



# **The CRUCIBLE**

## **12 Apr 2021**

### Contents

|  |   |
|--|---|
| 1. View from the virus .....                         | 2 |
| Widespread use of lateral flow tests in UK .....     | 2 |
| Impact of vaccines on mortality .....                | 3 |
| 2. Behaviours during pandemic .....                  | 4 |
| Gender differences in attitudes to vaccination ..... | 4 |
| 3. Healthcare today .....                            | 5 |
| COVID-19 and Long-Term Care .....                    | 5 |
| Herd Immunity in the UK.....                         | 6 |
| 4. Unlocking your data .....                         | 8 |
| Partnership between BREATHE and Savana .....         | 8 |
| 5. Technology tomorrow .....                         | 9 |
| Telehealth after COVID-19.....                       | 9 |



## 1. View from the virus

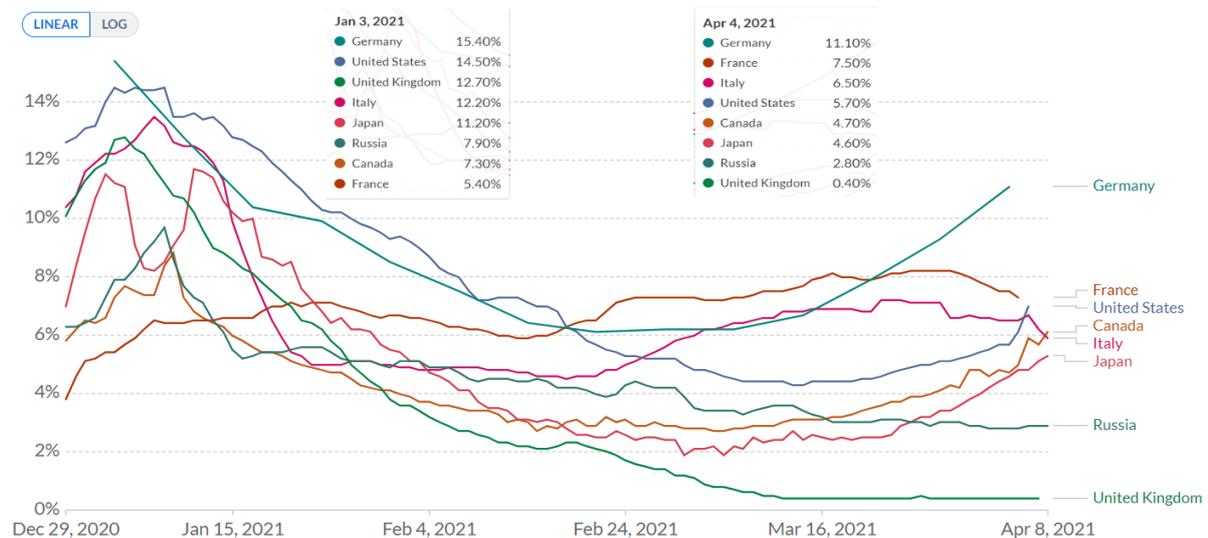
### Widespread use of lateral flow tests in UK

As of 9 April, everyone in the UK will be able to take a free rapid coronavirus test twice a week ([more](#)). This is the next wave in the expansion of COVID testing that previously focused on front line healthcare workers, care home residents and staff, those that need to travel to work and secondary school pupils. This is despite the UK already being the most tested country in the G8. **Figure 1.1** provides a dramatic comparison of the change in positivity rates since the beginning of the year across the G8 countries ([more](#)).

**Figure 1.1 – Trends in positivity rates for G8 countries**

The share of daily COVID-19 tests that are positive

Shown is the rolling 7-day average. The number of confirmed cases divided by the number of tests, expressed as a percentage. Tests may refer to the number of tests performed or the number of people tested – depending on which is reported by the particular country.



Source: [OurWorldInData](#)

There are particular concerns about the sensitivity of the lateral flow devices (LFD) and their ability to detect asymptomatic infections. The most recent data released by **NHS Test and Trace** indicates that there were 5,486,756 LFD tests over the period 25-31 March ([more](#)), of which 8,374 were positive, or a positivity rate of 0.15%. In total, **NHS Test and Trace** reports that there have been 130,000 positive cases from LFD tests that would have otherwise been missed – “breaking the chain of infection”.

