A decorative graphic in the top left corner featuring several cyan circles of various sizes and a thick green ring, all set against a light grey circular background.

# What are the population health implications of reduced access to care during the Covid-19 pandemic?

Produced for the  
Midlands Decision Support Network  
by The Strategy Unit

**November 2022**

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# Document control

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## Executive summary

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This report was commissioned by leaders in the 11 Integrated Care Boards (ICBs) and NHS England, the partners in the Midlands Decision Support Network. They asked us to identify which population groups, with which health conditions, have been most disadvantaged by the dramatic changes to use of health care services brought about by the coronavirus pandemic.

In the initial months of the pandemic, health care service activity was suddenly and dramatically curtailed. Many patients faced interruptions to their usual care and many more may have missed out on much needed care altogether. For some patients, the logical consequence of such a 'care gap' will have been that their health deteriorated to the point where they were forced to seek emergency care. To understand which groups were most affected, we conducted a detailed analysis of population level changes in patterns of emergency department visits and unplanned admissions to hospital.

This is a different approach to other studies that have attempted to quantify the hidden effects of Covid-19 on population health. Previous studies have prospectively selected specific conditions (e.g., diabetes) or patient groups (e.g., mental health) as their focus (1,2). By contrast, our approach of examining population level changes in patterns of emergency care use for signals of missed care, allows the data to reveal the most affected groups.

We identified 12 groups (of diagnoses) where the relative scale of increases in emergency care activity indicated that patients in these groups may have suffered adverse consequences from missed care (**fig A**). Like all clustering (or grouping) exercises, the groups are inherently subjective—there is no right grouping—and a reasonable case could be made for alternatives. We sought to identify a manageable number of clinically meaningful groups that could provide a useful basis for decision-making.

For each of these groups, we can describe with some certainty the quantitative changes in activity; but determining the causal factors behind the observed changes is considerably more challenging. For some of the 12 groups (and individual conditions) we think we have a good understanding of the mechanisms involved, but

for others the story is much less clear, and we openly acknowledge the existence of plausible explanations other than the ones tentatively proposed in this report.

The coronavirus pandemic was a global health crisis, and all regions of the UK were affected. Our work was conducted using national datasets because the signal-to-noise ratio<sup>1</sup> for changes in activity relating to specific conditions or diagnoses is likely to be stronger in national data. Disaggregating the data to regional or local level risked making it harder to spot the real changes we wanted to capture among incidental fluctuations common to all time series data.

The analysis produced for this report demonstrates marked changes (at a national level) in patterns of emergency care use for some conditions and groups of diagnoses. These changes suggest that the groups identified are suffering adverse consequences from missed care and the wider fallout caused by the coronavirus pandemic. However, we should not view these changes solely through the prism of Covid-19. The issues we have highlighted involve the complex interplay of many factors, known and unknown, short-term and long-term, national and local.

We set out our key findings and recommendations below. Our recommendations are necessarily high-level and offered as a prompt to stimulate discussion rather than a definitive course of action. The response of individual health systems seeking to address factors behind the increased use of emergency care by patients in these groups will rightly be influenced by their own local context. We welcome the opportunity to discuss alternative perspectives on the causal factors behind our observations and on potential solutions.

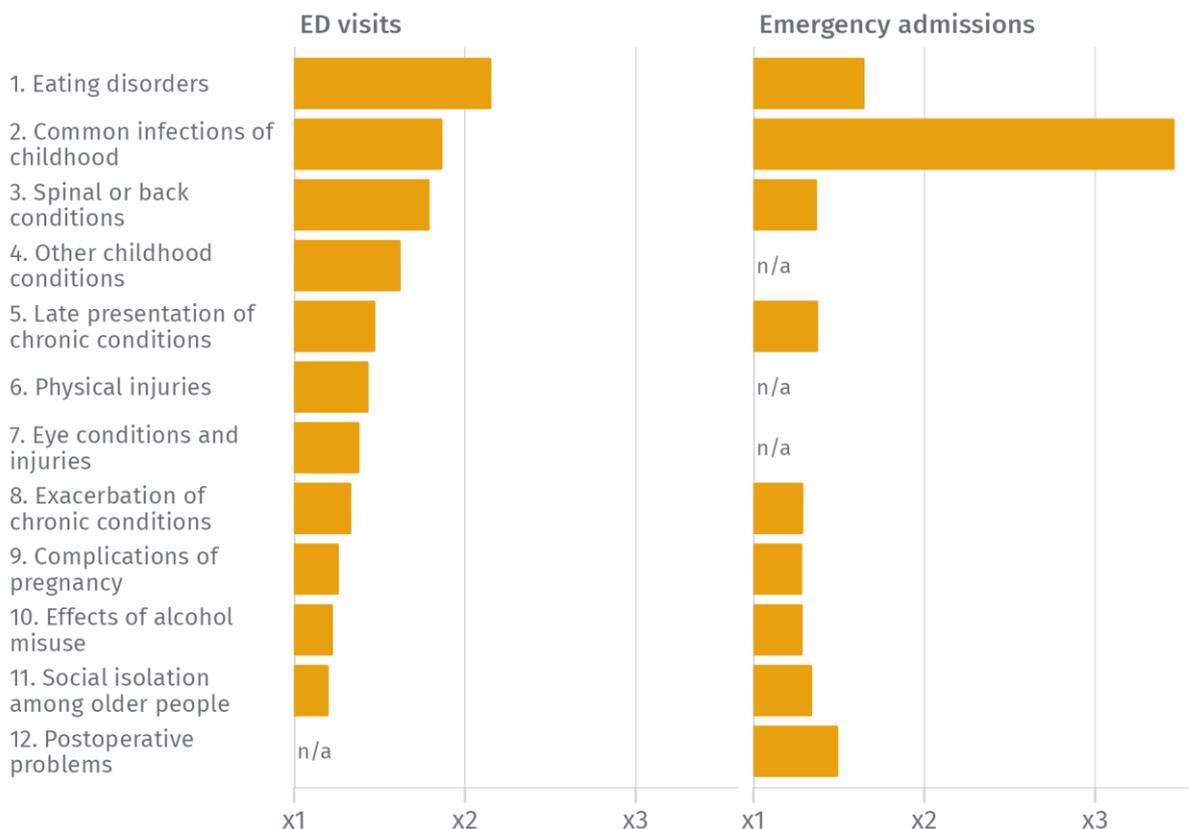
**Figure A** shows relative changes in Emergency Department (ED) visits and emergency admissions for our 12 diagnosis groups. However, when comparing groups, the absolute change is also important. This and other information about each of the groups can be found in the profiles that form chapter 3 of the report.

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<sup>1</sup> signal-to-noise ratio describes the ratio of useful information to false or irrelevant information.

**Fig A: Increased emergency care use by patients in these groups suggests they were adversely affected by fallout from the coronavirus pandemic**

scale of increase, x2 = a doubling



Note: No ED visits included in postoperative problems group; no admissions incl. in other childhood conditions, physical injuries, or eye conditions and injuries groups

Source: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

## Findings and recommendations

Eating disorder services were under immense pressure in the years before the pandemic. Access to care was poor and waiting times were deteriorating. Incidence rates increased further during the pandemic and there has been a subsequent step change in the rates of patients with eating disorders attending ED and being admitted in an emergency. Incremental improvements in eating disorder services will help but the substantial imbalance between need and supply suggests more radical change is required. **The problems are widespread and so ICBs may wish to collaborate to**

**review eating disorder services and develop solutions. National or regional policy interventions may also be warranted.**

The Covid-19 pandemic has disrupted the development of immunity and the usual seasonal patterns of many childhood communicable diseases. For the next few years, the risk of disease outbreaks will be elevated and diseases that commonly occur during the winter may be seen at other times of the year. **ICBs should pay careful attention to national disease surveillance systems and seek to increase the coverage of childhood vaccination programmes.**

There has been a marked increase in the rates of urgent care activity related to back problems. The cause is not altogether clear, but the substantial increase in sedentary behaviour and home-working that occurred during the pandemic may have played a part. **ICBs should seek to promote awareness of the steps employers and workers can take to reduce the risks of musculoskeletal disorders being caused or made worse by less-than-ideal ergonomic conditions, and work with partner organisations to increase population levels of physical activity.**

In the early phases of the pandemic, access to routine chronic disease management in primary care was severely disrupted. And in 2021, a further interruption occurred when GPs were asked to prioritise the roll-out of the Covid-19 vaccine programme. The consequences of these events are now being felt in urgent and emergency care systems as patients present in increasing numbers with delayed identification and exacerbations or complications of long-term conditions. Returning rapidly to pre-pandemic levels of chronic disease management will be challenging given competing demands and constrained resources in primary care. **If ICBs are concerned about capacity in primary care to deliver chronic disease management then it may be necessary to consider how to direct resource to patients at the highest risk of negative clinical outcomes.**

We note an increase in the rate of injury presentations at ED that appear, in some cases, to be the result of physical violence. Other studies have reported increases in the rates of domestic violence (3). **ICBs may want to consider how they can work with partners in Local Authorities and the voluntary sector to ensure victims of domestic violence are able to receive the support they need, when they need it.**

There has been a sharp increase in the number of ED presentations for simple eye conditions. It is likely that many of these have been displaced from primary care as

patients struggle to secure an appointment. **ICBs may wish to ensure that alternative forms of service provision for simple eye-related problems, such as community optometry services, are well sign-posted and readily accessible.**

The delivery of ante-natal, intra-partum and post-natal services changed considerably during the pandemic. Mothers and their babies were discharged from hospital after birth earlier than would otherwise be the case. Access to ante-natal and post-natal services were restricted or delivered remotely and many health visitors were redeployed to deal with the national emergency. These decisions, whilst taken for good reasons, appear to have led to an increase in ED attendances and emergency admissions involving complications of pregnancy. **ICBs should work to ensure that pregnant women's access to in-person maternity services and antenatal appointments is safe in the context of Covid-19, but also recognises the benefits of in-person care and women's preferences.**

Our analysis corroborates other studies that indicate that the pandemic was associated with an alarming increase in the number of high-risk drinkers and alcohol-related harm (4). The short-term effects are seen as increases in ED attendances and emergency admissions. Long-term effects in the form of increased demand for mental health services, dialysis and transplant surgery are likely to follow. **ICBs will want to ensure that treatment services for alcohol addiction are adequately resourced. It would be prudent to plan on the basis that there will be an increase in demand for alcohol-related renal failure and mental ill health in the years to come.**

Our analysis indicates an increase in the number of older people presenting at ED or being admitted in an emergency for conditions that might have been prevented given adequate provision of social care, community nursing and therapies. These increases, however, appear to be a continuation of pre-pandemic trends, rather than a completely new phenomenon. Longstanding challenges with recruitment in these sectors have been widely reported. The development of ICBs may give fresh impetus and new mechanisms to address these issues.

**As ICBs strive to increase levels of planned hospital care and clear the elective backlog, it is important that surgical follow-up and aftercare keeps pace.** Our analysis has identified an increase in the rate of emergency admissions for complications following surgery, most notably in the urology and gynaecology specialties.

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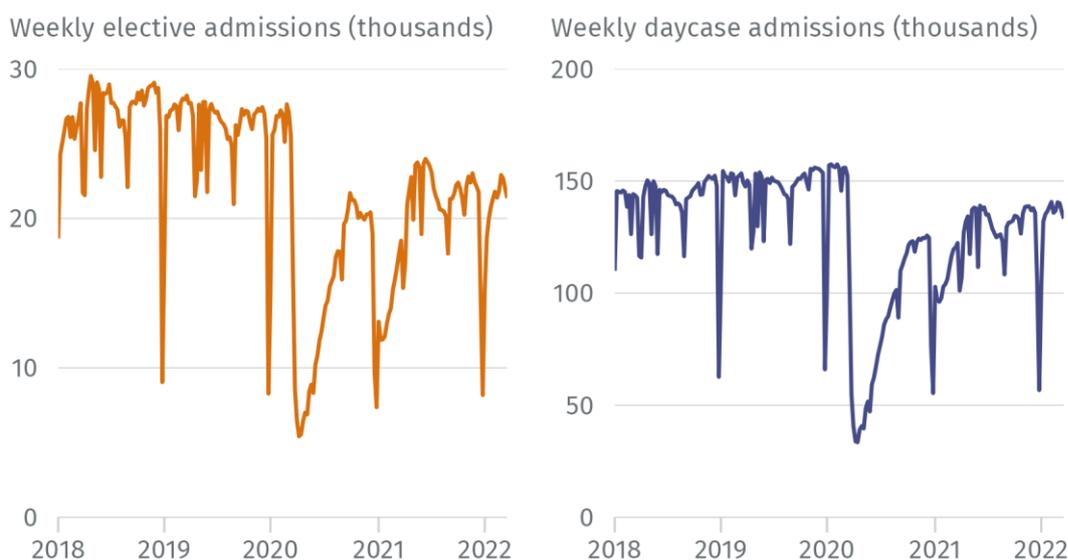
# 1. The impact of Covid-19 on health care activity

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The coronavirus pandemic caused major changes in the utilisation of healthcare services. These changes included large reductions for many services, but also some selective increases such as for telemedicine.

The initial outbreak of coronavirus forced the NHS to postpone enormous volumes of planned treatment (e.g., admissions for surgery following a period on a waiting list) to free up staff and beds to accommodate the anticipated surge in patients unwell with Covid-19. Patient referrals from general practitioners (GPs) to secondary care fell sharply as access to primary care reduced and patients and their GPs sought to balance the risks and benefits of referral. There was a sharp reduction in both overnight and daycase elective admissions from March 2020 (**fig 1**).

**Fig 1: Elective activity was reduced as part of a deliberate plan to preserve capacity for Covid patients, but has been slow to recover**



Source: SUS+, National Commissioning Data Repository.

