From famine to feast – reflections on the availability and use of data at a local level through the pandemic.

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Introduction

Leicestershire County is located in the heart of rural England, with an approximate population of 800,000 people. Parts of Leicestershire, along with Leicester City, were subject to the first 'local lockdown' in England during the pandemic

This paper will focus on how changes in available data drove public health interventions and the public narrative throughout the COVID-19 pandemic and provide recommendations on how to better use the data to influence the public narrative.

The paper was initially written in early 2021 before the coming of the Delta variant, the vaccination programme and the lifting of national restrictions. Some additions to reflect the changing picture since early 2021 have been made in this final version.

Background

The weekly COVID-19 incidence rates for the first year of the pandemic can be seen for Leicester City, Leicestershire, and Rutland compared to the overall COVID-19 incidence rates across England in Figure 1. In June 2020 Leicester City had a rate of infection significantly higher than any other area and preceded the setting of a local 'lockdown' that is the focus of this paper. In absolute terms, infections rates were notably higher than during the local lockdown in the run up to the second national lockdown in October 2020 and the third lockdown in January 2021.

Since the beginning of 2021, slow but steady progress was made in Leicester City and Leicestershire, as demonstrated by the falling incidence rates. Subsequently, the additional transmissibility of the Delta variant, the easing of national restrictions and a Euro 2020 related surge in infections, have resulted in higher infection levels than were seen at any time in 2020. Thankfully the success of the vaccination programme has, thus far, kept a lid on the worst of the resulting deaths.

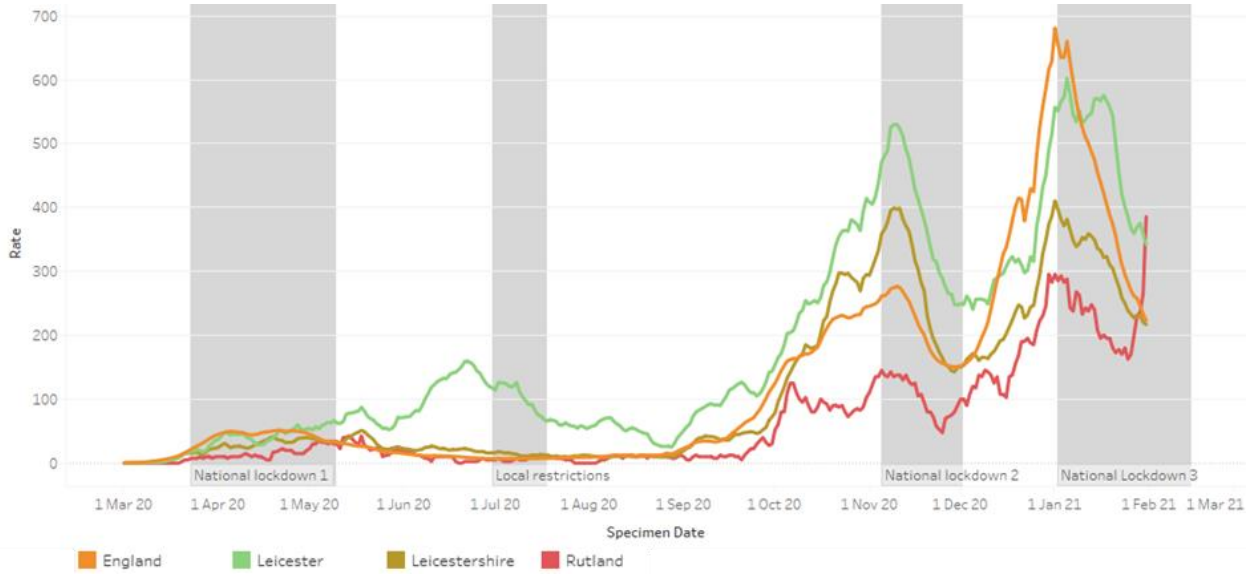

Figure 1: Trend in Weekly COVID-19 Incidence Rates (per 100,000 population) in Leicester City, Leicestershire, and Rutland 2020– All Ages[1]

The development of more widespread testing and, as a result, better data has driven an increasingly sophisticated response locally to the pandemic over time. During the first national lockdown, the data that could be used and shared with the public was scarce. The local lockdown in July 2020 coincided with some data being available for internal and public use and the run up to the second national lockdown saw an increase in the amount of data available to use. However, the proliferation of available data did not solve all issues related to the usage and public understanding of the data.

