Public Health 218 (2023) 136–138

Contents lists available at ScienceDirect

Public Health

journal homepage: www.elsevier.com/locate/puhe

Short Communication

Rapid rise in COVID-19 among young people in England – learning for the future

K.A. Twohig [a], A. Zaidi [b,*], I. Campos-Matos [c,d], R. Hope [b], J. Hall [a,e], D. Chudasama [b], M. Sinnathamby [b], J. Fitzpatrick [c], G. Dabrera [b], H. Mohammed [b]

[a] National Infection Service, Public Health England, London, UK
[b] UK Health Security Agency (formerly Public Health England), London, UK
[c] Office for Health Improvement and Disparities (formerly Health Improvement Directorate, Public Health England), London, UK
[d] Collaborative Centre for Inclusion Health, UCL, UK
[e] UCL Institute for Women's Health, UK

ARTICLE INFO

Article history:
Received 9 August 2022
Received in revised form
13 December 2022
Accepted 3 January 2023
Available online 6 January 2023

Keywords:
COVID-19
England
Surveillance
Socio-economic status
Inequalities
Deprivation
Young people
Students

ABSTRACT

Objectives: We determined the age and sociodemographic distribution of COVID-19 cases between January and September 2020 to identify the group with the highest incidence rates at the beginning of the second wave in England.
Study design: We undertook a retrospective cohort study design.
Methods: SARS-CoV-2 cases in England were linked with area-level socio-economic status indicators using quintiles of the Index of Multiple Deprivation (IMD). Age-specific incidence rates were stratified by IMD quintile to further assess rates by area-level socio-economic status.
Results: Between July and September 2020, SARS-CoV-2 incidence rates were highest amongst those aged 18–21 years, reaching rates of 213.9 (18–19 years) and 143.2 (20–21 years) per 100,000 population by week ending 21 September 2022. Stratification of incidence rates by IMD quintile evidenced that despite high rates observed in the most deprived areas of England amongst the very young and older age groups, the highest rates were observed in the most affluent areas of England amongst the 18- to 21-year-olds.
Conclusions: The reversal of sociodemographic trend in COVID-19 cases in England for those aged 18–21 years at the end of the summer of 2020 and beginning of the second wave showed a novel pattern of COVID-19 risk. For other age groups, the rates remained highest for those from more deprived areas, which highlighted persisting inequalities. Combined, this demonstrates the need to reinforce awareness of COVID-19 risk for young people, particularly given the late inclusion of the 16–17 years age group for vaccination administration, as well as continued efforts to reduce the impact of COVID-19 on vulnerable populations.

Introduction

Following the peak in the first COVID-19 wave in late April 2020 in England, incidence steadily declined after the introduction of a suite of non-pharmaceutical interventions (NPIs) by the UK Government. Throughout the months of March to May, the highest incidence rates of COVID-19 were seen in those aged ≥80 years; there were also disproportionately higher rates among men, people of Black, Asian and Minority Ethnicities and people living in the most deprived areas of England.[1]

Incidence rates declined until late June, after which an accelerated rise was noted in August, accompanied by a marked shift in the age distribution of cases. Here, we describe the epidemiological patterns in COVID-19 rates by age group and area-level deprivation between July and September 2020.

Methods

Data sources

COVID-19 is a notifiable disease in England, and positive tests are reported from public health, National Health Service (NHS) and

Abbreviations: NPIs, Non-pharmaceutical interventions; IMD, Index of Multiple Deprivation; ONS, Office for National Statistics'.

