

## Friday Report: Issue 65

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**COVID-19 Actuaries Response Group – Learn. Share. Educate. Influence.**

COVID-19 is still one of the hottest topics for scientific papers and articles. The COVID-19 Actuaries Response Group provides a bi-weekly Friday update with a summary of key papers, articles and data.

### Vaccines

#### Valneva Vaccine Approved ([link](#))

The MHRA has approved the Valneva vaccine, VLA2001, for use in the UK. At the current time there is no indication that the government plans to use it widely, having terminated a supply agreement last Autumn. Readers may recall that in mid-2020 the government signed an agreement with Valneva for a jointly funded manufacturing site in West Livingston in Scotland.

Unlike other currently approved vaccines, it comprises inactivated whole virus particles with high S-protein density, along with two adjuvants. It could thus be of use for those for whom the current vaccines are unsuitable, or those who are hesitant because of their perceptions of technologies used by the current vaccines.

The vaccine is approved for use for ages 18-50, and would be a two-dose course, at least 28 days apart.

#### Moderna Vaccine Approved for 5 to 11 Year Olds ([link](#))

The existing Moderna vaccine “Spikevax”, has now been approved by MHRA for use by ages 5-11, to add to the existing approval for age 12 and over. The announcement notes that the approval takes into account similar approval by the European Medicines Agency (EMA), and that the original approval was reliant on the EMA decision.

Moderna will therefore now be available in addition to the Pfizer vaccine for this age group, although any use is still subject to an appropriate recommendation by the JCVI.

### Vaccine Progress

The “Spring Booster” programme continues to make steady, if unspectacular, progress. Around 40% of the 4.5m eligible over-75s in England have now received a fourth dose. A small number of these will have received a fourth dose prior to this programme, as a first booster for immunocompromised people. The programme has been running for just over a month, so is averaging around 0.5m a week.

Meanwhile, at the other end of the age range, there appears to be relatively slow progress in the 5 to 11 age group. Around 4% are vaccinated despite MHRA approving the Pfizer vaccine for this age group on 22 December and JCVI recommending vaccination of the group on 16 February. Whether this is to do with hesitancy, children being infected recently, or difficulties with the distribution of the vaccine is unclear – it is likely a combination of all these factors.

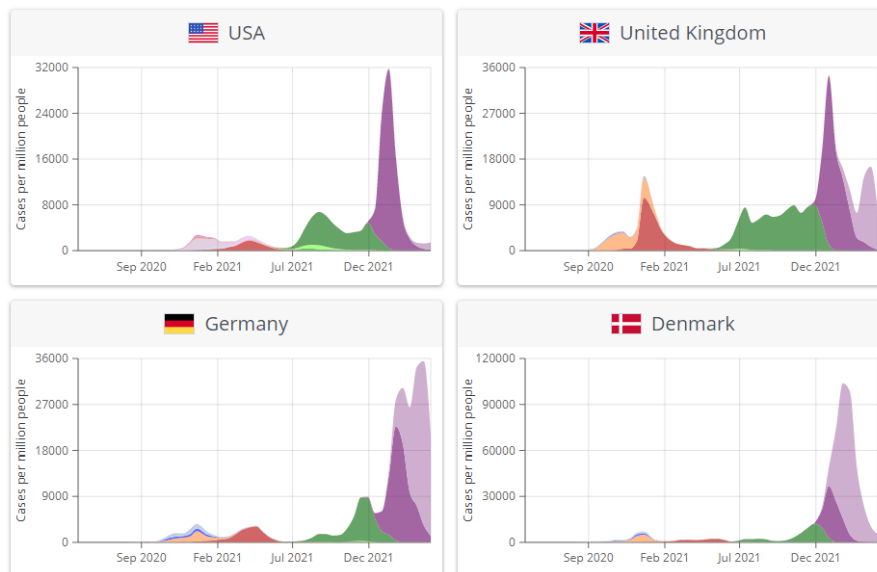
MHRA approved the Pfizer vaccine for this age group on Dec 22<sup>nd</sup>, and JCVI recommended vaccination of this group on Feb 16<sup>th</sup>.