[1] Public Health England, Power Bi, Covid-19 Situational Awareness Explorer Portal (2021). *Cases Line Lists and ONS Mid-2019 Population Estimates.*

Phase 1. Data During the First National Lockdown – No meaningful data bar deaths data.

At the time of the first national lockdown from March to May 2020, the only data available came from Pillar 1 testing data, conducted by Public Health England and NHS hospitals on priority individuals and those who were admitted to hospital, and daily death reports. During this period, the public health community was predominantly preoccupied with managing the lockdown and dealing with the issues arising from COVID-19, including focussing on translating PPE guidance, fielding queries from the public.

The Pillar 1 data could only be seen as a snapshot of the true case rate although the public believed this largely to be a comprehensive picture of infection. The national and local focus on death rates as the main data available was a blunt instrument but did achieve the effect of encouraging the public to closely follow the lockdown restrictions. However, using this data to develop meaningful interventions was difficult because it was more closely correlated with the number and location of care homes. The local focus at that stage being universal comms and the translation of guidance. With limited data the targeting of specific high rate areas, sectors, or routes of transmission was minimal.

Phase 2. The Local Lockdown – Boundary line branded 'stupid' by residents

Community based testing ('pillar 2' testing) via the PCR test began to be rapidly expanded nationally from April onwards, firstly targeted on key workers and then to the broader population. The development of 'NHS' Test & Trace and the mobile app came on stream in May 2020. These national developments, although belated, were an essential step in providing the infrastructure with which to collect meaningful data on the incidence of COVID and possible exposure routes.

However, through May and June 2020 the data available to local authorities was scant. IT was first announced by the then Secretary of State for Health that Leicester City was a 'hot spot' area for COVID in mid June 2020. At that stage there was no data available to the local

authority to suggest parts of the County surrounding the city also had elevated levels of COVID19.

