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## Severe mental illness and European COVID-19 vaccination strategies

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For QCovid algorithm see <https://qcovid.org>

See Online for appendix

The EU advises prioritising vaccination for people whose health makes them particularly at risk for severe COVID-19, but leaves it to member states to decide which medical conditions get prioritised. Ethical, neuroscientific, and public health considerations have been used to prioritise individuals with severe mental illness (ie, psychotic disorders, bipolar disorders, and severe major depressive disorders).<sup>3–5</sup> We systematically reviewed national COVID-19 vaccine deployment plans across 20 European countries (appendix pp 1–2).

Eight of 20 countries explicitly mentioned psychiatry or mental illness in their national vaccine strategy documents. Several countries prioritised institutional residents, which can include people with severe mental illness (table). Only four countries (Denmark, Germany, the Netherlands, and the UK) had some form of higher vaccination priority for outpatients with severe mental illness. Additionally, Latvia, Romania, Spain, and Sweden prioritised outpatients with disabilities, possibly including severe mental illness, whereas the Czech Republic and Sweden specified behavioural or mental problems interfering with pandemic regulation adherence as priority indication.

A European Centre for Disease Control and Prevention survey found that most European countries used a combination of epidemiological data, mathematical modelling, guidelines, ethical considerations, and published research to define specific morbidities for vaccine prioritisation.<sup>4</sup> Here, we present four examples (from the Netherlands, UK, Denmark, and Germany) of different approaches that have positive outcomes for severe mental illness.

First, the UK used an Oxford University evidence-based algorithm to calculate the number of vaccinations needed to prevent one death.<sup>5</sup> Importantly, this QCovid algorithm (University of Oxford, UK), based on UK data from Jan 24 to June 30, 2020, explicitly includes severe mental illness among its risk predictors, and so does the UK vaccination strategy. However, preliminary data (which had not been peer reviewed as of Feb 11, 2021) suggest that vaccination coverage for patients with severe mental illness is lagging behind that of other comorbidity groups.<sup>6</sup>

Denmark, Germany, and the Netherlands initially omitted mental disorders from their COVID-19 vaccination strategies. After a large nationwide Danish cohort study found that an increased risk for 30-day mortality was associated with severe mental illness (adjusted OR 2.5, 95% CI 1.2–5.1) and use of antipsychotics (adjusted OR 3.3, 95% CI 2.3–4.8),<sup>7</sup> the Danish Health Authority urged health-care practitioners to refer for priority vaccination patients with psychotic disorders and other individuals with complex severe mental illness deemed to be at particularly high risk by the treating physician. Similarly, the Netherlands increased prioritisation of patients with severe mental illness following advocacy from mental health associations.<sup>8</sup>

The German federal research institute performed an umbrella review of published systematic reviews and meta-analyses to inform the federal Ministry of Health's selection of risk comorbidities.<sup>9</sup> However, evidence on psychiatric morbidity had not yet been systematically summarised at that time and was therefore not

National documentation		Cardiovascular		Metabolic		Lung		Immune system		CNS		Other		
Mentions psychiatric or mental illness	Priority for institutionalised people (<65 years)	List of risk comorbidities specified	Hypertension	Diabetes mellitus	Chronic kidney disease	Chronic liver disease	Chronic pulmonary disease	Auto-immune disease	Immuno-compromised conditions (eg, asplenia)	Post-transplant	Cerebrovascular disease	Chronic neurological or neuromuscular illness	Severe mental illness	Down syndrome
Effect sizes														
			1.09 (0.94-1.26)	1.32 (1.21-1.44)	1.55 (1.35-1.79)	1.74 (1.09-2.76)	1.89 (1.18-3.05)	HR1.19 (1.06-1.33)	RR1.39 (1.13-1.70)	4.20 (1.60-11.40)	1.44 (0.90-2.30)	HR 1.18 (1.08-1.28)	2.9 (1.3-6.6)	NA
Belgium	1	Yes	Tier1	Tier1	Tier1	Tier1	Tier1	Tier1	Tier1	Tier1	Tier1	Tier1	..	Tier1
Czech Republic	0	Yes	Tier1	Tier1	Tier1	Tier1	Tier1	..	Tier1	Tier1	..	Tier1	..	..
Denmark	1	Yes	..	Tier1	Tier1	Tier1	Tier1	..	Tier1	Tier1	..	Tier1	Tier1	Tier1
Finland	0	Yes	..	..	Tier1	Tier2	Tier1	..	Tier1	Tier1	..	..	..	..
France	1	Yes	Tier1	Tier1	Tier1	..	Tier1	..	..	Tier1	..	..	..	Tier1
Germany	1	Yes	Tier2	Tier1	Tier1	Tier1	Tier1	Tier2	Tier2	Tier1	Tier2	Tier2	Tier1	Tier1
Greece	0	No	..	..	..	..	..	..	..	..	..	..	..	..
Ireland	0	Yes	Tier1	Tier1	Tier1	Tier1	Tier1	..	Tier1	Tier1	..	Tier1	..	Tier1
Italy*	0	No	..	..	..	..	..	..	..	..	..	..	..	..
Latvia	0	Yes	Tier2	Tier1	Tier1	Tier2	Tier2	..	Tier2	Tier2	..	..	..	Tier1
Malta	1	No	..	..	..	..	..	..	..	..	..	..	..	..
Netherlands	1	Yes	..	Tier1	Tier1	Tier1	Tier1	Tier1	Tier1	Tier1	..	..	Tier1	..
Norway	0	Yes	..	Tier2	Tier1	Tier2	Tier2	Tier2	Tier1	Tier1	Tier2	Tier1	..	Tier1
Poland	0	Yes	Tier1	Tier1	Tier1	Tier1	Tier1	..	Tier1	Tier1	Tier1	Tier1	..	..
Portugal	0	Yes	Tier2	Tier2	Tier1	Tier1	Tier1	..	..	..	..	..	..	..
Romania	0	Yes	..	Tier1	Tier1	Tier1	Tier1	Tier1	Tier1	Tier1	Tier1	Tier1	..	Tier1
Spain	1	No	..	..	..	..	..	..	..	..	..	..	..	..
Sweden†	0	Yes	Tier1	Tier1	Tier1	Tier1	Tier1	..	Tier1	Tier1	Tier1	Tier1	..	Tier1
Turkey	0	No	..	..	..	..	..	..	..	..	..	..	..	..
UK	1	Yes	..	Tier2	Tier1	Tier1	Tier1	..	Tier1	Tier1	..	Tier2	Tier2	Tier1