## Variants

### Visualisations of case rates by variant

[CoVariants.org](https://covid19.ourworldindata.org/variants) are now mapping case rates from [OurWorldInData](https://ourworldindata.org/) to the estimated frequency of variants within countries that sequence at least 3% of Covid cases.

A sample of graphs from their website shows Alpha in red, Delta in green, Omicron BA.1 in dark purple and Omicron BA.2 in light purple. The USA and the UK had a pronounced BA.1 spike in January 2022. The UK is in a subsequent BA.2 wave which has not yet been seen in the USA. In Germany and Denmark, there have been more cases associated with BA.2 than with BA.1.



### Omicron sub-lineages

According to [cov-lineages.org](https://cov-lineages.org/), Omicron can now be separated into 5 “constellations”. A constellation is a collection of mutations which are functionally meaningful, but which may arise independently numerous times. These are BA.1, BA.2, BA.3, BA.4 and BA.5. In turn there are further descendants within these constellations, as well as Omicron XE, a recombinant.

BA.2.12.1, BA.4 and BA.5 are increasing in frequency ([link](#)).

According to the [CDC](https://www.cdc.gov/), BA.2 accounted for 74% of Covid-19 cases in the USA between 10 and 16 April. An emerging sub-lineage BA.2.12.1 accounted for 19% of cases, with BA.1.1 and B.1.1.529 accounting for the rest of cases. BA.2.12.1 is thought to be behind rising cases and hospitalisations in New York State ([link](#)).

Small numbers of samples of sub-lineages BA.4 and BA.5 (descendants of BA.2) have been submitted to GISAID from a number of countries. The majority are noted in South Africa, and may be linked to rising case counts and test positivity rates there ([link](#)).

## Medical

### Paxlovid added to PANORAMIC

As of 31 March, the PANORAMIC study set up to investigate the benefits of antiviral treatment in the community had grown to 20,000 participants. The study was originally focused on Molnupiravir, but Paxlovid was added to the trial on 12 April ([link](#)) with up to 17,000 new courses. A mere 10 days later, trial participants stand at 24,800 and the study has been swamped by “*an extraordinarily large volume of registrations*” ([link](#)). The study is targeted on those that have had symptoms of COVID starting within the last five days; the shorter the separation between symptoms and registration the better.

Even though this is apparently the fastest-growing clinical trial ever in the UK, it is worth noting that the trial represents only a small fraction of the millions of courses of treatment that have been purchased by the UK government and are apparently available. Meanwhile in the USA, 2.7 million courses of Molnupiravir and 1.7 million courses of Paxlovid have been distributed to state and territorial health departments ([link](#)), with a new website to help those with symptoms find supplies at doctor surgeries, pharmacies or health clinics ([link](#)).

### Expanded list of symptoms of COVID infection

Two years into the pandemic, on April 5 the UK Health Security Agency (UKHSA) increased the number of symptoms of COVID infection on its official list.

The classic symptoms were continuous cough, fever and loss of smell and taste; with the latter initially struggling to be recognised. Now, with an increasing number of Omicron variants, the official list has expanded to include shortness of breath, unexplained tiredness or lack of energy, muscle aches, long lasting headaches, sore throat, stuffy or runny nose, loss of appetite, diarrhoea and feeling sick.

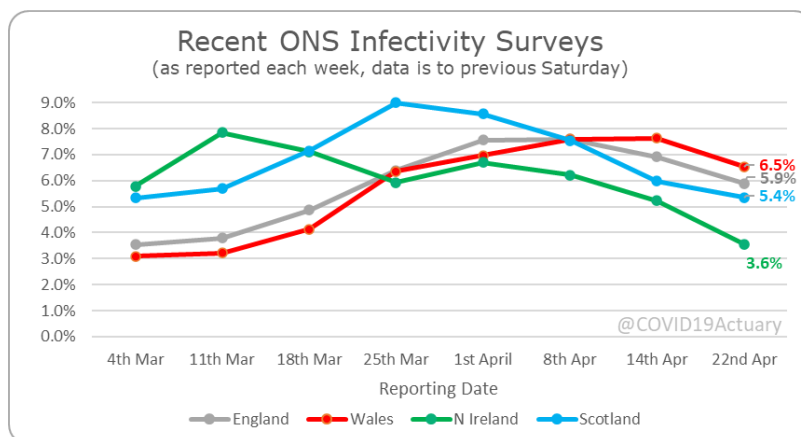
The updated guidance ([link](#)) from UKHSA notes that these symptoms are very similar to other respiratory infections and “*it is not possible to tell if you have COVID-19, flu or another respiratory infection based on symptoms alone.*” Anyone with symptoms of a respiratory infection and a high fever should stay home and avoid other people, much as many did in the past. As free testing stopped in the UK at the beginning of April, this is all part of the new normal of “Living with COVID”.

