

Tues 19<sup>th</sup> April 2022

## **Modelling the COVID-19 epidemic; the Reproduction Number and other indicators**

**Current estimate of Rt (new positive tests): 0.70 – 0.90 (7 days previous 0.70-0.90)**

**Current estimate of Rt (hospital admissions): 0.75 – 0.95 (7 days previous 0.85-1.05)**

**7 day incidence based on new positive tests: 257 / 100k (7 days previous 360)**

**14 day incidence based on new positive tests: 616 / 100k (7 days previous 823)**

**7 day average of total positive individuals (pillar 1/2): 7.6% (7 days previous 8.7%)**

**7 day daily average tests / 1000 population: 34.7 (7 days previous 41.4)**

**Number of new positive tests in over 60s in last 7 days: 1037 (7 days previous 1443)**

**Proportion of total positive tests occurring in over 60s: 25.2% (7 days previous 22.6%)**

**COVID-19 +ve hospital admission in last week: 219 (7 days previous 264)**

**7 day average COVID-19 inpatients: 562 (7 days previous 621)**

**COVID-19 +ve ICU patients: 1 (7 days previous 3)**

The number of new COVID-19 positive cases continues to fall in the context of a further reduction in testing, while percentage of positive tests has also fallen modestly. It is likely that overall there is a decline in community transmission of the virus, though case numbers are no longer a reliable indicator of community transmission due to changes in testing behaviour. The percentage of positive tests which are in the over 60s has continued to increase, while absolute numbers have fallen. This is likely to reflect a combination of waning immunity and relaxation of restrictions along with age dependent changes in testing behaviour.

Hospital admissions and numbers of COVID-19 inpatients have fallen modestly in the past week but remain at relatively high level levels. COVID-19 critical care occupancy and COVID-19 hospital deaths are fluctuating at a relatively low level.

The Office for National Statistics (ONS) Coronavirus (COVID-19) Infection Survey (CIS) results reported that around 1 in 19 people in Northern Ireland had COVID-19 in the week up to 09th April, indicating that community transmission remains at a very high level, though declining slowly.

Tues 19<sup>th</sup> April 2022

## Prevalence of COVID-19 in Northern Ireland

The most recent ONS CIS report (03<sup>rd</sup> to 09<sup>th</sup> April) estimated that 95,900 people had COVID-19 (95% credible interval: 78,800 to 114,000) in Northern Ireland. This equates to 5.23% (95% credible interval: 4.30% to 6.21%) of the population in Northern Ireland, or 1 in 19 people (95% credible interval: 1 in 16 to 1 in 25).