Risk comorbidities selected for priority vaccination and their effect sizes (95%CI) for COVID-19 associated mortality risk. For full table of comorbidities see appendix p.3. Tier1 is highest priority risk comorbidities. Tier 2 is priority risk comorbidities. Effect sizes for COVID-19 mortality in risk comorbidities were adapted from umbrella review by Robert Koch Institut for the German national vaccination strategy. (literature search done Dec 11, 2020, and published Jan 29, 2021).<sup>3</sup> Effect sizes are OR, adjusted for at least the age of the study participants, unless otherwise specified. Empty cells show that this particular medical condition has not been specified as eligible for priority vaccination (ie, the strategy does not mention it). \*Two out of 20 Italian regions (Liguria and Veneto) are giving priority to residential care centers for people with disability and mental illness. †Besides people with a disease or condition involving an increase in risk, Sweden also prioritises a broader group of people with a condition that involves difficulties in following advice on infectious disease control measures; this applies to people aged 18-59 years with dementia and cognitive or mental impairment; this also applies to people living in socially vulnerable situations.

Table: Policies and risk comorbidities specified in national COVID-19 vaccination strategies

included in the original strategy. Following an update of its literature review, in which severe mental illness was found to be one of the few medical comorbidities with OR more than 2.0 for COVID-19 hospitalisation and mortality, the new strategy now explicitly includes severe mental illness in the highest risk group of medical comorbidities.<sup>9</sup>

Multiple high-quality studies have shown odds ratios for comorbid severe mental illness, and schizophrenia in particular, to equal or even surpass those of other risk comorbidities included for prioritisation (table).<sup>7,10</sup> Evidence-based policy would then require severe mental illness to be included in the list of risk comorbidities. Yet several sources of bias may have caused the risks associated with severe mental illness to be overlooked by most countries. Mental disorders are often not included as predictors in COVID-19 outcome studies. Studies specifically investigating the risks of psychiatric comorbidity have not yet been summarised in systematic reviews or meta-analyses and were therefore ignored by some national strategies and mathematical models.

Information collected in our report is not definitive or exhaustive. Countries are still developing vaccination plans and strategies can change as knowledge evolves. EU member states have been asked to share best practices for prioritisation through the Health Security Committee, coordinated by the European Commission.

In summary, European countries' vaccination strategies try to balance ethical and scientific evidence, but for individuals with severe mental illness an evidence-policy disconnect remains. Most of these patients are treated in the community, and are currently overlooked by the majority of European COVID-19 vaccination strategies. Our joint recommendations, representing professionals, patients, and families, are clear and urgent: explicit inclusion of both inpatients and outpatients with severe mental illness in priority groups for COVID-19 vaccination, meaningful patient and family organisational participation in developing vaccination plans, and engagement of peer workers in providing vaccination education to patients. We therefore call on the European authorities (Council, Parliament, and Commission), national health authorities, and the scientific community to take note of the summarised evidence and our recommendations, and to correct this intolerable inequality.

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