## Data

### ONS Infection Study ([link](#))

Covid infection prevalence is falling and is now lower in all nations than the levels reported in our previous Friday Report on 1 April.

In England, infection prevalence reported by age is tightly bunched between 5.7% and 6.6% for ages 25 and older. Infection levels are lowest among children in school years 7 to 11 at 2.8%. Most school children would have been on holiday in the first 2 weeks of April.

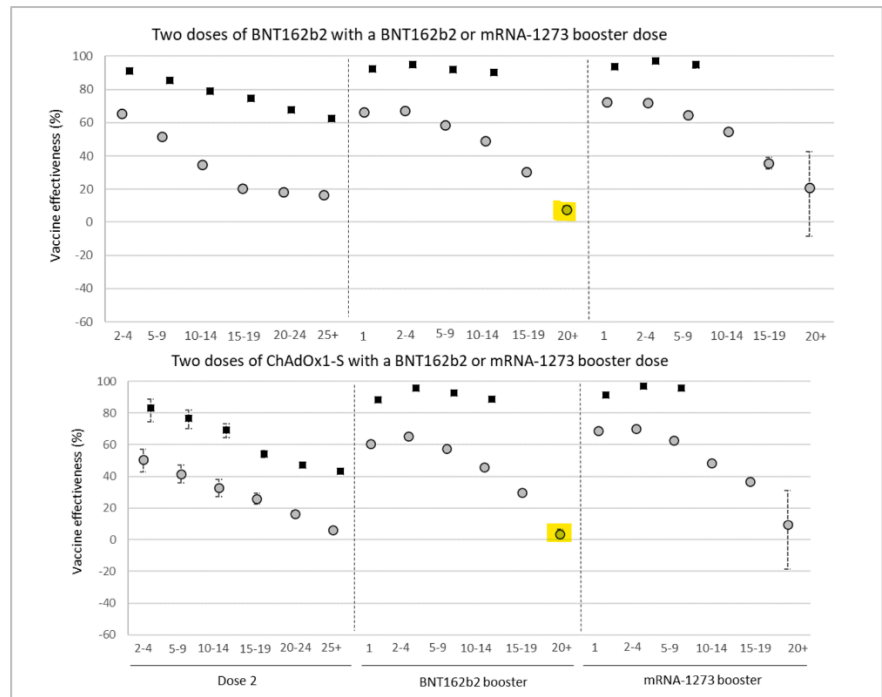


## Booster Effectiveness Against Symptomatic Infection

The latest Vaccine Surveillance Report from UKHSA has extended the booster effectiveness data to beyond 20 weeks, with the latest datapoints highlighted in yellow in the chart below. It is clear that after 5 months there is very little remaining effectiveness against symptomatic infection, whether the primary course was Pfizer (upper charts) or AZ (lower charts).

Note however that the comparison is now being made against an unvaccinated population, a significant proportion of whom will have infection-acquired immunity, most notably against Omicron itself. The results should be considered in this light.