## ONS COVID-19 Infection Survey Week up to 09<sup>th</sup> April

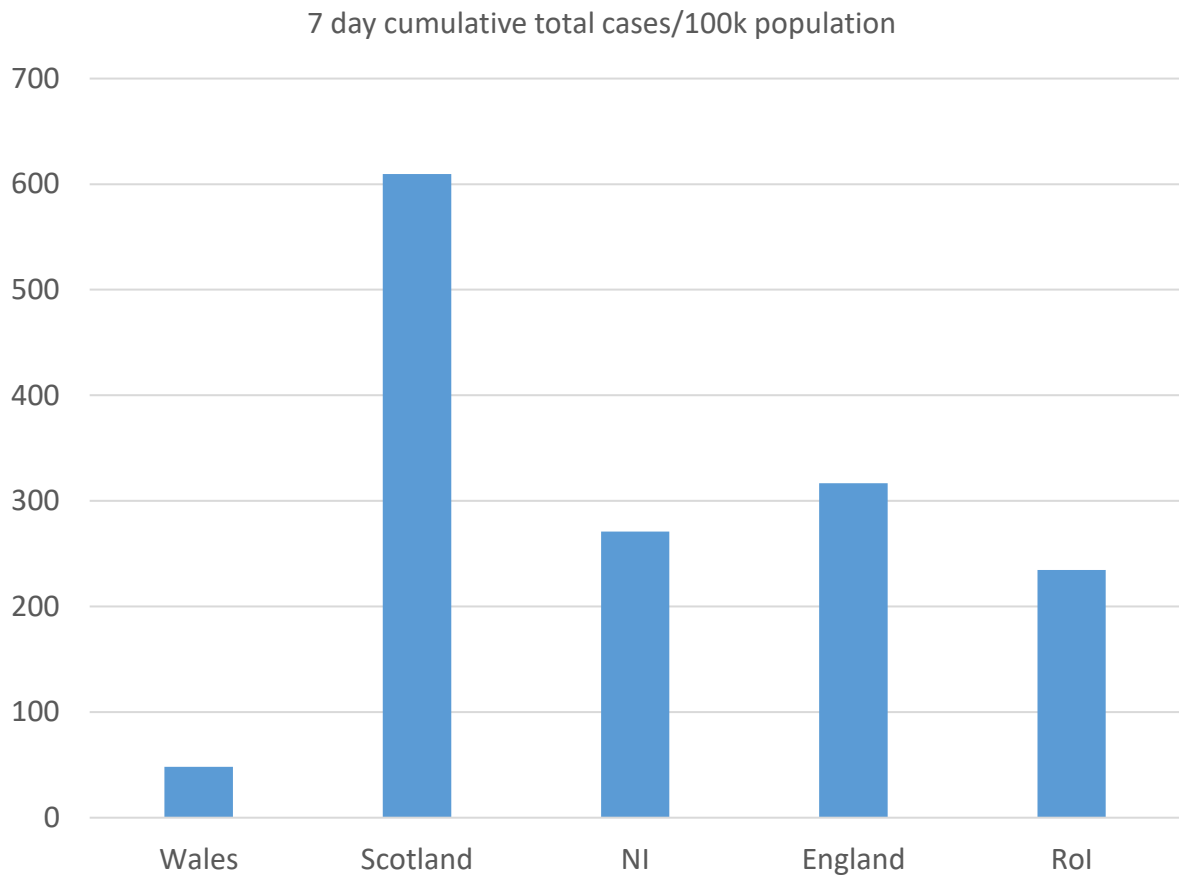
| Country          | Estimated average % of the population testing positive for COVID-19 |                       | Estimated average number of people testing positive for COVID-19 |                       |         | Estimated average ratio of the population testing positive for COVID-19 |       |       |
|------------------|---|-----------------------|--|-----------------------|---------|---|-------|-------|
|                  | 95% credible interval   | 95% credible interval | Lower  | Upper                 | Lower   | Upper   | Lower | Upper |
| England          | 6.92  | 6.72 - 7.13           | 3,773,800  | 3,662,100 - 3,888,000 | 1 in 14 | 1 in 15 - 1 in 14   |       |       |
| Wales            | 7.63  | 6.79 - 8.55           | 231,900  | 206,200 - 259,800     | 1 in 13 | 1 in 15 - 1 in 12   |       |       |
| Northern Ireland | 5.23  | 4.30 - 6.21           | 95,900   | 78,800 - 114,000      | 1 in 19 | 1 in 25 - 1 in 16   |       |       |
| Scotland         | 5.98  | 5.35 - 6.62           | 314,800  | 281,400 - 348,700     | 1 in 17 | 1 in 19 - 1 in 15   |       |       |

Source: Office for National Statistics – Coronavirus (COVID-19) Infection Survey

## NI, UK and Republic of Ireland comparison

Scotland has the highest reported COVID-19 incidence in the common travel area (CTA). Incidence of the virus decreased across the CTA in the last week. There is variation in testing and reporting throughout the CTA and data should be interpreted with this in mind.

Tues 19<sup>th</sup> April 2022



### **Regional variation in cases**

Incidence fell in all Local Government Districts but should be interpreted in the context of altered testing behaviours.

