

periscope

Pan-European Response to the Impacts of COVID-19 and
future Pandemics and Epidemics

Mental Health Impacts in Different European Populations

Deliverable 2.3



PERISCOPE

Pan-European Response to the Impacts of COVID-19 and future Pandemics and Epidemics

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 101016233

Deliverable No. 2.3

Mental Health Impacts in Different European Populations

Due date: 31/10/2023

Submitted on: 31/10/2023

Coordinator	University of Pavia
Lead Beneficiary	Karolinska Institutet (KI), Sweden
Contributing partners	IVN
Contact	Associate Professor Anna-Clara Hollander
Email	anna-clara.hollander@ki.se
Website	https://periscopeproject.eu/

Deliverable Type		
R	Document, report	X
DEM	Demonstrator, pilot, prototype	
DEC	Websites, patent filings, videos, etc.	
OTHER		
Dissemination Level		
PU	Public	X
CO	Confidential (Consortium members including the Commission Services)	
CI	Classified Information (Commission Decision 2015/444/EC)	
Deliverable History		
Date	Version	Author/Contributor
23/08/2023	Full version manuscript	Anna-Clara Hollander, Pär Flodin, Christina Dalman, Maria Niemi, Carmen C. Diaconu, Astrid Syvertsen

The authors of this report warmly thank Hanna Johans (KI) and Dr. Marta Dell'Aquila, (Policy Officer at FEAM) for their valued contributions and support in the production of this report.

In addition, we would like to express our appreciation to Professor Peter Allebeck for his work as the senior expert reviewer of this report.

Disclaimer: *Any opinions expressed in this report do not necessarily represent the views of KI, nor those of all PERISCOPE partners.*

Suggested citation: PERISCOPE (2023). Horizon 2020. Deliverable No. 2.3: Mental Health Impacts in Different European Populations.

ISBN number 978-91-8017-194-6

Table of Contents

EXECUTIVE SUMMARY	1
INTRODUCTION	4
1. Chapter 1: Systematic review of common mental disorders (CMD) following previous pandemics/epidemics and economic crises	8
1.1. Mental health impact of SARS	8
1.2. Mental health impact of the 2008 economic crisis	8
1.3. Summary of the findings	9
2. Chapter 2: Meta-analysis of self-reported CMDs from pre-pandemic and early pandemic days.....	11
2.1. Methods.....	11
Eligibility criteria	11
Pandemic waves.....	11
The containment measures	12
Search strategy and inclusion criteria	12
Statistics	12
2.2. The results.....	12
2.3. Summary of the findings	14
3. Chapter 3: Utilisation of primary care due to CMDs and dispensation of antidepressants – before and during the COVID-19 pandemic	16
3.1. Methods.....	16
Collection of data	18
Outcome	18
Analysis	18
3.2. The results.....	19
Utilisation of primary care due to CMDs	19
Dispensation of antidepressant medication	22
3.3. Summary of the findings	27
4. Chapter 4: The findings in context	30
1.1. Summary of the findings	30

1.2.	Self-reported CMDs	31
1.3.	Primary care utilisation due to CMDs	31
1.4.	Tele-/online consultation	32
1.5.	Dispensation of antidepressant medications	32
1.6.	Containment measures	33
1.7.	Limitations of this report	33
	CONCLUSIONS	34
	REFERENCES	37
	APPENDIX	40



EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Pan-European Response to the Impacts of COVID-19 and future Pandemics and Epidemics (PERISCOPE) has been investigating the broad socioeconomic and behavioural impacts of the COVID-19 pandemic to make Europe more resilient and prepared for future large-scale risks.

From the beginning of the COVID-19 pandemic, and with each new containment measure introduced, health professionals and the public voiced concerns. They feared that the infection, its lingering effects, and the impact of these containment measures on the economy and on daily life could increase the prevalence and incidence of common mental disorders (CMDs) in the population. The aim of this report was to study how the COVID-19 pandemic has affected mental health in the general population, measured as CMDs, referring to depressive disorders and anxiety disorders, as revealed by various data from 1) self-reported mental health (i.e. questionnaires, in which respondents read the question and selected a response by themselves), 2) primary healthcare utilisation due to CMDs, and 3) prescriptions of antidepressants to patients across member states of the European Union.

To understand whether and how the COVID-19 pandemic in Europe influenced CMDs, we have conducted:

- A systematic review of CMDs following previous pandemics/epidemics and economic crises.
- A meta-analysis of repeated self-reported surveys (before and during COVID-19) of CMDs in the general populations in Spain, the United Kingdom, Ireland, Denmark, Austria, the Netherlands, Norway and the Czech Republic, totalling 88,620 persons.
- A study of the unique number of individuals utilising CMD care in primary care during the COVID-19 pandemic compared to previous years in the populations of Sweden, Norway, the Netherlands and Latvia.
- A study of the unique number of individuals prescribed antidepressants during the COVID-19 pandemic compared to previous years, in the general population of Sweden, Austria and Slovenia.
- Studies of whether these changes were associated with the containment measures.

Contrary to previous findings on the economic crisis in 2008, our studies do not support that the COVID-19 pandemic altered the overall occurrence of CMDs in Europe, save small increases and decreases in different measures in specific countries. With regards to containment measures, it was only with school restrictions that small increases in CMDs, though mild, were found.

One limitation of this report is its exclusive focus on CMDs. Furthermore, the scope of this report is restricted to assessments of the general population, as stratified by age and gender. This prevents deeper understanding of vulnerable groups with additional risk factors of CMDs. However, to learn more about vulnerable groups, please see our other report: D2.4 Report: “Health inequalities from the perspective of COVID-19’s impact on the mental health of specific vulnerable groups,” published in parallel with this report.

Exploring the effects of the COVID-19 pandemic and the containment measures on CMDs is important for two interconnected reasons. Firstly, it will inform healthcare planners in their preparations to respond to future pandemics. Secondly, knowing which measures have the greatest unwanted mental health consequences will inform how future pandemics should be handled. When summing up our findings and comparing them to similar studies of the COVID-19 pandemic, we do not see an overall increase of CMDs in the European countries studied from the beginning of the pandemic, and in some areas there has even been a decrease.

This report reflects only the author’s view, and the European Commission is not responsible for any use that may be made of the information it contains.



INTRODUCTION

INTRODUCTION

The Pan-European Response to the ImpactS of COVID-19 and future Pandemics and Epidemics (PERISCOPE) project has been investigating the broad socioeconomic and behavioural impacts of the COVID-19 pandemic, with the intention of making Europe more resilient and prepared for future large-scale risks.⁽¹⁾ The PERISCOPE project has received funding from the European Union's Horizon 2020 Research and Innovation programme, under Grant Agreement number 101016233. One of the aims of PERISCOPE's second work packages (WP2) out of a total of 15 WPs was to explore how the COVID-19 pandemic has affected mental health and mental healthcare utilisation in member states of the European Union. This report presents those findings. For the other aim—to explore the impact of health inequalities on the mental health among especially vulnerable populations during COVID-19—see the D2.4 Report: *“Health Inequalities from the perspective of COVID-19's impact on the mental health of specific vulnerable groups.”*⁽²⁾

The focus of this report are common mental disorders (CMDs). According to the World Health Organization (WHO), CMDs refer to two main diagnostic categories: depressive disorders and anxiety disorders.⁽³⁾ These disorders are highly prevalent in the population, and impact the mood or feelings of affected persons. Symptoms range from mild to severe and persist from months to years.⁽³⁾ These disorders are diagnosable health conditions, and are distinct from feelings of sadness, stress, or fear that anyone may experience from time to time in their lives. At the global level, over 300 million people are estimated to suffer from depression, equivalent to 4.4% of the world's population.⁽³⁾ Studies have reported how the COVID-19 pandemic has been affecting severe psychiatric illnesses, such as schizophrenia and bipolar disorder, and rates of suicide;^(4,5) however, these outcomes are outside the scope of this report.

The gold standard method for assessing CMD prevalence in the general population is clinical population screening. However due to the high costs associated with these studies, they are rare. Furthermore, to assess changes in CMD prevalence, either longitudinal or repeated cross-sectional data are critical, which requires data collection on multiple occasions. In the absence of clinical population screenings, researchers commonly relies on survey studies based on self-reported mental health, using

instruments like the General Health Questionnaire (GHQ), but there are several more precise clinical instruments (e.g., World Health Organisation Composite International Diagnostic Interview (CIDI), Patient Health Questionnaire (PHQ)) that are also used in survey studies. However the disadvantages of surveys include both decreasing response rates as well as selection bias, as some socioeconomic groups are less likely to respond to surveys than others.(7) Thus, self-reported data should ideally be complemented by other types of data, such as data utilisation of mental healthcare or prescribed medication.

The majority (around 60%-90%) of European patients that seek help for CMDs encounter primary care centres only (rather than specialised out- or inpatient care) and many of these are treated with prescribed psychotropic medication. The most commonly prescribed psychotropic medication prescribed to adults with symptoms of CMDs are antidepressants (ACT NO6A), as these are considered one of the first-line treatments for moderate to severe depression.(6)

By the start of the COVID-19 pandemic, and at each initiation of specific containment measures such as social distancing, school restrictions, businesses restrictions, health monitoring, health resources, and mask wearing, there were questions raised as to how the infection itself, the residual conditions, and the consequences of the containment measures would affect mental health.(8) Also, as the COVID-19 pandemic contributed to large and unexpected macro- and micro economic changes, there was a widespread assumption that CMDs and mental healthcare utilisation for CMDs would increase.(8)

The aim of this report is to explore how the COVID-19 pandemic has been affecting mental health and mental healthcare utilisation in member states of the European Union. Exploring the effects of the pandemic and the associated containment measures on CMDs is important for two reasons. First, prospective future pandemics will need a better understanding of the need for mental healthcare to be able to facilitate public health planning and optimise healthcare spending in Europe. Secondly, knowing which measures have the greatest unwanted mental health consequences should inform us as to how future pandemics should be responded to. To understand whether and how the COVID-19 pandemic in Europe influenced CMDs, the report includes the following:

- A systematic review of self-reported CMD (i.e. questionnaires, in which respondents read the question and select a response by themselves without any outside interference) in previous pandemics/epidemics and economic crises.
- A meta-analysis of self-reported CMDs from pre-pandemic and early pandemic days to mid-pandemic days, and the effects of containment measure from eight European countries.
- A study of the unique number of individuals utilisation of CMD care in primary care during the COVID-19 pandemic compared to previous years in the population of Sweden, Norway, the Netherlands and Latvia, and whether these changes were associated with the containment measures.
- A study of the unique number of individuals prescribed antidepressants during the COVID-19 pandemic compared to previous years, in the total population of Sweden, Austria and Slovenia, and whether these changes were associated with the containment measures.

