

RAPID RESEARCH IN COVID-19 PROGRAMME

Minimising impact on vulnerable patients: data-driven design, monitoring and adaptation of COVID and non-COVID clinical care pathways

AIMS

Patients vulnerable to the most severe health impacts of COVID-19 were asked by the Scottish Government to shield from March through until August 2020. Shielding involved isolating at home, and even within the home, minimising contact with family members if they had been outside. Often with complex and multiple health problems, patients being asked to shield also faced serious disruption to regular and emergency clinic appointments and hospital admissions.

Shielding, as a protection strategy, had the potential to cause major disruption in care and potentially make underlying health conditions worse unless the NHS could adapt. Although shielding formally ended in August 2020, the need to deliver health care differently to keep patients vulnerable to COVID-19 safe continues to be a major challenge for the NHS.

The aim of this project was to better understand care needs for patients who were identified by the government as being required to shield. By understanding what care this patient group accessed prior to COVID-19, we aimed to help the NHS to plan for alternative ways of continuing care safely. Working with our NHS and local authority colleagues, we identified the need to extend this work to also identify indicators of potential community vulnerability to the impact of COVID-19.

KEY FINDINGS

- Despite the high clinical impact of COVID-19 and shielding, our review of the literature confirmed that little had been published about the care needs of the patients we were asking to shield.
- In addition to the primary health condition that made patients vulnerable to COVID-19, they often had multiple health conditions and were on medications that increased their risk of serious COVID-19 infection.
- Poor mental health was an important feature that placed patients at further risk from the isolation caused by shielding.

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- Health care use was high in these patients and when planning for their care consideration needs to be given to routine care monitoring, medications, investigations and treatments that often included regular attendance at the hospital. A&E, hospital outpatient and emergency in patient care was common.
- Other communities potentially vulnerable to the impacts of COVID-19 were identified using readily available data, in particular in relation to factors impacting the ability to socially distance.

WHAT DID THE STUDY INVOLVE?

Stakeholder involvement with our NHS and local authority partners who were involved in designing and delivering support to shielded patients and vulnerable communities was key. Members of the research team joined the NHS Grampian Shielding Operational Management Group. We participated in Clinical Board discussions, across primary and secondary care, around service redesign of care pathways. Our work was informed by patient feedback through clinical leads and a parallel survey of cancer patients and carers [Led by Prof Anderson].

Our NHS study team maintained a register of all patients who were asked to shield. We linked this register to their health care records from six NHS datasets: hospital admissions, A&E visits, outpatient clinic visits, community prescribing, blood tests, and biochemistry tests. Appropriate research ethics and data governance approvals were obtained.

To understand how often and what sort of health care services patients who were shielded were most likely to require, we used data from the year prior to the COVID-19 pandemic (Nov 2018 to Nov 2019) to help inform us. The data from each data base were linked and anonymised (so that individuals could not be identified) ready for research within the Grampian Data Safe Haven. We also collected relevant open data to help describe communities; information about housing, access to services and access to the internet. A 'Colorado social distancing score'¹ was estimated – this allowed the identification of areas where social distancing would be most difficult. The data were prepared, analysed and the outputs discussed and shared with our stakeholders throughout the study period.

¹<https://www.coloradohealthinstitute.org/research/colorado-covid-19-social-distancing-index>

WHAT WERE THE RESULTS AND WHAT DO THEY MEAN?

By April 2020, there were 14,579 people in Grampian NHS Health Board area who were 'shielded'; 2% of the total population. The median (average) age was 65 years, younger than our general hospital population (Fig 1). The shielded patients lived right across the Grampian region, with one in three people living in remote and rural areas (Fig 2).

Shielded patients often had more than one health condition. 2 in 5 people had a prior mental health condition. 1 in 5 people had three or more health conditions.

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In 2018 to 2019, on average, 12 of our shielded patients visited the A&E every day. The majority of A&E visits were for a major clinical need (70%), with half arriving by ambulance and half requiring admission to hospital. On average, 45 of our shielded patients were admitted to hospital every day. The total number of admissions per day increased as the year went on reflecting that for many patients who were shielded, their health conditions worsen over time and they need more health care support. Half of the admissions were 'day case' for treatments like chemotherapy but 43% of admissions were as emergencies. 800 admissions required high dependency or intensive care support over the 12 month period. One in five of our shielded patients attended outpatients more than 5 times during the year. In the outpatient department, six clinics saw more than 10 shielded patients per day [rheumatology, ophthalmology, respiratory, haematology, renal and gastroenterology]. Almost all the shielded population had at least one blood test in 2019, requiring an average of 6 outpatient or GP visits for blood tests over the 12 months. 53% of patients had required an antibiotic prescription in the previous 12 months.