Tues 19<sup>th</sup> April 2022

7-day total cases / 100,000 population by LGD

| 11th April | 18th April | LGD                                  |
|------------|------------|--------------------------------------|
| 349        | 262        | Antrim and Newtownabbey              |
| 435        | 331        | Ards and North Down                  |
|            |            | Armagh City, Banbridge and Craigavon |
| 254        | 146        |                                      |
| 339        | 218        | Belfast                              |
|            |            | Causeway Coast and Glens             |
| 338        | 210        |                                      |
| 254        | 164        | Derry City and Strabane              |
|            |            | Fermanagh and Omagh                  |
| 253        | 170        |                                      |
| 392        | 262        | Lisburn and Castlereagh              |
| 316        | 276        | Mid and East Antrim                  |
| 187        | 114        | Mid Ulster                           |
|            |            | Newry, Mourne and Down               |
| 266        | 200        |                                      |

### Determining the value of $R_t$

The most common approach to determining  $R_t$  during an epidemic is to use mathematical modelling, in particular a compartmental model using a SIR (susceptible, infectious, recovered) approach or a variation of it. Dozens of such models have been published and are in use throughout the world; there is no single standard model which everyone uses.

In addition to the impact of the mathematical model used, the calculated value of  $R_t$  is also influenced by the choice of input variable.  $R_t$  calculated for new COVID-19 cases will not be the same as  $R_t$  calculated for hospital admissions, or ICU occupancy, or deaths. There may be a significant lag (2-3 weeks) before a fall in  $R_t$  is apparent depending on the input variable(s) used.

The modelling group determines  $R_t$  using a bespoke Northern Ireland SIR model. As its primary input the group uses hospital in-patient admissions with community-acquired COVID-19, but also uses a range of other inputs. We therefore have several different values for  $R_t$