Comparative information for PCR testing over the period 25-31 March includes 996,728 tests, of which 2.0% were positive. That said, PCR testing would be focused on those individuals with symptoms or for confirmatory purposes.

There are other countries with comparable numbers of tests per positive case, such as Australia - 979 per 1 million in week to 11 April ([more](#)) - but such countries typically have suppression strategies designed to prevent any outbreaks, which the UK is a long way away from achieving. The question is whether a further massive expansion of LFD testing is the best use of available resources.

As far as I am aware, no other country has proposed to provide blanket and unfocused testing across the population at a cost running into hundreds of £m each week. Particularly when many positive tests may go unreported because of lack of financial support for those



testing positive and inability to check results, and when poor technique and low sensitivity of LFD may mean that a worrying number of false negatives would be confident that they could circulate as the country unlocks.

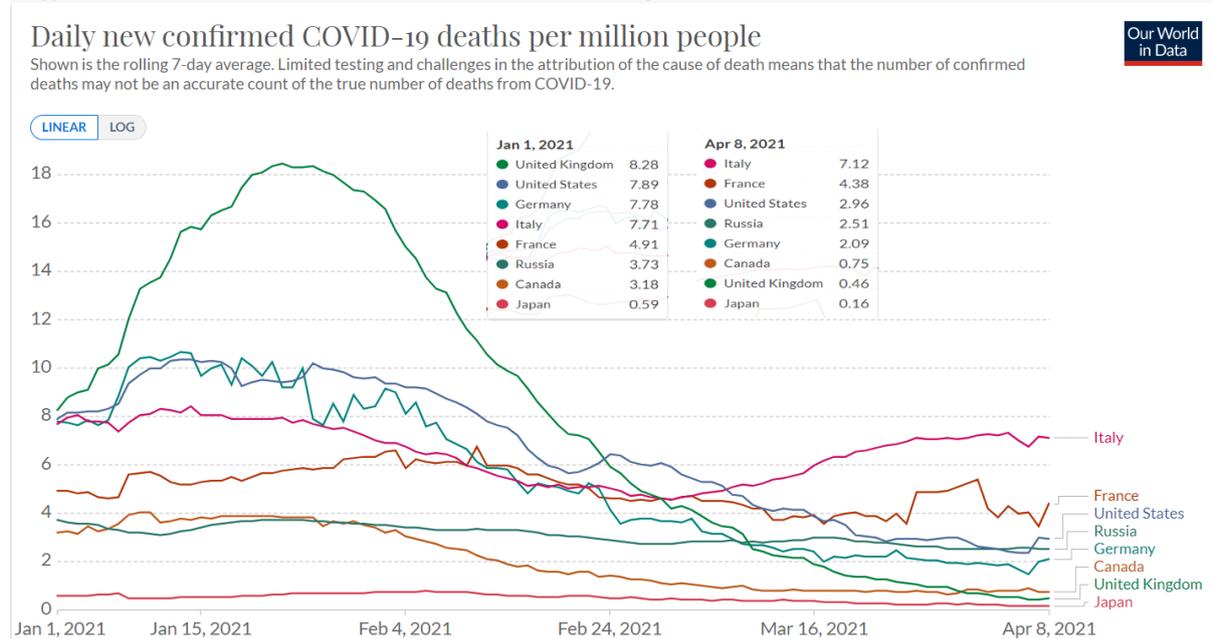
A number of experts, including **Professor Stephen Relcher** who advises on behavioural science on the SPI-B subcommittee of SAGE, have questioned whether any benefits will be seen in public health from this policy, and wonder why no cost-benefit analyses have been presented from appropriately designed evaluation studies ([more](#)).

## Impact of vaccines on mortality

**Public Health England** has been producing a series of monthly publications that estimate the number of deaths that have been prevented by vaccination in England since the start of the vaccination programme. The most recent report estimates that the direct effects of the vaccine prevented 10,400 deaths in those aged 60 or older by the end of March 2021 ([more](#)). This is likely to be an underestimate of the total impact because no allowance is made for the impact on transmission, and it is assumed that the reduction in deaths would only be seen 31 days after vaccination.