Below will be a review of the results,(9–13) followed by a discussion on how they fit with the broader scope of the question regarding how the COVID-19 pandemic in Europe influenced CMDs.



Chapter 1

1. Chapter 1: Systematic review of common mental disorders (CMD) following previous pandemics/epidemics and economic crises

Bereavement, fear, social isolation, socioeconomic difficulties are all known to be risk factors of CMDs and has been studied in relation to previous pandemics/epidemics. We systematically reviewed studies on mental health in previous pandemics/epidemics like the COVID-19 pandemic, and the earlier economic crises.(2,10) Below is an outline of our findings regarding CMDs following previous pandemics/epidemics similar to the COVID-19 pandemic and the economic crises of 2008.(10)

1.1. Mental health impact of SARS

Our systematic review identified three studies of mental health consequences of previous pandemics/epidemics similar to the COVID-19 pandemic, addressing changes in mental health before and after the onset of the severe acute respiratory syndrome coronavirus (SARS) epidemic in Hong Kong.(10) All of these studies were conducted on adults of older age. One study showed no changes in depression among men, but an increase in depression among (older) women. The second study found excess rates of suicide among older adults. The third, a study of older women, showed increased rates in depression and perceived stress.

1.2. Mental health impact of the 2008 economic crisis

Regarding mental distress/mental illness following the 2008 economic crisis, our systematic review summarised 84 studies.(10) Among these, 15 studies were based on population-based surveys measuring depression (affective disorders, included among our definition of CMDs), and 25 assessed other mental health outcomes such as mental distress, see below. Seven studies assessed mental healthcare utilisation for severe mental illness, and 37 assessed suicides (neither are reported here).

Table 1: Studies of mental health impacts of the 2008 economic crisis, number of studies with increased effect, no effect, or decreased effect

	Depression / Affective disorders			Other mental health problems such as mental distress		
	number of studies with			number of studies with		
Regions*	increased effect	no change	decreased effect	increased effect	no change	decreased effect
US/Canada	8	1	1	2	0	0
Europe & Central Asia	1	1	0	16	3	0
East Asia & Pacific	3	0	0	2	0	0
Multiregional	----	----	----	1	1	0
Study size**						
Below 1,000	0	1	0			
>1,000 – ≤10,000	7	0	0	7	2	0
>10,000	5	1	0	14	2	0

* Categorized according to World Bank regions (<https://data.worldbank.org/country>)

** Total number of study participants

Twelve of the studies measuring depression conducted in Canada, Hong Kong, the USA, Europe, Spain, or Australia found a significant increase. One international study surveying 106,158 adults living in 21 European countries found no effect of the crisis on depressive feelings. Most of the 25 studies assessing other mental health outcomes were conducted in nationally or regionally representative samples, and most found evidence for increased mental distress. Six studies found no changes in mental health outcomes.(10)

1.3. Summary of the findings

Overall, we found only three previous studies on the mental health consequences of epidemics/pandemics on CMDs, and these were all published after the SARS pandemic in Hong Kong. There is however a larger body of literature on the consequences of the 2008 economic crisis, where there seems to have been an increased risk of CMDs in the general population in some—but not all—settings.



Chapter 2

2. Chapter 2: Meta-analysis of self-reported CMDs from pre-pandemic and early pandemic days

The aims of our meta-analysis (11) were to determine how the COVID-19 pandemic affected mild and severe CMDs across Europe, and to test whether the containment measures were related to changes in the rates of mild and severe CMDs.

2.1. Methods

The study protocol has been registered in The International Prospective Register of Systematic Reviews (PROSPERO), with registration number CRD42022343130.

Eligibility criteria

The meta-analysis included population-based prospective and cohort studies that addressed COVID-19 and CMD outcomes. Studies reporting the following set of data were included: 1) self-reported (collected using questionnaires, in which respondents read the question and select a response by themselves without any outside interference) depression or/and anxiety; 2) from pre-/early pandemic and during the COVID-19 pandemic; 3) from any European country; 4) longitudinal or repeated cross-sectional studies; 5) study samples representative of the general population; 6) the outcome(s) measured by one of the validated instruments (GAD-7, HADS, PHQ-9, WHO-5). (12) Studies were excluded if they were editorial papers or cross-sectional studies that evaluated depression or anxiety at only one time point.

Pandemic waves

According to the World Health Organization, COVID-19 could be characterised as a pandemic on 11 March 2020, and the countries included in this meta-analysis started implementing containment measures from 10 March (Czech Republic) to 23 March (UK). This report considered pre-, early, and during-pandemic time waves, to allow for the study of changes in CMDs, as well as the impact of restriction measures, which in many cases had not been implemented in the early pandemic period of the present study.

- “Pre-pandemic” refers to data collected prior to 11 March 2020
- The “early pandemic” refers to data collected between 11 March 2020 and 31 March 2020 (apart from in Austria, where data was collected in April 2020).
- “Pandemic time” refers to data collected during the height of the pandemic – 21 April 2022 at the latest.

The containment measures

The containment severity index was provided by Kubinec et al.,(15) and included six distinct policy areas: social distancing, schools, businesses, health monitoring, health resources, and mask wearing. It was created by combining two COVID-19 datasets—the CoronaNet COVID-19 Government Response Event Dataset and the Oxford COVID-19 Government Response Tracker—using a Bayesian time-varying measurement model, tracking policymakers' policy intensity in each of these policy domains from 1 January 2020 to 14 January 2021, for over 180 countries. These measures provide aggregate summaries of policy-making activities, which capture the intensity of a country's government response to COVID-19 in a given policy domain.

Search strategy and inclusion criteria

The present meta-analysis builds upon the search strategy and search results of a previous study (14), as well as an additional systematic literature search;(11,14) therefore the present meta-analysis includes studies published between 1 January 2020 and 21 April 2022. The meta-analysis included population-based prospective and cohort studies which addressed COVID-19 and CMD outcomes. A standardised data extraction template specifying requested data in detail was sent to all corresponding authors with access to microdata or aggregated data, depending on availability.

Statistics

The analyses generated pooled estimates of changes in CMD prevalence in European countries for a) pre-during pandemic periods, and for b) early/during pandemic periods, separately. Therefore, the pooled results are reported as the average pre-/early-to-during difference in prevalence, and its 95% confidence intervals (95% CI). The meta-analysis focused on changes in the prevalence of proportions using random effects analysis, and this can be read more in detail in the article (12) on changes in mild and severe CMDs in relation to demographic factors and changes in containment measures.

2.2. The results

For the studies included, see reference 11. The study included 15 datasets from Spain, the United Kingdom, Ireland, Denmark, Austria, the Netherlands, Norway and the Czech Republic, totalling 88,620 persons from 12–99 years, 54.7% of whom were women. The data of the included studies were gathered between October 2017 and March 2022. The meta-analysis did not show any significant change in mild or severe self-reported CMDs

measured as the average pre/early-to-during difference in prevalence from before the pandemic to during the pandemic in any of the demographic groups studied (see Table 2). However, among the datasets with data from the early pandemic period, small but significant decreases were found in levels of mild CMDs. None of the analysed age and gender groups displayed significant pre/during pandemic changes in the prevalence of mild or severe CMDs (see Table 2) but among studies with data from the early pandemic period, there were small but significant decreases in the prevalence from early in to during the pandemic among some sub-groups (see Table 2). Country-specific analyses revealed no overall changes in the prevalence of mild or severe CMDs. However a significant increase in mild CMDs was found in Ireland and a significant decrease in both mild and severe CMDs was found in the Netherlands. The only containment measure that seems to have an effect on CMDs was school restrictions, which slightly increased mild CMDs.

Table 2: Meta-analysis of change in self-reported average prevalence (Δ Prev) of CMDs from pre-pandemic to during and early pandemic to during the pandemic in total and by age and gender.

			Pre-pandemic to during the pandemic		Early-pandemic to during the pandemic		
			effect Δ Prev	p-value	effect Δ Prev	p-value	
Mild	Total		-0.010	0.839	-0.050	0.006*	
	By age	0–18	-0.013	0.669	-0.119	0.368	
		19-64	-0.021	0.672	-0.059	0.012*	
		65+	0.017	0.732	-0.016	0.056	
	By gender	Male	-0.013	0.746	-0.039	0.029*	
		Female	-0.012	0.842	-0.059	0.004*	
	By gender & age	Male	0–18	-0.037	0.099	-0.052	0.734
			19–64		-	-0.052	0.046*
			65+			-0.006	0.461
		Female	0–18	-0.013	0.736	-0.153	0.237
			19–64			-0.066	0.006*
			65+			-0.037	0.023*
Severe	Total		0.002	0.923	-0.024	0.008*	
	By age	0–18	-0.015	0.463	-0.116	0.048	
		19–64	0.008	0.828	-0.031	0.020*	
		65+	0.009	0.631	-0.002	0.722	
	By gender	Male	0.003	0.884	-0.016	0.059	
		Female	-0.002	0.938	-0.031	0.002*	
	By gender & age	Male	0–18	-0.024	0.158	-0.032	0.732
			19–64	0.008	0.790	-0.024	0.072
			65+	0.006	0.635	0.003	0.365
		Female	0–18	-0.019	0.303	-0.153	0.003*
			19–64	0.002	0.965	-0.037	0.007*
			65	0.003	0.881	-0.011	0.137

* Statistically significant at 95 % level

2.3. Summary of the findings

This meta-analysis suggests that as the COVID-19 pandemic progressed in Europe, there was a decline in mild forms of CMD, while rates of severe CMDs remained stable. However increased school restrictions were found to be associated with small increases in mild CMDs. Only Ireland had increases in the prevalence of mild CMDs from the pre-pandemic period, while the Netherlands was the only country with decreases from pre-pandemic to during the pandemic in mild CMD prevalence.

