This Data Insight examines the impact of the Covid-19 pandemic on the mental health of clinically extremely vulnerable children and children living with clinically extremely vulnerable people in Wales, using data linkage methods. It is intended as a summary of a research article recently published in BMJ Open.

Background

In March 2020, people deemed clinically extremely vulnerable (CEV) to severe illness or death from Covid-19 were advised to ‘shield’ at home, remaining indoors and minimising contact with others. CEV people were identified in two ways: by applying an algorithm based on clinical code lists to routine electronic health records, and by health professionals based on their clinical judgement.

By July 2020, around 130,000 people had been identified as CEV in Wales. Almost 5,000 of these were children less than 18 years old. In addition, by June 2020, there were almost 14,400 school-aged children in Wales who were living with at least one other person who was advised to shield.
Restrictions imposed by the shielding guidance, coupled with a higher risk of severe illness, may have exacerbated feelings of loneliness and isolation and contributed to poorer mental health amongst CEV children compared to non-CEV children. In addition, children living with a CEV person may have been at greater risk of mental health difficulties. This is due to both restrictions to protect their vulnerable household members and fears of causing them harm.

Research examining the impact of the pandemic on the mental health of the population is ongoing, including the impact on children. Previously, no studies had examined the impact specifically on CEV children or children living with a CEV person.

Our study looked at the impact of the Covid-19 pandemic on use of healthcare services for anxiety or depression in Wales, for:

- CEV children
- children living with a CEV person
- children in the general population.

Such insights for this population are important to inform responses to potential future public health emergencies.

**What we did**

This research linked ten anonymised health and demographic datasets in the Secure Anonymised Information Linkage (SAIL) Databank. We created three study cohorts for 2020:

1. CEV children (n = 3,769)
2. Children living with at least one CEV person (n = 20,033)
3. A general population group of children who were not identified as CEV or living with a CEV person (n = 415,009).

To explore the potential impact of the pandemic on children's mental health, we created two comparison cohorts for 2019:

1. Children who had similar health conditions to CEV children, before the pandemic (n = 599)
2. A general population cohort of children living in Wales before the pandemic (n = 438,924).

We used clinical codes to identify the first record of anxiety or depression in primary or secondary healthcare data during the Covid-19 pandemic (23 March 2020 – 31 January 2021, referred to as 2020/2021) and pre-pandemic (23 March 2019 – 31 January 2020, referred to as 2019/2020).

We tested the hypothesis that there was no difference in the risk of having a record of anxiety or depression in primary or secondary care in 2020/2021 between the three cohorts (CEV children, children living with a CEV person and children in the general population).

To do this, we plotted Kaplan-Meier survival curves for each cohort, which show the probability of having no record of anxiety or depression over time. In addition, we used Cox regression to calculate unadjusted and adjusted Hazard Ratios with 95% confidence intervals (CIs). Cox regression is a method for investigating the effect of several variables upon the time a specified event takes to happen, and a Hazard Ratio estimates the relative risk of that event. Variables included age, sex, deprivation quintile, rurality and history of anxiety or depression as well as CEV status. Using the same methods, we also tested the hypothesis that there was no difference in the risk of having a record of anxiety or depression in 2019/2020 between two cohorts (CEV children and children in the general population).
Finally, we calculated the change in the period prevalence of anxiety or depression for CEV children and children in the general population, between 2019 and 2020. Period prevalence is defined as the proportion of a population that has a certain characteristic at any point during a given time period of interest.

**What we found**

There was no statistically significant difference in the risk of having a record for anxiety or depression in primary or secondary care between children living with a CEV person and children in the general population. This was after adjusting for demographic characteristics and history of anxiety or depression.

During the pandemic (2020/21), CEV children were found to be at a statistically significantly higher risk of having a record for anxiety or depression compared to children in the general population (Table 1, Figure 1, and Figure 2).

However, this significantly increased risk of anxiety and depression for CEV children was also evident pre-pandemic in 2019/2020 (HR=2.03, 95% CI=1.37–3.01, p<0.001).

Table 1. Unadjusted and adjusted hazard ratios (HR) for the risk of having a record of anxiety or depression during the Covid-19 pandemic (2020/21)

<table>
<thead>
<tr>
<th>HR and 95% CI (unadjusted)</th>
<th>CEV children</th>
<th>3.09 (CI 2.64–3.61) p&lt;0.001</th>
<th>1.16 (CI 1.04–1.30) p&lt;0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR and 95% CI adjusted for demographics: age, sex, deprivation and rurality</td>
<td>2.81 (CI 2.40–3.29) p&lt;0.001</td>
<td>1.09 (CI 0.97–1.22) p=0.14</td>
<td></td>
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<tr>
<td>HR and 95% CI adjusted for demographics and history of anxiety or depression</td>
<td>2.27 (CI 1.94–2.66) p&lt;0.001</td>
<td>1.02 (0.91–1.14) p=0.746</td>
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HR, Hazard ratio; CI, confidence interval; CEV, clinically extremely vulnerable