* Corresponding author. COVID-19 Epidemiology, UK Health Security Agency, 61 Colindale Avenue, London, NW9 5EQ, UK.
E-mail address: asad.zaidi@ukhsa.gov.uk (A. Zaidi).

https://doi.org/10.1016/j.puhe.2023.01.001

private laboratories performing SARS-CoV-2 testing. These data are collected using the Second Generational Surveillance System, a routine national laboratory-based surveillance system for notifiable diseases.[2] The address of each case of COVID-19 was assigned using their NHS Digital Patient Demographic Service record. Area-level socio-economic status was defined using quintiles of the Index of Multiple Deprivation (IMD),[3] a measure of relative deprivation; these data were linked to the residential lower super area (small-area geographical unit with an average population of 1614)[4] of each patient. Cases with specimen dates between 27 January 2020 and 27 September 2020, inclusive, comprised the final data set.

Study design

A retrospective cohort study design was used to determine age-stratified COVID-19 rates over the study period between January to September 2020. After identifying the peak age groups, we further stratified these into 2-year age groups to examine incidence rates and test positivity, particularly for the second wave, which began from week of 29 June 2020. We also examined trends by IMD quintiles and region of residence.

Results

Between July and September 2020, COVID-19 rates increased across all age groups, but to the largest extent in 20- to 29-year-olds; among whom the weekly rate increased 10-fold from 9.3 to 95.5/100,000 population (Supplementary Fig. 1). There was also a surge in incidence among those aged 10–19 years with the second highest rate (75.9/100,000) in the week of 21 September.

Among young people, the highest rates were in those aged 18–19 years (213.9/100,000 population) and 20–21 years (143.2/100,000 population) in the week of 21 September (Supplementary Fig. 2A). Although testing rates also increased,[1] test positivity was highest in 18–21 years (Supplementary Fig. 2B).

From mid-August 2020 to the end of the study period, the highest rates in 18- to 19-year-olds nationally were reported in those from the least deprived quintile; among 20- to 21-year-olds, the rates in those from the least deprived quintile increased to the largest extent and, as of September 2020, exceeded but were similar to those from the most deprived quintile (Fig. 1). The inverse relationship between deprivation and cumulative rates among 18- to 21-year-olds observed in all regions of England except Yorkshire and the Humber (Supplementary Fig. 3). The relative shift in rates by IMD quintile was not observed among people of other age groups, where the highest rates have consistently been among those from the most deprived quintile (Fig. 1). While a marked deprivation gradient was observed in other age groups, this was not seen in the 18–21 years group (Fig. 1).

Discussion

In the summer of 2020, COVID-19 cases increased sharply in England, with the highest incidence rates among 18- to 21-year-olds at the beginning of the autumn. During this period, although the overall COVID-19 rates (in people of all ages) were highest among people living in the most deprived areas of England, the highest age-specific rates for 18- to 21-year-olds were among those living in the least deprived areas. However, there did not appear to be a marked difference between deprivation quintiles for this age group. In comparison, there was a clear gradient for other age groups, with the highest rates observed in the most deprived quintile and the lowest rates in the least deprived quintile.[1]

This analysis included comprehensive, individual-level data from the national COVID-19 surveillance system linked to a robust measure of socio-economic status; it therefore included all cases in

