

COVID-19 epidemiological look forward July 7th 2021

Report to OMAB from Sharon Stoltz, Director of Public Health

1. Background

- 1.1. This discussion paper draws on key public health and epidemiological data to enable OMAB to consider some scenarios, possibilities and reasonable worst case potentials for the next few months in terms of the effect of COVID-19 on the population in York. Data is current as of Friday 2nd July.
- 1.2. Whilst for the most part the paper focusses on infection rates and public health consequences, there are obvious implications for CYC and partner services, including adult and children's social care, education, business and the economy, and community wellbeing.

2. What national models say on future COVID trends

- 2.1. There are three main covid-19 models in the UK which aim to predict trends in future case rates, hospitalisations and deaths:
 - [Imperial college London](#)
 - [University of Warwick](#)
 - [London School of Hygiene and Tropical Medicine](#)
- 2.2. All three teams take slightly different approaches, and all three advise SAGE (The UK 'Science Advisory Group for Emergencies'). It is expected that combined these three models contribute to SAGE's recommendations to the government on steps in the roadmap, and any future COVID control measures.
- 2.3. Each of the three models use slightly different parameters, but generally the models make the following 'assumptions': no variants arise that behave differently to the current variants in the UK; there is high vaccine uptake across the adult population; immunity from vaccination or exposure to COVID does not fade with time; the vaccination protects against illness and death, but also gives partial protection against infection and transmission; 'baseline measures' such as 'hands, face, space remain in place after the end of the roadmap; and there is limited account for seasonality or other conditions such as flu.
- 2.4. All scenarios have since March described a third wave of infections across the summer of 2021. There has been significant uncertainty in both the timing and scale of this wave, but general agreement which estimates it will occur in the summer months of 2021 and be smaller in magnitude than the wave that occurred in January 2021. The models suggested that steps one and two of the roadmap will have little impact on case numbers. This has proven to be correct. The predicted wave linked to steps three (17th May) and four (21st June) of the roadmap is now occurring, driven by the relaxing of restrictions and the rise of the Delta variant, which is estimated to be around 60% more transmissible than the previous dominant variant (Alpha) and now represents above 95% of all COVID cases.
- 2.5. The models have however consistently predicted that the rates of hospitalisation and deaths through future waves of COVID will be less than previously seen, due to immunity in the population resulting from vaccination. The models predict, to different extents, an uncoupling of infection and serious illness, meaning that a greater proportion of those who are infected with COVID will be able to remain at home and not become seriously ill. The exact details around this vary between the models.

3. What we have seen and are seeing locally

3.1. York has experienced three distinct waves of COVID-19, which are instructive as they give some information on the scale and timings of future waves:

	Peak cases (highest day)	Exponential growth period (days) ~	Peak hospitalisations (highest day)	Days from peak cases to peak hospitalisations	Number of deaths
Wave 1 (March-May 2020)	50* cases	NA*	81 beds	NA*	172 deaths
Wave 2 (Sep-Nov 2020)	159 cases	22 days	68 beds	38 days	61 deaths
Wave 3 (Dec 20-March 21)	245 cases	32 days	163 beds	18 days	163 deaths

*Testing was limited to those in hospital, and case rates are likely to have been significantly higher

