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Risks of covid-19 hospital admission and death for people with learning disability: population based cohort study using the OpenSAFELY platform

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ABSTRACT

OBJECTIVE

To assess the association between learning disability and risk of hospital admission and death from covid-19 in England among adults and children.

DESIGN

Population based cohort study on behalf of NHS England using the OpenSAFELY platform.

SETTING

Patient level data were obtained for more than 17 million people registered with a general practice in England that uses TPP software. Electronic health records were linked with death data from the Office for National Statistics and hospital admission data from NHS Secondary Uses Service.

PARTICIPANTS

Adults (aged 16-105 years) and children (<16 years) from two cohorts: wave 1 (registered with a TPP practice as of 1 March 2020 and followed until 31 August 2020); and wave 2 (registered 1 September 2020 and followed until 8 February 2021). The main exposure group consisted of people on a general practice learning disability register; a subgroup was defined as those having profound or severe learning disability. People with Down's syndrome and cerebral

palsy were identified (whether or not they were on the learning disability register).

MAIN OUTCOME MEASURE

Covid-19 related hospital admission and covid-19 related death. Non-covid-19 deaths were also explored.

RESULTS

For wave 1, 14 312 023 adults aged ≥16 years were included, and 90 307 (0.63%) were on the learning disability register. Among adults on the register, 538 (0.6%) had a covid-19 related hospital admission; there were 222 (0.25%) covid-19 related deaths and 602 (0.7%) non-covid deaths. Among adults not on the register, 29 781 (0.2%) had a covid-19 related hospital admission; there were 13 737 (0.1%) covid-19 related deaths and 69 837 (0.5%) non-covid deaths. Wave 1 hazard ratios for adults on the learning disability register (adjusted for age, sex, ethnicity, and geographical location) were 5.3 (95% confidence interval 4.9 to 5.8) for covid-19 related hospital admission and 8.2 (7.2 to 9.4) for covid-19 related death. Wave 2 produced similar estimates. Associations were stronger among those classified as having severe to profound learning disability, and among those in residential care. For both waves, Down's syndrome and cerebral palsy were associated with increased hazards for both events; Down's syndrome to a greater extent. Hazard ratios for non-covid deaths followed similar patterns with weaker associations. Similar patterns of increased relative risk were seen for children, but covid-19 related deaths and hospital admissions were rare, reflecting low event rates among children.

CONCLUSIONS

People with learning disability have markedly increased risks of hospital admission and death from covid-19, over and above the risks observed for non-covid causes of death. Prompt access to covid-19 testing and healthcare is warranted for this vulnerable group, and prioritisation for covid-19 vaccination and other targeted preventive measures should be considered.

Introduction

Identifying high risk groups for severe outcomes from covid-19 is critically important for risk stratification, which informs vaccine prioritisation initiatives and

WHAT IS ALREADY KNOWN ON THIS TOPIC

Emerging evidence has shown that people with learning disability are at higher risk from covid-19 related mortality compared with the general population. Existing studies on the association of learning disability with severe outcomes from covid-19 often adjusted for variables that might be partly a consequence of the learning disability, such as deprivation and comorbidities, which complicates interpretation of results.

WHAT THIS STUDY ADDS

Adults with learning disability and those with Down's syndrome or cerebral palsy have markedly increased risks of hospital admission and death from covid-19. Similar patterns were observed for children, but absolute risks of covid-19 hospital admission and death were small. Prompt access to covid-19 testing and healthcare is warranted for this group, and prioritisation for covid-19 vaccination and other targeted preventive measures should be considered.

other targeted preventive measures. People with learning disability, who total more than one million people in England alone or 2% of the adult population, are one such vulnerable group.¹ People with learning disability have a lower intellectual ability (usually IQ<70) and impaired social and adaptive functioning, with the onset in childhood. Learning disabilities are usually classified using a wide severity range (mild, moderate, severe, or profound), and consequently intensity of support needs differs widely.

