-funded (Horizon 2020) Covid-19 mental health study
activities between the Member States). The mental health status in the EU Member States should be monitored in relation to a variety of working and living conditions to identify predictors and mechanisms of resilience. Subsequently, the study would be coordinated and performed by the European research team (execution phase).

6.2.2. Policy option 2 – Awareness raising and interventions

What? Given the research gaps identified in this report (see 5.4.2), the awareness of the public and of policy-makers at the EU and national levels regarding the mental health consequences of the Covid-19 pandemic, as well as on health-promoting factors should be further increased. The same applies to the efficacy of (public) mental health services amid the pandemic and potential factors (e.g., demographic factors) affecting this efficacy.

Why? As demonstrated by this report, there is a lack of studies on the mental health consequences of the Covid-19 pandemic in specific population groups (e.g., non-healthcare employees), as well as on protective factors. An increased awareness of these topics might be reached by strengthening further research activities in the field. Furthermore, detailed insights concerning (public) mental health services, such as the efficacy of telemedicine and teletherapy, or self-guided, low-threshold mental health interventions in different settings, would be needed to mitigate the potential medium- and long-term negative mental health consequences of the Covid-19 pandemic and to ensure preparedness for similar public health emergencies in the future (see also policy option 4).

Who? In addition to highlighting the need for further research activities to the European Commission and the Member States, the European Parliament could promote the establishment of funding programmes for different research activities. Those Member States where only a few or no observational studies on the psychosocial and mental health impact of the pandemic have been carried out should be particularly encouraged to support respective research projects. Again, observational longitudinal studies on mental health trajectories in specific population groups should ideally be performed by research experts in the field of resilience and mental health (e.g., psychology, medicine, sociology, neuroscience, public health, and other health sciences), who also have expertise regarding this study design. Similarly, research groups from departments/universities with expertise concerning evidence synthesis methods, especially individual-participant data (IPD) systematic reviews and meta-analyses, should be involved.

How? The European Parliament could promote the establishment of funding programmes for several research projects, especially longitudinal or repeated cross-sectional studies and systematic reviews/meta-analyses for a solid evidence base (see Table 3).
Table 3 – Possible research activities for policy option 2

<table>
<thead>
<tr>
<th>Research project</th>
<th>Details</th>
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| **Observational longitudinal or repeated cross-sectional studies on mental health outcomes in specific population groups and investigating mental health from a resilience perspective** | - The studies should focus on population groups which have been under-represented in scientific literature so far:  
  - Covid-19 patients and survivors (e.g., patients with persistent and/or delayed or long-term complications during/after Covid-19);  
  - non-healthcare employees, especially those affected by remote working, but also employees in occupations that were most severely affected by the containment measures (e.g., arts, culture, gastronomy, hotels);  
  - unemployed individuals;  
  - children/adolescents;  
  - young to middle-aged individuals;  
  - older adults;  
  - people with particular risk exposure, such as family caregivers or working parents.  
- The observational studies should also assess potential changes in the diagnoses of mental disorders in the European population.  
- In addition to monitoring mental health, the related predictors (especially protective factors) and potential resilience mechanisms and their interaction in various population groups should be investigated. In general, mental health status should be examined in relation to a variety of working and living conditions.  
  - Funding sum depending on the EU country and the sample size (e.g., €0.5 million per year for a 5-year longitudinal study on 1 000 participants in Germany). |
| **Systematic reviews and meta-analyses** | - Systematic reviews/meta-analyses on the efficacy of different mental health interventions in various population groups, such as, for example:  
  - low-threshold psychosocial and mental health services fostering resilience (e.g., telephone helplines, digital workshops, self-guided interventions) which can reach many individuals in different settings (e.g., schools, universities, workplace, communities).  
  - interventions to cope with loneliness (identified as a risk factor for mental problems) and to strengthen social support networks.  
  - teletherapy to treat mental disorders.  
- Funding sum depending on topic of review and number of identified studies (e.g., €250 000-€500 000 per review).  
- For those mental health interventions for which there is evidence of positive psychological effects based on systematic reviews and meta-analyses, meta-analyses using individual participant data (IPD) from the included studies could be conducted. These analyses make it possible to examine potential factors influencing the efficacy of interventions (e.g., demographic factors such as age, gender) and to identify those population groups who benefit most from specific interventions (estimated funding sum: €500 000 per IPD analysis). |
6.2.3. Policy option 3 – EU-wide mental health services research study

What? To collect more information and make reliable conclusions regarding the consequences of the Covid-19 pandemic and the containment measures on mental health services in the EU Member States, an EU-wide mental health services research study could be carried out. Such a study could benefit from the infrastructures for the exchange of health data between the countries within the European Health Data Space.