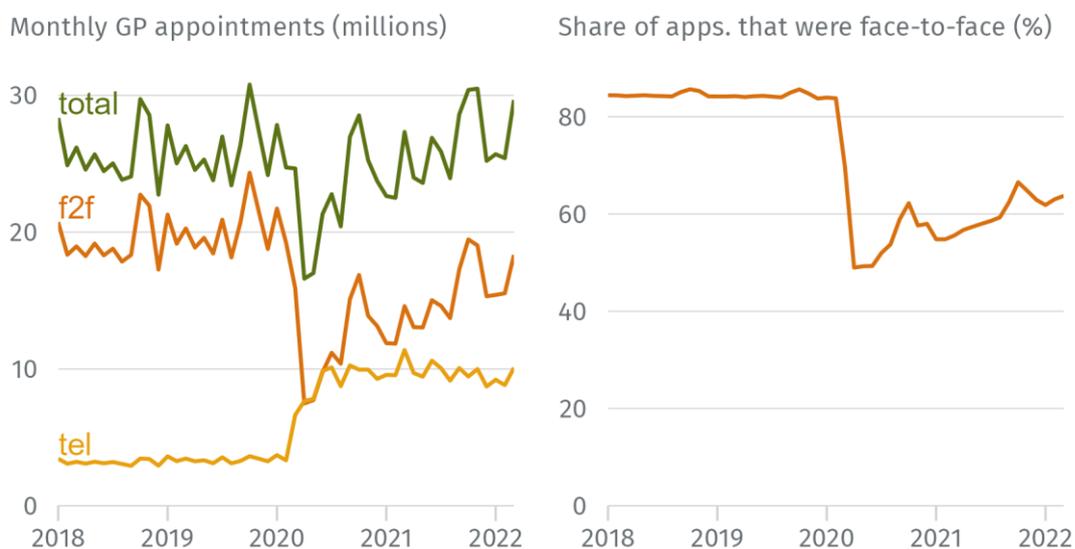
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What are the population health implications of reduced access to care during the Covid-19 pandemic?

Even after the initial waves of Covid-19 had subsided, hospitals struggled to deliver care at pre-pandemic rates because of necessary infection control procedures. Despite improvements in 2021 compared to the first year of the pandemic, the number of elective admissions carried out in early 2022 was still well below its pre-pandemic level (**fig 1**). A total of 6.8 million people were waiting to start hospital treatment with the NHS at the end of July 2022, the highest number since records began (5).

General practice in England was already struggling with longstanding workforce shortages before the pandemic hit. The number of number of appointments booked in general practice dropped sharply in April and May of 2020—the first months of the UKs first lockdown. Appointment volumes, however, were fast to recover, and by Autumn 2020 were back to pre-pandemic levels (**fig 2**). From December 2020 onward, many practices also delivered a large proportion of the Covid-19 vaccination programme alongside their usual patient care (Covid vaccination activity is not included in **fig 2**).

**Fig 2: Appointment volumes in general practice recovered quickly, but with a reduced share of face-to-face apps.**

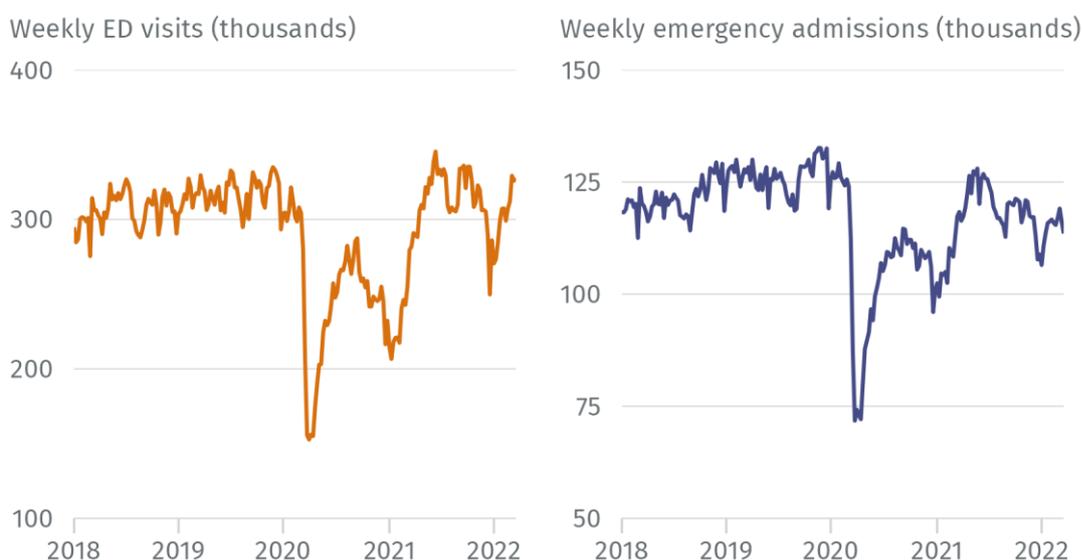


Note: NHS Digital estimates the total number of appointments in England if all GP practices had submitted data. Home visit, video, and missing mode of delivery not shown. Covid vaccination appointments are excluded.  
Source: Appointments in general practice, NHS Digital.

To limit infection risk, general practices were quick to adopt remote triage and care delivery. In just a couple of months practices shifted from handling 85% of consultations face to face to undertaking 50% of them remotely. The proportion of face-to-face appointments has since increased and reached two-thirds (66%) by mid-2022.

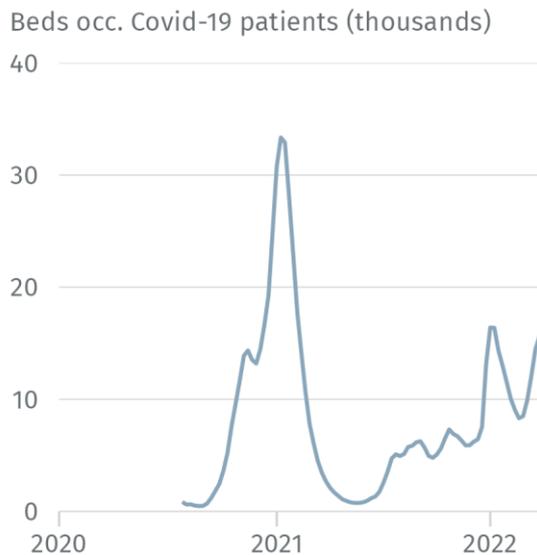
In England, visits to accident and emergency departments and emergency admissions to hospital both fell precipitously in the immediate aftermath of the coronavirus outbreak (**fig 3**). There were 200 thousand fewer unplanned admissions to hospital in April 2020 compared with April 2019 (6). The drop-off in admissions during subsequent waves although still pronounced was less severe. By mid-2021, high levels of vaccine uptake moderated the effect of a surge in cases caused by the Delta variant (of SARS-CoV-2, the strain of coronavirus that causes Covid-19) and followed swiftly by the Omicron variant. This meant fewer beds occupied by Covid patients than in earlier waves and more capacity retained for treating non-Covid patients (**fig 4**).

**Fig 3: Emergency care services were heavily disrupted during the first 18 months of the pandemic**



Source: SUS+, National Commissioning Data Repository.

**Fig 4: By mid-2021, vaccines meant fewer beds occupied by Covid patients and more capacity for treating non-Covid patients**



Source: COVID-19 daily situation reports, NHSE.

The changes seen in health and care activity over the past two and a half years can be explained by a combination of demand and supply factors. On the supply side, the ability of hospitals to deliver a full range of services has been hampered by, prioritisation of limited resources to treat patients with Covid-19, increased staff absences, and stricter infection control protocols. At the same time, changes in health seeking behaviour, for example, fear of becoming infected while visiting a care facility or public misunderstanding that medical help should still be sought in an emergency may have affected demand for care. And finally, policy and societal responses to the pandemic may have caused changes in underlying health needs. For example, social distancing, both mandatory and voluntary, led to reduced rates of some common respiratory infections.

What is certain is that millions of patients living with health problems faced interruptions to their care and many more may have missed vital opportunities to receive initial assessment and diagnosis for emerging health problems. The implications for people's future health outcomes of this 'care gap'—the difference between the level of healthcare provided in the past couple of years and that which might have been provided in 'normal' times—is the subject of the rest of this report.

## 2. The effects of the pandemic on morbidity

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The effect of Covid-19 on mortality patterns has been widely reported but by contrast its effect on morbidity remains relatively underexplored. Studies to date have prospectively selected a single disease or condition and tracked outcomes. For example, the Office for National Statistics have investigated cancer and mental health (2), and the Health Foundation's REAL Centre have tracked people waiting for a hip replacement and those with diabetes (1). We take a different—retrospective—approach. Our starting point is a detailed analysis of population level changes in patterns of urgent and emergency care utilisation. By starting with the consequences of the pandemic and working backwards we avoid the need to select in advance a small number of specific conditions and are free to let the data reveal the most affected groups.

Our focus is emergency care—A&E visits to type 1 emergency departments<sup>2</sup> and unplanned admissions to hospital—as this is where the negative consequences of missed care are most readily observable.

We assess the extent of changes in patterns of non-Covid morbidity by comparing presenting conditions and diagnoses across two time periods—the first in 2019 before Covid-19 struck and the second in the third quarter of 2021 when beds occupied by Covid-19 patients were relatively low and emergency hospital activity had returned to close to its pre-pandemic level. In selecting these two time periods we sought to optimise several criteria: the two periods should be of equal length; the earlier period should predate any effect of the coronavirus pandemic; the periods should be long enough for meaningful comparison; they should include the same season or part of a year; and as far as possible the later period should be a time when the number of Covid-19 patients was low and hospital activity was close to normal (pre-pandemic) levels.

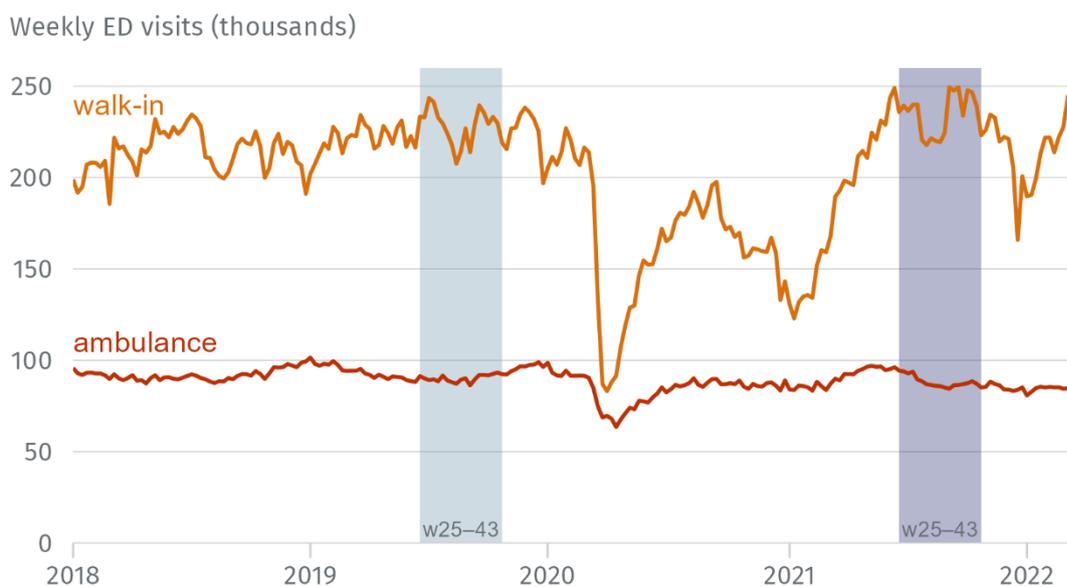
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<sup>2</sup> Type 1 departments are major emergency departments that provide a consultant-led 24-hour service with full facilities for resuscitating patients.

If the pandemic had not occurred, we might have expected levels of ED attendances and emergency admissions to have increased a little between 2019 and 2021 because this was the secular trend. But we wouldn't have expected substantial changes in the distribution of these admissions by health condition. So should we see that attendances or admissions for a particular condition have grown substantially between the two periods, then we might reasonably ask whether this has occurred because of reduced access to care during the pandemic, or for other reasons.

Our primary analysis is based on a comparison of 19 weeks from 2021 (weeks 25 to 43, 21 June to 31 October inclusive) with the same weeks in 2019<sup>3</sup> (figs 5 and 7). We decided against extending the comparison into November due to concerns that health service use may have been affected by the presence of, or reporting of, the Omicron Covid variant.

**Fig 5: By Summer 2021, ED visits had returned to their pre-pandemic level**

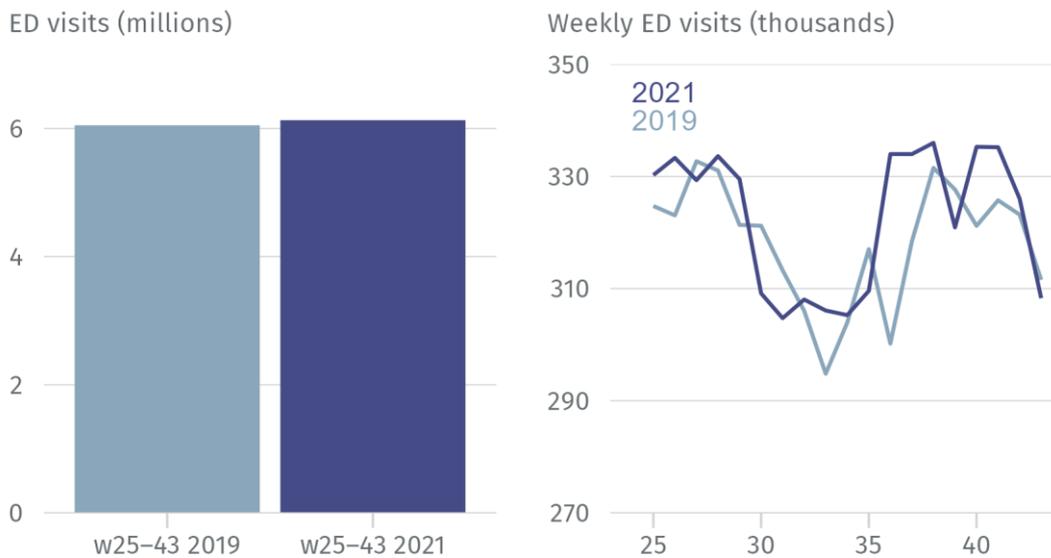


Source: SUS+, National Commissioning Data Repository.

<sup>3</sup> Weeks are numbered according to the ISO week date system that is part of the ISO 8601 date and time standard issued by the International Organization for Standardization (ISO).