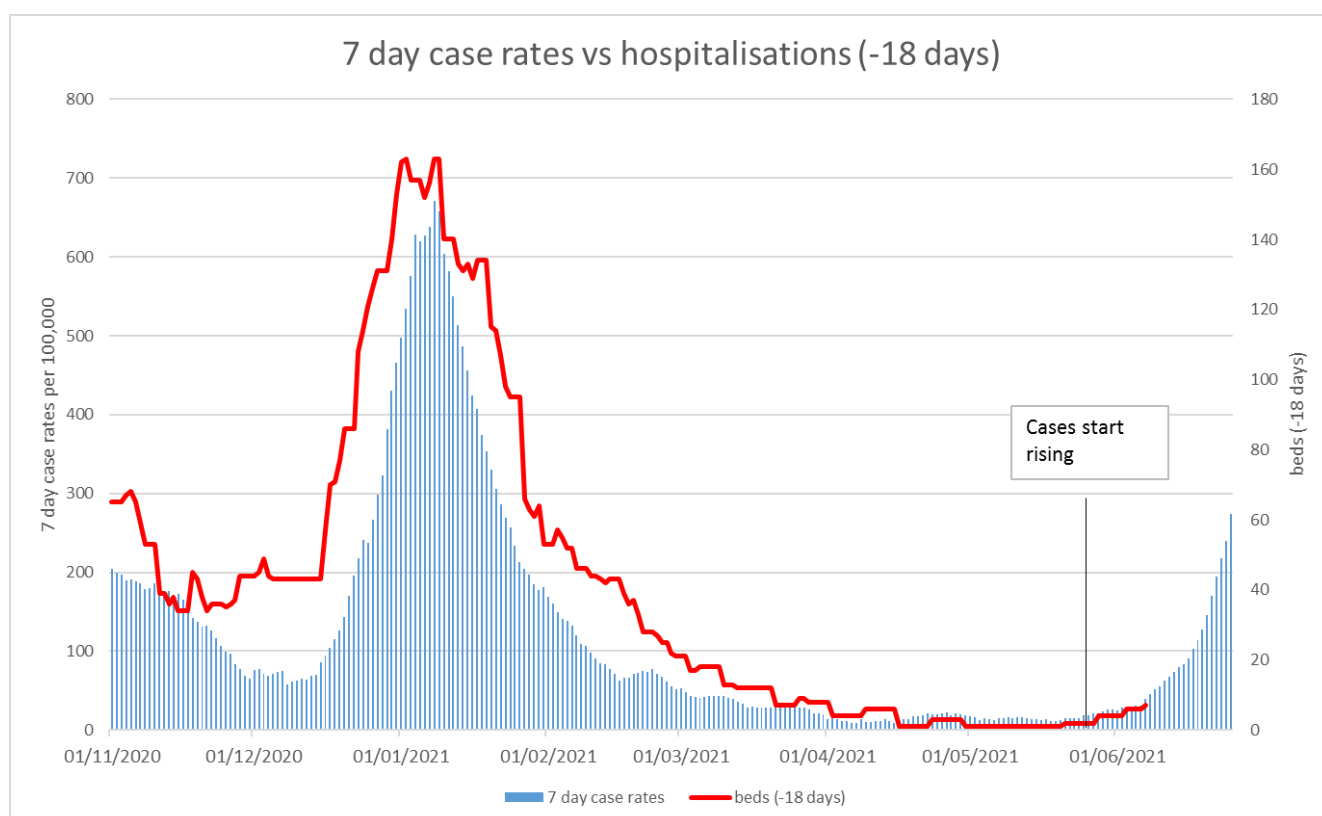
~ from 50 per 100,000 to peak

3.2. This paints a picture of how COVID waves have worked in our city: cases start to rise slowly, rise exponentially for a 3-4 week period before peaking due to national restrictions being imposed, with hospitalisation peaking 3-5 weeks after cases start to rise.

3.3. Currently case rates are rising rapidly in York, and stand at 392 per 100,000, a rolling total of 826 over a 7 day period. We can notice a number of things about this rise:

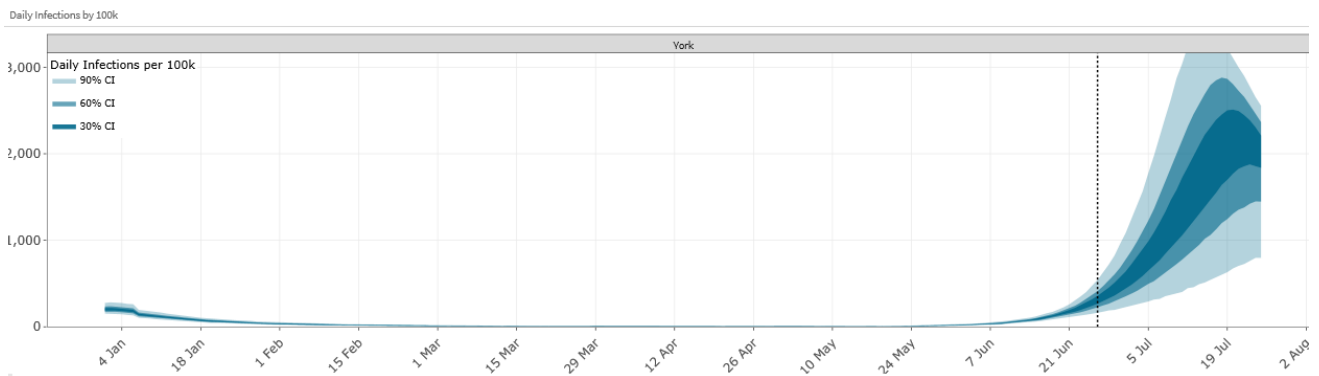
- Cases started rising consistently from the 27th of May, 35 days ago
- PCR testing positivity has risen almost exactly in line with cases from the 25th of May to 13.8%
- Hospitalisations started to rise very slightly on the 8th June but stand at only 7 currently
- No deaths have yet been recorded

3.4. The following chart uses the gap between cases peaking and hospitalisations peaking seen in York in the winter wave (18 days), and plots the two against one another. As can be seen, the trends in the two variables are strongly aligned, but there are early signs that the link between the rapid rise in cases and hospitalisation has been broken. A further 2 weeks of data would help confirm this trend.