A strength of this meta-analysis is the relatively homogenous healthcare systems with universal access across European countries, which enables valuable multinational comparisons, considering their varied containment strategies for COVID-19. Another is that we collected raw or aggregated data from the study authors, which allowed for fewer restrictions on the data analysis in comparison to if we had only relied on data that was reported in the published studies. Still, there are several limitations. One is that the data are unweighted, so the results may not accurately represent the population being studied, and pre-/early and during demographics are therefore not necessarily comparable. Moreover, we chose to define the pre-pandemic period as any timepoint up until and including March 2020. This definition of our pre-pandemic timepoint may impact comparability of our results with other studies using different timepoints.



Chapter 3

3. Chapter 3: Utilisation of primary care due to CMDs and dispensation of antidepressants – before and during the COVID-19 pandemic

As CMDs are often treated in primary care, or with antidepressant medication prescribed both in primary care or in specialist psychiatric care, we decided to study series of routinely and continuously-sampled data of CMD-related primary care utilisation (in Sweden, Norway, the Netherlands, Latvia) and dispensation rates of antidepressants (in Sweden, Austria and Slovenia), before and during the COVID-19 pandemic. By relating these changes in the utilisation of primary care due to CMDs and dispensation of antidepressants before and during the COVID-19 pandemic to country-specific time trajectories of two containment measures, we also evaluated the differential impact of containment strategies on the rates of CMDs. Methods

3.1. Methods

Retrospective observational studies of rates of: 1) visits to primary care due to CMDs, and 2) antidepressant dispensation registry data to assess the change in CMDs in primary care and/or antidepressant dispensation rates, and how these rates were associated with containment measures. Forecasting models based on pre-pandemic data was used to predict a counterfactual scenario assuming that the pandemic did not actually happen.

The change is subsequently derived from comparing the observed and expected rates. Forecasting models are commonly considered advantageous because of their ability to adjust for underlying trends and seasonality when predicting expected rates. Training forecasting models relies on the availability of routinely collected data on the outcome variable; for example, in Europe, information about routinely recorded visits to primary care or the use of antidepressants in official registries with near-universal coverage.

ARIMA forecasting models

Any change was then determined by comparing the observed and expected rates. We modelled time-series using Autoregressive Integrated Moving Average (ARIMA) models to predict the expected rates (for a more detailed description of these see the article (12). In this thesis, Autoregressive (AR), Integrated (I), and Moving Average (MA) forecasting models are used to predict the expected rates in AD dispensation rates.

ARIMA models are commonly employed in epidemiological studies, and adjust for seasonality and trends in predicting the counterfactual scenario.⁽¹²⁾ “AR” in the ARIMA acronym refers to the underlying assumption that lagged and past values of the variable can be used to predict the future. ARIMA models are linear regression models that rely on stationarity to predict expected rates. Therefore, we convert non-stationary data, such as seasonality, to stationary data. “MA” refers to calculating how the average in the underlying trend changes over time by considering the number of lagged forecast errors. When building ARIMA models, it is common to obtain multiple models. The model that best aligns with historical data is chosen based on model selection estimators. This departs from the philosophical assumption that there is a single “best” model that represents the most probable counterfactual scenario.

Akaike Information Criterion

Our studies use the Akaike Information Criterion (AIC) to determine which prediction model best explains the historical data. The AIC is among the most frequently used criteria for evaluating prediction models, and is commonly employed in epidemiology. Each prediction model is given a score based on goodness-of-fit criteria, and the ARIMA model with the lowest AIC score is selected.

Timepoints

To allow for examination of the change in rates at various timepoints during the intra-pandemic period, we have chosen to study immediate, intermediate, and long-term changes in AD dispensations.

“Immediate change” is defined as a deviation from expected rates in March 2020, which coincides with the onset of the pandemic. This timepoint may be justified by findings from similar studies attributing isolated peaks in March 2020 to stockpiling tendencies among individuals with valid prescriptions.

“Intermediate change” is defined as the deviation from expected rates in April 2020. The selection of this timepoint departs from the assumption that the onset of the pandemic in March 2020 may have had an immediate effect on depression.

The long-term change is defined as the average deviation from expected rates in the entire intra-pandemic period; from March 2020 through December 2020.

Collection of data

For the three-year process of obtaining the data for this project and recommendations for making the data more accessible, see Appendix 1. Data availability was generally scarce, and due to the ongoing pandemic, register owners frequently reported having longer processing times than usual. We received data that could be used from Norway (drug dispensation only), Sweden (both primary care utilisation and drug dispensation), Latvia (only primary care utilisation), the Netherlands (primary care utilisation only), Slovenia (both primary care utilisation and drug dispensation), and Austria (both primary care utilisation and drug dispensation).

Outcome

The outcome variable was therefore the ratio between the observed and the predicted monthly number of unique individuals either being treated for CMDs in primary care or for dispensation of antidepressants per 100,000 persons, subsequently referred to as Dispensing Rate Ratios (DRR). If an individual was treated for the same outcome two or more times within the same month, that person was only counted once. The population denominator was the covered population corresponding to the same month. Hence, the observed and predicted time series displays the monthly number of unique individuals being treated or being prescribed antidepressants per 100,000 persons.

Containment measure indices

As above indices of containment measures were provided by Kubinec et al.(15) Due to the high degree of collinearity among the six available measures we selected only the two that were most plausibly relevant for population mental health; namely social distancing and school restrictions. The social distancing index captures restrictions on individual mobility, such as lockdowns, travel bans, etc. The index on school restrictions captured the provision of education, including closure of secondary schools, mandated distance educations, postponements of school exams, etc.

Analysis

The data was structured in time series format with monthly counts of the number of unique individuals visiting primary care that were registered with anxiety disorders or depression as main diagnoses. Hence, for each mental illness, an individual was counted only once per month, although the same individual could be counted for two different

calendar months, or once for depression and once for anxiety during the same months. For more details, see the specific references.(12,13)

3.2. The results

Utilisation of primary care due to CMDs

Average monthly counts of primary care due to CMDs during the 12 months period prior to the pandemic onset in March 2020 (i.e., baseline,) varied widely across the countries, with highest levels in Sweden (1,963 per 100,000 person-months), followed by Norway (1,529 per 100,000 person-months), the Netherlands (653 per 100,000 person-months), and lastly Latvia (227 per 100,000 person-months).

Mean changes in the prevalence during the first 10 months

The Swedish population (all ages and both genders combined) displayed a significant 9% reduction in primary care use from March 2020 until December 2020. There was a clear age gradient with larger reductions with age driven by females, whereas males did not display similar reductions among the older age groups. Norway did not display an overall change in primary care due to CMDs in the total population during the first year (i.e., 10 months) of the pandemic. Interestingly, compared to Sweden, Norway displayed an inverted pattern of age-dependent change, where younger age groups decreased more than older. Furthermore, this age-dependent difference was more pronounced among males than females. The Netherlands presented a similar pattern of change in primary care due to CMDs as Norway, where no significant changes occurred for the population at large. However young adults (particularly females) displayed the largest decrease in primary care due to CMDs. Women 0–14 years old displayed a 18% drop, whereas females 75+ showed a 6% increase. Latvia was the only country where primary care due to CMDs increased in the total population (29% increase) from April to December 2020. Although the increase was largest among women (22%, compared to 16% for men), both genders displayed increase in primary care due to CMDs among older age groups.

Time trends

Analysis of changes of primary care due to CMDs on a monthly basis revealed the largest decreases (15%) occurred in April and May 2020 in Sweden. Levels returned to near normal in June 2020, to again drop below expected levels during autumn of 2020, albeit not as dramatically. Similar to Sweden, the largest drop in CMDs in Norway (10%)

occurred during spring 2020 and this was normalised by June 2020. In Latvia and the Netherlands, elevated levels occurred in April 2020 and remained more or less elevated throughout the year in 2020. To view the data related to times for depression and anxiety (both included in CMD), refer to Figures 1 and 2.

Figure 1: Monthly counts of unique individuals with anxiety disorders. In 2019, the average monthly care prevalence in Sweden was 1400 individuals per 100,000 person-months, 780 per 100,000 person-months in Norway, 300 per 100,000 person-months in the Netherlands, and 200 per 100,000 person-months in Latvia.