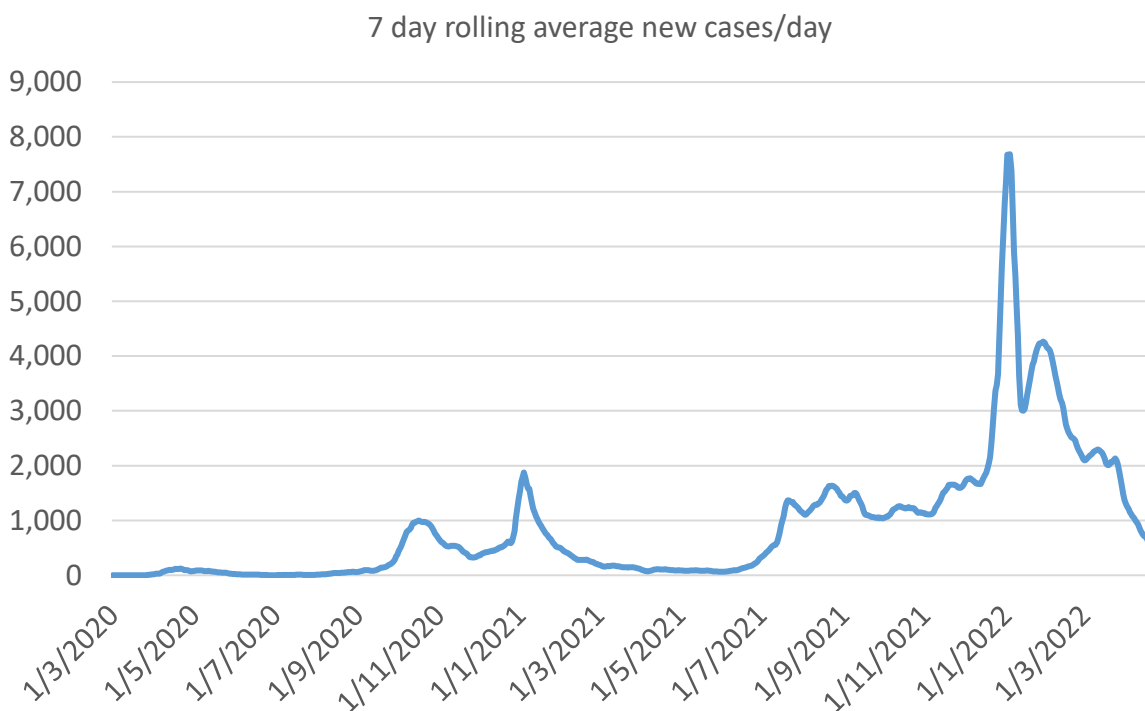
Tues 19<sup>th</sup> April 2022

each day, each of which has a midpoint value and a lower and upper boundary (95% confidence intervals). In addition a number of academic groups, both in the UK and ROI, model the COVID-19 epidemic and we have access to their estimates of  $R_t$  for Northern Ireland.  $R_t$  can also be determined based on a contact matrix survey, and this approach may be more reliable when levels of community transmission are very low.

The value of  $R_t$  for cases is in the range 0.70 – 0.90 and for admissions 0.75 – 0.95.

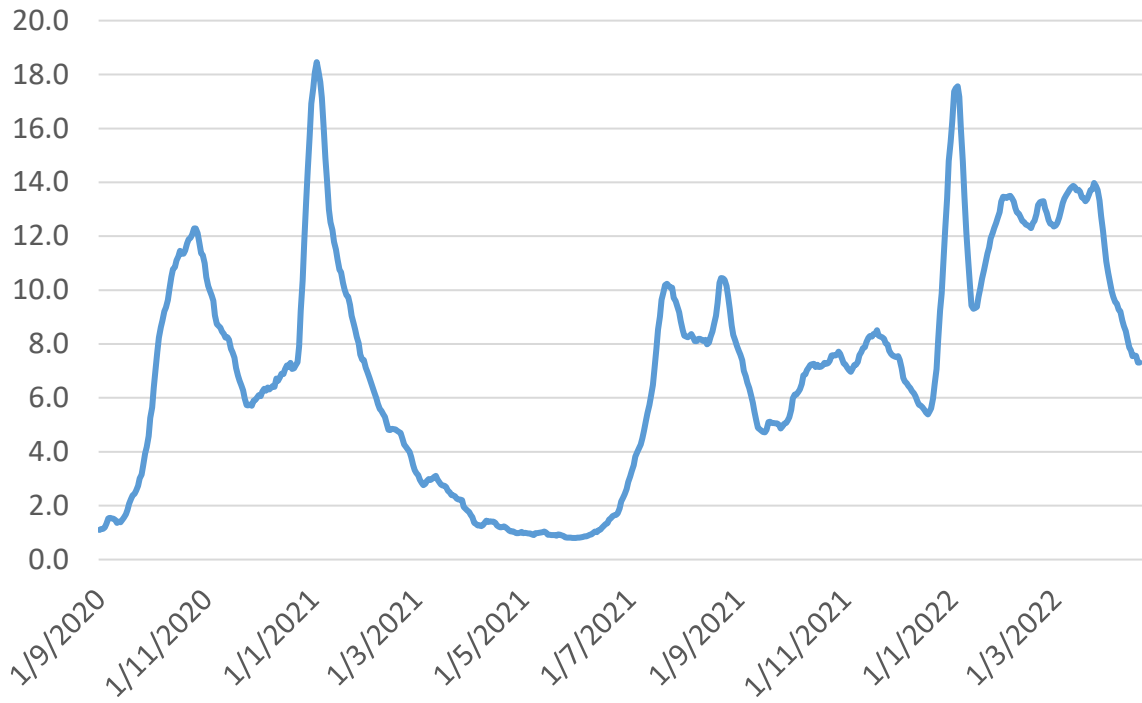
### Trends for Northern Ireland

The graphs below show trends in cases and test positivity. The number of new COVID-19 positive cases continues to fall in the context of a further reduction in testing, while percentage of positive tests has also fallen modestly. It is likely that overall there is a decline in community transmission of the virus, though case numbers are no longer a reliable indicator of community transmission due to changes in testing behaviour. The percentage of positive tests which are in the over 60s has continued to increase, while absolute numbers have fallen. This is likely to reflect a combination of waning immunity and relaxation of restrictions along with age dependent changes in testing behaviour.