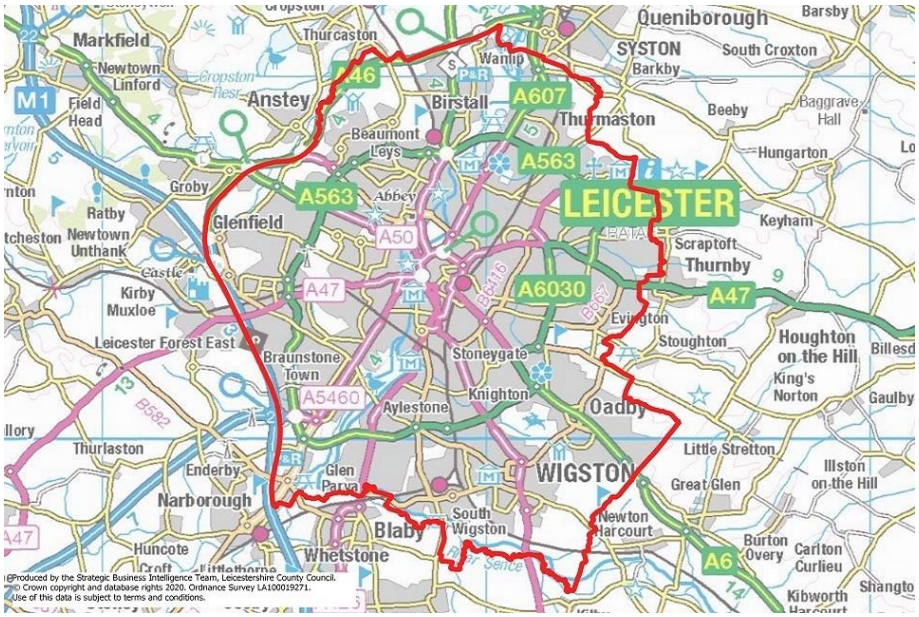

Figure 2: Map of the local lockdown boundary line in Leicester

The first "local lockdown" in Leicester was put into place on 29 June 2020, affecting over 100,000+ Leicestershire residents in the districts of Oadby and Wigston, Blaby, and Charnwood, along with the 300,000 residents of Leicester City, as seen in Figure 2.

The boundary line was determined by data on hotspots and case numbers available to PHE. This data was not available to local authorities before the declaring of the local lockdown. Leicestershire County Council was in a position of having to reactively explain the need for the boundary to the public. The established boundary was a 'best fit', drawn using elements of natural geography like the M1 motorway and administrative boundaries, and driven by science based on the data provided by Public Health England.

The inability to properly communicate the reasoning behind where and why the boundary was drawn in advance led to some negative public perception of the local lockdown as misguided and ill-informed, with the boundary seen as being developed for convenience rather than based on science. A BBC story headlined this "Boundary line branded 'stupid' by residents". This was not the case but does rather stress the need for transparency and openness in data availability in advance of important

decisions. I am tempted at this stage to say Iraq and Brexit, but I will leave that for other commentators.

Later that week the Council was provided with access to more detailed data and was finally able to this in the public domain. Amongst other data we were able to show the age of COVID-19 cases in Leicestershire County, comparing the case numbers during the first wave and the local lockdown. As seen in Figure 3, the COVID-19 case rate in Leicestershire County in the first national lockdown based only on pillar 1 (clinically prioritised testing, on the left) was disproportionately higher amongst older people, with cases having a median age of 70 years old. Where increased testing had given us better data later on, the Council was able to communicate where the case rate was genuinely highest in the community (community testing Pillar 2 data, on the right). Here, the COVID-19 case rate is much more prevalent amongst younger and working-aged populations, with cases having a median age of 38 years old. This data allowed for a better explanation of COVID cases per age group in the County and better targeted communications and interventions to prevent spread, as opposed to 'just' counting deaths.