**Figure 1.2** provides a comparison of the rate of daily confirmed COVID-19 deaths for different G8 countries since the start of the year ([more](#)). The chart reflects the earlier emergence of the B.1.1.7 in the UK, whilst it has only become the dominant variant in the USA and Western Europe during March.

**Figure 1.2 – Trends in the rate of COVID-19 deaths across G8 countries**



Source: [OurWorldInData](#)



## 2. Behaviours during pandemic

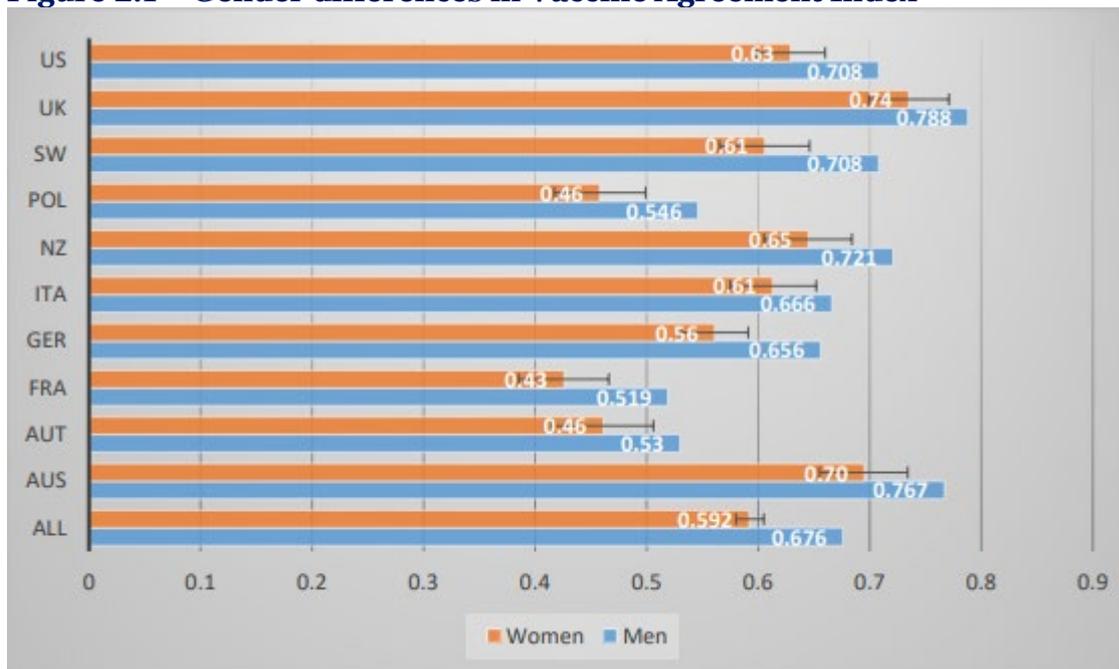
### Gender differences in attitudes to vaccination

A study by **Galasso et al.** of vaccination patterns in 10 different countries has identified “a gender paradox” ([more](#)). Prior surveys in different countries found that women are typically more concerned about the health consequences of COVID-19 and more likely to follow public health guidance, such as washing hands.

However, findings from this study indicate that women are more hesitant in seeking out vaccination (58% vs 66%), less likely to believe that vaccination is the only solution (69% vs 72%) and more resistant to the imposition of compulsory vaccination (38% vs 44%) – with the percentages in the brackets setting out the percentages for women and men respectively that were in agreement with the policy or statement. A key factor in vaccine skepticism related to the role of large corporations in vaccine development. In a subsequent Crucible, we will explore how the combatorial style of media presentation of claims relating to the vaccines may be affecting people’s trust and perceptions.

All the findings in the study reflect the pooled results across the 10 countries, and it should be noted that the differences between countries were very significant with values on a Vaccine Agreement Index ranging from 47% in France to 76% in the UK.