During weeks 25 to 43 in 2021 there were 6.1 million visits to A&E, marginally more than the 6 million in the same period in 2019 (**fig 6**). Emergency admissions during weeks 25 to 43 in 2021 were slightly below their 2019 levels, 2.4 million compared with 2.3 million (**fig 8**).

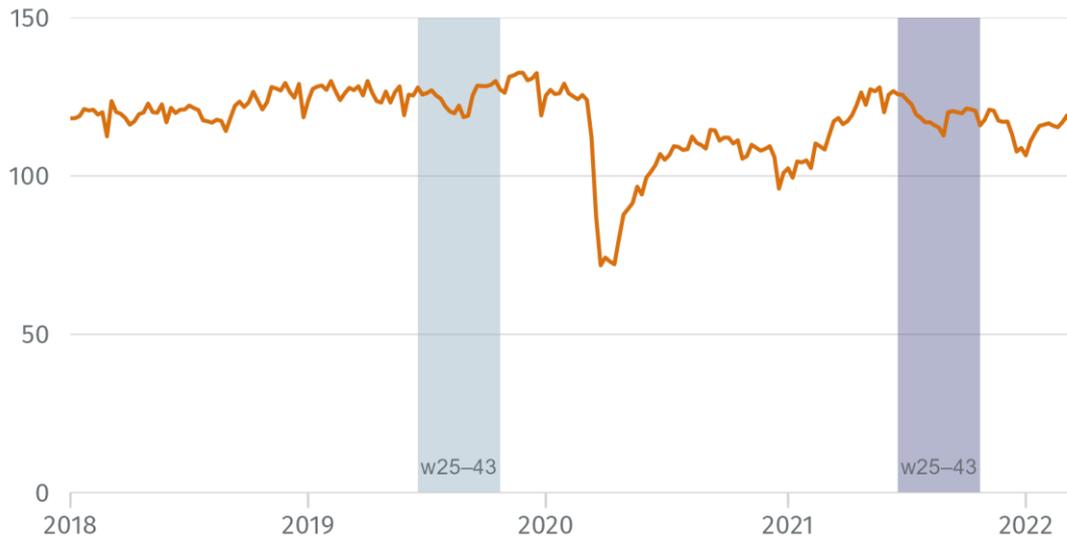
**Fig 6: ED visit volumes in weeks 25–43 in 2021 were similar to the same period in 2019**



Source: SUS+, National Commissioning Data Repository.

**Fig 7: By Summer 2021, emergency admissions had recovered close to their pre-pandemic level**

Weekly emergency admissions (thousands)



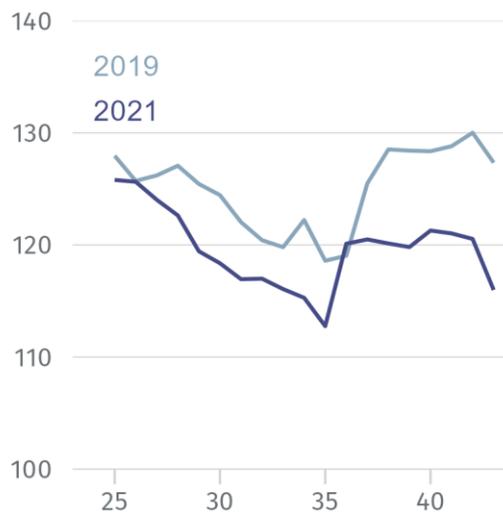
Source: SUS+, National Commissioning Data Repository.

**Fig 8: Emergency admissions in weeks 25–43 in 2021 were 4.6% below their level in 2019**

Emergency admissions (millions)



Emergency admissions (thousands)



Source: SUS+, National Commissioning Data Repository.

Take any two time periods and compare the frequency of presenting conditions in A&E or diagnoses among inpatients and you will observe differences. Differences might arise from an underlying trend driving a gradual increase in the number of patients seeking care, or from seasonal factors, which are known to cause significant fluctuations in the incidence of some diseases, and small differences might be the result of random or chance variations inherent in all natural phenomena. Changes to the way diagnoses are recorded and coded can also create the illusion of variation where none is present.

We sought to isolate changes in the frequency of individual diagnoses that were unlikely to be the result of an underlying trend, seasonal factors, chance variation, or coding changes. We did this by the application of statistical process control methods based on a type of control chart called the funnel plot. Statistical process control methods are designed to study variability of performance over time or between groups and are powerful tools for population health surveillance and monitoring.

In the case of A&E visits, we first selected a subset of providers (hospitals) that recorded a valid diagnosis code for more than 80% of their total A&E activity across both time periods. For emergency admissions our findings are based on the main condition the patient was in hospital for (the primary diagnosis) across all providers in England.

Unsurprisingly, the biggest increases in diagnoses in both A&E and emergency inpatient settings relate directly to cases or suspected cases of Covid-19 (**tables 1 and 2**). Its presence is also implicated in other diagnoses, for example, we suspect increases in post-viral fatigue syndrome are related to long Covid (**table 1**). It has been reported that the electrolyte disorder hypomagnesemia (a deficiency of magnesium in the bloodstream) may predispose patients with Covid-19 to more severe disease. Diagnoses of hypomagnesemia in ED were almost four times higher in weeks 25-43 in 2021 than the same period in 2019 (**table 1**).

Our primary interest, however, is in non-Covid related diagnoses. Immediately obvious are large increases in common viral infections of childhood (**tables 1 and 2**). Visits to ED with a diagnosis for bronchiolitis or viral wheeze were more than three times higher in weeks 25-43 in 2021 than the same period in 2019 (**table 1**). Emergency admissions for acute bronchiolitis due to respiratory syncytial virus (RSV) were 26 times higher (**table 2**). We also observed increases for diagnoses primarily affecting older age groups: ED visits for radiculopathy (a pinched nerve in the spine)

where the median age was 50 increased by 150% (**table 1**). There were double the number of visits for hyperglycaemia (a high level of sugar in the bloodstream) a common but potentially serious, if untreated, complication of diabetes (**table 1**).

As reported by other studies the coronavirus pandemic seems to have been associated with an increased incidence of eating disorders. Visits to A&E with an eating disorder diagnosis doubled and admissions were 2.3 times greater than in the same period pre-pandemic (**tables 1 and 2**).

### Table 1: ED diagnoses with the biggest increases

When activity returned to pre-pandemic levels in the second-half of 2021 these diagnoses were recorded with greater frequency than in 2019

| Diagnosis                               | Visits w25-w43 2021 | Change from 2019 (2=doubling etc.) |
|---|---------------------|------------------------------------|
| Severe acute respiratory syndrome       | 1,038               | Inf                                |
| Hypomagnesemia                          | 565                 | 3.92                               |
| Specimen collection                     | 1,086               | 3.56                               |
| Bronchiolitis                           | 27,577              | 3.19                               |
| Postviral fatigue syndrome              | 548                 | 3.06                               |
| Viral wheeze                            | 27,586              | 3.01                               |
| Hydrocele of tunica vaginalis           | 503                 | 2.86                               |
| Cyclical vomiting syndrome              | 1,564               | 2.82                               |
| Lumbar radiculopathy                    | 2,639               | 2.73                               |
| Hyponatremia                            | 4,522               | 2.33                               |
| Cervical radiculopathy                  | 1,612               | 2.22                               |
| Eating disorder                         | 1,011               | 2.15                               |
| Brief resolved unexplained event        | 991                 | 2.13                               |
| Hypocalcemia                            | 476                 | 2.11                               |
| Hand foot and mouth disease             | 2,557               | 2.07                               |
| Closed fracture of nasal bones          | 2,298               | 2.06                               |
| Infantile colic                         | 537                 | 2.06                               |
| Cluster headache syndrome               | 1,371               | 2.01                               |
| Hyperglycemia                           | 3,481               | 1.98                               |
| Respiratory failure without hypercapnia | 936                 | 1.97                               |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

**Table 2: Inpatient diagnoses with the biggest increases**

When activity returned to pre-pandemic levels in the second-half of 2021 these diagnoses were recorded with greater frequency than in 2019

| Diagnosis                                   | Admis. w25-w43 2021 | Change from 2019 (2=doubling etc.) |
|---|---------------------|------------------------------------|
| Emergency use ICD codes for COVID-19        | 62,871              | Inf                                |
| Special screening exam. viral diseases      | 200                 | 100                                |
| Acute bronchiolitis due to RSV              | 10,099              | 23.0                               |
| RSV pneumonia                               | 677                 | 15.4                               |
| Acute bronchiolitis hu. metapneumovirus     | 171                 | 9.50                               |
| Acute bronchitis due to RSV                 | 101                 | 7.21                               |
| Other viral infections unspec. site         | 1,304               | 4.28                               |
| Human metapneumovirus pneumonia             | 140                 | 4.00                               |
| Other viral pneumonia                       | 494                 | 3.34                               |
| Drug-induced headache, nec.                 | 249                 | 2.86                               |
| Entovirus infection, unspec. site           | 311                 | 2.51                               |
| Acute bronchiolitis other organisms         | 1,102               | 2.42                               |
| Other respiratory conditions of newborn     | 2,029               | 2.37                               |
| Other respiratory disorders                 | 806                 | 2.36                               |
| Acute bronchiolitis, unspec.                | 15,380              | 2.33                               |
| Eating disorder, unspec.                    | 536                 | 2.33                               |
| Hypertensive heart & renal dis. w/failure   | 288                 | 2.23                               |
| HTV heart & renal dis. w. CHF & renal fail. | 288                 | 2.23                               |
| HTV heart & renal dis. w. CHF               | 123                 | 2.20                               |
| Bacterial pneumonia, unspec.                | 333                 | 2.12                               |
| Viral pneumonia, unspec.                    | 410                 | 2.08                               |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

### 3. Clinical cohorts

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We identified 480 separate inpatient diagnoses and more than 200 A&E diagnoses where the increase in frequency was sufficiently greater than the overall change in activity of that type to be flagged as meriting further investigation.

Some of these diagnoses are obviously directly related to Covid-19 itself, others prompt one to speculate about the wider effects of the pandemic and associated policies, and for some no obvious causative factor comes to mind.

To help make sense of our findings we looked for groups of diagnoses that related to the same condition or patient group or had a similar underlying cause. If distinct patient groups or clinical cohorts could be identified and described, then they could indicate a direction for further research or provide a focus for health systems looking to mitigate any negative effects of the pandemic on population health.

This grouping exercise was completed by a small team of Strategy Unit employees that included data experts and persons with a clinical background. We did not seek to be exhaustive (i.e., assign all diagnoses to a group) and focussed our attention on diagnoses with the biggest increases. For simplicity, each diagnosis was only permitted to be assigned to a single group. It's important to remember that this was an exercise in judgement—for any individual we can't know the exact nature of the events that led to their presentation or subsequent diagnosis. We relied on the available data alongside our experience and domain knowledge to make an informed judgment about the factors that most likely contributed to presentation and diagnosis.

We identified the 12 groups listed below.

**Common infections of childhood**—common infections of childhood e.g., bronchiolitis, hand, foot and mouth disease, otitis media (middle ear infection).

**Other childhood conditions**—less common conditions affecting children e.g., hydrocele of tunica vaginalis (fluid build-up that forms around a testicle), cyclical vomiting syndrome.

**Late presentation of chronic conditions**—visits and admissions where the primary diagnosis suggests the patient is presenting for medical care later than would be ideal

e.g., electrolyte disorders (hyponatremia, hypocalcaemia, hypokalaemia, hypercalcemia), cancers.

**Exacerbation of chronic conditions**—visits and admissions where the primary diagnosis suggests an exacerbation or complication of a pre-existing long-term condition e.g., diabetes, hypertension, heart failure, angina.

**Eating disorders**—visits and admissions for eating disorders e.g., anorexia nervosa.

**Effects of alcohol misuse**—visits and admissions for diseases and conditions that can be attributed to excessive alcohol consumption e.g., alcohol-related liver disease.

**Physical injuries**—visits for injuries that are commonly the result of physical violence e.g., closed fracture of nasal bones, open wound of lip.

**Social isolation among older people**—visits and admissions among older people where social isolation may be a contributing factor e.g., skin ulcers, rhabdomyolysis (a condition in which skeletal muscle tissue dies, releasing substances into the blood that cause kidney failure), delirium.

**Spinal or back conditions**—visits and admissions for spinal or back conditions—e.g., lower back injuries, radiculopathy (pinched nerve in the spinal column).

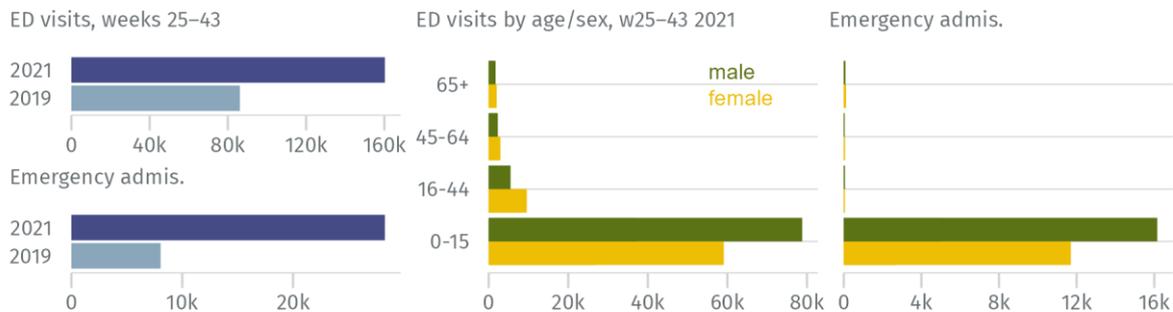
**Complications of pregnancy**—visits and admissions involving complications of pregnancy e.g., hyperemesis gravidarum (severe vomiting in pregnancy), miscarriage, complications of abortion.

**Eye conditions and injuries**—visits relating to minor eye conditions and injuries e.g., meibomian cyst (lump or swelling in the eyelid), conjunctivitis, foreign body in eye.

**Postoperative problems**—admissions relating to postoperative problems e.g., attention to surgical dressings, complications of genitourinary devices and implants.