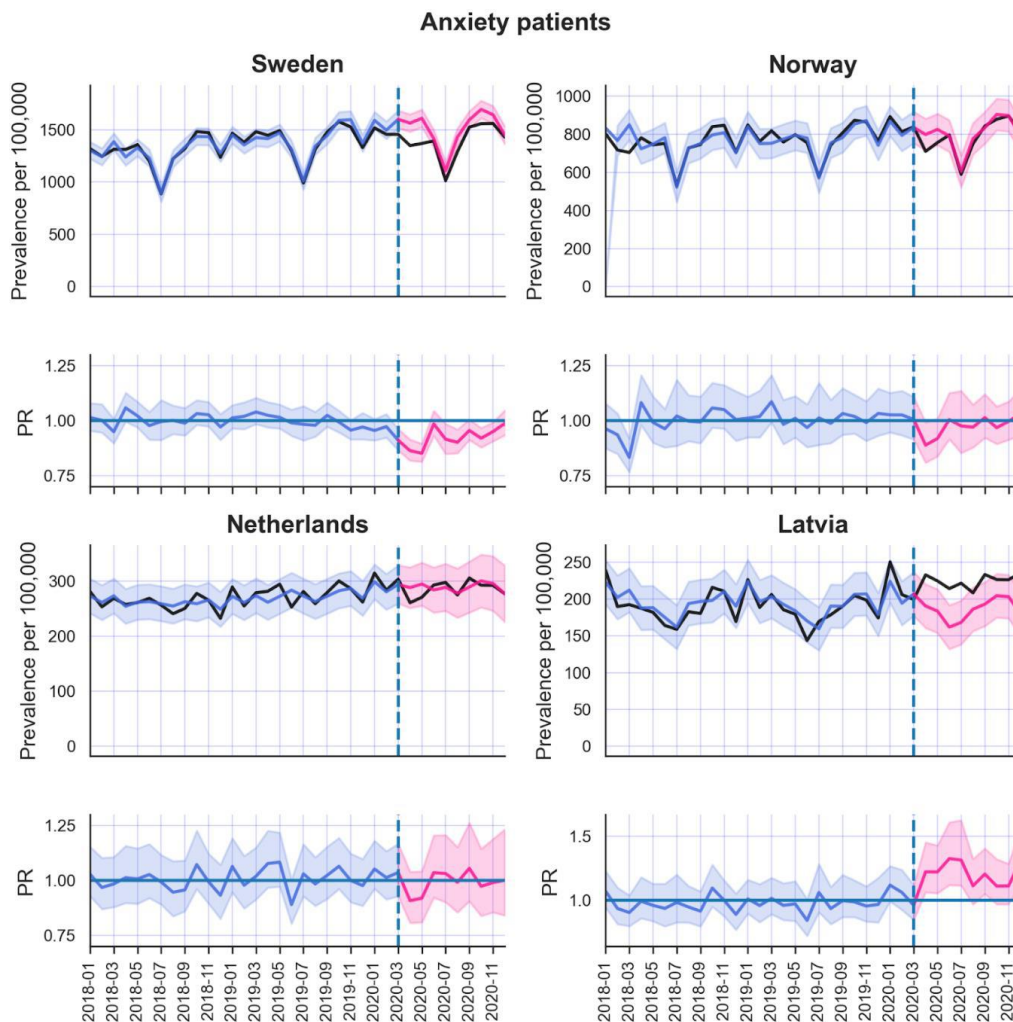
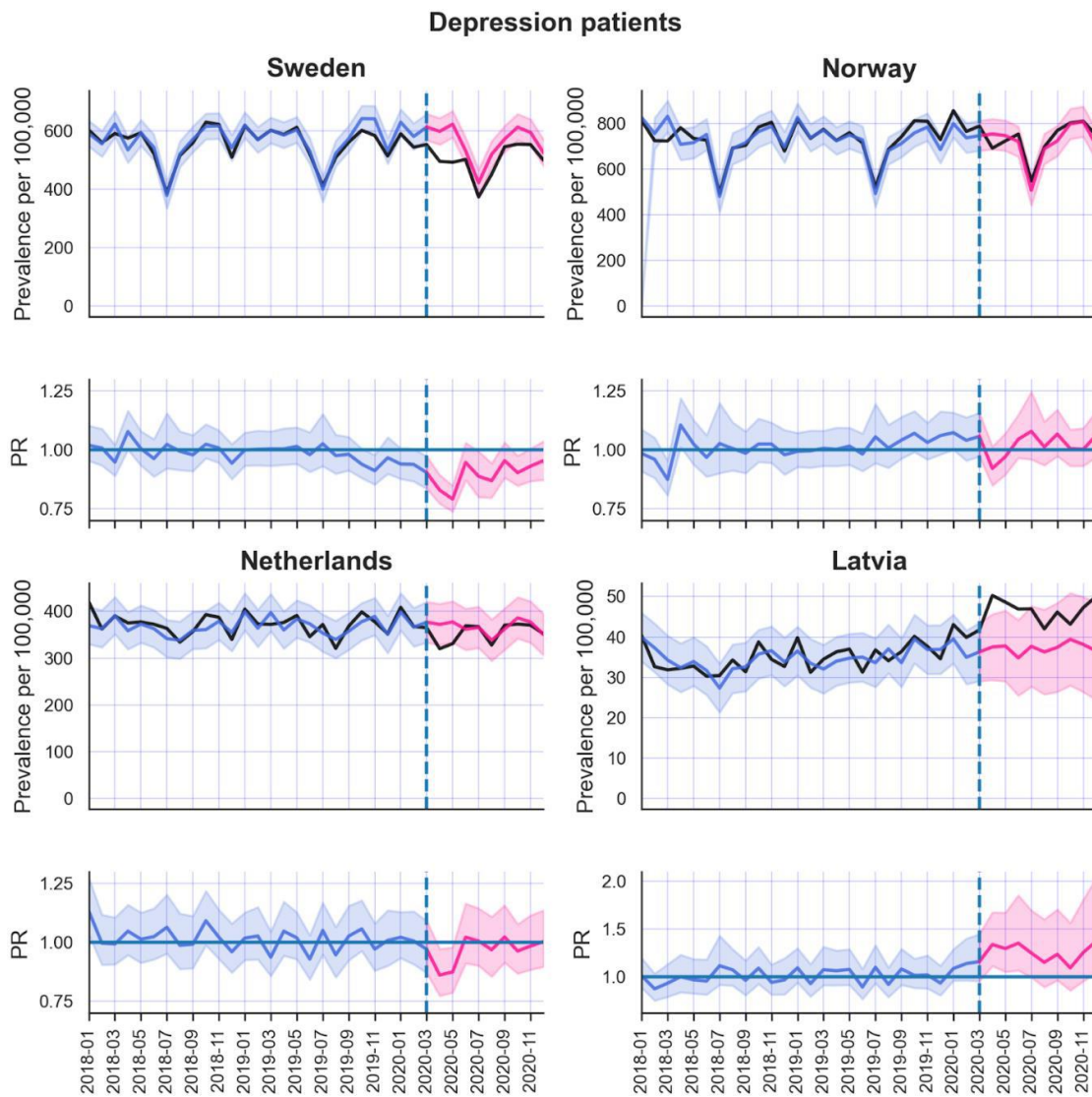


Figure 2: Monthly counts of unique individuals with depressive disorders. Prevalence of depression prior to the pandemic varied from approximately 40 per 100,000 person-months in Latvia, to 750 per 100,000 person-months in Norway. The rates in Sweden and the Netherlands were 500 and 350 per 100,000 person-months, respectively.



Increased virtualisation of primary care

From Sweden and Norway, we had data on the degree of virtualisation (i.e., the number of primary care consultations that took place either online, via mobile app, or on the telephone). Both countries underwent a sudden and dramatic virtualisation of primary mental healthcare. In Sweden, during the 12 months prior to pandemic, there was a 73.6% increase and in Norway, there was a 117% increase.

Effects of containment measures

The relationship between CMD-related primary care utilisation and containment measures (i.e., school restrictions and social distancing) were weak.

Dispensing of antidepressant medication

The baseline was the average monthly count of dispensing of antidepressant medication in all ages and genders from March 2019 through February 2020 and it varied greatly by country. The highest was found in Austria with an average monthly count of 4320 per 100,000 persons during the 12 months preceding the onset of the COVID-19 pandemic, followed by Sweden with an average monthly count per 100,000 persons of 3530, and the lowest average monthly count per 100,000 persons of 2091 was found in Slovenia.

Changes in drug dispensation rates

The immediate change was defined as the deviation from expected rates in March 2020, the onset of the pandemic. The intermediate change was defined as the deviation from expected rates in April 2020. The long-term change was defined as the average deviation from expected rates in the entire intra-pandemic period; from March 2020 through December 2020.

The Austrian population at large displayed a statistically significant immediate increase of 5% in March 2020 (Table 3). However in April 2020 the dispensation in Austria later decreased significantly, compared to pre-pandemic levels. For age and gender differences, see Table 3, Figure 3. The Slovenian population displayed a statistically significant increase of 6% in March 2020 (Table 3, Figure 4). Contrary to Austria and Sweden, the dispensation rates in the entire Slovenian population continued to increase to 11% compared to expected rates in April 2020 and in May 2020. An immediate increase of 8% in the dispensation of antidepressants was displayed in March 2020 in Sweden's general population, see Table 3, Figure 5. After that the rates decreased throughout 2020.

As the early isolated peaks in all countries were followed by a rapid drop in antidepressant dispensation, this may be attributable to stockpiling behaviour by individuals who held valid prescriptions from before the onset of the pandemic but had yet to receive dispensation at a pharmacy, so we tried to exclude these months and after excluding the assumed stockpiling months, Austria and Slovenia, which had previously displayed significant long-term increases, generally dropped to close-to-expected and lower-than-expected rates, indicating no change and decreasing rates in dispensation of antidepressants in the intra-pandemic period.

Impact of country-specific containment measures

The relationships between the investigated containment measures and change in dispensation of antidepressant medication were weak. School closures in Austria were associated with slight decreases in dispensation of antidepressant medication. No statistically significant associations between school closures and a change in dispensation of antidepressant medication were found in the younger school-age group (0–29 years old) in any of the countries included.

Table 3 The immediate (in March), intermediate (April 2020) and long-term change (March 2020 – December 2020) in dispensation of antidepressant medication as Dispensation Rate Ratio (DRR) [Observed / Expected] including 95% confidence intervals for Austria, Slovenia and Sweden.