**Figure 2.1 – Gender differences in Vaccine Agreement Index**



Source: [COVID-19 vaccine’s gender paradox](#)

The study further tested the effect of four different information priming campaigns for the assertion that “the only way to become immune to COVID-19 in the long run is by vaccination. The primings were targeting i) not being infected, ii) not infecting others, iii) protecting healthcare system, iv) protecting the economy. Interestingly, the different primings seem to have had a similar level of impact as each other, but were more effective with men than women.



## 3. Healthcare today

### COVID-19 and Long-Term Care

The tireless work of the **International Long Term Care Policy Network** ([more](#)) has been pivotal to our better understanding of the impact of COVID-19 on long-term care facilities around the world. Their current estimate is that 41% of all COVID-19 deaths were residents of care homes (including residential and nursing facilities), based on data collated across 22 countries ([more](#)). In the UK, the **Care Quality Commission (CQC)** has been publishing weekly data ([more](#)) on deaths in care home residents since late April 2020. Over the period from 10 April 2020 to 2 April 2021, there have been 148,402 deaths of care home residents, and 39,071, or 26%, are believed to have been as a result of COVID-19. Age UK estimated that there were 400,000 residents in UK care homes in May 2019.

The **ILTCPN** has just launched the **Social Care COVID Resilience & Recovery project** ([more](#)) that aims to draw together international evidence and learnings to inform policy and practice so as to increase the resilience of the care sector in the UK over the longer term. 4 separate workstreams are expected to report between Summer 2021 and Summer 2022, and will include recommendations on the recovery from, and future prevention and management of, COVID-19.

In addition, the volunteer group supporting the **COVID Tracking Project** in the USA, launched the **Long-Term-Care COVID Tracker** in September 2020 to collect, publish and analyse data on long-term care facilities across the USA. This project concluded in March 2021, and a blog of key learnings ([more](#)) included the following:

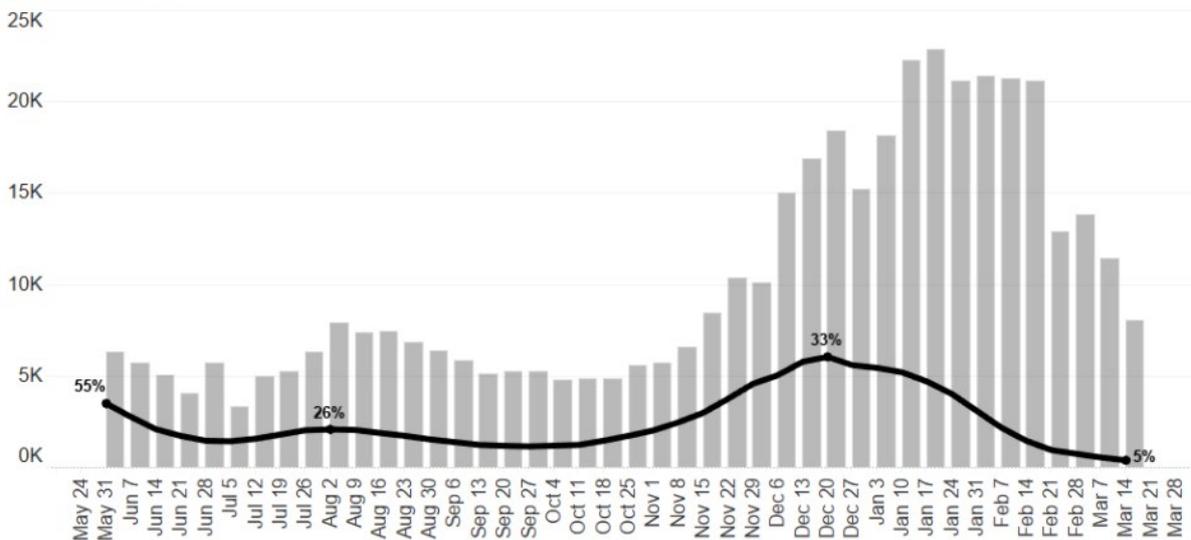
- 1 in 10 nursing home residents in the USA died from COVID-19 (comparable to the UK)
- A report from the **General Accountability Office** in May 2020 ([more](#)) identified that 82% of US nursing homes had been cited for deficiencies in infection prevention and control over the period 2013 to 2017, and that half of these had persisting problems over multiple years. A follow-up report in March 2021 reported that recommendations set out in the earlier report had not been implemented, including the need to have a clear data landscape on COVID-19 infections and deaths.
- It has been the roll-out of the vaccine programme that has been pivotal to reducing death toll in nursing homes, with the percentage of COVID-19 deaths falling from 33% at the end of the year to 5% in most recent weeks (see **Figure 3.1**).