4. Modelling future case rates

4.1. Short-term modelling from [Imperial College](#) gives probabilities for case rates by local authority over a 3-week timeframe. It is currently showing a 99% chance that the R value is above 1 in York with an estimated R of 2.1, meaning infections will be increasing. A range of scenarios is shown over the next 4 weeks in the chart below, with intervals of confidence:



4.2. This demonstrates that the exponential rise in cases could go very high and exceed previous peaks in the worst case scenario, with national restrictions the only tool which has previously turned the curve on rises of cases.

4.3. However as shown above this will not automatically feed into higher levels of hospitalisation and death, with one of the primary reasons being the age range of cases: currently, case rates are still low in the most vulnerable, the over 60s, at 20.2 per 100,000 (10 cases in a week).

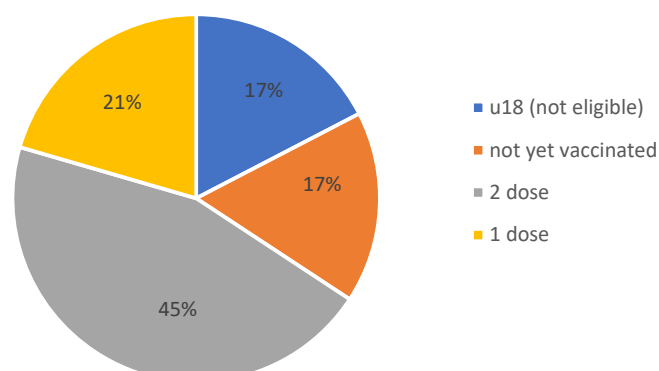
4.4. The majority of cases seem to be circulating within the 10-19 and 20-29 age range. With no restriction of movement for residents of that age range COVID is likely to exponentially increase: 5,810 people in these age bands have already had COVID in York but this still leaves 59,089 people in this age range susceptible to infection. The end of university and school terms may provide a natural 'break point' for chains of transmission, and vaccination coverage will soon start to provide meaningful protection to some, with 14% of 18-29s covered by two doses and 46% having received one dose (2-3 weeks are required to develop full immunity).

5. Population remaining vulnerable to COVID

5.1. All of the risks described above are hugely mitigated the higher the level of population protection there is through natural immunity or vaccination.

5.2. As of the start of July 2021, not all of York's population are protected from COVID by 2 doses of vaccination. As chart 1 below shows, 17% of our population (over 36,000 people) are not eligible for the vaccination as they are under 18, 17% of the eligible population have not been vaccinated, and 20% of the remaining number have only received one dose.

1. York - vaccination coverage 1st July 2021

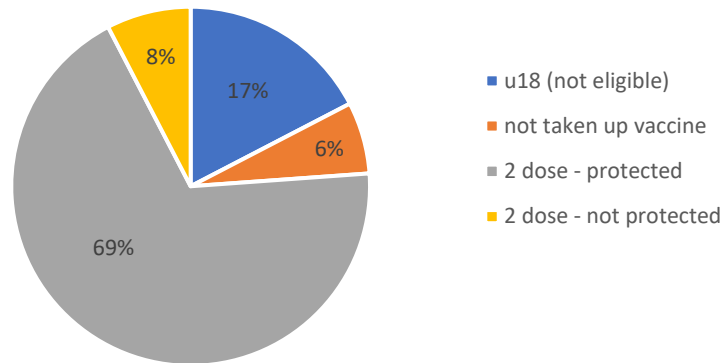


5.3. By the targeted end of the vaccination programme, (end of July, or 2-3 weeks after to factor in immune delay) the population will have received more protection by vaccination, as shown below in Chart 2.

However:

- 17% will still not be eligible (under 18)
- 6% will be eligible but not taking up their vaccine ([Cabinet Office](#) assumptions are for 95% uptake in over 50s, and 90% uptake in over 18-50s)
- 8% may not have full protection from second doses against the Delta variant ([PHE data](#) suggests Pfizer is 96% effective and AZ 92% effective against hospitalisation and death from the Delta variant)

2. York - projected vaccination coverage (end of vaccination programme, summer 2021)



5.4. This leaves potentially 31% of our population still not fully protected, around 66,000 people. The harms to this population are mitigated by the fact that they are likely to be younger and less vulnerable to consequences of COVID infection, and vaccine effectiveness against severe illness and death is likely to be higher than it is against infection. However Long COVID / post-COVID syndrome can be a severe debilitating health condition, not always related to strength/effects of symptoms during the acute phase, and is reported to have affected up to 2 million people in England. In CYC so far, 18 members of staff have taken an average of 50 days off work due to Long COVID (HR data)

5.5. Additionally, this does not take into account the role immunity due to past infection plays in this, with an rate of past infection in the UK estimated at 15.6% ([seroprevalence data, PHE](#)) and evidence that immunity due to infection could last as long as a year.