As of February 2021, the Learning from Death Reviews programme reported that 1405 people with a learning disability had died from covid-19 in England since February 2020.² The true number is probably far higher because of gaps in learning disability registration. The latest estimates from 2015 suggest that 23% of people with learning disability are included on the learning disability register.¹ Emerging evidence from the first wave of the covid-19 pandemic in the United Kingdom showed that people with learning disability were at higher risk from mortality³⁻⁷ than people in the general population. For instance, the Oxford RCGP Research and Surveillance Centre sentinel network reported an odds ratio of 1.96 (95% confidence interval 1.22 to 3.18) for mortality during the first wave of infection in the UK among people with learning disability compared with those without.⁴ People with Down's syndrome might be at particularly high risk; an analysis of primary care data from eight million adults reported a hazard ratio of 10.4 (7.1 to 15.2) for covid-19 death associated with Down's syndrome.⁸ However, existing studies on the association of learning disability with severe outcomes from covid-19 do not include the second wave of the pandemic. Additionally, these studies frequently adjusted for variables that might be partly a consequence of the learning disability, such as deprivation and comorbidities, complicating interpretation of the results.⁴ A lack of clarity also exists on the increased risk of covid-19 deaths among people with milder learning disability, and this aspect needs exploration.⁹

The higher risk of premature death among people with learning disability in England is well known^{1 10} and triggered the establishment of general practice learning disability registers to allow for better provision of their healthcare. A number of mechanisms exist which could increase the risk of covid-19 mortality in this group. People with learning disability have a higher prevalence of covid-19 mortality risk factors, including obesity, diabetes, epilepsy, and poverty.¹¹⁻¹³ Medical conditions underlying the learning disability might confer additional risk; for instance, people with Down's syndrome are more vulnerable to impaired cellular immunity, congenital heart disease, and respiratory conditions.^{14 15} Many people with learning disability in England live in residential care or supported accommodation, or receive community based social care¹⁶; therefore, they have frequent contact with carers and other care recipients, and face challenges in physical distancing. Difficulties

understanding the protective measures needed, compounded by a lack of accessible information, further increase the vulnerability of this group to infection.¹⁷ Healthcare access and quality, including prevention and treatment, are frequently worse for people with learning disability, leading to avoidable deaths.¹⁰ Treatment failures,¹⁰ including do not resuscitate orders,¹⁸ might increase their risk of death once infected.

Until 24 February 2021, the national recommendations for prioritisation of covid-19 vaccination in England included all adults with cerebral palsy, severe to profound learning disability, Down's syndrome, and the whole resident population in care settings where a high proportion of residents would be eligible for vaccination (for example, due to learning disability).^{19 20} This guidance means that not everyone on the learning disability register would be eligible for covid-19 vaccination, including people with mild to moderate learning disability from causes other than Down's syndrome or cerebral palsy who are not living in residential care. This work was undertaken rapidly in response to an urgent need to inform policy making on vaccination prioritisation in the UK and elsewhere.

The aim of this study was to use linked electronic health records within the OpenSAFELY platform to rapidly describe the risk of covid-19 related hospital admissions and deaths among children and adults with learning disability in England compared with the general population. A subsidiary aim was to separate the risk by type of learning disability (severe to profound, cerebral palsy, Down's syndrome, on the learning disability register), including people with learning disability not originally included in the first six groups of the phase 1 vaccination priority list in the UK.

Methods

Study design

We performed two population based, observational cohort studies of patients in England using data within the OpenSAFELY platform.

Data

We used data from primary care linked to secondary care and mortality records in England. Records were linked to the NHS England inpatient activity datasets from Secondary Uses Service (SUS) data extracts, including data from inpatient activity datasets for determining covid-19 related hospital admissions.²¹ Office for National Statistics (ONS) death data were used to determine covid-19 related deaths. The dataset analysed within OpenSAFELY is based on 24 million people currently registered with general practice surgeries that use TPP SystmOne software—approximately 40% of the population in England. All data are pseudonymised and include coded diagnoses (using Read version 3, CTV3 codes), drugs, and physiological parameters. No free text data are included. The OpenSAFELY platform is a new data source and validation studies are not yet available.