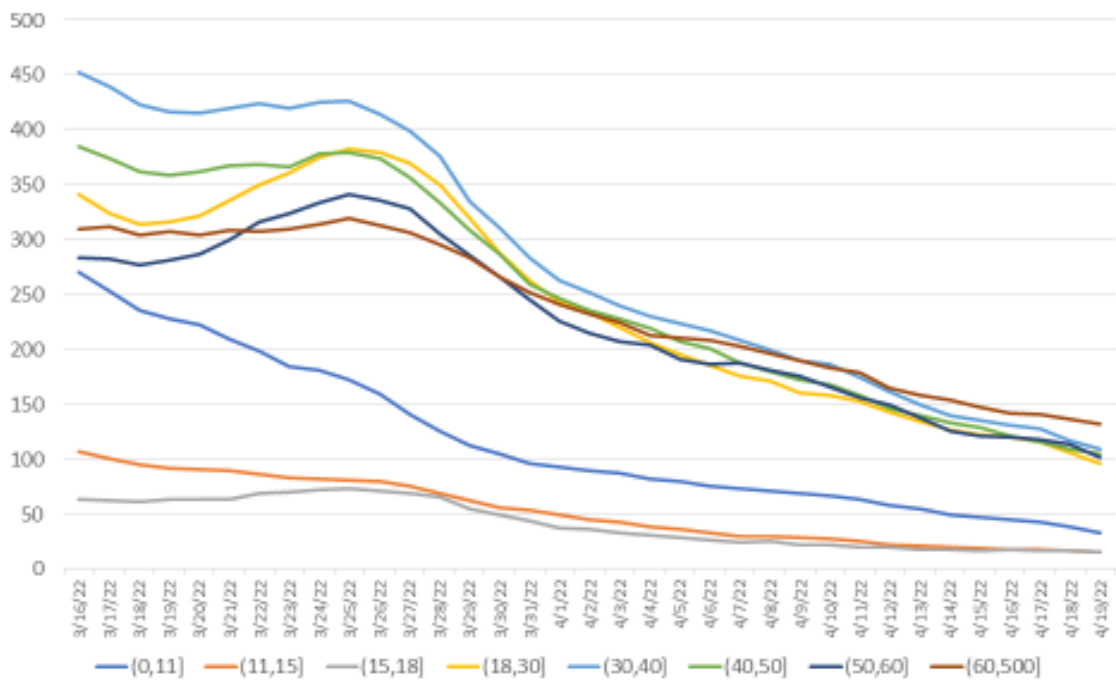


Tues 19<sup>th</sup> April 2022

7 day rolling average test positivity (%)