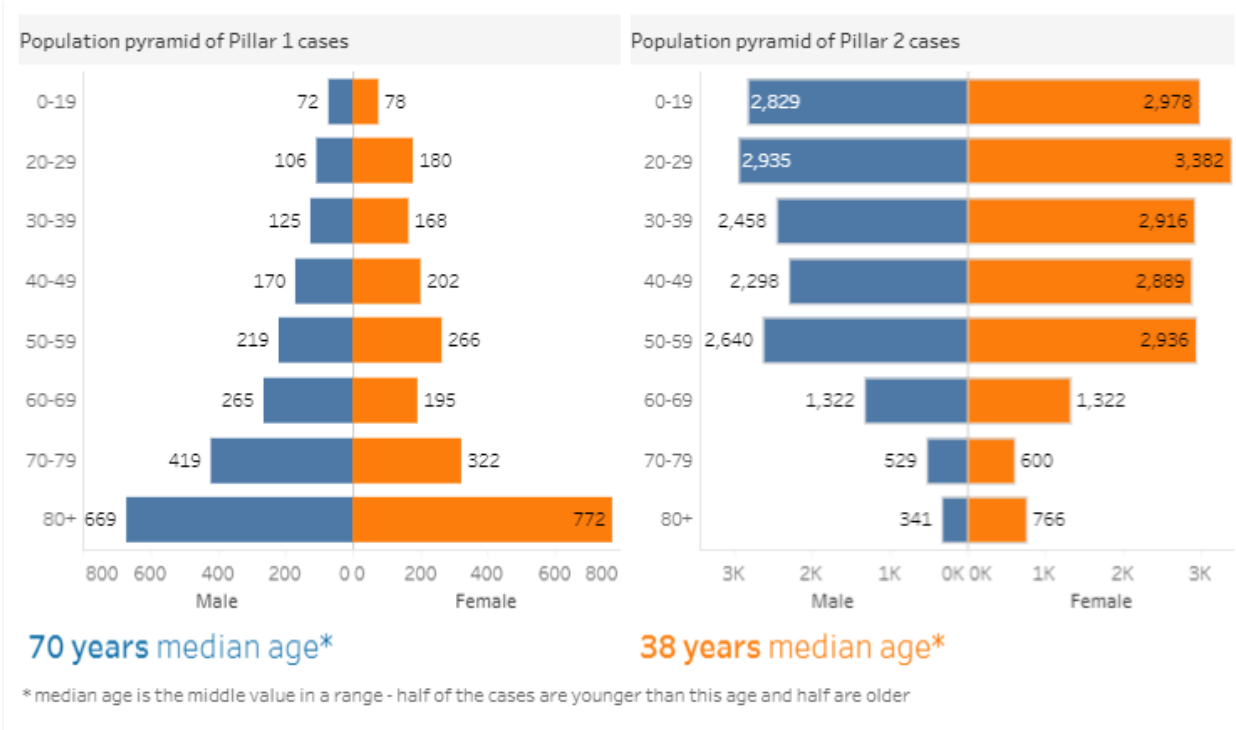

Figure 3: COVID-19 Cases by Age in Leicestershire

Similarly, the data in Figure 4 was not available at the time of the local lockdown, but shows case rates for a sample fortnight during the

summer of 2020. It does demonstrate that areas 'donuting' Leicester City, seen in the middle in white without data, have a higher case rate than those that are farther away from the city. This would have helped explain why the lockdown boundary included areas that were outside of Leicester City when it was implemented.