### 3.1 Common infections of childhood

**Fig 9: Emergency care activity increased for many common infections of childhood**



Sources: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

We observed large increases in emergency care activity (both ED visits and emergency inpatient admissions) for many common infections of childhood (**fig 9**). Accident and emergency departments saw more than three times the number of cases of bronchiolitis and viral wheeze, and double the number of cases of hand, foot, and mouth disease in the third quarter of 2021 compared with the same period in 2019 (**table 3**). These increases in visits to ED fed through to inpatient settings. Unplanned admissions for acute bronchiolitis due to respiratory syncytial virus (RSV)—its most common viral cause—increased 23-fold and admissions for enterovirus infection a common cause of hand, foot and mouth disease were 2.5 times higher (**table 4**).

The primary factor behind these changes in activity was disruption to the normal seasonal pattern of common viral respiratory infections caused by measures taken to curb the coronavirus pandemic. In the initial months of the pandemic, a raft of non-pharmaceutical interventions, including social distancing, lockdowns, school closures, and continuous promotion of hand hygiene helped control the transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2—the virus that causes Covid-19). A by-product of these public health measures was their effect on the transmission of other respiratory viruses such as influenza and RSV. RSV is one of the common viruses that cause coughs and colds in winter and is the commonest cause of bronchiolitis. Southern hemisphere countries were the first to report a marked decline in paediatric RSV and influenza cases and admissions during the anticipated Winter peak of 2020 (June–August). A similar pattern was subsequently observed in the

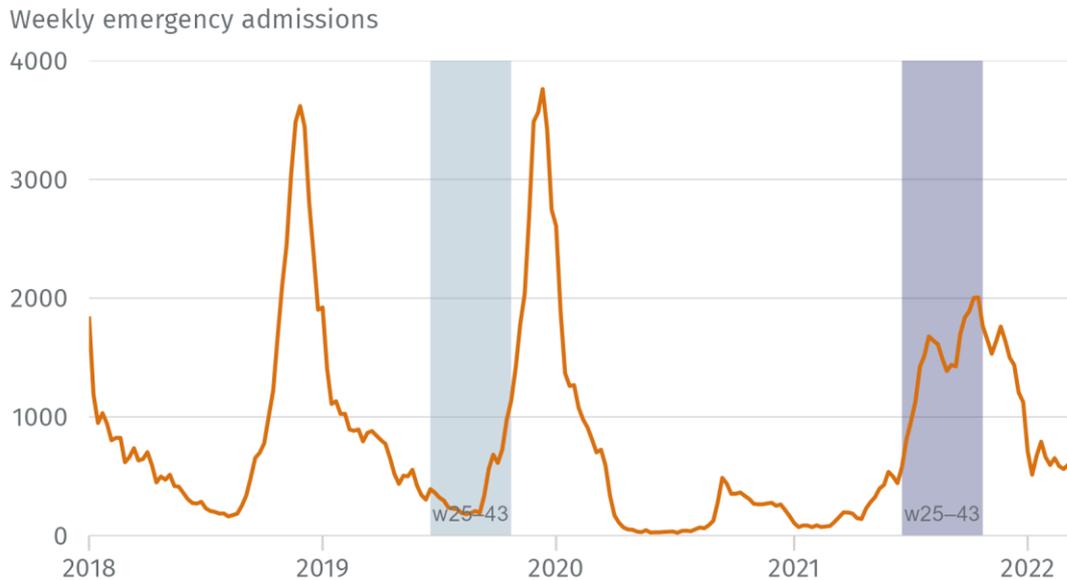
northern hemisphere (7). For example, in England during October and November 2020, no RSV-positive samples were detected in national surveillance and test positivity for RSV and influenza remained low throughout Winter 2020-21 (8).

However, the absence of a usual Winter peak for RSV stopped children developing immunity, and as restrictions were eased new exposures led to a surge in cases arriving much earlier than in a normal year. Public Health England warned in July 2021 that cases in young children had begun to rise; its surveillance system showed that positivity of samples tested for RSV increased over five consecutive weeks, from 1.2% to 8.9%. By the week ending 8 August 16.4% of samples tested positive for RSV (9). This distorted seasonal pattern is reflected in the trajectory of emergency admissions for our group of common childhood infections (**fig 10**).

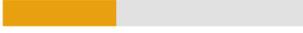
It may take several years before seasonal patterns of viral respiratory infections settle down. In the meantime, Integrated Care Boards (ICBs) should keep careful track of existing national surveillance systems for early indications of any rise in infections. Levels of influenza activity have been low to moderate for several years; the 2017 to 2018 season was the last time high levels of influenza activity were seen in the UK. Australia recently experienced an unusually early and 'very significant' season with flu viruses (10). Data from Australia help predict what is to come in the northern hemisphere in the winter of 2022-23 (11). Given the extremely high levels of pressure already present in the system the appearance of any new demand would pose a significant challenge. Vaccination of children (with the nasal vaccine), older adults and other high-risk groups remains the most effective measure to prevent severe disease caused by influenza and efforts should be made to maximise coverage.

Since the beginning of January 2022 an increase in the frequency of severe acute hepatitis of unknown origin in previously healthy young children has been noted in the UK and internationally (12). Investigations are ongoing, but the most recent research points to coinfection with two viruses—common adeno-associated virus 2 (AAV2) and an adenovirus—as the best explanation for the onset of severe liver disease in affected children (13,14). At the time of writing, the most recent UKHSA briefing reported an overall decline in rates of cases (15).

**Fig 10: The coronavirus pandemic disrupted the normal seasonal pattern for many common infections of childhood**



**Table 3: ED diagnoses for common infections of childhood**

| Diagnosis                             | Visits w25-w43 2021   | Change from 2019 (2=doubling etc.)   |
|---------------------------------------|---|--|
| Bronchiolitis                         | 27,577   | 3.19  |
| Viral wheeze                          | 27,586   | 3.01  |
| Hand foot and mouth disease           | 2,557    | 2.07  |
| Upper respiratory infection           | 81,797  | 1.59  |
| Otitis media                          | 11,104   | 1.48  |
| Otitis media with rupture of ear drum | 905      | 1.35  |
| Eczema herpeticum                     | 431      | 1.27  |
| Viral disease with exanthem           | 2,837    | 1.19  |
| Otitis externa                        | 5,478    | 1.17  |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

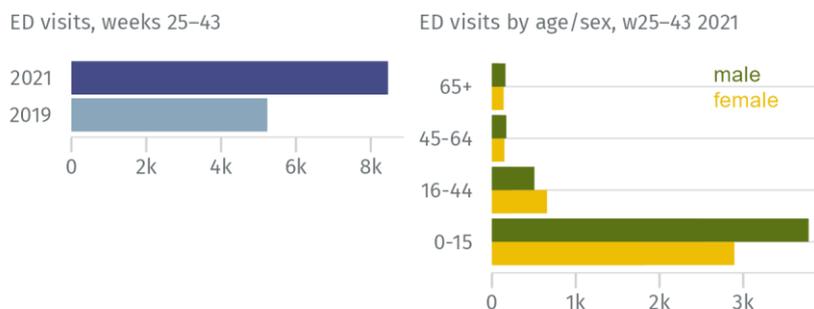
**Table 4: Inpatient diagnoses for common infections of childhood**

| Diagnosis                               | Admis. w25–w43 2021   | Change from 2019 (2=doubling etc.)   |
|---|---|--|
| Acute bronchiolitis due to RSV          | 10,099   | 23.0  |
| RSV pneumonia                           | 677      | 15.4  |
| Acute bronchiolitis hu. metapneumovirus | 171      | 9.50  |
| Other viral infections, unspec. site    | 1,304    | 4.28  |
| Human metapneumovirus pneumonia         | 140      | 4.00  |
| Entovirus infection, unspec. site       | 311      | 2.51  |
| Acute bronchiolitis other organisms     | 1,102    | 2.42  |
| Other spec. respiratory disorders       | 806      | 2.36  |
| Acute bronchiolitis, unspec.            | 15,380  | 2.33  |
| Eczema herpeticum                       | 605      | 1.42  |
| Parainfluenza virus pneumonia           | 136      | 1.25  |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

## 3.2 Other childhood conditions

**Fig 11: ED visits increased for a small number of non-viral childhood conditions**



Sources: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

Visits to ED increased for a small number of other predominantly childhood conditions not typically associated with a viral infection (**fig 11**). Diagnoses of hydrocele tunica vaginalis were almost three times higher in weeks 24 to 43 in 2021 than in 2019 (**table 5**). A hydrocele is fluid build-up that forms around a testicle. Hydroceles are common in young children, but can occur at any age, and in most cases are painless and disappear without treatment.

Visits to ED with a diagnosis of cyclical vomiting syndrome (CVS) or brief resolved unexplained event (BRUE) were both more than double their pre-pandemic levels (**table 5**). CVS is a relatively rare disorder that usually starts in childhood but can also affect adults. It is characterised by recurrent bouts of intense vomiting interspersed with periods of completely normal health. The cause of CVS is not fully understood but the vomiting episodes are not caused by an infection or another illness. BRUE is a term used to describe an event in an infant characterised by a marked change in breathing, tone, colour, or level of responsiveness, followed by a complete return to a baseline state, and that cannot be explained by a medical cause.

Febrile seizures are usually triggered by a higher-than-normal body temperature. While they can be alarming and distressing to witness these seizures are usually short-lived and harmless to the child. Some studies have investigated an association between Covid-19 infection and febrile seizures (16). However, the strength of any such association remains unclear making it difficult to assess whether Covid-19 may have contributed to the increase we found (**table 5**).

In the absence of a convincing epidemiological explanation for an apparent increase in the incidence of these conditions health systems should focus on gaining a better understanding of the mechanisms behind the observed changes. ICBs may also want to reassure themselves that the process by which people decide to attend ED or are directed to ED (e.g., via NHS 111) is functioning appropriately for these conditions.

There are no emergency admission diagnoses in this group.

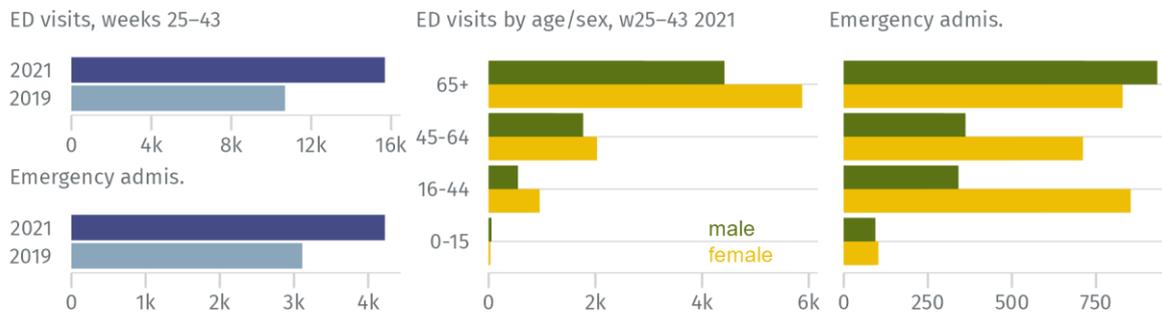
**Table 5: ED diagnoses for other childhood conditions**

| Diagnosis                        | Visits w25–w43 2021  | Change from 2019 (2=doubling etc.)   |
|----------------------------------|--|--|
| Hydrocele of tunica vaginalis    | 503     | 2.86  |
| Cyclical vomiting syndrome       | 1,564   | 2.82  |
| Brief resolved unexplained event | 991     | 2.13  |
| Infantile colic                  | 537     | 2.06  |
| Febrile convulsion               | 4,866  | 1.29  |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

### 3.3 Late presentation of chronic conditions

**Fig 12: Delays in diagnosis may have contributed to an increase in late presentations**



Sources: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

The defining characteristic of visits and admissions in this group is a primary diagnosis that suggests the patient is presenting for medical care later than would be ideal. The clearest example being a 27% increase in patients diagnosed with cancer in ED (**table 6**). Unplanned hospital admissions for bladder and testicular cancer were 64% and 35% higher in 2021 than in 2019 (**table 7**).

Visits to ED also increased for a number of common electrolyte abnormalities. Diagnoses of hyponatremia—a condition that means you don't have enough sodium in your blood—were 2.3 times higher in 2021 than in 2019 (**table 6**). Mild forms of electrolyte disorders often don't have any noticeable symptoms, these usually only start to appear once a disorder becomes more severe. The most common causes are loss of bodily fluids, certain medications or underlying chronic diseases.

The high frequency of admissions among middle-aged women (**fig 12**) are mostly associated with a diagnosis of iron deficiency anaemia due to blood loss. Admissions with this diagnosis increased by 48% (**table 7**). The most common cause of iron deficiency anaemia in premenopausal women is heavy menstrual bleeding (or menorrhagia). Often it is an underlying reproductive condition causing the heavy or prolonged bleeding. Conditions such as endometriosis, uterine polyps or fibroids, and polycystic ovary syndrome can all cause menorrhagia.