5.6. It is entirely plausible however that a surge in cases in the remaining at-risk population may occur similar to the size and scale of previous waves, although higher levels of immunity may produce a 'herd' effect that would slow down the speed at which this moves through the population.

6. Other risks

6.1. A number of other factors should be considered besides direct and anticipated COVID-19 infection rates:

- *Long Covid*: modelling has been done by Vale of York CCG on expected use of new MDT Long Covid services (see table below); numbers are borne out by high numbers already accessing services. It is unclear how vaccination attenuates the risk of developing Long Covid in those who catch the virus.

	Worst case	Best case
Estimated number of people in York infected with COVID so far (tested and not tested)	29,037	29,037
COVID no long term symptoms	22,939	25,843
COVID and still unwell after 3 weeks	5,807	2,904
COVID and still unwell after 12 weeks	290	290

- *Mental Health:* demand for services has risen due to lockdown, with modelling from TEWV NHS mental health trusting that they anticipate large rises in long term inpatient and community mental health use. First episode of psychosis diagnosis increased during the first lockdown in York, with more people entering crisis services than usual, and waiting lists have grown for IAPT.
- *Social care:* demand for children's and adults services has risen due to lockdown, reflected for instance in modelling by FEHA which shows a higher acuity of need coming through Early Help
- *Current trends in A+E attendance,* with a 4-fold rise in under-5s attendance for respiratory viral symptoms at York Hospital and with particular pressures on teenage mental health attendances
- *Primary care:* including historically high trends in primary care demand, difficulties in enabling face-to-face appointments at pre-covid levels, workforce challenges including due to Test and Trace, and a high backlog of demand
- *Influenza and winter planning:* rates of flu were very low in the last winter; this puts us at risk of a higher number of cases this coming winter due to lack of residual immunity (passive and active). In the last bad flu year, 2014/15 which PHE summarises as a year of 'moderate levels of infection', there were 44,000 excess deaths (not all directly linked to flu), a record since 1999/2000. This interestingly following a record low number of excess deaths the previous year.

7. Reasonable Worst Case Scenarios

7.1. Below is shown an assessment of a number of reasonable worst case scenarios for the public health of the city.

	Likelihood	Impact
Continued moderate community circulation of COVID-19 among unvaccinated population	High	Low
Continued moderate community circulation of COVID-19 among unvaccinated population leading to levels of hospitalisation and death lower than seen in previous waves	Medium	Medium
Continued moderate community circulation of COVID-19 among unvaccinated population leading to levels of hospitalisation and death higher than seen in previous waves	Low	High
Flu epidemic in winter 2021/22 (pandemic not considered)	Medium	High
Long COVID is not attenuated by vaccination and continues to affect those who are infected with COVID	Medium	High
School closures continue in September due to large outbreaks	Medium	High
High level of other non vaccine-preventable diseases due to low levels of immunity e.g. RSV, Norovirus	High	Medium
Outbreak of common VPD due to lower vaccination rates eg measles, mumps	Low	High
COVID vaccine booster not taken up as well as primary jab	Medium	Medium
COVID immunity from vaccination or exposure waning more quickly than anticipated	Low	Medium
Another VOC which is more transmissible and/or has vaccine escape	Medium	High

8. Implications

OMAB are recommended to:

- Consider how we prepare partners to plan for ongoing community circulation of COVID and consideration of local public health measures eg communications, Test and Trace, Outbreak management eg closures beyond 19th July and for at least a year
- Support the appropriate resources to help the NHS deliver the vaccination programme (+flu) as an ongoing public health measure into winter
- Anticipate and plan now for higher levels of winter support than usual needed, for examples measures around extreme cold, housing, food and fuel poverty, affordable warmth, dealing with excess deaths, flu vaccination and staff absence.
- Note exceptionally high levels of demand in four key sectors in the city – primary care, secondary care, social care, mental healthcare – which is likely to continue in the medium to near term, due to ongoing patient/client backlogs, the need to factor in PPE and social distancing to practice, staffing and isolation issues, and increased population need due to the effects of lockdown. These problems are all interlinked in a complex adaptive manner, and rely on all sectors working together to solve.

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