### Figure 3.1 – Proportion and number of COVID-19 deaths in US nursing homes

#### COVID-19 DEATHS IN CMS-REGULATED NURSING HOMES

Lines show new deaths reporting by CMS. Bars show deaths overall reported by CDC in the same week. Labels show ratio of CMS deaths to all deaths.



Source: [Long-Term-Care COVID Tracker](#)

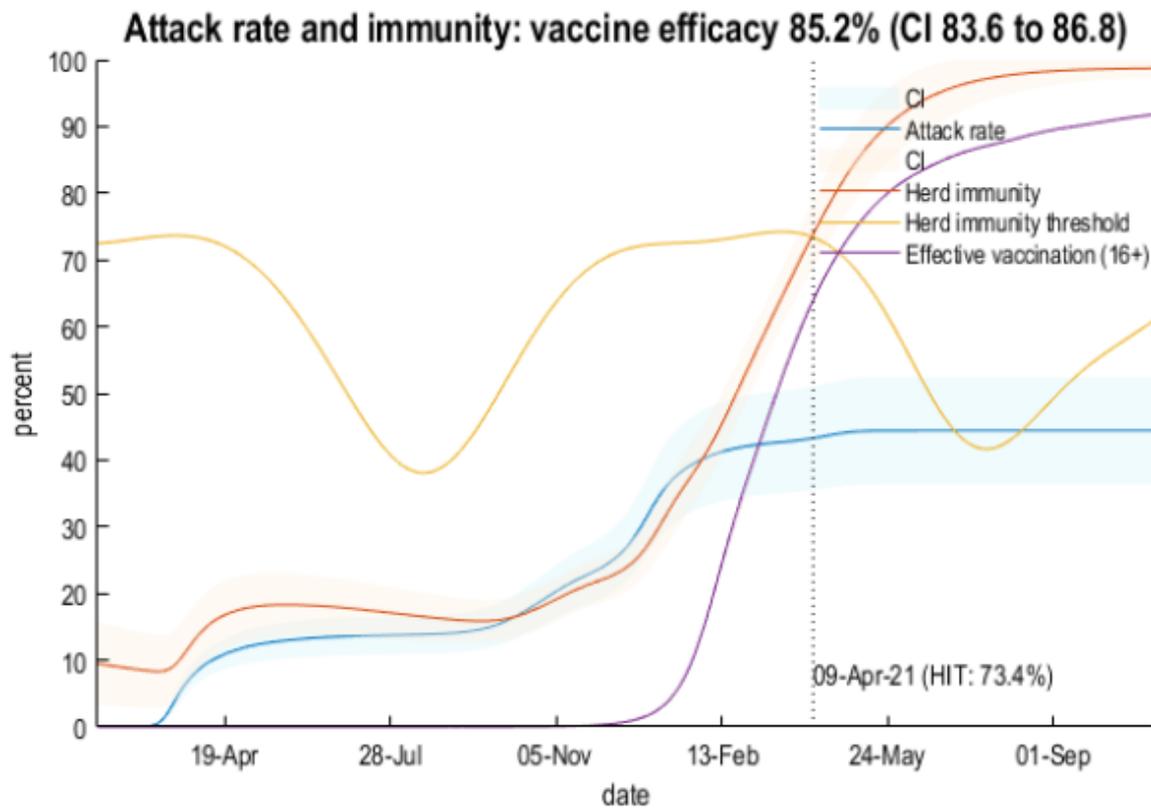
## Herd Immunity in the UK

In the early phases of the pandemic, it was estimated that more than 70% of the population would need to have been infected to achieve herd immunity ([more](#)). The toll of COVID-19 and the extraordinary strains placed on the healthcare services meant that this was quickly discarded as a reasonable strategy. Since then, there has been much discussion as to whether heterogeneity in the transmission of the virus meant that that herd immunity might be achieved through a lower level of infection, but lockdowns and social distancing restricted the spread of the virus. However, with the widespread roll-out of vaccines across different priority groups in the UK, more than 50% of the population have evidence of antibodies ([more](#)) and the question of herd immunity has arisen again.