The diagnosis and treatment of these and other gynaecological conditions appears to have been particularly disrupted by the pandemic. Between February 2020 and January 2022 gynaecology waiting lists in England increased from 286 thousand to

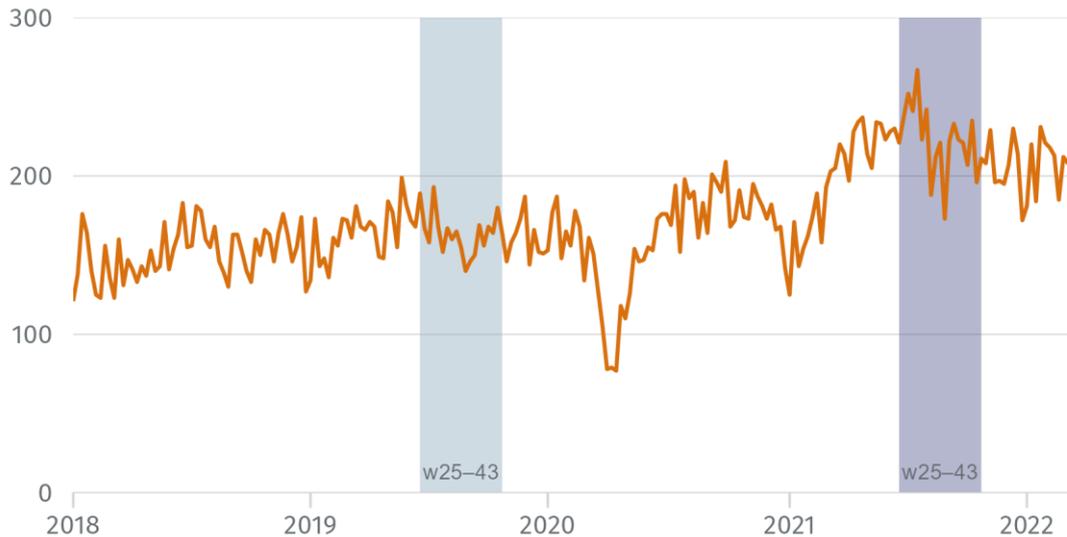
457 thousand—a 60% increase, the most in percentage terms of all elective specialities (17). Even this number is likely an underestimate of the true level of unmet need as for most of the first two years following the start of the pandemic gynaecology referral rates were lower than before the pandemic. The concept of a hidden backlog—patients who, in normal times, would have been referred for treatment, but for a number of pandemic-related reasons have not yet found their way into the health system—is the source of much concern to those working on elective recovery plans. The National Audit Office explains the lower levels of referrals seen during the pandemic as both some people avoiding healthcare settings because of fear of the virus or to reduce demand on the NHS, and others possibly having difficulty getting appointments with their GPs, consultants or diagnostic services (18).

Admissions for this group started to climb in the first half of 2021 and have remained elevated into the early months of 2022 (**fig 13**).

The decision to postpone most elective care in the first few months of the pandemic and the subsequent disruption caused by further waves of Covid-19 has led to huge numbers of people without a diagnosis or waiting for treatment. Delayed diagnosis can have serious consequences for outcomes and others are having to cope with pain and discomfort while they wait for treatment. The challenge the NHS faces in dealing with what is an unprecedented backlog of elective care has received much attention and a delivery plan for tackling the backlog was launched in February 2022 (19). In this context, we think our findings primarily serve to reinforce the scale of a known problem and what is now required is a focus on the delivery of recovery plans.

**Fig 13: Admissions linked to late presentation of LTCs were 28% higher in 2021 compared with 2019**

Weekly emergency admissions



Sources: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

**Table 6: ED diagnoses linked to late presentation of chronic conditions**

| Diagnosis                  | Visits w25-w43 2021 | Change from 2019 (2=doubling etc.) |
|----------------------------|---------------------|------------------------------------|
| Hyponatremia               | 4,522               | 2.33                               |
| Hypocalcemia               | 476                 | 2.11                               |
| Primary malignant neoplasm | 6,267               | 1.27                               |
| Hypokalemia                | 3,478               | 1.24                               |
| Hypercalcemia              | 947                 | 1.23                               |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

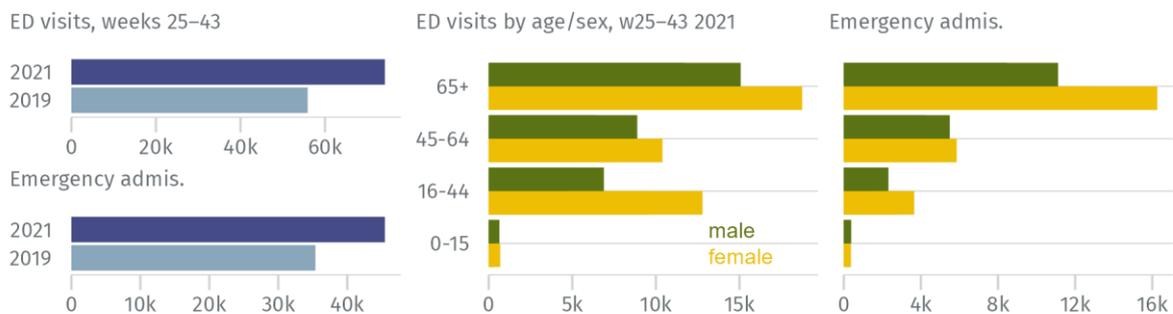
**Table 7: Inpatient diagnoses linked to late presentation of chronic conditions**

| Diagnosis                                       | Admis. w25-w43 2021  | Change from 2019 (2=doubling etc.)   |
|---|--|--|
| Malignant neoplasm: Lateral wall of bladder     | 121     | 1.64  |
| Iron def. anemia second. to bld loss chronic    | 1,749  | 1.48  |
| Perforation of gallbladder                      | 297     | 1.42  |
| Abnormal finding diagn. imag. abdo. region      | 150     | 1.40  |
| Oth. disorders electrolyte & fluid balance nec  | 364     | 1.36  |
| Malignant neoplasm: Testis, unspecified         | 131     | 1.35  |
| Obstructive hypertrophic cardiomyopathy         | 150     | 1.29  |
| Acute appendicitis with generalized peritonitis | 578     | 1.26  |
| Anaemia in neoplastic disease                   | 687     | 1.19  |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

### 3.4 Exacerbation of chronic conditions

**Fig 14: Disruption to routine care may have caused admissions for LTCs to increase**



Sources: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

We found increases in visits and admissions where the primary diagnosis suggests an exacerbation or complication of a pre-existing long-term condition, for example, hyperglycaemia in people with diabetes where visits doubled (**table 8**). After common infections of childhood this was the group that saw the biggest absolute increase in the number of both ED visits and hospital admissions.

Many of the diagnoses listed in **table 9** are associated with conditions like diabetes and hypertension, where interruptions to routine care and support services can be expected to lead to problems. National audit data shows a marked drop in the numbers of people receiving vital diabetes checks during 2020 and 2021 (20); and 63% of people who reported difficulties managing their diabetes in 2021 attributed this, at least in part, to not having sufficient access to their health care team (21). The importance of these routine checks should not be overlooked: Valabhji and colleagues found an increased risk of mortality in 2021 for people with diabetes who did not receive recommended diabetes care processes in the previous two years (22).

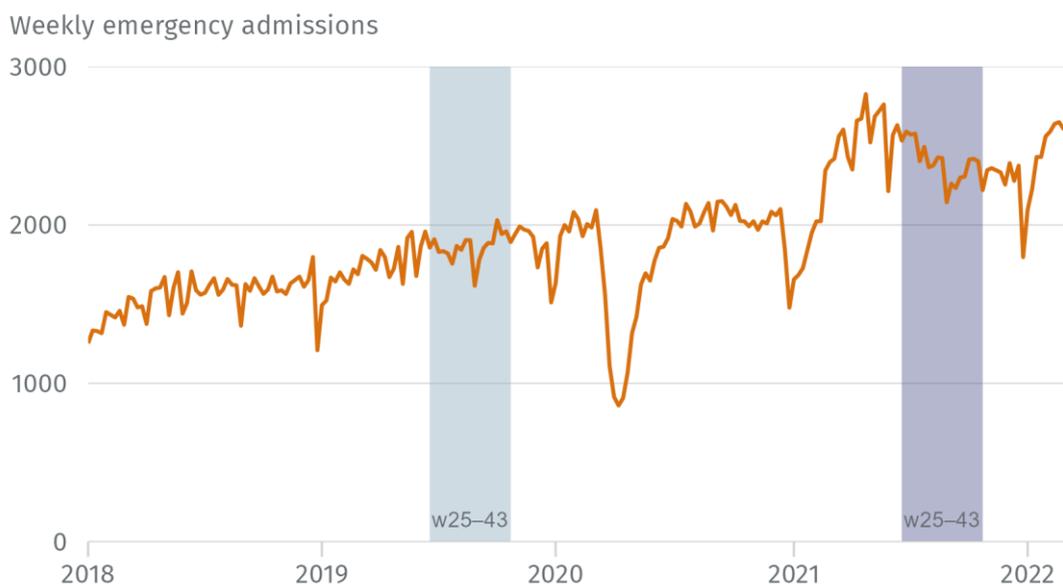
Recent evidence suggests that the risk of cardiovascular problems, such as a heart attack or stroke, remains high even many months after a SARS-CoV-2 infection clears up (23). Researchers are trying to understand who is most at risk of these heart-related problems, how long the risk persists and what causes these symptoms. We found increases in urgent cases of heart failure, thrombotic disorders, and angina (**tables 8 and 9**). Health systems should be prepared to deal with a rise in the burden of

cardiovascular diseases. The chronic nature of these conditions means the consequences for patients and health systems will likely be long-lasting.

Like other parts of the NHS, primary care services were heavily disrupted in the initial phase of the pandemic. During 2021, GPs were asked to prioritise the roll-out of the Covid-19 vaccine programme. This work has continued with third phase booster vaccinations for priority groups from September 2022. These events have had repercussions for the prevention, identification, and management of chronic disease, which are now being felt by urgent and emergency care systems. There is an urgent need for a rapid return to pre-pandemic levels of chronic disease management. In the short term, given competing demands and constrained resources, local systems may want to consider prioritising patients at highest risk of poor clinical outcomes for urgent review.

Admissions for this group show a similar pattern to those for the late presentation of chronic conditions group (**fig 15**).

**Fig 15: Admissions linked to exacerbation or complication of LTCs were 30% higher in 2021 compared with 2019**



Sources: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

**Table 8: ED diagnoses linked to exacerbation or complication of chronic conditions**

| Diagnosis                                | Visits w25–w43 2021  | Change from 2019 (2=doubling etc.)   |
|--|--|--|
| Cluster headache syndrome                | 1,371     | 2.01    |
| Hyperglycemia                            | 3,481     | 1.98    |
| Miscellaneous certificate request        | 5,509     | 1.68    |
| Benign prostatic hyperplasia             | 660       | 1.56    |
| Hypertensive disorder, systemic arterial | 10,575    | 1.46    |
| Hydronephrosis                           | 466       | 1.44    |
| Iron deficiency anemia                   | 1,636     | 1.43    |
| Intermediate uveitis                     | 566       | 1.37    |
| Cauda equina syndrome                    | 6,696     | 1.30    |
| Malignant hypertension                   | 573       | 1.29    |
| Ulcerative colitis                       | 2,835     | 1.26    |
| Pulmonary embolism                       | 18,315   | 1.25    |
| Anemia                                   | 7,291     | 1.19    |
| Prolapse of female genital organs        | 597      | 1.18   |
| Congestive heart failure                 | 13,594  | 1.18  |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

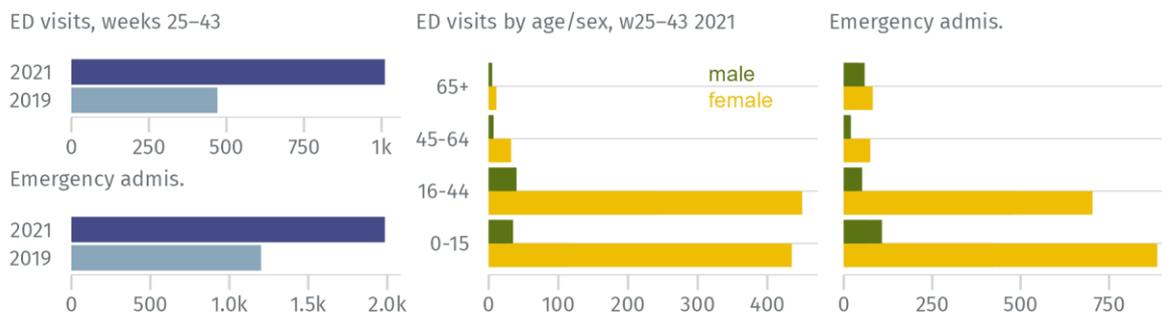
**Table 9: Inpatient diagnoses linked to exacerbation or complication of chronic conditions**

| Diagnosis   | Admis. w25–w43 2021 | Change from 2019 (2=doubling etc.) |
|---|---------------------|------------------------------------|
| HTV heart & renal dis. w. CHF & renal fail.       | 288                 | 2.23                               |
| HTV heart & renal dis. w. CHF                     | 123                 | 2.20                               |
| Unspec. DM: w. ketoacidosis                       | 136                 | 1.70                               |
| Poisoning: Methadone                              | 160                 | 1.65                               |
| Iron deficiency                                   | 166                 | 1.57                               |
| Non-insulin-dep. DM: w. OPH complicat.            | 187                 | 1.52                               |
| Endometriosis of uterus                           | 230                 | 1.49                               |
| Insulin-dep. DM: w. OPH complicat.                | 139                 | 1.42                               |
| Oth. & unspec. adrenocortical insufficiency       | 269                 | 1.39                               |
| Heart failure, unspecified                        | 5,537               | 1.37                               |
| Excessive menstruation w. irregular cycle         | 410                 | 1.37                               |
| Iron deficiency anaemia, unspecified              | 9,391               | 1.34                               |
| Attention to artificial openings of urinary tract | 154                 | 1.33                               |
| Dissection of aorta [any part]                    | 520                 | 1.31                               |
| Non-insulin-dep. DM: w. ketoacidosis              | 1,609               | 1.30                               |
| Ulcerative (chronic) pancolitis                   | 606                 | 1.29                               |
| Follow-up exam. after chemo. for oth. cond.       | 174                 | 1.28                               |
| Essential (primary) hypertension                  | 10,384              | 1.25                               |
| Other forms of angina pectoris                    | 1,832               | 1.25                               |
| Parastomal hernia w. obstruction, w/o gangrene    | 551                 | 1.24                               |
| Anaemia in oth. chronic diseases                  | 292                 | 1.24                               |
| Addisonian crisis                                 | 425                 | 1.23                               |
| Unspec. DM: w/o complicat.                        | 318                 | 1.23                               |
| Interstitial pulmonary disease, unspec.           | 606                 | 1.23                               |
| Other hypoglycaemia                               | 199                 | 1.22                               |
| Comb. d/o mitral, aortic & tricuspid valves       | 454                 | 1.21                               |
| Non-insulin-dep. DM: w. neuro. complicat.         | 228                 | 1.21                               |
| Cauda equina syndrome                             | 590                 | 1.20                               |
| Elevated BP reading, w/o diag. of HT              | 308                 | 1.20                               |
| Hypo-osmolality and hyponatraemia                 | 8,833               | 1.20                               |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

### 3.5 Eating disorders

**Fig 16: More young people are requiring emergency treatment for eating disorders**



Sources: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

While the pandemic has impaired population mental health globally, it seems to have had particularly detrimental effects on young people with or at risk of eating disorders (24). We found big increases in the frequency of ED visits and unplanned admissions with an eating disorder diagnosis. Visits to ED for eating disorders more than doubled, and admissions increased by 64% during weeks 25 to 43 in 2021 compared with the same period in 2019 (**fig 16**). The relative increase in ED visits with an eating disorder diagnosis (+115%) was greater than that experienced by any of the other 11 groups, and only the common infections of childhood group experienced a bigger relative increase in admissions.