Figure 1. Visualisation of the unadjusted and adjusted hazard ratios (HR) for the risk of having a record of anxiety or depression during the Covid-19 pandemic (2020/21)
Relative to the general population, the risk of having a record of anxiety or depression for CEV children increased from 2019/20 to 2020/2021 (Table 2; risk ratio: 1.90 to 3.04, respectively). In 2019/20, CEV children were almost two times more likely to have a record for anxiety or depression than children in the general population. In 2020/21, CEV children were over three times more likely to have a record for anxiety or depression than children in the general population.

However, over this time, the period prevalence of anxiety or depression increased only slightly amongst CEV children (from 4.17% to 4.22%), but declined amongst children in the general population (from 2.19% to 1.39%).

We conclude that the higher risk among the CEV children was largely driven by a reduction in presentations to healthcare services by children in the general population during the pandemic – rather than a marked increase in presentations for anxiety or depression amongst the CEV children.
Table 2. Risk of records of anxiety or depression in children (aged 2–17 years) who were clinically extremely vulnerable (CEV) and those in the general population, in 2019/2020 and 2020/2021

<table>
<thead>
<tr>
<th>Time period</th>
<th>CEV children 2020/21 - children identified through shielded patient list 2019/20 – comparable cohort of children with the conditions listed in the shielded patient list</th>
<th>Children in the general population in Wales</th>
<th>Crude risk ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. children with recorded anxiety or depression</td>
<td>Total no. of children</td>
<td>Period prevalence (%)</td>
</tr>
<tr>
<td>2020/21 (During Covid-19)</td>
<td>159</td>
<td>3,769</td>
<td>4.22</td>
</tr>
</tbody>
</table>

Percentage point change over time points

-0.05
0.8

CEV, clinically extremely vulnerable.

**Why it matters**

This novel linked data study contributes to our understanding of mental health amongst CEV children, and those living in a household with a CEV person in Wales during the Covid-19 pandemic.

Firstly, in both years, CEV children were at greater risk of having a record of anxiety and depression than children in the general population. Given that these children are likely to have greater contact with healthcare services, signposting across services, including mental health services, is likely to be beneficial.

When considering changes in presentations for anxiety or depression during the pandemic among CEV children and children in the general population, the difference in risk between the two groups was greater during the pandemic compared to pre-pandemic. However, this was explained by a marked decline among children in the general population presenting to healthcare services with anxiety or depression during this time. This reduction in presentations for anxiety and depression among children in the general population may reflect reduced access to NHS services during the pandemic, and a lack of access to mental health care for children and young people.

We are mindful that routinely collected data does not capture self-reported health. In addition, other evidence suggests increased demand and an unmet need for mental health support in the UK, for children with and without pre-existing mental health problems, since 202010,11.

Therefore, this evidence should be considered and interpreted alongside evidence from other population-wide data linkage studies and national surveys. This would contribute to a comprehensive understanding of the relationship between mental health support needs, expressed demands, and care provision to better target services to those who need them the most.
What next

We are building on this research study by working across Public Health Wales, Swansea University and the Wolfson Centre for Young People’s Mental Health. We draw on the strength of the linked data available in Wales to help improve our understanding of children and young people’s mental health and wellbeing. This work will be further facilitated by the launch of a new Research Institute in Mental Health and Suicide Prevention at Swansea University in October 2023.


This work is a collaboration between ADR Wales, Public Health Wales, Welsh Government, the National Centre for Population Health and Wellbeing Research (NCPHWR), Population Data Science at Swansea University, and Oxford University.

References


Acknowledgements

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It provides a snapshot of informative research currently underway at ADR Wales but is not intended to provide a complete picture of work undertaken within this field or the ADR Wales programme of work. The information presented in this Data Insight has been reviewed by ADR Wales colleagues with expertise within these thematic areas and is accepted to be accurate at the point of publication. Views expressed in this Data Insight are those of the researchers and not necessarily those of ADR Wales partner organisations.

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This research has been carried out as part of the ADR Wales programme of work, as part of the Early Years, Housing and Homelessness and Mental Health thematic research areas. The thematic research areas align with the priority themes identified in the Welsh Government’s Programme for Government.

ADR Wales brings together data science experts at Swansea University Medical School, staff from the Wales Institute of Social and Economic Research and Data (WISERD) at Cardiff University and specialist teams within the Welsh Government. It develops new evidence which supports the Programme for Government by using the SAIL Databank at Swansea University to link and analyse anonymised data. ADR Wales is part of ADR UK, which is funded by the Economic and Social Research Council (part of UK Research and Innovation).

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