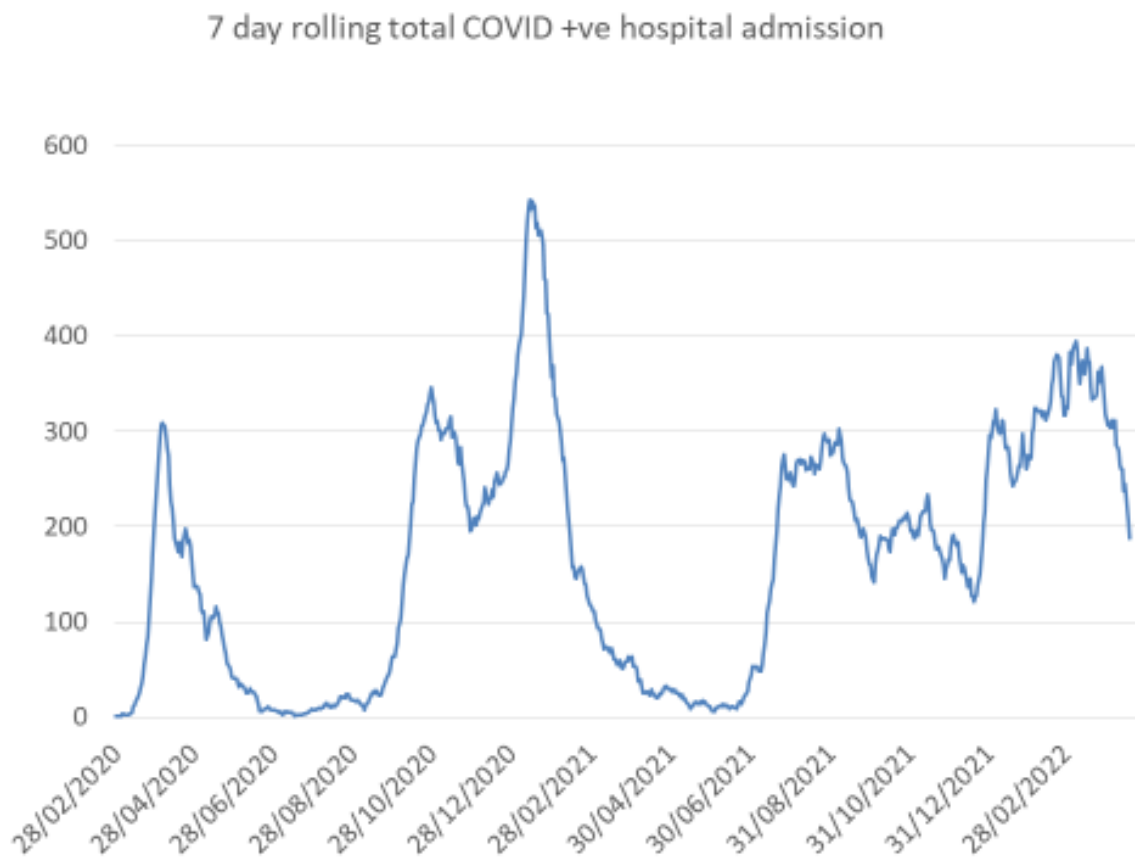


Daily Cases by Age Band  
(7 day moving average)