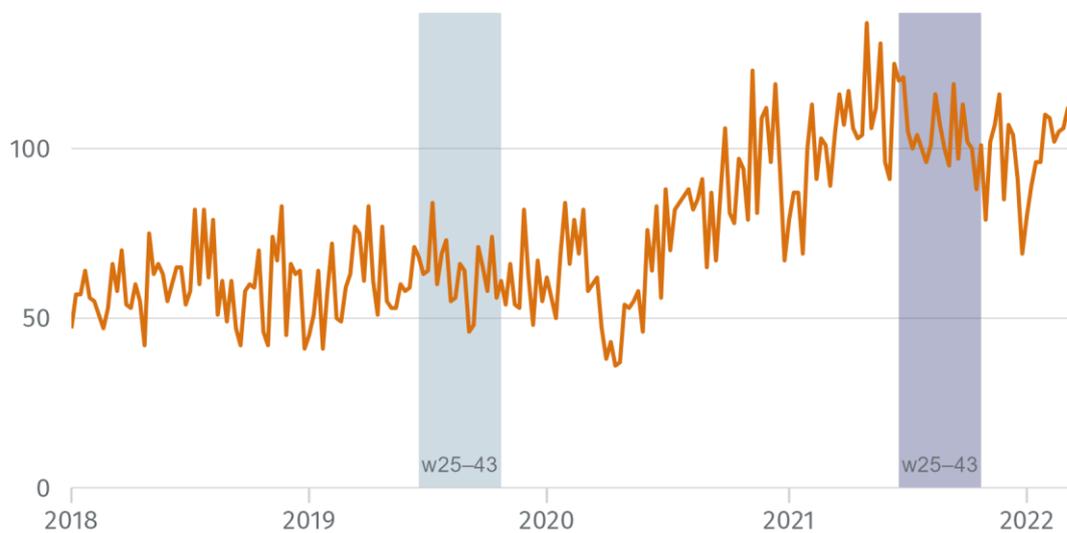
Studies in other countries have also reported increased incidence of eating disorders among young people (25). According to Rodgers et al. (26), the pandemic has created a global context likely to increase eating disorder risk and symptoms, decrease factors that protect against eating disorders, and exacerbate barriers to care.

Eating disorders in young people were on the rise before the pandemic; there is a growing body of evidence that shows pandemic conditions have fuelled a significant worsening of the situation. Existing services are struggling to cope with the increased demand. In England, child and adolescent eating disorder services have seen almost a doubling in the number of both urgent and routine referrals, and waiting times have risen (27,28). Without access to early treatment an increase eating disorders will have serious consequences for both individuals and the wider health system. Eating

disorders have among the highest mortality rate of any mental health illness. Patients living with eating disorders require psychological support as well as support for what can be serious physical complications. The challenges faced by young people with eating disorders and by the services that care for them will not suddenly disappear as we move into the recovery phase of the pandemic. It is our view that the scale of the issue is sufficiently large to require a regional or national response.

**Fig 17: Eating disorder admissions started climbing from mid-2020 and have remained elevated**

Weekly emergency admissions



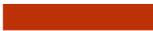
Sources: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

**Table 10: ED diagnoses of eating disorders**

| Diagnosis       | Visits w25-w43 2021 | Change from 2019 (2=doubling etc.) |
|-----------------|---------------------|------------------------------------|
| Eating disorder | 1,011               | 2.15                               |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

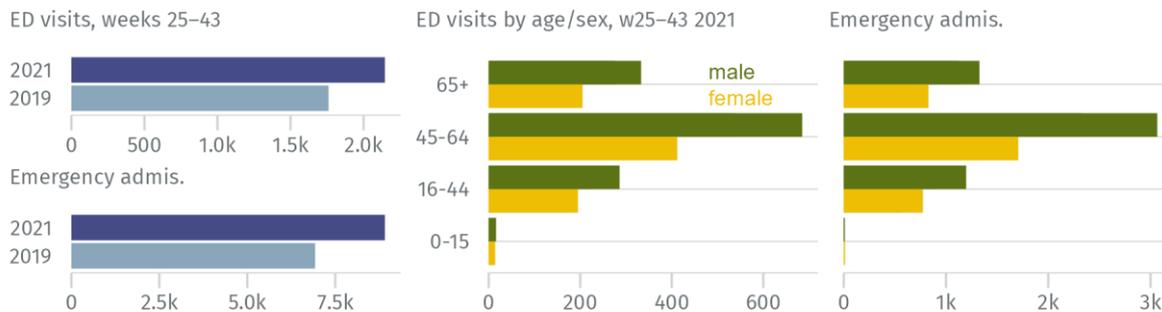
**Table 11: Inpatient diagnoses of eating disorders**

| Diagnosis                    | Admis. w25-w43 2021  | Change from 2019 (2=doubling etc.)   |
|------------------------------|--|--|
| Eating disorder, unspecified | 536   | 2.33  |
| Other eating disorders       | 113   | 1.82  |
| Anorexia nervosa             | 978  | 1.52  |
| Anorexia                     | 301   | 1.26  |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

### 3.6 Effects of alcohol misuse

**Fig 18: Admissions and visits for alcohol-related conditions increased**



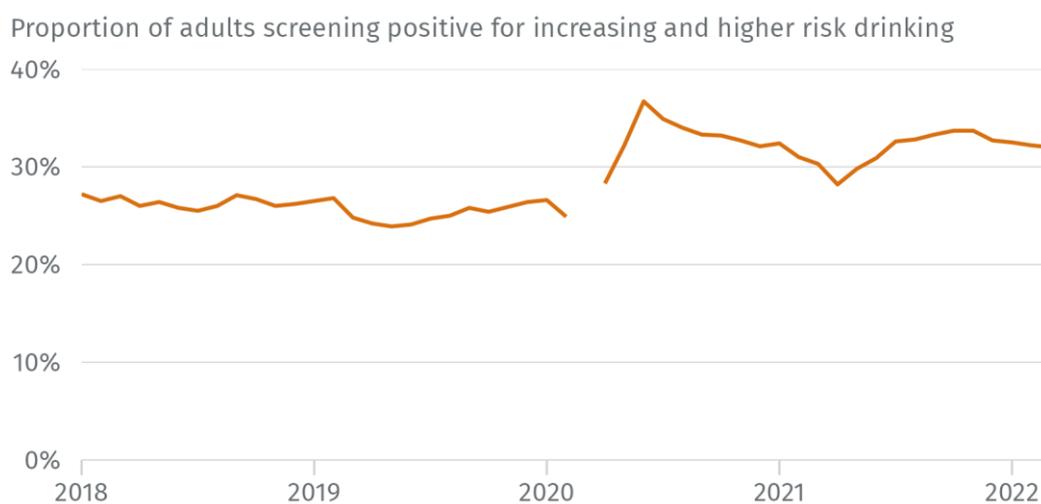
Sources: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

This group of diagnoses includes diseases and conditions that can be attributed to excessive alcohol consumption. Interventions to curb the spread of Covid-19 have had a major effect on where and how alcohol has been purchased. In England, national ‘lockdowns’ meant the closure of pubs, restaurants, and nightclubs. When hospitality has been open it has often been subject to restrictions, including—a ban on indoor dining, table service only, and a requirement to have ‘substantial meals’ when ordering alcohol. It is also known that stress is a prominent risk factor for the onset and maintenance of alcohol misuse. From the start of the pandemic researchers have been trying to understand the overall impact on patterns of alcohol consumption of psychological distress (triggered by the interaction of financial difficulties, social isolation, and uncertainty about the future) and changes in the physical and financial availability of alcohol.

Worryingly, mortality data point to increased consumption and higher rates of alcohol attributable harm. Data from the Office for National Statistics show deaths from alcohol-specific causes increased from 11.8 per 100,000 people in 2019 to 14.0 per 100,000 in 2020. This increase is the highest year-on-year change in 20 years and follows a period of relatively stable rates since 2012 (29). The most recent data show that this increase has persisted through 2021 and into 2022 (30). These figures may reflect changes in people’s willingness or ability to access both healthcare and specialist alcohol treatments services during the pandemic as well as the direct impact of changes in alcohol consumption on health.

Survey data suggest a nuanced but no less concerning picture. There has been an increase in the number of higher risk drinkers, and the heaviest drinkers have increased their consumption the most (4). The proportion of adults in England drinking at risky levels has risen significantly during the pandemic compared to the preceding 6 years and the increase in risky drinking has been sustained beyond the national lockdowns of 2020 and 2021 (**fig 19**).

**Fig 19: Since the start of the pandemic, there has been a sustained increase in the prevalence of self-reported risky drinking**



Note: Data for March 2020 is missing. Screening results from alcohol use disorders identification test consumption (AUDIT C).  
Source: Alcohol Toolkit study.

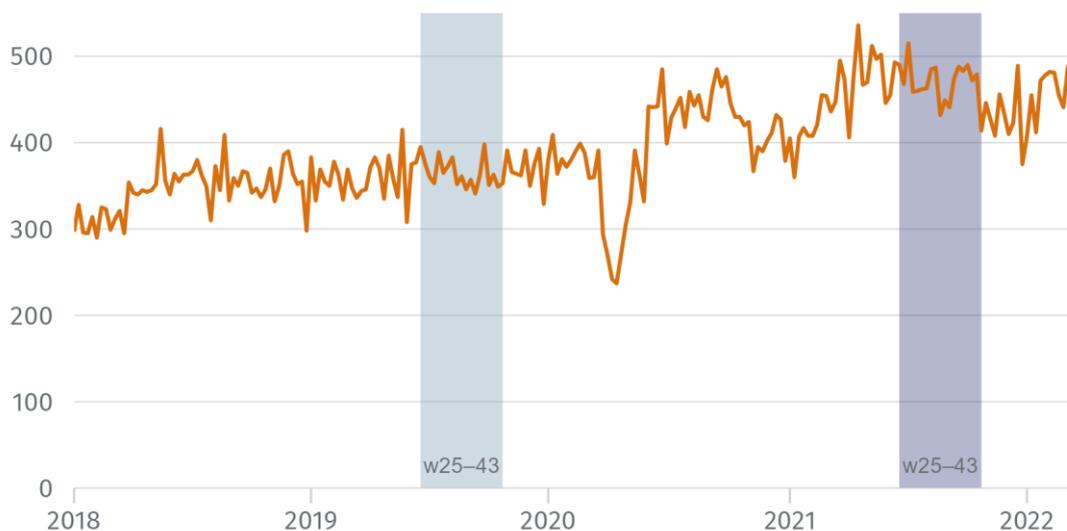
Many of the health consequences of alcohol are chronic conditions that develop over a long period of time. Two recent modelling studies have attempted to quantify the longer-term effects of changes to drinking habits during the coronavirus pandemic and their subsequent effects on population health and health-related costs (4,31). In work commissioned by NHS England, the Sheffield Alcohol Research Group estimated that over the next 20 years, there would be an additional 207,597 alcohol-attributable hospital admissions and 7,153 alcohol-attributable deaths, costing the NHS an additional £1.1bn compared to if alcohol consumption had remained at 2019 levels (31). Heavier drinkers and those in the most deprived areas, who already suffer the highest rates of alcohol attributable harm, are expected to be disproportionately affected (31). In a separate modelling study, the Institute of Alcohol Studies and

HealthLumen (specialists in disease modelling) concluded that changes in alcohol consumption during the pandemic, even if short lived, will result in a significantly increased health and economic burden in England; and if drinking patterns do not revert to pre-Covid patterns, the disease burden will be far higher (4).

The Covid-19 pandemic has contributed to a worsening of trends in alcohol harm. This is likely to have consequences for services dealing with the acute, chronic, and mental health effects of alcohol harm. Local health systems should ensure treatment and rehab services are adequately resourced and be aware of longer-term requirements for dialysis and transplant surgery. If this trend is to be reversed, then there needs to be step change in the level of preventive service provision and serious consideration given to the potential for new national policy interventions.

**Fig 20: There has been a sustained increase in alcohol-related admissions**

Weekly emergency admissions



Sources: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

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**Table 12: ED diagnoses for effects of alcohol misuse**

| Diagnosis             | Visits w25-w43 2021  | Change from 2019 (2=doubling etc.)   |
|-----------------------|--|--|
| Chronic liver disease | 2,146  | 1.22  |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

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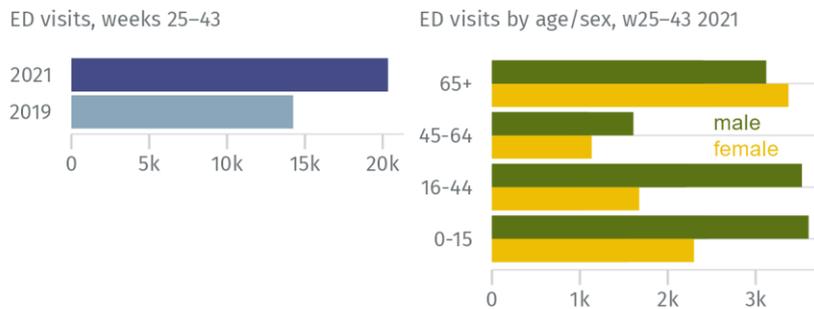
**Table 13: Inpatient diagnoses for effects of alcohol misuse**

| Diagnosis                    | Admis. w25-w43 2021  | Change from 2019 (2=doubling etc.)   |
|------------------------------|--|--|
| Other acute pancreatitis     | 370       | 1.51    |
| Alcoholic fatty liver        | 113       | 1.47    |
| Deficiency of vitamin B      | 256       | 1.45    |
| Alcoholic hepatic failure    | 1,939     | 1.34    |
| Alcoholic gastritis          | 1,175     | 1.33    |
| Fatty liver nec.             | 409      | 1.28   |
| Wernicke's encephalopathy    | 123     | 1.26  |
| Other cirrhosis of liver     | 1,196   | 1.23  |
| Alcoholic cirrhosis of liver | 3,276  | 1.21  |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

## 3.7 Physical injuries

**Fig 21: Injury presentations to ED increased**



Sources: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

Visits to ED increased for a range of physical injuries where physical violence is thought to be a common cause (**fig 21**). For example, visits for a broken nose were more than two times higher in the third quarter of 2021 compared with the same period in 2019. Problem drinking is often a contributing factor to violent incidents, including domestic violence, so it is perhaps unsurprising that we found increases in diagnoses linked to both alcohol misuse and physical violence.