		DRR (95%CI)	Austria	Slovenia	Sweden	
Immediate change	Both genders	All ages	1.05 (1.04-1.08)*	1.06 (1.00-1.12)*	1.08 (1.07-1.10)*	
		0-29	1.09 (1.05-1.12)*	1.01 (0.97-1.06)	1.02 (1.00-1.05)	
		30-59	1.07 (1.05-1.10)*	0.99 (0.97-1.02)	1.11 (1.09-1.13)*	
		60+	1.04 (1.02-1.06)*	0.99 (0.96-1.03)	1.08 (1.05-1.11)*	
	Females	All Ages	1.10 (1.05-1.15)*	1.06 (1.00-1.12)*	1.10 (1.08-1.12)*	
		0-29	1.09 (1.05-1.13)*	1.04 (1.00-1.08)*	1.03 (1.00-1.05)*	
		30-59	1.07 (1.05-1.10)*	0.99 (0.97-1.02)	1.13 (1.11-1.15)*	
		60+	1.04 (1.07-1.12)*	1.06 (1.01-1.12)	1.08 (1.05-1.11)*	
	Males	All ages	1.04 (1.02-1.06)*	0.98 (0.96-1.02)	1.07 (1.05-1.09)*	
		0-29	1.02 (0.99-1.05)	0.96 (0.92-1.02)	1.03 (1.00-1.05)*	
		30-59	1.05 (1.02-1.06)*	0.99 (0.96-1.02)	1.09 (1.06-1.11)*	
		60+	1.02 (0.99-1.05)	0.98 (0.95-1.02)	1.07 (1.05-1.08)*	
	Intermediate change	Both genders	All ages	0.88 (0.87-0.90)*	1.11 (1.05-1.16)*	0.97 (0.96-0.99)*
			0-29	0.95 (0.92-0.98)*	1.07 (1.03-1.11)*	0.94 (0.93-0.96)*
			30-59	0.90 (0.88-0.92)*	1.12 (1.08-1.14)*	0.97 (0.96-0.99)*
			60+	0.87 (0.85-0.89)*	1.22 (1.18-1.26)*	0.97 (0.94-1.00)
Females		All Ages	0.88 (0.85-0.92)*	1.12 (1.06-1.17)*	0.98 (0.96-0.99)*	
		0-29	0.95 (0.91-0.98)*	1.05 (1.00-1.08)*	0.93 (0.92-0.95)*	
		30-59	0.90 (0.88-0.92)*	1.11 (1.08-1.14)*	0.97 (0.95-0.99)*	
		60+	0.87 (0.85-0.89)*	1.17 (1.11-1.24)*	0.97 (0.94-1.00)	
Males		All ages	0.88 (0.86-0.90)*	1.15 (1.12-1.19)*	0.98 (0.97-1.00)	
		0-29	0.91 (0.88-0.93)*	1.10 (1.04-1.16)*	0.96 (0.94-0.98)*	
		30-59	0.90 (0.88-0.91)*	1.12 (1.08-1.14)*	0.97 (0.96-1.00)	
		60+	0.86 (0.84-0.89)*	1.20 (1.16-1.23)*	0.99 (0.98-1.00)	
Long-term change		Both genders	All ages	0.94 (0.92-0.96)*	1.11 (1.06-1.16)*	0.98 (0.96-0.99)*

		0-29	0.99 (0.98-1.02)	1.07 (1.02-1.11)*	0.94 (0.93-0.96)*
		30-59	0.94 (0.92-0.96)*	1.11 (1.09-1.15)*	0.97 (0.96-0.99)*
		60+	0.93 (0.91-0.95)*	1.22 (1.19-1.26)*	0.97 (0.94-1.00)
	Females	All Ages	0.94 (0.92-0.96)*	1.11 (1.06-1.17)*	0.97 (0.96-0.99)*
		0-29	1.02 (0.98-1.05)	1.05 (1.01-1.09)*	0.93 (0.91-0.96)*
		30-59	0.93 (0.91-0.95)*	1.12 (1.09-1.15)*	0.97 (0.94-0.99)*
		60+	0.93 (0.91-0.96)*	1.17 (1.11-1.24)*	0.97 (0.94-1.00)
	Males	All ages	0.94 (0.92-0.95)*	1.16 (1.13-1.19)*	0.98 (0.97-1.00)*
		0-29	1.02 (0.98-1.05)	1.10 (1.04-1.16)*	0.96 (0.94-0.98)*
		30-59	0.95 (0.92-0.96)*	1.12 (1.09-1.14)*	0.98 (0.96-1.00)
		60+	0.92 (0.90-0.94)*	1.20 (1.16-1.23)*	0.99 (0.98-1.00)

* Indicates that the DRR significantly deviates from the expected rate according to age group, gender, and calendar month

Figure 3 Antidepressant medication dispensations, both genders, all ages in Austria. (A) Monthly dispensing rate per 100,000 individuals. (B) Dispensation Rate Ratios [observed/expected].

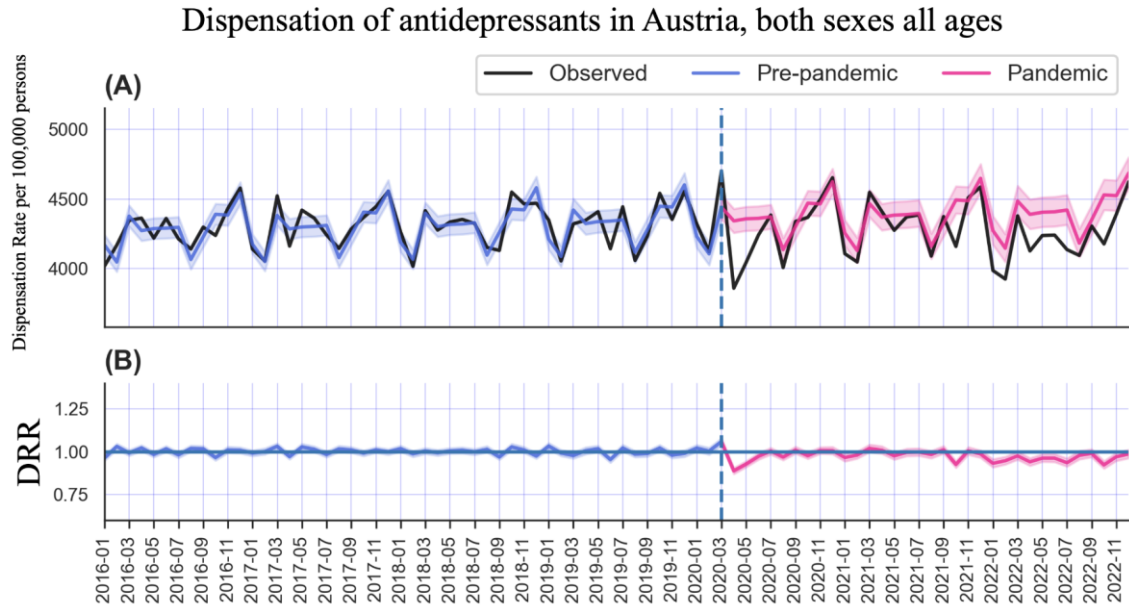


Figure 4 Antidepressant medication dispensations, both genders, all ages in Slovenia. (A) Monthly dispensing rate per 100,000 individuals. (B) Dispensation Rate ratios [observed/expected].

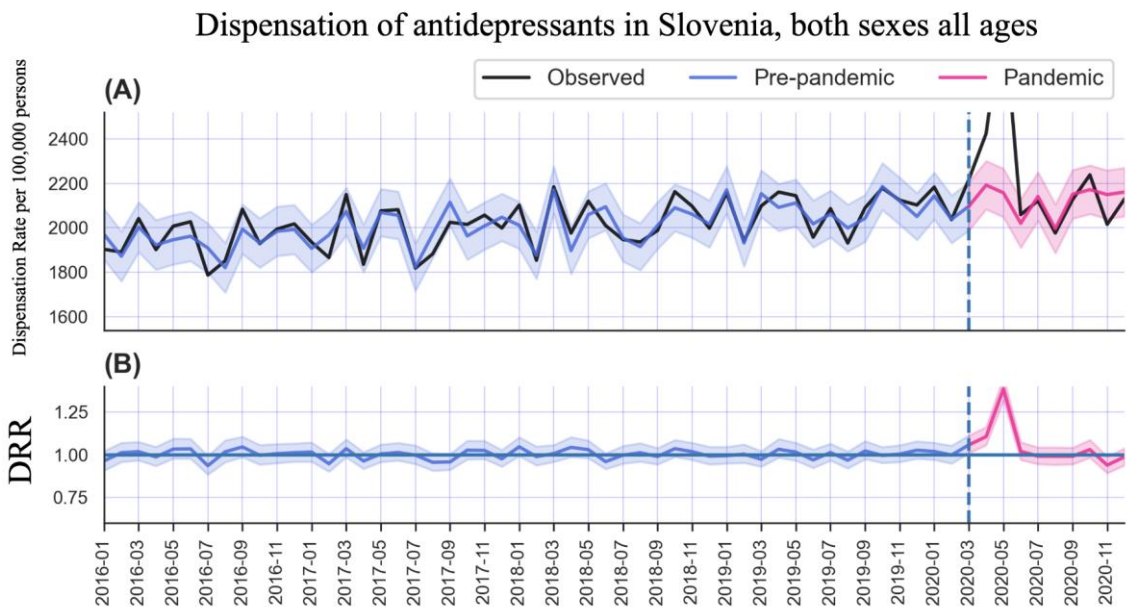
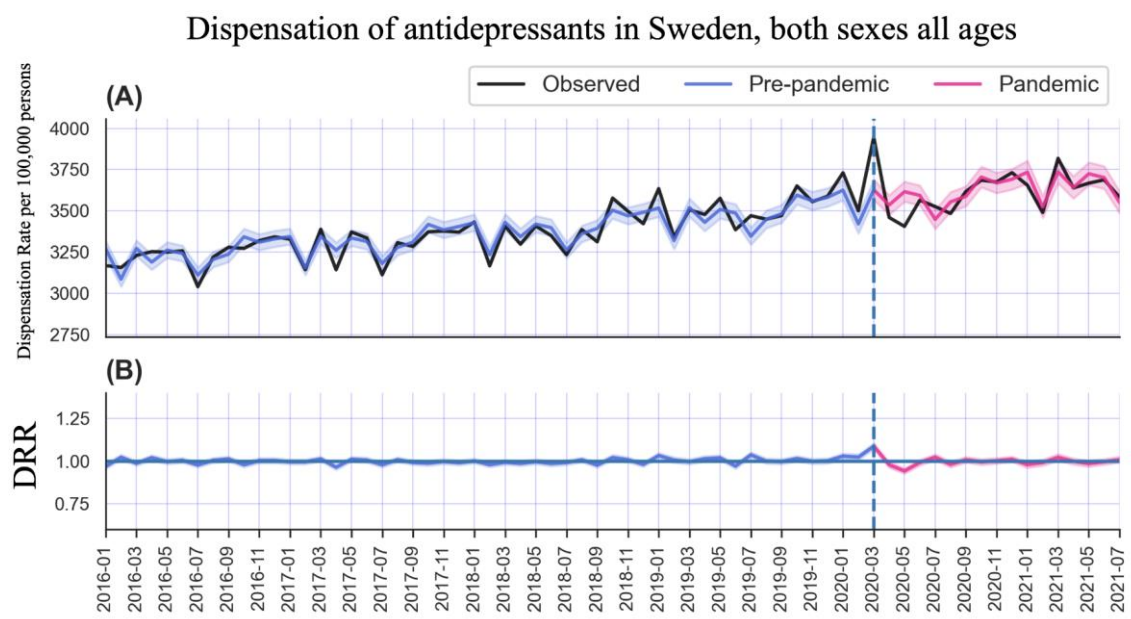