Why? Based on the results of this report, primary care data (e.g., medical records from general practice), (clinical) routine data/secondary data (e.g., data collected by health insurances for accounting purposes, such as diagnoses of mental disorders or inpatient stays), or health data from national patient registers have hardly been used or combined with research data to examine mental health changes amid the Covid-19 pandemic (see 5.6). However, since by using data negative research effects like selection bias, dropouts or memory effects could be prevented, the collection of these data could be considerably relevant to objectively assessing the impact of the pandemic and other public health emergencies on mental health, as well as on (critical) mental health services (e.g., during and after a public health crisis). To date, national patient registers are not available in all EU countries. Moreover, the legal and technical requirements for the use of (mental) health data differ between the Member States. The latter problem is currently addressed by the European Health Data Space which aims at facilitating health data sharing across the EU. Using this newly created infrastructure for data sharing at the European level, an EU-wide health services study could be carried out, with a focus on psychosocial and mental health services. More reliable conclusions about how the national (mental) healthcare systems have responded to the pandemic, could in turn feed into the development of a European emergency preparedness plan for mental health (see policy option 4).

Who? The European Commission should further promote the creation of the European Health Data Space, especially with respect to mental health data. The European Parliament could recommend that the Member States establish the necessary requirements (e.g., legal, technical) to facilitate health data sharing across the EU. EU countries with no centralised patient registers (e.g., on psychiatric patients) could be encouraged by the European Parliament and the European Commission, to establish respective registers, for example, based on the experiences of other Member States that are exchanged as part of the European Health Data Space. Furthermore, the Parliament could highlight the need for a European health services study to the European Commission and the Member States and promote the establishment of the necessary long-term funding programmes to realise the study, for example, within a call under Horizon Europe (estimated funding sum needed: €10 million, depending on the number of participating institutes and the range of EU countries to assess). Different additional European actors might be involved (see policy option 1; e.g., European Public Health Association (EUPHA), WHO Regional Office for Europe, non-governmental organisations such as Mental Health Europe). At national level, for example, the respective Ministries of Health and Research, national institutes of epidemiology and public health, health insurance, and (mental) healthcare providers could contribute to the study. Based on routine health data, as well as those from patient registers from each EU country, the study could be coordinated by a consortium of relevant research institutes in the field of psychology, medicine (e.g., psychiatry), and health services research who have (methodological) expertise in carrying out healthcare research and in analysing primary care or routine data.

How? The EU-wide study could focus on the assessment of pandemic-related changes in psychosocial and mental health services for patients with pre-existing mental disorders, as well as those individuals who were psychologically burdened by the pandemic (possibly leading to a first diagnosis of mental illness) and in need of mental health services. Possible research questions might refer to the efficacy of telemedicine and teletherapy in treating mental disorders during the
pandemic in the face of disrupted face-to-face healthcare (e.g., is teletherapy more useful for specific mental disorders based on routine data?). To date, a worldwide study of the WHO (WHO, 2020b) has shown disruptions of general healthcare in 93% of countries, including the European region. Based on a survey among focal points appointed by the respective Ministries of Health, for example, outpatient services in mental and general hospitals, and community-based mental health services were more affected than other services, which might have negative consequences for the further course of mental illness and the further treatment of these patients after the pandemic. However, the study did not solely focus on the EU and did not rely on other health data (e.g., routine data). By considering primary care and routine data such as diagnoses of mental disorders, inpatient admissions, or changes of medication in an EU-wide study, more detailed conclusions about the mental health impact of the pandemic and its consequences for mental healthcare in the EU would be possible. An EU-wide mental health services study should measure long-term data and analyse the whole mental healthcare supply chain, that is, they should not only measure selective data (e.g., on acute medical care in a hospital), but also consider how further treatment worked (e.g., transition from inpatient to outpatient treatment and beyond). First, a conceptualisation phase would serve to define the research questions, study concepts, relevant health data (outcomes), as well as the detailed methodological procedures (e.g., infrastructure for sharing of mental health data between the countries). Subsequently, the study would be coordinated and performed by the research team (execution phase).