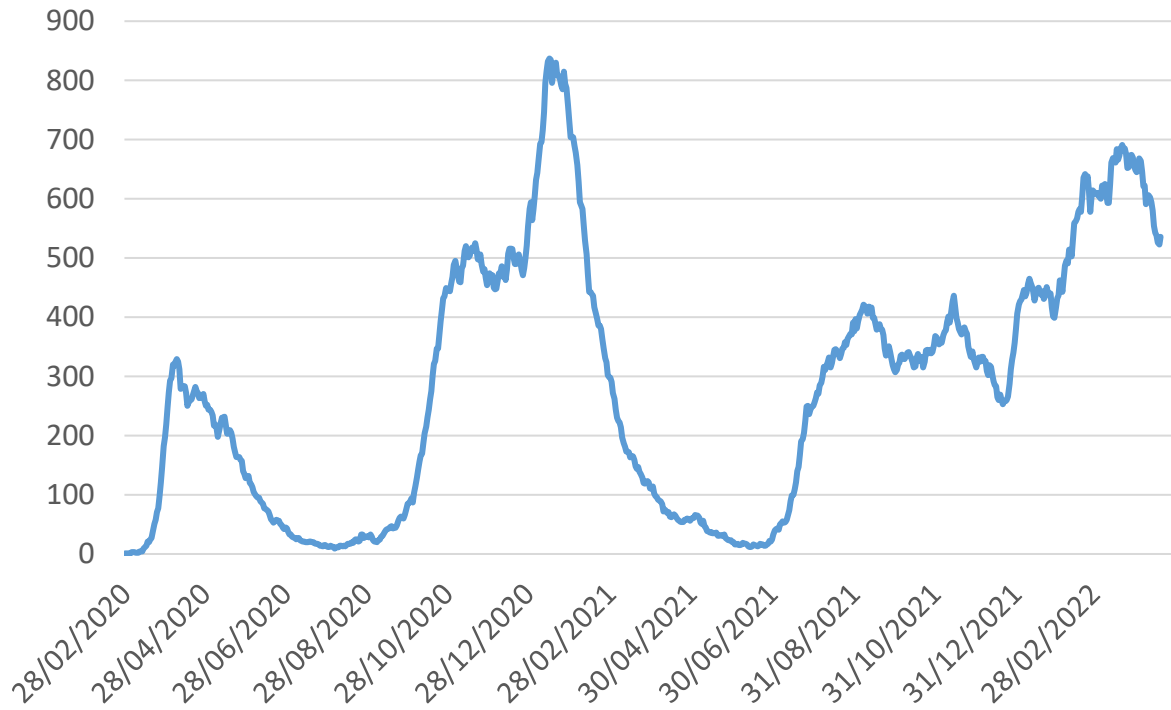
Tues 19<sup>th</sup> April 2022

The following graphs show hospital admissions of COVID positive patients over a rolling 7-day period and the number of hospital inpatients. Hospital admissions and numbers of COVID-19 inpatients have fallen modestly in the past week but remain at relatively high level levels. COVID-19 critical care occupancy and COVID-19 hospital deaths are fluctuating at a relatively low level.

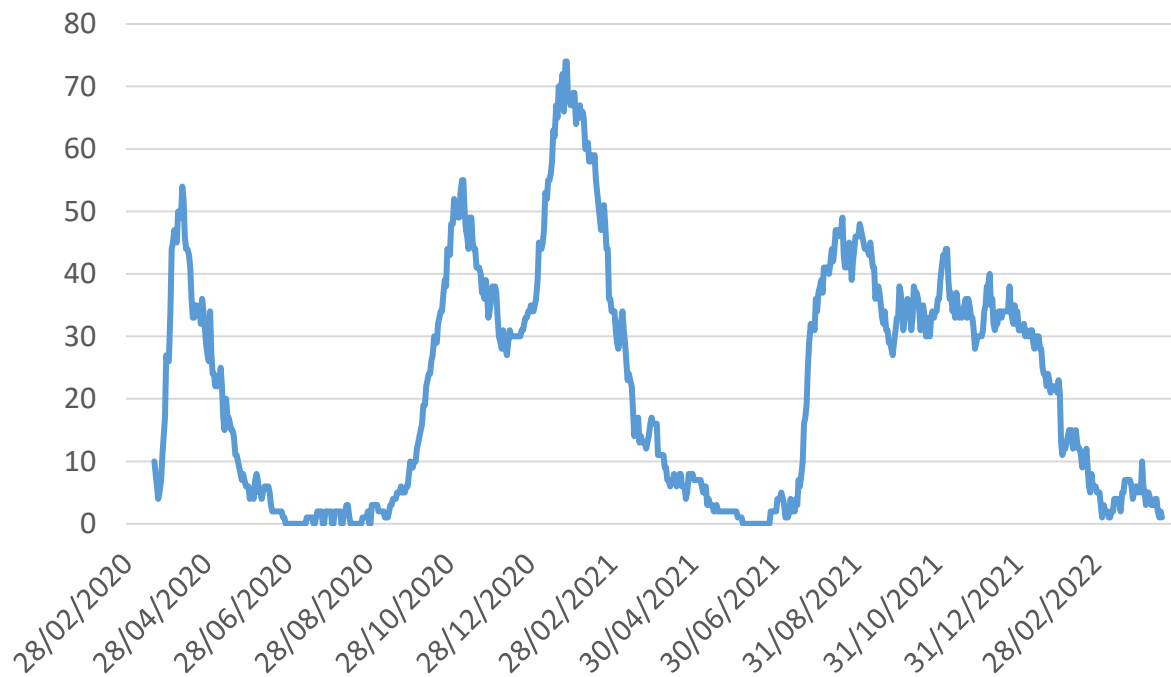


Tues 19<sup>th</sup> April 2022

COVID +ve total inpatients



COVID +ve patients in ICU





Tues 19<sup>th</sup> April 2022

Covid-19 7 day total hospital deaths