Figure 5 Antidepressant medication dispensations, both genders, all ages in Sweden. (A) Monthly dispensing rate per 100,000 individuals. (B) Dispensation Rate Ratios [observed/expected].



3.3. Summary of the findings

During the initial phase of the COVID-19 pandemic (April–May 2020) the prevalence of primary care-recorded CMDs dropped in Sweden, Norway and the Netherlands, but increased in Latvia. In Norway and the Netherlands, prevalence returned to baseline during the summer of 2020 and then remained close to expected levels until the end of the study period (March 2021). Meanwhile, Sweden and Latvia maintained decreased and increased CMDs care prevalence, respectively.

Regarding changes in rates of dispensations of antidepressant medication, Austria, Sweden and Slovenia had peaks in the early stages of the pandemic. However for Slovenia these somewhat higher rates at the beginning were kept throughout the pandemic whereas for Austria and Sweden, they decreased at the start of the pandemic to lower-than-expected levels. Women generally displayed higher increases in most countries and across age groups compared to their male counterparts. After excluding the assumed stockpiling months, Austria and Slovenia, which had previously displayed significant long-term increases, generally dropped to close-to-expected and lower-than-expected rates.

Within-country differences in changes in the prevalence of seeking primary care due to CMDs and/or dispensation of antidepressant medication could be due to both actual need and varying COVID-19 restriction policies, making seeking mental healthcare

easier or more difficult. International differences are furthermore modulated by country-specific organisation of healthcare systems (e.g., degree of virtualisation in primary healthcare services) and cultural factors influencing help-seeking behaviour.

The main strength of the studies is the relatively long time series allowed for predictions of prevalence rates taking into account seasonality and long-term trends. Furthermore, using country-specific indices quantifying the extent of containment measures in relevant dimensions, the current studies provide an initial attempt to evaluate the effects of policy on public mental health. There are several limitations too. Firstly, the data quality of the outcomes likely differs between countries and possibly within the same country over time. Since data providers were reluctant to send microdata, we requested aggregated data which, despite detailed specifications, might differ depending on the extraction procedures. Secondly, we are unable to separate changes in true need or rates triggered by the pandemic from confounding factors of changes in healthcare utilisation (e.g., due to access and healthcare-seeking behaviour unrelated to need). Consequently, any conclusions about the effect of the pandemic and associated containment measures on public mental health based on data on care utilisation or dispensation rates are limited.

Chapter 4

4. Chapter 4: The findings in context

1.1. Summary of the findings

At the beginning of the COVID-19 pandemic, and at each initiation of specific containment measures, worries arose that the infection itself, the residual conditions, and the consequences of the containment measures and the large and unexpected macro- and micro economic changes would increase CMDs in the population.(5) According to our systematic review, the worries that CMDs would increase was supported by a large body of literature concluding that CMDs had increased in a range of populations in different countries following the economic crisis in 2008.(10) Contrary to early studies in the first year of the pandemic, our studies have not found support for that the COVID-19 pandemic has modified overall CMD rates in the European countries we have been studying, albeit small increases and decreases in different measures in specific countries. Our meta-analysis (11) of self-reported CMDs in European countries (including studies from Spain, the United Kingdom, Ireland, Denmark, Austria, the Netherlands, Norway and the Czech Republic) totalling 88,620 persons show that as the COVID-19 pandemic progressed, there was a decline in mild forms of CMDs, while rates of severe CMDs remained stable. However school restrictions were found to be associated with small increases in mild CMDs. Only in Ireland was increases in the prevalence of mild CMDs from the pre-pandemic period seen, while the Netherlands saw decreases from pre-pandemic to during pandemic in the prevalence of mild CMDs, the only country to experience this. In the retrospective observational study of CMD-related primary healthcare utilisation in Sweden, Norway, the Netherlands and Latvia, we observed that CMDs dropped during the initial phase of the COVID-19 pandemic (April–May 2020) in Sweden, Norway and the Netherlands, but increased in Latvia.(12) In Norway and the Netherlands, the prevalence returned to baseline during the summer 2020 and then remained close to expected levels until the end of the study period (March 2021). Meanwhile, Sweden and Latvia maintained the same new levels. In the retrospective observational time series study of antidepressant dispensation in Sweden, Austria and Slovenia there were isolated peaks in the early stages of the pandemic, followed by a drop to either close-to or lower-than-expected rates that more or less stagnated until the end of 2020.(13) In April 2020, Slovenia continued to display increased rates, whereas Austria and Sweden decreased to lower-than-expected levels. Meanwhile, Sweden maintained the same new levels. After excluding the assumed stockpiling months, Austria and Slovenia, which had previously displayed significant

long-term increases, generally dropped to close-to-expected and lower-than-expected rates.

1.2. Self-reported CMDs

Earlier findings regarding self-reported CMDs as an effect of the pandemic have been mixed. An early global meta-analysis covering the first year of the COVID-19 pandemic found that population mobility and daily COVID-19 infection rates were associated with approximately a 25% increase in the prevalence of CMDs in 2020 compared to 2019.⁽¹⁴⁾ Later meta-analyses assessing studies globally with pre-pandemic to during pandemic data found no changes in the prevalence of a broader range of mental disorders and symptoms when assessed after mid-2020, although there was an initial increase in prevalence at the beginning of the pandemic ^(16,17) resembling our meta-analysis with a European focus. The early study “Global prevalence and burden of depressive and anxiety disorders in 204 countries and territories in 2020 due to the COVID-19 pandemic” ⁽¹⁴⁾ were debated as it relied on the Global burden of disease (GDB) framework for estimating pre-pandemic levels of CMDs and used single-threshold values, but our meta-analysis used repeated cross-sectional studies or longitudinal design to measure the baseline level and utilised two separate levels of CMDs (i.e. mild and severe).⁽¹¹⁾ Moreover, the longer follow-up periods of the included studies have allowed additional nuances in these changes, associations, and long-term effects.

1.3. Primary care utilisation due to CMDs

The initial drop in CMD-related primary care utilisation seen in our study and a subsequent return to pre-pandemic levels parallels what has been seen elsewhere. During April 2020 in the UK, Carr et al.⁽¹⁸⁾ reported reductions in treated incidence of CMDs. Although there was an initial increase of treated cases (19%) of anxiety reported during March 2020 in a Spanish population;⁽¹⁹⁾ this was soon replaced by a large decrease. Furthermore, depression immediately showed a sharp decrease (64%) during the first months (March to June 2020) of the pandemic, and by early 2021 CMD incidences reached pre-lockdown levels. Differences among the healthcare systems (e.g., care expenditure and accessibility) prevent conclusive country comparisons both of prevalence rates at baseline and over time. The country that did not align with this pattern is Latvia, which displayed prolonged elevated levels of primary care utilisation.

This might be due to the low baseline prevalence in Latvia, likely reflecting a patient group of more severe cases, hence unable to halt care seeking.(20) Also, until recently, Latvian mental health services were primarily limited to providing in-patient care. New funds from the EU in 2019 were allocated to improve Latvia's outpatient mental healthcare by strengthening the current facilities and opening new psychiatric clinics.(21) This recent change in access to healthcare may have influenced the intra-pandemic rates of individuals who had been suffering for a long period of time and finally received delayed treatment during the pandemic.

1.4. Tele-/online consultation

The strict containment measures during the pandemic reduced the access to physical healthcare services and health delivery systems worldwide have experienced a shift in the mode of delivery of care, with a dramatic transfer from face-to-face consultation towards tele-/online consultations. In the current study, only Swedish and Norwegian data contained information on the degree to which primary healthcare encounters were provided face-to-face or through distance consultations. While Sweden increased CMDs distance consultations by 74%, in Norway the increase was 117%, which contributed to maintained rates in Norway despite falling rates in Sweden during 2020. This is in line with studies from the Netherlands (22) and Denmark (23), which found that the declining number of in-person encounters in psychiatric open care coincided with an increase in telehealth encounters.