The **Dynamic Causal Modelling** group at **UCL** under **Professor Karl Friston** have made a series of predictions about most likely scenarios, comparing estimated levels of effective vaccination with seasonally adjusted viral transmission rates to posit a cross over point on 9 April by when it was estimated that 73.4% of the UK population over age 16 would have effective immunity thanks to vaccination or prior infection as set out in **Figure 3.2** ([more](#)).



**Figure 3.2 – Relationship between vaccine effectiveness and herd immunity**



Source: [Dynamic Causal Modelling, UCL](#)

Other modelling groups have questioned whether these conclusions are precipitous ([more](#)), citing evidence from the **REACT-1** study over the period 11 to 30 March that shows a R value of 1, suggesting that social distancing restrictions are still needed to stop infections increasing. The expectation is that increased social contacts after relaxing lockdown will lead to a further surge of infections, potentially exacerbated by increasing prevalence of new variants and attrition in the effectiveness of the immune response.



## 4. Unlocking your data

### Partnership between BREATHE and Savana

**BREATHE** is the UK Health Research Hub for Respiratory Health, one of 7 research hubs developed through **HDR UK**. **BREATHE** aims to improve respiratory health by improving the use of data and data science by the NHS, researchers, industry and charities. The Director and Deputy Directors are **Professor Aziz Sheikh** at the **University of Edinburgh** and **Professor Jenni Quint** at **Imperial College London** respectively ([more](#)).

**Savana**, an international medical data company, has been using natural language processing and machine learning since 2014 to read multi-lingual clinical documents, including free text, to support patient management, disease prevention and research.

Last week, **BREATHE** and **Savana** have launched **BIGCOVIDATA** ([more](#)) which will provide access to routine secondary care data, including free text, for patients in English, French, German and Spanish-speaking countries. This will allow better prediction of COVID19 progression and outcomes, and will provide approved international researchers with access to international real world evidence through the SAIL Databank service ([more](#)).



## 5. Technology tomorrow

### Telehealth after COVID-19

The **American Medical Association** carried out a routine survey in 2016 to identify the use of emerging technologies by doctors in daily practice. A follow-up survey in 2019 found a doubling in adoption of telehealth & virtual technology to 28%, and an increase in remote monitoring and management to up to 20%. The unprecedented events of COVID-19 have made telehealth the norm. However, doctors are concerned about how to optimise technologies, safeguard patient data privacy and integrate records from virtual and in-person visits. Patients are concerned about quality of care and payments for virtual care ([more](#)).

In order to get a better sense of where we all might be headed, I would recommend the following article from **Philips** ([more](#)) that provides a vision of the future of healthcare delivery. Their ten examples of telehealth innovation paint a very different picture of the future to the pre-COVID-19 world, including the following:

- 1) Screening and engaging with patients before they enter the hospital or surgery
  - prevent unnecessary exposure, opportunity for online lifestyle coaching
- 2) Remote training around medical imaging and procedures
  - webcams providing first person perspective, technical expertise available during procedures, ability to train, guide and assist colleagues in other location
- 3) Tele-ICUs
  - high-definition cameras and telemetry allow constant monitoring of patients, predictive analytics provide alerts to deterioration
- 4) Wearable biosensors
  - remote monitoring of chronic diseases at home, transitioning between facilities, or capturing data/providing peace of mind to high-risk mothers
- 5) Tele-dentistry
  - sharing high resolution photos to get personalised, practical advice, allowing dentists to keep in touch with patients between visits and monitor progress
- 6) Virtual Care Stations (**Figure 5.1**)
  - connected, accessible room that enables provider to visualise remotely patient's area of concern.

**Figure 5.1 – Patient consultations in a Philips Virtual Care Station**



Source: [Philips](#)