6.2.4. Policy option 4 – Joint European emergency preparedness to counteract negative mental health consequences

**What?** In addition to emergency (pandemic) preparedness plans that focus on infection prevention/control and medical measures to fight cross-border health threats (e.g., treatment), such as the rescEU stockpile, the EU Joint Procurement Initiative, and the European health union, the EU would also benefit from a specific EU-wide emergency preparedness for psychosocial and mental health support.

**Why?** As demonstrated by this report (see 4.1.2), joint European forces regarding psychological support measures to combat potential negative mental health consequences of the Covid-19 pandemic as a cross-border threat to health have been rather neglected. For example, helplines to provide psychosocial support have not been offered in all EU Member States. Similarly, no access to wellbeing support or mental health services across the EU has been provided (e.g., consistent and centralised action recommendations on safeguarding mental health addressed to the general public and vulnerable groups). Nevertheless, there have been several single initiatives on mental health recommendations at the EU level, for example, by the WHO (WHO, 2021c) or Mental Health Europe. Therefore, in addition to emergency preparedness with respect to medical countermeasures (such as addressed by the HERA initiative within the European health union; see 6.1), the EU might also benefit from a joint preparedness plan regarding the provision of psychosocial and mental health support during and after public health crises.

**Who?** The European Parliament could suggest the creation of a new initiative on mental health preparedness and response and promote the establishment of the necessary funding programmes. Moreover, various actors at the international and EU (e.g., WHO, Pan-European Mental Health Coalition, Mental Health Europe) as well as national levels (e.g., Ministries of Health and Research of Member States; national public health institutes) should be involved. Furthermore, researchers with...
a focus on mental health/resilience, as well as prevention and intervention programmes in different population and age groups should participate.

**How?** The mental health preparedness and response strategy could be initiated as part of the newly established European health union and alongside initiatives like HERA or the pharmaceutical strategy (see 6.1), to increase preparedness and to provide joint response measures for the potential negative mental health impacts of health crises (e.g., pandemic outbreak). In collaboration with other actors at the international, EU and national levels, and based on scientific evidence (e.g., using evidence syntheses performed by mental health researchers; see policy option 2), response mechanisms and psychosocial support services could be developed to be offered to the general public, as well as specific subgroups in each Member State (e.g., children and adolescents, family caregivers, patients with chronic health conditions) in anticipation of, during and in the aftermath of public health crises. Following the example of the WHO (WHO, 2021c) and other mental health organisations, a wide range of resources for mental health support (e.g., action guidance on how to stay mentally healthy during quarantine, telephone helplines, stress management guides, story books for children, digital workshops) in different languages could be prepared and offered in a centralised way on EU and Member State websites. These EU-wide mental health services would be a supplement to the health communication policy of the EU (e.g., ECDC). In addition, criteria for a sufficient supply for the EU population of (critical) mental health services amid emergencies could be defined, for example, based on a European study of healthcare supply (see policy option 3). By promoting high standards for mental health services in the EU (e.g., minimum scope for mental outpatient services in each Member State), the serious disruptions of (critical) mental healthcare that occurred during the Covid-19 pandemic (WHO, 2020b), could be prevented.
References

* included systematic review (pillar 2)
# included primary study (pillar 3)


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How are we coping with the pandemic? Mental health and resilience amid the Covid-19 pandemic in the EU


How are we coping with the pandemic? Mental health and resilience amid the Covid-19 pandemic in the EU


World Health Organization, WHO Regional Office for Europe, A systematic approach to monitoring and analysing public health and social measures (PHSM) in the context of the COVID-19 pandemic:


This report reviews the existing scientific evidence regarding the mental health of different population groups amid the Covid-19 pandemic in the European Union (EU) and its influential factors. Since the beginning of the pandemic, there has been extensive research on the psychosocial and mental health consequences, showing negative effects especially in the general population compared to before. On the other hand, there is also evidence of resilient responses as the pandemic progressed – that is, the maintenance or recovery of mental health. However, these findings are limited to the first wave or shortly thereafter.

No reliable conclusions regarding the mental health impact of Covid-19 policy responses – containment and support measures – are possible. Several risk factors were identified, with a need for more research on protective factors. Finally, the study outlines a set of relevant policy options to address the mental health challenges during the Covid-19 pandemic and similar future situations.