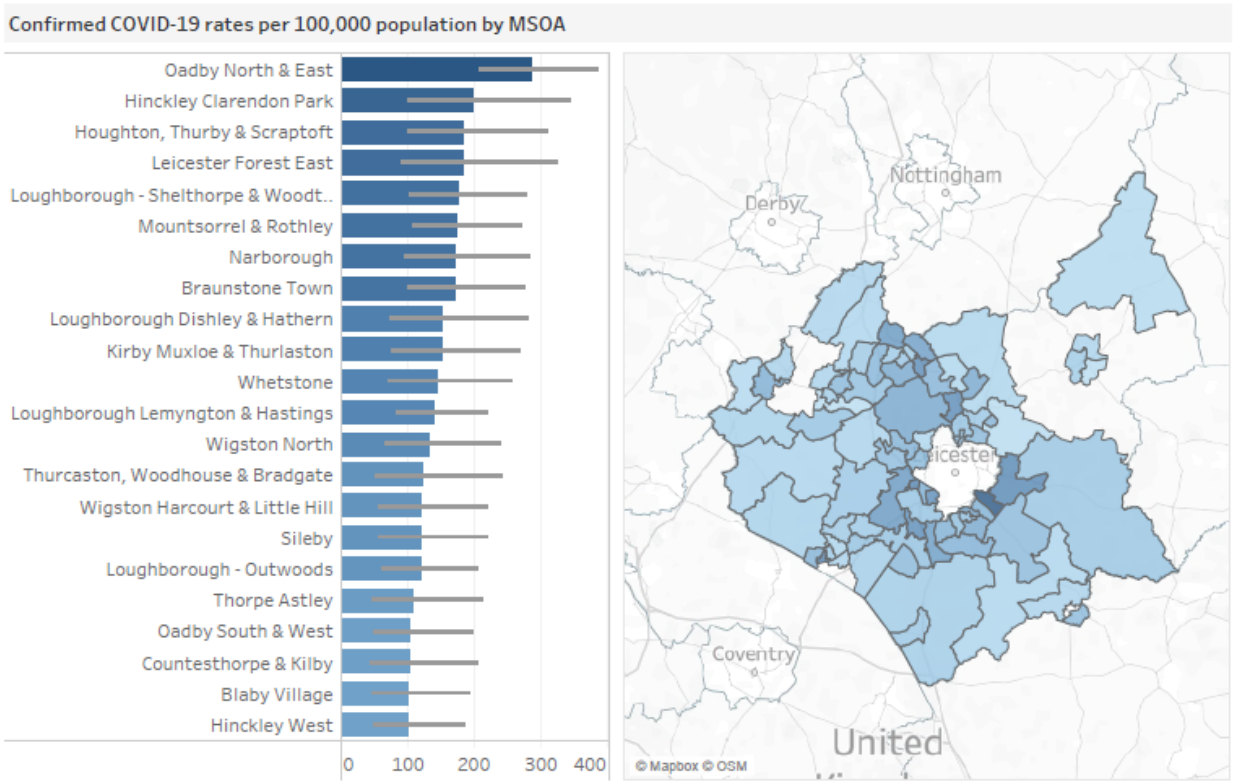

Figure 4: Fortnightly Rate of Cases by Middle Layer Super Output Area (MSOA)

Inevitably, although the publication of data was helpful in being able to explain the situation to the public, it also had negative consequences with a 'fear of the other' being expressed by those outside of the areas and within it. Those in the lockdown area were stigmatised. The nadir of this being a threat from the Chief Constable of neighbouring Nottinghamshire that he would turn back anybody from Leicester that travelled over into 'his' area despite having no legal authority to do so.

Within the lockdown area, Leicester City seemed to remain remarkably cohesive but there were a number of comments that the largely white area of Wigston was only in the lockdown area because of high rates in the more ethnically diverse neighbouring area of Oadby. Unfortunately we did not have case rates broken down by ethnicity at this stage to address these concerns.

Statistical literacy was also an issue that has had to be managed. The ability of individuals to confuse absolute and relative rates, absolute and relative risk, comparing rates in widely differing population sizes, false negativity and positivity have all been regular issues, muddying the narrative.

Lastly, everything became about the 'area', the rates of infection in it, the rules that applied within the area and the timetable to get out of restrictions, drowning out key messages on routes of transmission and personal behaviour.

Key lessons learned from this local lockdown are that statistical data in advance of implementing health measures builds public confidence in the actions taken. The more transparent the better. However, area-based data drives an area-based narrative, which may lead to the public developing a fear of people who live in other areas and potentially stereotyping or discriminating against certain people based on where they live, without taking into account their lived experience or any underlying structural issues.

Phase 3. After the Local Lockdown – from famine to feast.

From August 2020 onwards, the incident management team in Leicestershire County Council were able to consider case data by age group, ethnicity, deprivation, ward-level data, etc on a daily basis as the data flow moved from a famine to a feast. Detailed data reports from Public Health England were supplemented by individual case data, local intelligence including soft, qualitative data from community outreach, whistle-blower contacts, contract tracing data, common exposure data, and postcode coincidence data. Other information, such as Google mobility data and data on wastewater testing of sewage outflows, also became available.

Figure 5 demonstrates some of the information available in the epidemiology reports provided by Public Health England.