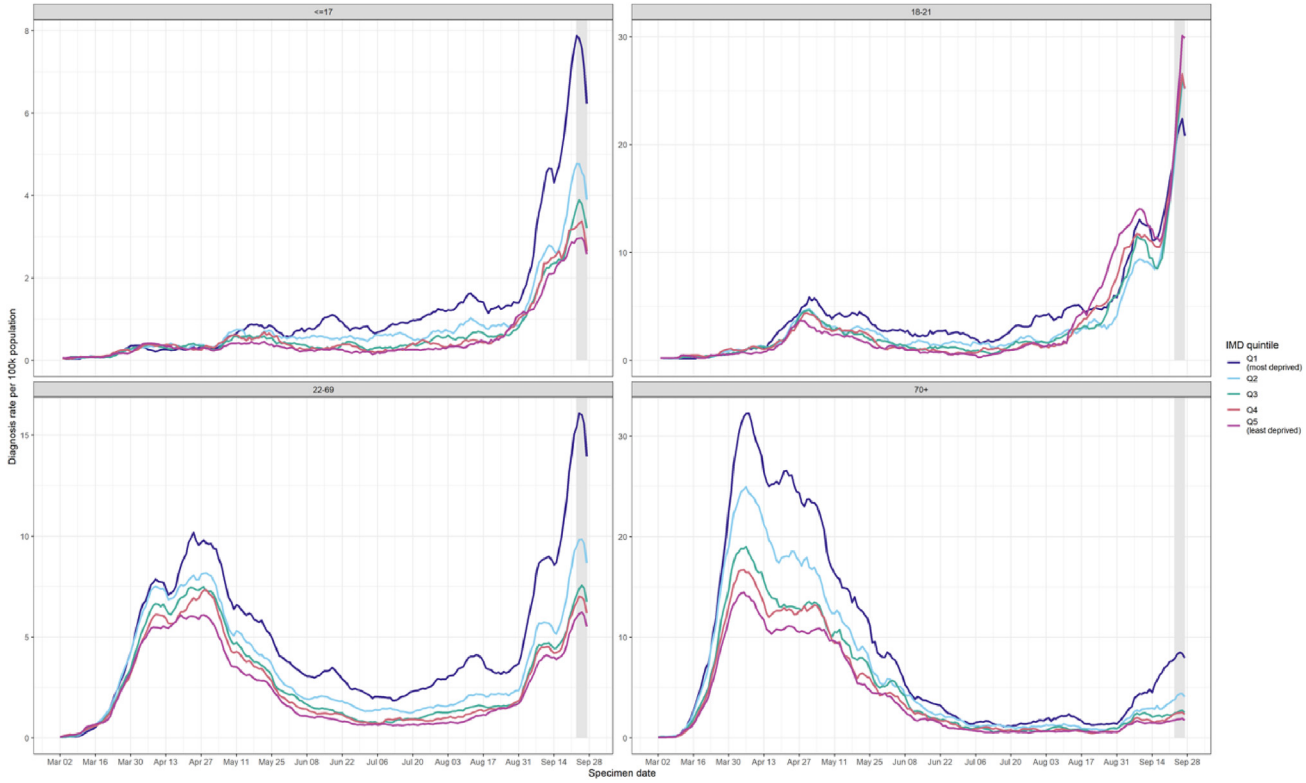

Fig. 1. Rolling 7-day average incidence rates of COVID-19 by Index of Multiple Deprivation quintile and age group, 2 March to 29 September 2020, England.

England and is not subject to the selection bias inherent to survey sampling. The limitations of this study include lack of information on the reasons for COVID-19 testing, including travel history or whether testing occurred because of contact tracing. In addition, due to the absence of population data by ethnicity, age group and IMD quintile, we could not determine rates combining these factors, which would have provided further details on potential inequalities in COVID-19 rates. Although IMD is widely used in England for research, it is a measure of area-level, rather than individual-level, socio-economic status and is therefore subject to the ecologic fallacy. Finally, 18- to 21-year-olds can be a mobile population, and their case details may be attributed to previous residential geography if recent relocations are not yet reflected in their NHS records. However, there is evidence that family socio-economic status can have an impact on longer-term outcomes and might be a reliable indicator of deprivation level, resources and accessibility.[5]

Surveillance data until mid-May 2020 highlighted older people and people living in the most deprived areas of England as higher risk groups, which likely reflected the prioritisation of testing at that time.[3] There is evidence that COVID-19 testing rates in young people disproportionately underestimated incidence in March and April, as seroprevalence reported from the REACT-2 study in late June was highest among people aged 18–24 years (6.9%), most of whom were not tested when they were experiencing symptoms.[6]