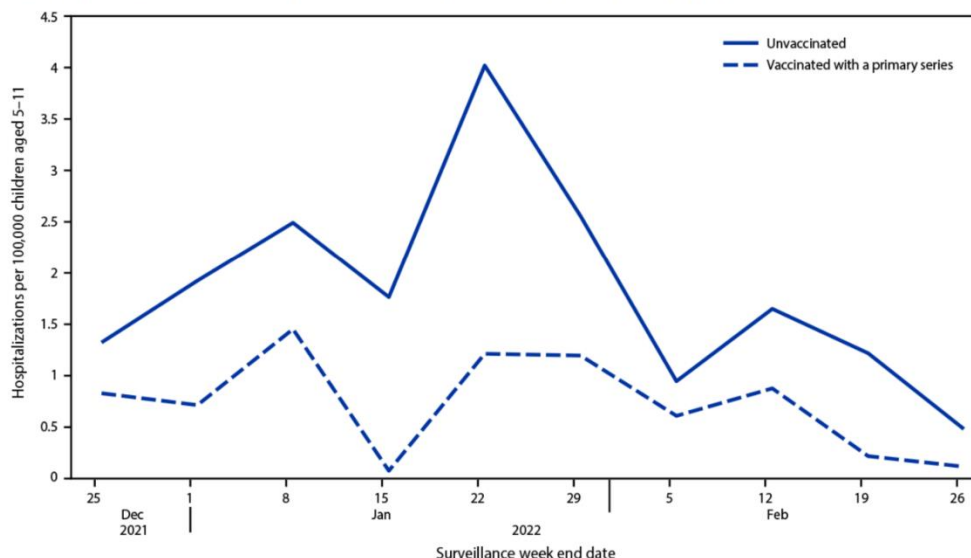
In addition, we reported in the last Friday Report ([link](#)) that effectiveness remains high against serious illness, albeit that waning post 15 weeks is seen there too, thus emphasising the need for a second booster for the oldest age groups.



## USA Child Hospital Admissions by Vaccination Status ([link](#))

The CDC has published data relating to COVID hospitalisations of children aged 5 to 11 by vaccination status. It shows that unvaccinated children have been significantly more likely to be admitted. This age group became eligible for the vaccine on 2 November, and by early March around a third had received the full course.

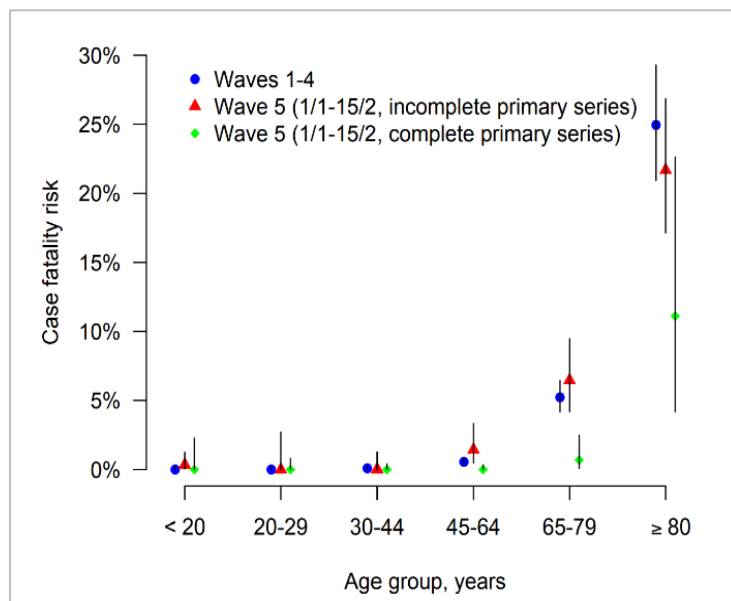
FIGURE. Weekly COVID-19-associated hospitalization rates\* among children aged 5–11 years, by vaccination status† during the Omicron-predominant period — COVID-NET,<sup>§</sup> 11 states, December 25, 2021– February 26, 2022