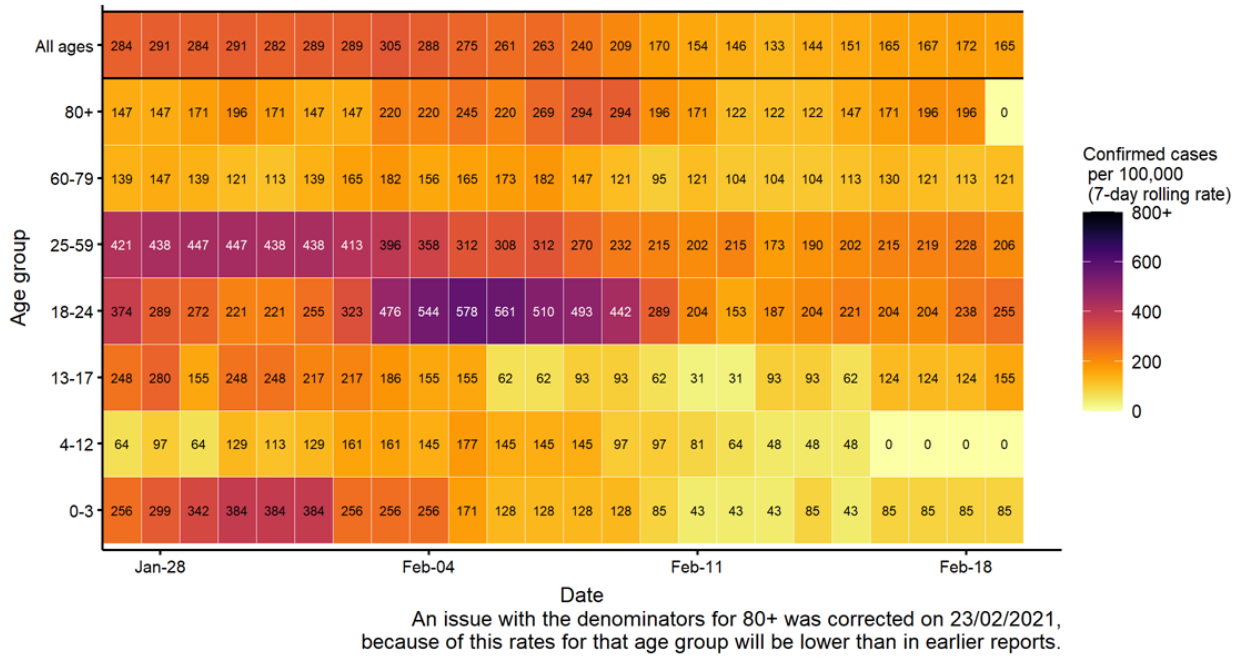

Figure 5: Heat Map of COVID-19 Cases by Age Group

Further data on COVID-19 exposure locations is also available through charts such as in Figure 6. This data is collected when an individual is asked what locations they have been frequenting when they are called for contact tracing and provides information on the likely routes of exposure to COVID-19. This was key as it enabled our targeted testing and message giving to move from an area basis to one that targeted high risk settings. The use of data driven by the lived experience of people's daily lives was an absolutely fundamental sea change in driving the public narrative, enabling a focus on behaviour such as car sharing, a targeting of specific sectors and a focus on actually breaking the chains for transmission.

The prevalence of this detailed data allows for specific interventions to be put into place, such as increasing testing in specific areas based on rising case numbers.