The increased detection of COVID-19 among younger people, mainly those aged 20–29 years, was also reported in other European countries, such as Austria, Croatia, the Netherlands and Norway, at the end of the summer 2020.[7] In England, the risk of infection may have changed disproportionately between different age groups and socio-economic backgrounds due to differential changes in behaviour during the easing of NPIs, including activities such as more frequent or larger social gatherings, or overseas travel in the summer holiday season.[8] Our results substantiate findings from a smaller number of cases detected through the Office for National Statistics' COVID-19 Infection Survey, which highlighted increased positivity among those aged 17–24 years and for those aged <35 years from less deprived areas.[9]

Young people reported higher anxiety, depression and loneliness during and after periods of lockdown.[5] Desire for access to supportive social circles and a feeling of normalcy may contribute to less strict adherence to recommended precautions, both throughout the summer of 2020 and potentially in response to future NPIs.[10] Further monitoring of the underlying risk factors for infection in young people, as well as severe or long-lasting outcomes such as long COVID, will become of increasing importance as we adapt to this next phase of mitigating the transmission of COVID-19.

Furthermore, given sustained higher rates overall in people living in the most deprived areas, ongoing, proactive monitoring of the relationships between deprivation and COVID-19 infection should be prioritised to ensure public health measures and policies are delivered equitably.

This study has highlighted the importance of monitoring the effect of changes in NPIs on the relationship between age-specific groups and deprivation to inform public health action during the continued COVID-19 pandemic as well as in future pandemics and outbreaks of respiratory viruses.

Author statements

Acknowledgements

The authors would like to extend our gratitude to the laboratories who regularly report COVID-19 surveillance data to PHE. The authors would also like to thank our colleagues in the Information Management and Data and Analytical Science (SGSS) Teams and the Epidemiology and Surveillance Cells for their ongoing support of the national COVID-19 response. Particular thanks to Isaac Florence who provided a template for some of the visualisations included in this report.

Ethical approval

In its role providing infectious disease surveillance, Public Health England has permission to handle data obtained by the Respiratory Datamart and the Second Generation Surveillance System under Regulation 3 of the Health Service (Control of Patient Information) Regulations 2002.

Funding

No additional funding was received to conduct this analysis.

Competing interests

None declared.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.puhe.2023.01.001.

References

1. Public Health England. Weekly national Influenza and COVID-19 surveillance report. 2020. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/923668/Weekly_COVID19_Surveillance_Report_week_40.pdf.
2. Clare T, Twohig K, O'Connell A-M, Dabrera G. Timeliness and completeness of laboratory-based surveillance of COVID-19 cases in England. *Public health* 2021;**194**:163–6.
3. Public Health England. *COVID-19: review of disparities in risks and outcomes*. 2020; Available from: https://www.gov.uk/government/publications/covid-19-review-of-disparities-in-risks-and-outcomes.
4. Office for National Statistics. *2011 Census: Population and household estimates for small areas in England and Wales, March 2011*. 2012.
5. Hagell A. *Summarising what we know so far about the impact of Covid-19 on young people*. Association for Young People's Health; 2021.
6. Ward H, Atchison CJ, Whitaker M, Ainslie KEC, Elliott J, Okell LC, et al. *Antibody prevalence for SARS-CoV-2 in England following first peak of the pandemic: REACT2 study in 100,000 adults*. medRxiv; 2020.
7. European Centre for Disease Prevention and Control. *COVID-19 surveillance report* [September 29, 2020]; Available from: https://covid19-surveillance-report.ecdc.europa.eu/#weekly_surveillance_summary; 2020.
8. Dunn P, Allen L, Cameron G, Alderwick H. A timeline of national policy and health system responses to COVID-19 in England: the Health Foundation 2020 Contract No.: September 28.
9. Office for National Statistics. *Coronavirus (COVID-19) Infection Survey: characteristics of people testing positive for COVID-19 in England*. 2020. September 2020.
10. Scientific Pandemic Influenza Group on Behaviours. *Increasing adherence to COVID-19 preventative behaviours among young people*. 22 October 2020 6 November 2020.