1.5. Dispensation of antidepressant medications

Antidepressant medication is considered one of the first-line treatments for moderate to severe depression and is commonly prescribed concurrently with psychological treatment to patients diagnosed with clinical depression and can be prescribed using tele-/online consultations. Hence, antidepressants dispensation rates can serve as a proxy for the prevalence of multiple depressive symptoms included among CMDs. The finding of isolated peaks in the early stages of the pandemic, followed by a drop to either close-to or lower-than-expected rates that more or less stagnated until the end of 2020 and this has been reported elsewhere. One Scandinavian study found general increases in antidepressant medication dispensation rates by the end of 2020 in Denmark, Norway and Sweden (24) and so did Israeli studies.(25) However in a study from Poland, the

rates decreased (26) and in Canada no differences were found.(26) In April 2020, Slovenia continued to express an increased rate, whereas Austria and Sweden saw decreases to lower-than-expected levels, in similarity with Canada.(26)

1.6. Containment measures

Overall, none of our studies showed strong associations between the onset of the containment measures and CMD. This is in contrast with a survey study covering 33 countries, which found that the prevalence of depression was significantly lower in countries with promptly implemented stringent restrictions.(27) However, our studies assessed prevalence at both early and later timepoints when restriction measures had already been implemented for an extended time. Given the high correlation of the policy indices, it is not surprising that the impact of each was similar and negligible in magnitude. The only containment measure that seems to have had an effect was the school restrictions which the meta-analysis indicated were associated with self-reported increases in mild CMDs. This is in line with increased distress levels among parents and children in association with school closures.(28,29)

1.7. Limitations of this report

This report exclusively addresses CMDs; therefore, we cannot draw conclusions regarding changes in other, more severe, mental disorders nor suicidality. However both severe mental illness and suicide are studied in Europe with similar results as ours regarding CMDs, meaning no great increase was seen but rather sometimes decreases.(7,8) Also, different diagnoses can have specific patterns and in the future needs to be studied by themselves, as done in Rumania. (30). In addition, the report gives no deeper understanding of vulnerable groups with additional risk factors of CMDs. To read more about the vulnerable groups and the policy challenges with regard to vulnerable groups, (see our other report: D2.4 Report: “Health Inequalities from the perspective of COVID-19’s impact on the mental health of specific vulnerable groups” published in parallel with this report).

CONCLUSIONS

CONCLUSIONS

When summing up our findings and comparing them to similar studies of the COVID-19 pandemic, we do not see an overall increase of CMDs in Europe from the start of the pandemic—and in some areas there has even been a decrease. Except for a small increase in mild CMDs associated with school closings, there is no sign of an increase in CMDs due to the containment measures. This is surprising, as the economic crisis in 2008 had negative effects on CMDs in many European countries. One explanation could be that the populations at large adopted to a collective “new normal.” Furthermore, the temporal nature of the pandemic and its associated restrictions may have had a less invasive effect on mental health than initially expected. It may also be possible that the increased awareness during the pandemic about mental health counteracted the risk factors associated with the implementation of containment measures.

REFERENCES

REFERENCES

1. Periscope. https://periscopeproject.eu/home_2023
2. Periscope. D2.4 Report: “Health inequalities from the perspective of COVID-19’s impact on the mental health of specific vulnerable groups” <https://backend.periscopeproject.eu/multimedia/periscope/mMax6HvJY-d2.1.-analytical-report-on-mental-health-impacts.pdf>: Periscope; 2023.
3. World Health Organisation (WHO). Depression and Other Common Mental Disorders: Global Health Estimates. Geneva: World Health Organization; 2017.
4. Ahmed N, Barnett P, Greenburgh A, Pemovska T, Stefanidou T, Lyons N, et al. Mental health in Europe during the COVID-19 pandemic: a systematic review. *The Lancet Psychiatry*. 2023;10(7):537
5. Pirkis J, Gunnell D, Shin S, Del Pozo-Banos M, Arya V, Aguilar PA, et al. Suicide numbers during the first 9-15 months of the COVID-19 pandemic compared with pre-existing trends: An interrupted time series analysis in 33 countries. *eClinicalMedicine*. 2022;51:101573.
6. Davidson JR. Major depressive disorder treatment guidelines in America and Europe. *Journal of Clinical Psychiatry*. 2010;71 Suppl E1:e04.
7. Stedman RC, Connelly NA, Heberlein TA, Decker DJ, Allred SB. The End of the (Research) World As We Know It? Understanding and Coping With Declining Response Rates to Mail Surveys. *Society & Natural Resources*. 2019;32(10):1139–54.
8. Holmes EA, O’Connor RC, Perry VH, Tracey I, Wessely S, Arseneault L, et al. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. *The Lancet Psychiatry*. 2020;7(6):547–60.
9. Niemi M, Osika W, Asper M, Dalman C, Pöllänen E, Simonsson O, et al. Analytical report on mental health impacts Deliverable 2.1. <https://periscopeproject.eu/>; 2020.
10. Asper M, Osika W, Dalman C, Pollanen E, Simonsson O, Flodin P, et al. Effects of the COVID-19 pandemic and previous pandemics, epidemics and economic crises on mental health: systematic review. *BJPsych Open*. 2022;8(6):e181.
11. Lok V, Sjöqvist H, Sidorchuk A, Flodin P, Osika W, Daly M, et al. Changes in anxiety and depression during the COVID-19 pandemic in the European population: A meta-analysis of changes and associations with restriction measures. 2023 *European Psychiatry* <https://doi.org/10.1192/j.eurpsy.2023.2467>

12. Flodin P, Sorberg Wallin A, Tarantino B, Cerchiello P, Mlada K, Kuklova M, et al. Differential impact of the COVID-19 pandemic on primary care utilization related to common mental disorders in four European countries: A retrospective observational study. *Frontiers in Psychiatry*. 2022;13:1045325.
13. Syvertsen A. Changes in antidepressant dispensation rates during the COVID-19 pandemic in Europe. A retrospective observational study using register data from Austria, Latvia, Slovenia and Sweden. Stockholm: Karolinska Institutet; 2023. (<https://ki.se/en/gph/periscope-a-pan-european-response-to-the-impacts-of-covid-19-and-future-pandemics-and-epidemics>)
14. Collaborators C-MD. Global prevalence and burden of depressive and anxiety disorders in 204 countries and territories in 2020 due to the COVID-19 pandemic. *Lancet*. 2021;398(10312):1700
15. Kubinec R, Barceló J, Goldszmidt R, Grujic V, Model T, Schenk C, et al. Statistically Validated Indices for COVID-19 Public Health Policies. Charlottesville; 2021.
16. Aknin LB, Andretti B, Goldszmidt R, Helliwell JF, Petherick A, De Neve JE, et al. Policy stringency and mental health during the COVID-19 pandemic: a longitudinal analysis of data from 15 countries. *Lancet Public Health*. 2022;7(5):e417–e26.
17. Robinson E, Sutin AR, Daly M, Jones A. A systematic review and meta-analysis of longitudinal cohort studies comparing mental health before versus during the COVID-19 pandemic in 2020. *Journal of Affective Disorders*. 2022;296:567–76.
18. Carr MJ, Steeg S, Webb RT, Kapur N, Chew-Graham CA, Abel KM, et al. Effects of the COVID-19 pandemic on primary care-recorded mental illness and self-harm episodes in the UK: a population-based cohort study. *Lancet Public Health*. 2021;6(2):e124–e35.
19. Raventos B, Pistillo A, Reyes C, Fernandez-Bertolin S, Aragon M, Berenguera A, et al. Impact of the COVID-19 pandemic on diagnoses of common mental health disorders in adults in Catalonia, Spain: a population-based cohort study. *BMJ Open*. 2022;12(4):e057866.
20. Taube M, Quentin W. Provision of community-based mental healthcare, Latvia. *Bull World Health Organ*. 2020;98(6):426–30.
21. Rancans E, Vrublevska J, Kivite-Urtane A, Ivanovs R, Ziedonis D. Prevalence of major depression and associated correlates in Latvian primary care population:

- results from the National Research Program BIOMEDICINE 2014-2017. *Nordic Journal of Psychiatry*. 2020;74(1):60–8.
22. Chow MW, Noorthoorn EO, Wierdsma AI, van der Horst M, de Boer N, Guloksuz S, et al. Impact of the first COVID-19 outbreak on mental health service utilisation at a Dutch mental health centre: retrospective observational study. *BJPsych Open*. 2021;7(6):e213.
 23. Hansen JP, van Sas TQB, Flojstrup M, Brabrand M, Hvolby A. The effect of the March 2020 COVID-19 lockdown on national psychiatric contacts in Denmark: An interrupted time series analysis. *Brain and Behavior*. 2021;11(8):e2264.
 24. Tiger M, Wesselhoeft R, Karlsson P, Handal M, Bliddal M, Cesta CE, et al. Utilization of antidepressants, anxiolytics, and hypnotics during the COVID-19 pandemic in Scandinavia. *Journal of Affective Disorders*. 2023;323:292–8.
 25. Frangou S, Travis-Lumer Y, Kodesh A, Goldberg Y, New F, Reichenberg A, et al. Increased incident rates of antidepressant use during the COVID-19 pandemic: interrupted time-series analysis of a nationally representative sample. *Psychological Medicine*. 2022:1–9.
 26. Krupa D, Czech M, Pinkas J, Mosiolek A. Impact of COVID-19 Pandemic on the Use of Antidepressant and Antianxiety Pharmaceuticals as Well as Sick Leave in Poland. *Int J Environ Res Public Health*. 2022;19(4).
 27. Prati G, Mancini AD. The psychological impact of COVID-19 pandemic lockdowns: a review and meta-analysis of longitudinal studies and natural experiments. *Psychological Medicine*. 2021;51(2):201
 28. Spinelli M, Lionetti F, Pastore M, Fasolo M. Parents' Stress and Children's Psychological Problems in Families Facing the COVID-19 Outbreak in Italy. *Frontiers in Psychology*. 2020;11:1713.
 29. Ludwig-Walz H, Dannheim I, Pfadenhauer LM, Fegert JM, Bujard M. Increase of depression among children and adolescents after the onset of the COVID-19 pandemic in Europe: a systematic review and meta-analysis. *Child Adolesc Psychiatry Ment Health*. 2022;16(1):109.
 30. Serbanescu, M. and Diaconu C. COVID-19 impact on mental health with a specific focus on the access to and consumption of mental health care services in Romania, 2023 Stefan S. Nicolau Institute of Virology. (<https://ki.se/en/gph/periscope-a-pan-european-response-to-the-impacts-of-covid-19-and-future-pandemics-and-epidemics>)