Over the course of the pandemic, media reports have highlighted an increase in rates of domestic violence among intimate partners and against children (3). Between April and June 2020, the 24-hour National Domestic Abuse Helpline that offers support to women experiencing domestic abuse in England and Wales logged a total of 40,397 calls and contacts, a 65% increase compared with the first three months of 2020 (32). There are obvious challenges in accurately quantifying the prevalence of what is a largely hidden crime, but it's clear that 'lockdowns' reduced women's options for escape and likely made things worse for many women and children who were experiencing, or who had experienced, domestic abuse.

A review of 20+ studies on changes in prevalence and severity of domestic violence (DV) during the pandemic reported an increase in the severity of DV and increases in some types of DV but for other types of DV and the overall prevalence of DV findings were inconclusive (3). Only studies of participant-reported abuse were included because official records (e.g., police, helpline, or hospital records) risk picking up changes in help-seeking behaviour alongside any change in true prevalence.

Research suggests that the average length of abuse experienced before accessing a domestic abuse support service is six years, and this varies greatly with some women experiencing abuse for far longer, so women affected by abuse during the pandemic could be seeking help for many years (33).

In our analysis, the relative increase in total visits to A&E across all diagnoses listed in **table 14** was similar for men and women. For older patients, we expect a greater share of some of these injuries to be the result of a fall rather than physical violence.

ICBs are ideally positioned to engage with partner organisations including local authorities and charities to ensure access to DV services for their local populations.

There are no emergency admission diagnoses in this group.

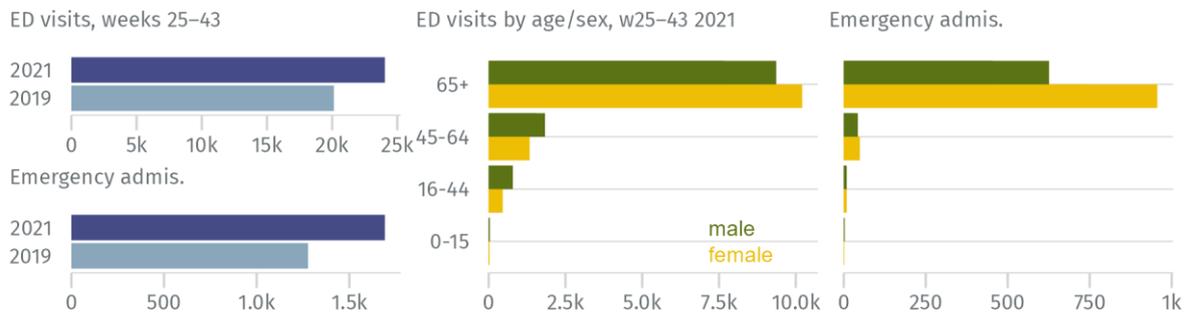
**Table 14: ED diagnoses of physical injuries**

| Diagnosis                      | Visits w25-w43 2021  | Change from 2019 (2=doubling etc.)   |
|--------------------------------|--|--|
| Closed fracture of nasal bones | 2,298    | 2.06   |
| Laceration of eyelid           | 513     | 1.81  |
| Open wound of lip              | 3,691   | 1.55  |
| Contusion of nose              | 1,624   | 1.49  |
| Contusion of ear               | 515     | 1.48  |
| Bleeding from nose             | 8,008  | 1.33  |
| Fracture of orbit              | 467     | 1.30  |
| Injury of kidney               | 2,318   | 1.28  |
| Blunt injury of eye            | 909     | 1.12  |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

### 3.8 Social isolation among older people

**Fig 22: Social isolation may have contributed to higher admissions among older people**



Sources: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

We observed an increase in both ED visits and unplanned admissions for diagnoses that are most common among older people and where social isolation may be a contributing factor. In this group, the biggest increases in ED visits were for skin ulcers and rhabdomyolysis (**table 15**). Rhabdomyolysis occurs when muscle fibres are damaged and release their contents into the bloodstream. Trauma and prolonged immobilisation, for example, following a fall is a common cause of rhabdomyolysis among older people.

Visits to ED and unplanned admissions for delirium also increased (**tables 15 and 16**). Delirium is a serious disturbance in mental abilities that results in confused thinking and reduced awareness of the environment. It occurs when the normal sending and receiving of signals in the brain become impaired and is a common presenting symptom of any severe illness, including Covid-19, in older adults.

In most cases, delirium is triggered by a combination of contributing factors including for example, chronic illness, changes in metabolic balance, infection, or side effects of medication. However, social, and environmental factors such as increased isolation and emotional stress have also been identified as important risk factors (34).

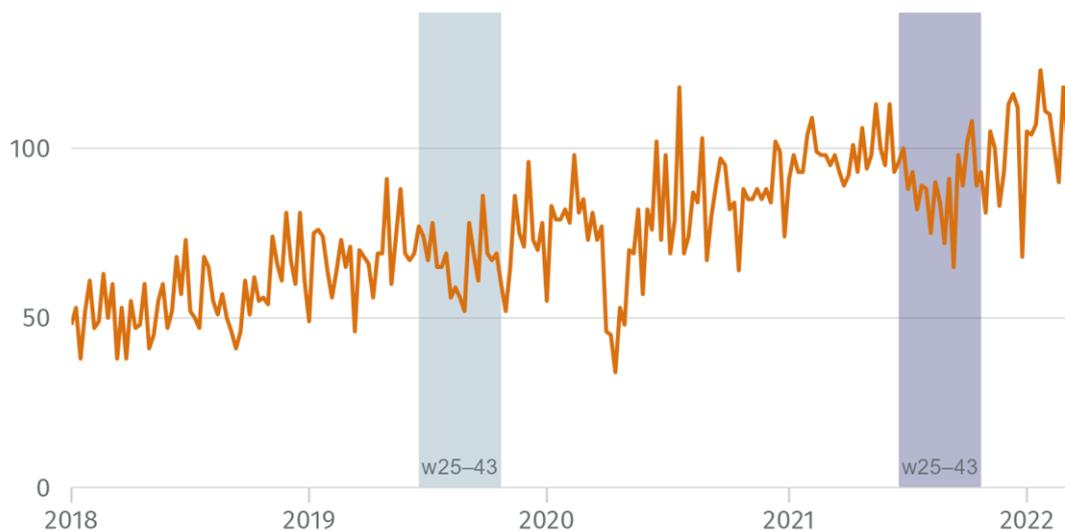
The issues facing the social care system in England are longstanding in nature but have been bought into stark relief by the Covid-19 pandemic. An increase in the diagnosis of skin ulcers and rhabdomyolysis in ED may reflect the severe capacity problems in social care. Ambulance service pressures may also be factor: response times started to worsen from Summer 2021 and have since deteriorated further (35).

ICBs may want to explore the feasibility and potential benefit of channelling additional funding to social care to help bolster capacity and resilience.

**Figure 23** suggests that the increase we found in unplanned hospital admissions was part of a longer-run trend rather than a step-change. One potential explanation could be increased use of tools to monitor for new-onset delirium among inpatients. In 2019, delirium was added to the National Early Warning Score 2 (NEWS2)—a standardised approach to assessing acute illness—used by all NHS hospitals in England (36).

**Fig 23: Admissions where social isolation may have been a factor were already trending upward before the pandemic hit**

Weekly emergency admissions



Sources: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

**Table 15: ED diagnoses among older people where social isolation may be a contributing factor**

| Diagnosis                        | Visits w25-w43 2021   | Change from 2019 (2=doubling etc.)   |
|----------------------------------|---|--|
| Ulcer of skin of lower extremity | 1,547    | 1.84  |
| Rhabdomyolysis                   | 1,230    | 1.47  |
| Delirium                         | 12,292  | 1.22  |
| Acute renal failure syndrome     | 8,977    | 1.07  |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

What are the population health implications of reduced access to care during the Covid-19 pandemic?

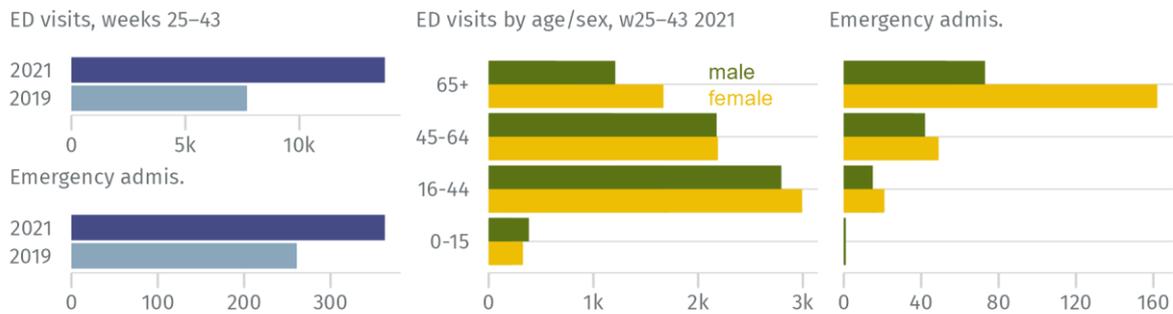
**Table 16: Inpatient diagnoses among older people where social isolation may be a contributing factor**

| Diagnosis                             | Admis. w25-w43 2021  | Change from 2019 (2=doubling etc.)   |
|---------------------------------------|--|--|
| Delirium not superimposed on dementia | 873  | 1.36  |
| Other delirium                        | 836  | 1.31  |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

### 3.9 Spinal or back conditions

**Fig 24: ED visits for spinal or back conds. were 79% higher in w25–43 2021 than in 2019**



Sources: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

We observed significant increases in visits to ED for spinal or back conditions (**fig 24**). Visits to ED for radiculopathy (a pinched nerve in the spine) and lower back injuries were 151% and 58% higher in 2021 than in 2019 (**fig 24**). Three quarters of these visits occurred in working age adults (**fig 24**). Risk factors for back problems include degenerative changes, injuries, poor posture, obesity, and physical inactivity.

A systematic review of the effects of the pandemic on physical activity concluded that during the first year of the pandemic (to October 2020) physical activity decreased significantly in all age groups, in males, and females, and in most countries (37). The most recent data from Sport England covering the 12 months to November 2021 show that while activity levels dropped because of restrictions designed to stop the spread of the virus, they then stabilised and are now starting to recover. However, physical activity levels are still lower compared to pre-pandemic, with 600 thousand (1.9%) fewer active adults and 1.3 million (2.6%) more inactive adults (38).

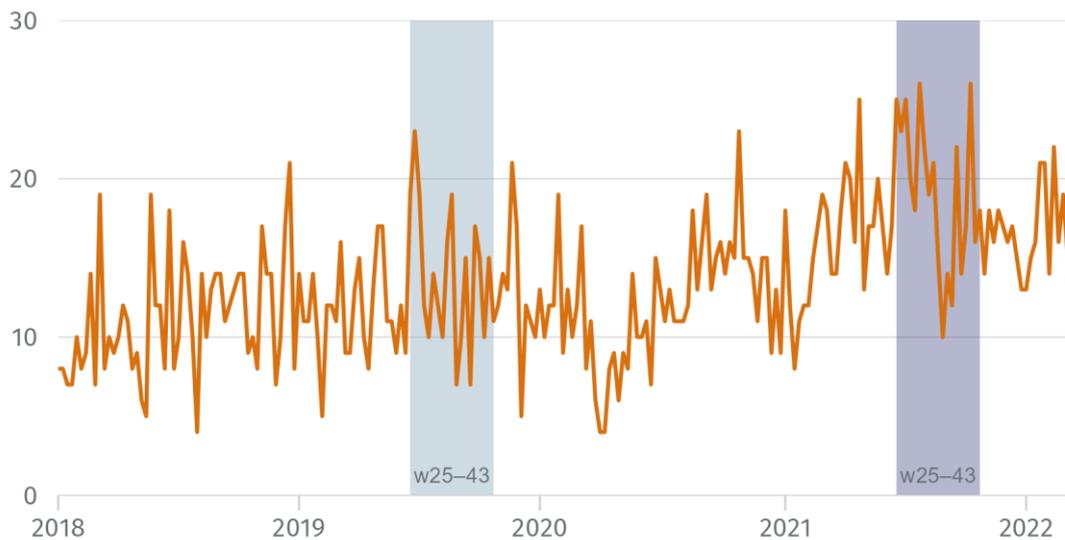
Following the pandemic, the proportion of jobs involving working from home jumped. This trend has continued even after quarantine measures were lifted. This change in work environment exposes workers to a greater risk of musculo-skeletal problems related to ergonomically poor working conditions. In this context, health systems may wish to explore approaches to promote the importance of good ergonomics for home workers; alongside efforts to increase physical activity levels.

The higher frequency of emergency admissions among older females compared with males (**fig 24**) suggests a significant share of admissions in this group may be

osteoporosis related. It has been reported that the pandemic decreased screening and disrupted treatment for osteoporosis (39).