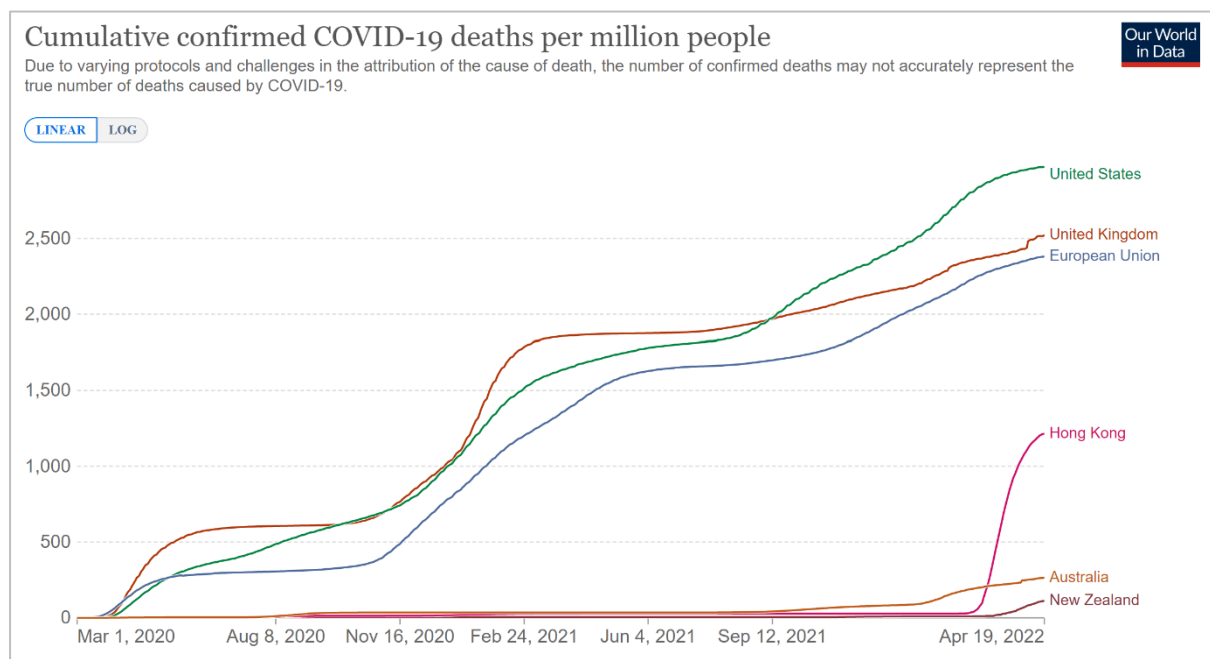
The peak of admissions during the Omicron period was more than twice that seen during the Delta wave. The headline statistic quoted by the CDC is that hospitalisations for non-vaccinated children were twice the rate of those who had received both jabs, with 87% being unvaccinated. However, there was no significant difference in severe outcomes by vaccination status.

## BA.2 Case Fatality Rate in Unvaccinated Similar to Ancestral Strain [\(link\)](#)

A study in Hong Kong, which has just undergone a very severe wave linked to Omicron BA.2, has revealed that the case fatality rate for those who have not been vaccinated is broadly equivalent to the original strain of the virus. This contradicts a commonly repeated misconception that Omicron is a relatively mild version of the virus.



With relatively low vaccine take-up in older age groups (around 20% of the 80+ population have completed the primary course), much greater transmissibility of BA.2 and a much lighter regime of NPIs in contrast to the original lockdown, the result has been significant mortality. The graph below shows Covid-19 death rates for various countries, including those that had similarly low mortality until recently. This demonstrates the extreme nature of recent Hong Kong mortality, which can be attributed to the low vaccination coverage in the older age groups.