Just as the distribution of patients shielding varied across Grampian, so did other factors that could potentially make a community vulnerable to COVID-19 or the impact of the control measures. One index, Colorado social distancing index, was translated into a mapping tool to identify areas with a combination of high 'essential workers', overcrowded housing, higher population density and high socioeconomic deprivation. This identified communities potentially vulnerable to COVID-19 transmission within each of the three local authorities.

Our research described in detail the use of health care that shielded populations were likely to need adapted in order to maintain their health, while minimising the risk from COVID-19 infection. By highlighting that many patients had multiple health conditions, monitoring and treatment requirements, we raised the importance of employing a holistic approach to redesigning care and support, including the importance of mental wellbeing. The research also highlights the importance of supporting communities where minimising COVID-19 transmission may be hardest.

Figure 1 The age distribution by sex for each of the shielding categories. Compared to the overall shielding population, those who had a transplant or immunosuppression were younger. Those with respiratory diseases were older.

Horizontal line shows the median (average) age of the entire shielding population.
F=female, M=male

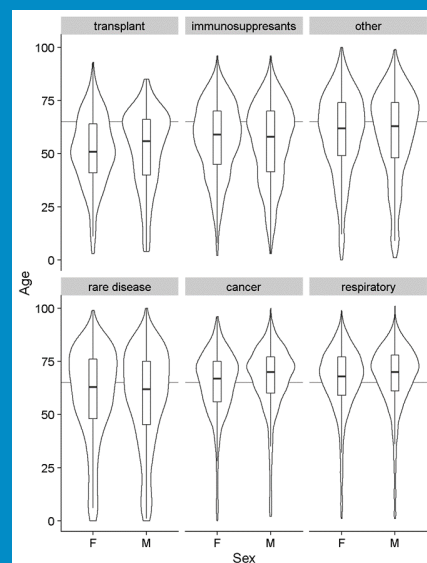


Figure 2. Shielded patients lived all across Grampian including in remote and rural areas

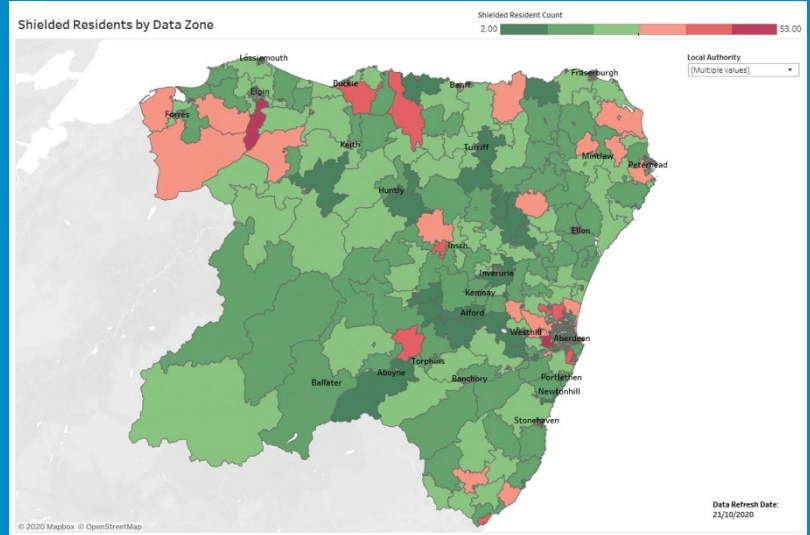
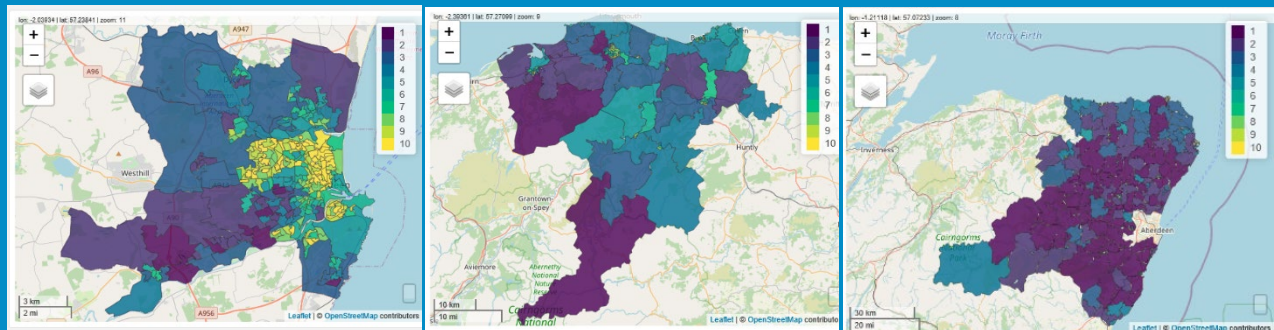