**Fig 25: Average weekly admissions for spinal or back conditions climbed to 17 in 2021 compared with 13 in 2019**

Weekly emergency admissions



Sources: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

**Table 17: ED diagnoses for spinal or back conditions**

| Diagnosis                      | Visits w25-w43 2021 | Change from 2019 (2=doubling etc.) |
|--------------------------------|---------------------|------------------------------------|
| Lumbar radiculopathy           | 2,639               | 2.73                               |
| Cervical radiculopathy         | 1,612               | 2.22                               |
| Torticollis                    | 937                 | 1.63                               |
| Injury of muscle of lower back | 8,561               | 1.58                               |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

**Table 18: Inpatient diagnoses for spinal or back conditions**

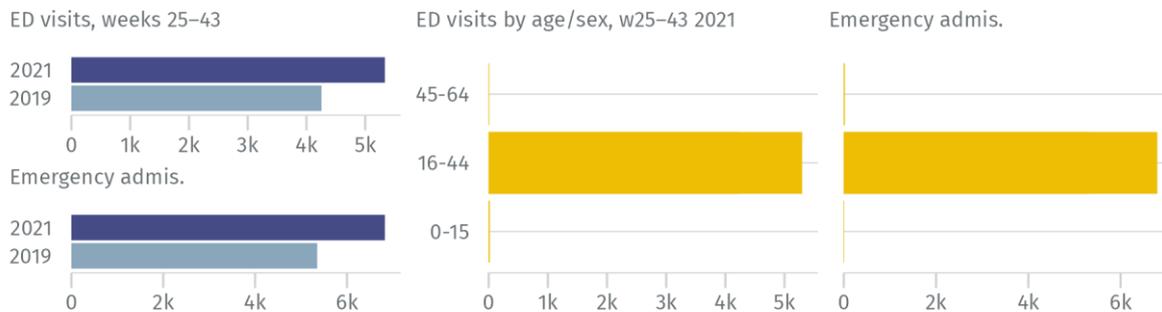
| Diagnosis                            | Admis. w25-w43 2021 | Change from 2019 (2=doubling etc.) |
|--------------------------------------|---------------------|------------------------------------|
| Fatigue fracture of vertebra         | 133                 | 1.62                               |
| Other spondylosis with radiculopathy | 223                 | 1.25                               |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

What are the population health implications of reduced access to care during the Covid-19 pandemic?

### 3.10 Complications of pregnancy

**Fig 26: More women were treated in hospital for pregnancy complications**



Sources: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

We observed increased visits to ED and unplanned admissions to hospital involving complications of pregnancy, for example, severe vomiting in pregnancy (hyperemesis gravidarum), and miscarriage (**fig 26 and tables 19 and 20**).

This increase was not caused by an increase in the number of births. Data from ONS show that births in England and Wales were lower in both 2020 and 2021 than in 2019 (40).

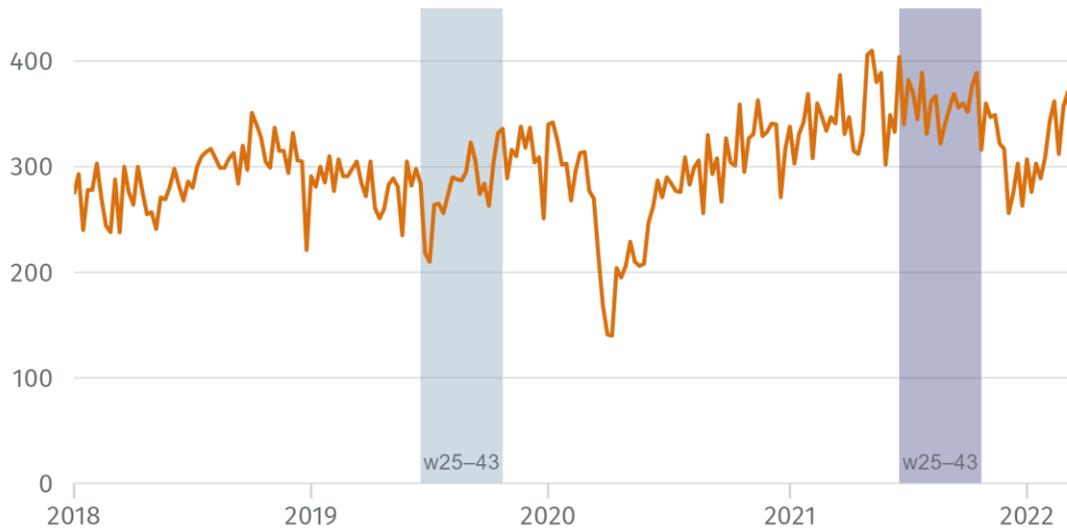
Early in the pandemic, the UK government placed pregnant women into the group of people who were considered 'vulnerable' to the severe effects of Covid-19 (41) and recommended that they 'be particularly stringent in following social distancing measures', including attendance at clinical settings only for essential medical care. In response to the pandemic, substantial modifications to maternity services were introduced. The most common modifications included a reduction in the number of antenatal contacts offered by any method; conversion of some antenatal appointments to remote consultations, particularly in the first and second trimesters; an increase in self-monitoring of blood pressure; modification of GDM screening; a reduction in the frequency of fetal growth surveillance by ultrasound and reduced options for place of birth (42).

Studies in the UK and internationally have shown that women who do not attend antenatal services are at increased risk of maternal death, stillbirth, and other adverse perinatal outcomes (43). ICBs should work to ensure that pregnant women's access to in-person maternity services and antenatal appointments is safe in the context of

Covid-19, but also recognises the benefits of in-person care and women’s preferences.

**Fig 27: More women are being admitted for pregnancy complications than before the pandemic**

Weekly emergency admissions



Sources: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

**Table 19: ED diagnoses for pregnancy complications**

| Diagnosis                       | Visits w25-w43 2021 | Change from 2019 (2=doubling etc.) |
|---------------------------------|---------------------|------------------------------------|
| Miscarriage with complication   | 418                 | 1.57                               |
| Excessive vomiting in pregnancy | 4,917               | 1.23                               |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

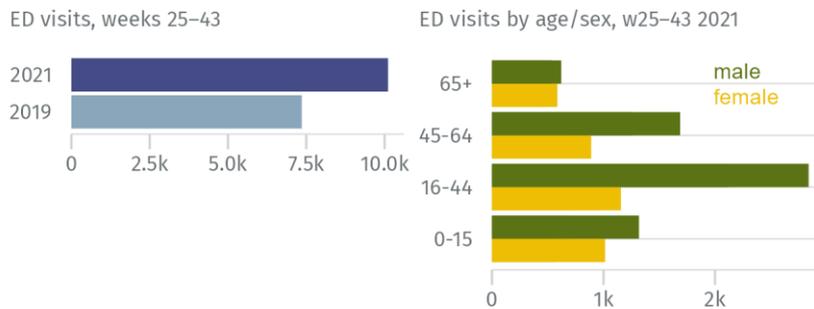
**Table 20: Inpatient diagnoses for pregnancy complications**

| Diagnosis                                       | Admis. w25-w43 2021  | Change from 2019 (2=doubling etc.)   |
|---|--|--|
| Maternal care oth. fetal problems               | 155     | 1.96  |
| Medical abortion: complicat. by haemorrhage     | 202     | 1.85  |
| Supervision of preg. w. hist. abortive outcome  | 112     | 1.44  |
| Oth. complicat. abortion, ectopic & molar preg. | 116     | 1.41  |
| Hyperemesis gravidarum w. metabolic disturb.    | 3,822  | 1.27  |
| Vomiting of pregnancy, unspec.                  | 496     | 1.26  |
| Supervision of other normal pregnancy           | 123     | 1.26  |
| Abnorm. biochemical finding AN screen. mother   | 1,672   | 1.22  |
| Spontaneous abortion: c/b haemorrhage           | 257     | 1.21  |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

### 3.11 Eye conditions and injuries

**Fig 28: ED visits for minor eye conditions and injuries increased by 37%**



Sources: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

We observed a notable increase in visits to ED for some eye conditions and injuries. Visits with a diagnosis listed in **table 21** increased by 37%. Conditions like conjunctivitis and eyelid cysts (cyst of meibomian gland) are common self-limiting eye conditions that can often be treated safely at home.

Many of these conditions appear to be amenable to management outside of a hospital setting in the community. For these conditions difficulties in accessing primary care, perceived or real, may have been a contributing factor to increased ED activity. Even though the number of appointments has returned to pre-pandemic levels, access and experience of general practice have been significantly affected by Covid-19. The latest results from the GP Patient Survey—a nationally representative survey that asks patients in England about their experiences of their local GP practice—collected between January and April 2022, show poorer experience of making an appointment. Nearly half of respondents (47%) said it was not easy to get through to their GP practice on the phone, the lowest value since the question was first included in the survey in 2018; and 26% had avoided making an appointment in the previous 12 months because they found it too difficult (44).

From July 2022, ICBs assumed delegated responsibility for commissioning primary care; and improving access to primary care is a key priority in the operational planning guidance published by NHSE at the start of the year (45). ICBs may also want to explore the potential for community optometry services to serve as the first point of contact for eye health, especially urgent minor eye conditions.

There are no emergency admission diagnoses in this group.

**Table 21: ED diagnoses for eye conditions and injuries**

| Diagnosis                               | Visits w25–w43 2021  | Change from 2019 (2=doubling etc.)   |
|---|--|--|
| Cyst of meibomian gland                 | 544     | 1.92  |
| Posterior vitreous detachment           | 717     | 1.54  |
| Acute conjunctivitis caused by chemical | 693     | 1.50  |
| Bacterial conjunctivitis                | 1,983   | 1.47  |
| Allergic conjunctivitis                 | 1,050   | 1.46  |
| Retained foreign body in eye            | 723     | 1.39  |
| Corneal foreign body                    | 2,673  | 1.27  |
| Blepharitis                             | 558     | 1.23  |
| Viral conjunctivitis                    | 1,170   | 1.18  |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

## 3.12 Postoperative problems

Fig 29: Admissions for postoperative problems increased, esp. in urology & gynaecology



Sources: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

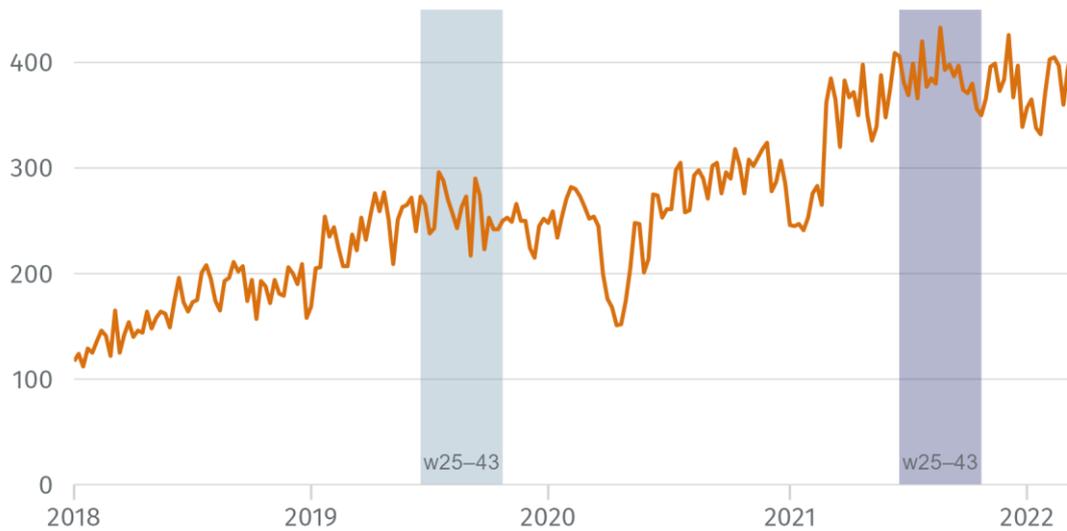
The diagnoses in this group relate to complications of surgical and medical care. Admissions for general follow-up care and attention to dressings increased (**table 22**). However, we also noted a step change in admissions with a diagnosis indicating complications of urological (especially among older men) and gynaecological procedures (**table 22**).

Care needs to be taken to ensure that as local systems work to recover elective services as quickly as possible, with the aim of delivering around 30% more elective activity by 2024/25 than before the pandemic, that postoperative care services are not overlooked (19). Patient outcomes after elective surgery are dependent on both the quality of the intervention and the follow-up support provided in the days and weeks afterward. ICBs may want to pay special attention to follow-up care in the urology and gynaecology specialties.

There are no ED diagnoses in this group.

**Fig 30: A step-change increase in admissions for postoperative problems occurred from early 2021**

Weekly emergency admissions



Sources: Strategy Unit analysis; SUS+, National Commissioning Data Repository.

**Table 22: Inpatient diagnoses for postoperative problems**

| Diagnosis   | Admis. w25-w43 2021 | Change from 2019 (2=doubling etc.) |
|---|---------------------|------------------------------------|
| Oth. specified surgical follow-up care                              | 510                 | 2.01                               |
| Follow-up exam. after surgery for oth. cond.                        | 787                 | 1.77                               |
| Attention to surgical dressings and sutures                         | 1,246               | 1.54                               |
| Inf. & inflamm. rxn. prosthetic dev., implant, & graft urinary sys. | 3,302               | 1.42                               |
| Mech. complicat. oth. urinary devs. & implants                      | 1,465               | 1.37                               |

Sources: Strategy Unit analysis; SUS+, National Commissioning Dataset Repository.

## 4. Conclusion

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The coronavirus pandemic caused major changes in the utilisation of healthcare services. Millions of patients living with health problems faced interruptions to their care and many more may have missed vital opportunities to receive initial assessment and diagnosis for emerging health problems. This report attempts to identify which population groups, with which health conditions, have been most disadvantaged by these dramatic changes. Determining how health outcomes have been affected by reduced access to care, and who has been most affected by these impacts, is vital if resources are to be directed to mitigate the unintended consequences of the pandemic.

The analysis produced for this report demonstrates marked changes (at a national level) in patterns of emergency care use. We identify 12 groups of patients (clinical cohorts) that appear to be suffering adverse consequences from missed care and wider fallout caused by the coronavirus pandemic. Determining the causal factors behind the observed changes is challenging. For some of the 12 groups (and individual conditions) we think we have a good understanding of the mechanisms involved, but for others the story is much less clear, and would benefit from further investigation.

We make a number of necessarily high-level recommendations. These are primarily offered as a prompt to stimulate further discussion rather than a definitive course of action. The response of individual health systems seeking to address factors behind the increased use of emergency care by patients in these groups will rightly be influenced by their own local context.

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