APPENDIX for the report “Mental Health Impacts in Different European Populations”:
Deliverable 2.3

Challenges of collecting data on mental health care utilisation in Europe



EXECUTIVE SUMMARY OF THE APPENDIX

The Horizon 2020-funded PERISCOPE project Work Package 2 (WP2) has collected mental health utilisation data in Europe. This process has encountered several obstacles, which are described below. For the collection of the data, we contacted a wide range of institutions in Europe. Contacts were identified by employing a snowball sampling approach involving searching the research literature and engaging with collegial networks, including the PERISCOPE network. In total, we reached out to over 500 individuals despite great effort, the data collected only covers less than 2/3 of the European countries, as reported in PERISCOPE's COVID-Atlas (<https://periscopeproject.eu/covid-atlas>). To improve knowledge of mental health utilisation in the future, The European Health Data Space needs to facilitate standardised data.

Background

Tracking changes in the mental health of the general population can be accomplished using surveys and self-assessment instruments. However, changes in the mental health in the general population can also be studied using suicide rates, rate of psychotropic prescriptions or mental health care utilisation. Most studies investigating the mental health impact of the pandemic rely on surveys, including self-assessment instruments like The General Health Questionnaire (GHQ), or more precise clinical instruments (e.g., World Health Organization Composite International Diagnostic Interview (CIDI)). However, time trends in mental health care utilisation data can provide important complementary information to survey data; first because routinely collected mental health care data are continuously recorded with higher time resolutions compared to survey studies that rely on only one or a few baseline measurements. Secondly, mental health care utilisation records are based on clinically validated diagnoses determined by clinicians, whereas survey studies, even when employing validated psychometric assessment scales, rely on less valid self-reported data that commonly overestimate rates of mental illness. Thirdly, healthcare utilisation data sometimes provide more complete coverage of the study population than what is feasible using survey data.

Even before the pandemic, researchers, along with policymakers, have faced obstacles in accessing the data they need and this has been acknowledged as one of the reasons for the European Health Data Space (https://health.ec.europa.eu/ehealth-digital-health-and-care/european-health-data-space_en) to support better use of health care data in Europe. Below is an example of the work of the PERISCOPE project to illustrate the persisting challenges in obtaining mental health care utilisation data in Europe.

The aim of this project was to gather monthly counts of mental health care utilisation for individuals, stratified by age and gender group, spanning from 2015 until at least December 2020, and, in some cases, later.

Requested data included five types of population register data:

- a) suicide rates
- b) prescription rates and utilisation of psychiatric services
- c) access to a primary care
- d) specialised outpatient care
- e) and inpatient care

Contacted persons

Starting in November 2020, we contacted a wide range of individuals involved in public health institutions and epidemiological research in Europe. Contacts were identified through research literature, engagement with collegial networks in public mental health, including the PERISCOPE network, by employing a snowball sampling approach. In total, we reached out to over 500 individuals from November 2020 to June 2023.

Countries

We contacted researchers and/ or governmental organisations to obtain data in the following countries: Australia, Bosnia, Bulgaria, Belgium, Switzerland, Denmark, Estonia, Greece, Ireland, Spain, France, Finland, the United Kingdom, Hungary, Croatia, Israel, Island, Italy, Latvia, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Slovakia, and Sweden.

Person Months

Six persons have been involved in the data collections, part-time, for approximately 4–30 months.

Variables by type of data

Altogether, we requested approximately 100 register-based mental health outcomes. In detail, this included data on healthcare usage related to nine disease categories: anxiety disorders, depressive disorders, alcohol use disorders, self-harm, insomnia, post-traumatic stress disorders (PTSD), all psychiatric disorders, schizophrenia, and any other (somatic or psychiatric) disorder. For both primary and outpatient care, we collected five metrics for each disease category:

- Number of unique individuals per month.
- Number of unique individuals using remote consultations per month.
- Total number of encounters per month.
- Number of remote encounters per month.
- Number of first visits within a 365-day period.

This meant, in a best-case scenario, we would ideally have obtained 45 metrics (9 diseases x 5 metrics) related to the usage of both primary care and specialised outpatient care. For inpatient care, we requested data on the same disease groups, but only for 3

metrics (excluding those related to remote consultations). This would ideally have resulted in 27 variables (9 diseases x 3 metrics).

We also gathered monthly data on individuals prescribed psychotropic medications, including anxiolytics, antidepressants, sedatives, and antipsychotics. Additionally, we wanted to obtain suicide data from death registers, using two specific ICD-10 definitions. We asked the data providers to break down the data by:

- Age groups (ideally in 5-year increments or multiples thereof)
- Gender
- Time (month and year)
- Geographical region (national or subnational)

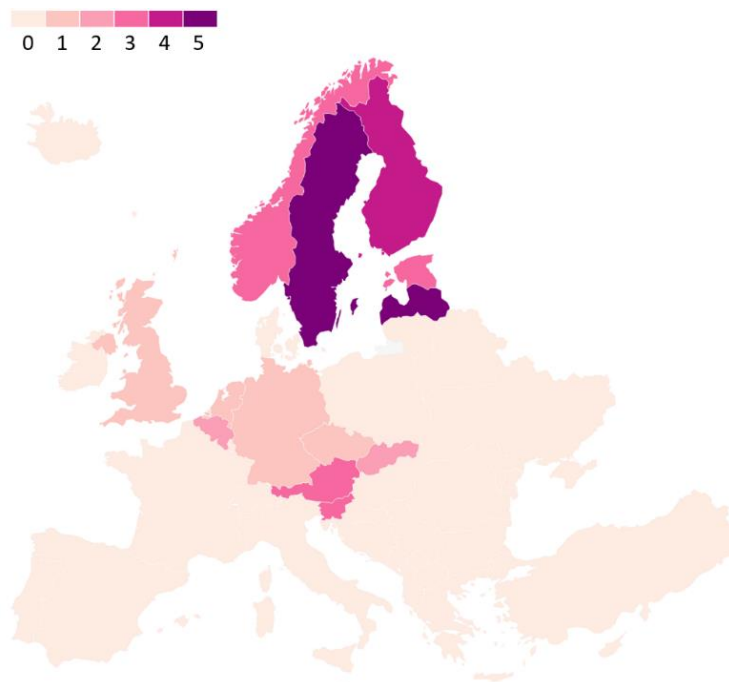
Obtained data

Eventually we obtained register data from 16 countries, see Figure 1 below. The data obtained from Scandinavia and the Baltic countries was the most complete. Monthly counts on psychiatric care utilisation in primary care were obtained from seven countries. Outpatient data was obtained from five countries, inpatient from nine, prescription rates from seven, and suicide from nine countries. Data availability was generally scarce, and due to the pandemic (at the time ongoing), the register owners frequently reported longer processing times than usual. Eventually, we obtained tailored datasets from four countries (and seven independent databases). The collected data can be found in PERISCOPE's project COVID-Atlas: <https://periscopeproject.eu/covid-atlas>.

Cost of purchases

The cost of the data has varied greatly: We have paid between EUR 0 for primary care data from Sweden to EUR 8,000 for specialised care data from Norway. Up to this point, we have paid a total of approximately EUR 56,000.

Figure 1: The number of types of data obtained from health registers in Europe



Policy recommendations regarding better access to mental health data in Europe

The data eventually collected on mental healthcare utilisation can be viewed in <https://periscopeproject.eu/covid-atlas>. The European Health Data Space (EHDS) is an initiative to improve access to and the comparability of health data in European countries, and efforts are ongoing, as there are major problems regarding the coverage and comparability of health data. Monitoring and research on mental health in the EU would benefit from having standardised data and from making existing data available promptly, including access for researchers abroad; possibly facilitated by organisations like Eurostat, where aggregated data from member countries can be requested, similar to how cause of death data is already provided by Eurostat for everyone upon request (although the data is time-lagged, and is updated yearly, rather than monthly).

One of the aims of WP2 was to explore how the COVID-19 pandemic has affected mental health and mental healthcare utilisation in EU countries. To suggest policy recommendations based on other findings of the WP2 (see the main report No. 2.3: Mental Health Impacts in Different European Populations and its sister report the D2.4 Report: “Health Inequalities from the perspective of COVID-19’s impact on the mental health of specific vulnerable groups.” The WP2 arranged a preparatory workshop (held

on 18 January 2023) to suggest recommendations and among these recommendations some recommendations concerned an increase of the availability of relevant data. The insights gathered during the first workshop were used to further develop a policy-driven discussion during a follow-up meeting, held on 29 March 2023, with Public Health experts.

Both a summary of the workshops and the additional policy recommendations can be read in PERISCOPE Deliverable 2.4: Health Inequalities from the perspective of COVID-19's impact on the mental health of specific vulnerable groups, written in parallel with this report D 2.3.

Conclusion

To facilitate data exchange and comparison between countries, care data needs to be standardised, with the goal of increasing the understanding of mental health and mental health care utilisation in the EU.