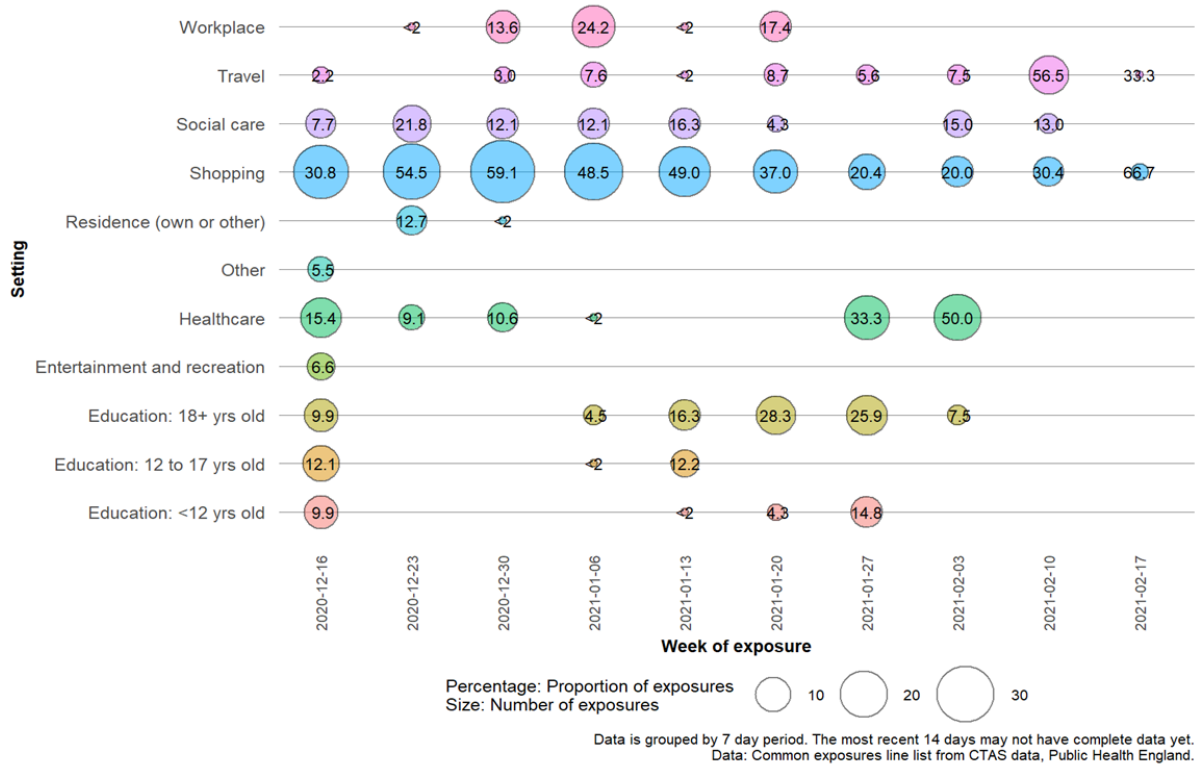

Figure 6: Common Exposure Line List from CTAS Data, PHE

Phase 4. See that meteor?

Of course, the situation since early 2021 has changed markedly. Without a doubt the vaccination programme has reduced the risk of death by a good 90%. Although the current daily death numbers of approx. 150 still represents a significant mortality burden, it is realistic to think that without the national vaccination programme and with no national restrictions in place the current daily death toll would be well above 2000 a day.

The data continues to show that, although deaths are relatively lower, the pandemic is by no means over. Case rates are, as of late September 2021, some of the highest we have seen locally driven by a wave of cases in the unvaccinated 0-16 age group. Upwards of 55% of all cases currently occur in the under 20s. The pressure on the NHS remains extreme.

However, the ending of legal restrictions does limit the ability of local areas to take action in response to the rich local data picture.

Essentially, the levers are back to the position seen in the first wave of communicating with the public and urging them to 'do the right thing', albeit using data to do this in a more targeted and nuanced way than back in the early days.

Having advocated in this paper for strong transparent data to guide policy and interventions, it is equally right to say that data without the policy and intervention levels is impoverished in its strength. At its most extreme it is akin to knowing exactly when and where the a meteor will strike the earth. So what?

Conclusion

The journey to access and communicate reliable data on the COVID-19 pandemic is constantly changing and has been a long one. There has, and continues to be, a strong need to use the available data to shape the public narrative on the pandemic.

The emphasis that was placed on area-based data has predominantly steered the public discourse and the interventions that the government has then put in place.

Learning from the data experience of the pandemic should put greater emphasis on presenting data linked to the way people live their lives, moving from an area based narrative to one shaped by people's work, their home circumstances and their educational settings for instance

It would also be useful to improve the statistical literacy of the general population to better help them understand the data that is being shared. Finally, data works best when it is integrated across the response partnership, so it is important to bring together the local qualitative data with the available quantitative data to better understand the local health situation.

References

Public Health England, Power Bi, Covid-19 Situational Awareness Explorer Portal (2021). *Cases Line Lists and ONS Mid-2019 Population Estimates.*