Fig 3 Example of the Colorado Social Distancing Score². This was one of a series of indicators translated into map tools to support service planning for communities potentially vulnerable to COVID-19 and the impact of the control measures.



WHAT IMPACT COULD THE FINDINGS HAVE?

Here we report the health and healthcare characteristics of people shielding to the COVID-19 pandemic.

The implications for:

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- Patients and practice – by working closely with NHS and local authority colleagues in Grampian, the findings from the work informed the redesign of care delivery during the shielding period and continue to do so as we move through into winter. The patient register, and methods to link to key health care data, have enabled NHS Grampian to implement real time monitoring and alerts for clinical teams caring for shielded patients in order to optimise care if a patient was admitted to hospital. Knowing which patients were shielding and their pre-COVID-19 care patterns allowed the NHS to adapt how care was delivered during COVID-19. This included an increase of up to 50% of out-patient care being delivered virtually, making more ad-hoc clinical contact available, and protecting in-patient visits for those most in need. More than 3000 of the shielded patients have been admitted to hospital since April 2020.
- Policy – understanding the anticipated health care utilisation prior to COVID-19 supports and informs service delivery and priorities for this key patient group. It also provides a base line to compare the changes in care during the pandemic and after. Highlighting the importance of multimorbidity, mental health and high care need is key to informing how patients, shielded during the first wave of the pandemic, should be supported.

HOW WILL THE OUTCOMES BE DISSEMINATED?

The study team have presented its findings both locally to the NHS and local authorities and also to Public Health Scotland. We have gone on to work with colleagues in Public Health Scotland to identify policy and evidence gaps that can be further addressed, building on the outputs of this study. We have also shared the findings with colleagues across NHS England and Wales.

With the local community, we have discussed the study and its initial aims and findings through local media and more widely through Twitter and social media. Scientific publications are now in preparation. The first of a series of podcasts has been made discussing this project and related research which describe why health and care data is so important in responding to COVID-19.

The analytical methods and code for the vulnerable communities work is available as open source through Github so that other researchers can build on the work. We continue to add to this resource.
https://jessbutler.github.io/social_distancing/#social-distancing-score

This work forms an important baseline and set of methods that can be applied across Scotland and the UK to understand the ongoing impacts on people and communities who are identified as vulnerable to COVID-19 and pandemic control measures. We have joined a collaboration of Health Foundation funded Networked Data Labs to be able follow up the ongoing care needs and outcomes of shielded patients across the UK.

CONCLUSION

Understanding the impact of COVID-19 on patient care for the most vulnerable patients was informed by using data from electronic health records. This work allowed a better understanding of who was on the shielding register, measured their pre-COVID-19 care, showed how care had changed during lockdown, and allowed the NHS to adapt care including virtual, ad-hoc, protected in-patient and outpatient visits. Working closely with NHS and local authority colleagues allowed rapid description of the key elements of the care pathway and informed a holistic approach to planning and adapting care during the COVID-19 pandemic.

RESEARCH TEAM & CONTACT

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ADDITIONAL INFORMATION

This project completed on 31st Oct. 2020; however related work is ongoing and the project outputs continue to be taken forward in partnership NHS Grampian and other stakeholders. The project was supported by an award of £76,212 from the Chief Scientist Office.