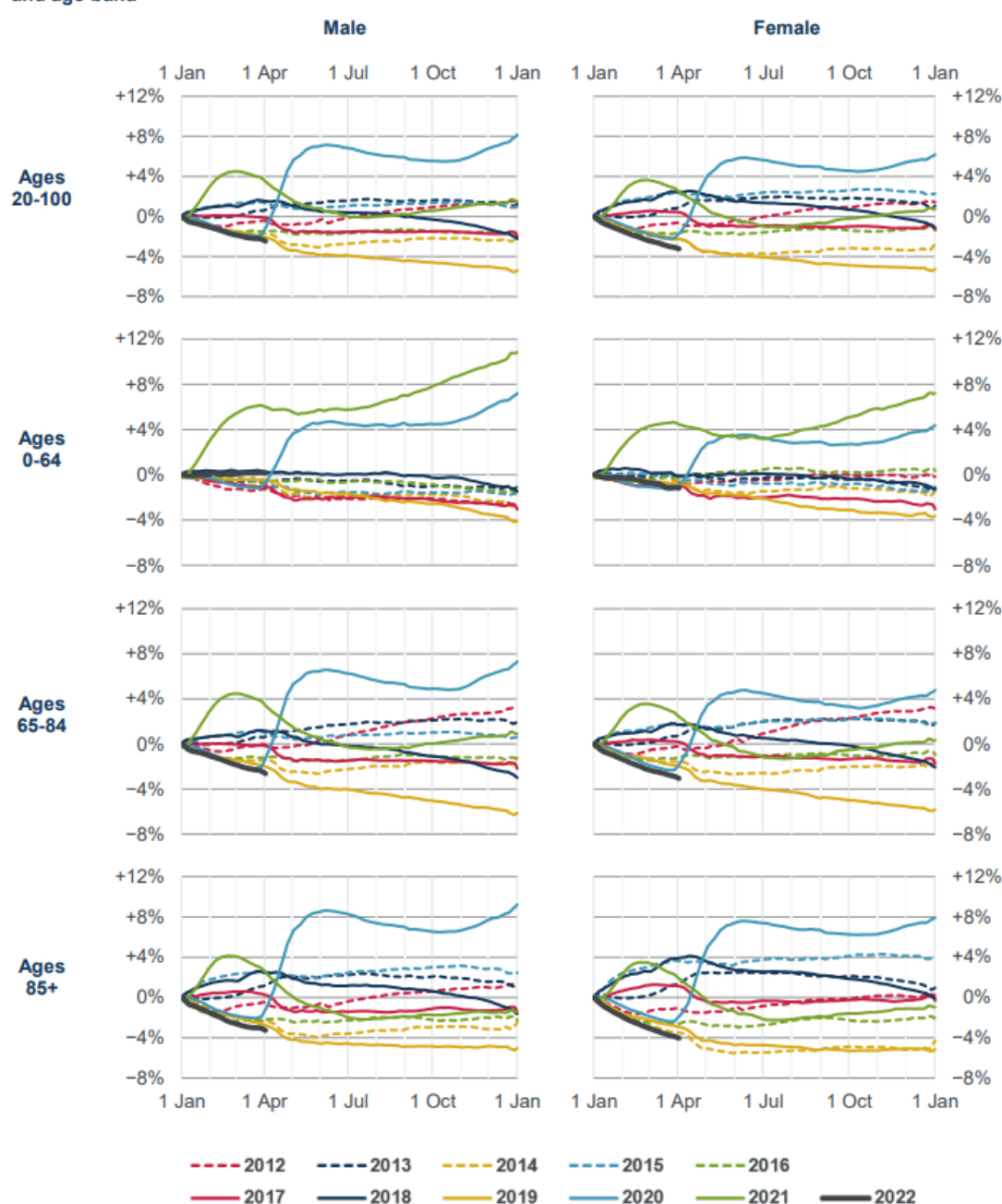


## Excess mortality in England and Wales in Q1 2022

In addition to weekly Mortality Monitor reports, the Continuous Mortality Investigation (CMI) publishes a more detailed quarterly report. The [most recent version](#) was published on 12 April and showed that the cumulative standardised mortality rate for 2022 was 2.8% below the 2012-2021 average, and 0.7% below 2019. The CMI have used 2019 as their benchmark throughout the pandemic which makes the fall in mortality rates relative to 2019 particularly encouraging.

The report also gives a breakdown of standardised mortality rates by age band and gender, relative to historic rates. Mortality rates in 2022 have been lower than Q1 mortality rates in all years between 2012 to 2021. For females below age 65, mortality rates have been similar to mortality rates in early 2019 and 2020. However for males below age 65, mortality rates are in line with the 2012-2021 average and are exceeded only by mortality rates in Q1 2021.

**Chart G: Cumulative standardised mortality rate (cSMR) compared to the 2012-2021 average, by gender and age-band**



## And Finally...

By day, many actuaries apply their modelling skills in the field of human longevity. But this weekend we congratulate TobyKeith on his entry into the Guinness Book of Records as the oldest living dog ([link](#)).

TobyKeith is a chihuahua living in Florida, USA and he celebrated his 21<sup>st</sup> birthday on 9 January 2022. His owner, Gisela, thinks the key to his grand old age is genetics, a healthy diet (vegetables, rice and chicken and no sugary treats) and, most importantly, a loving home.

To reach these conclusions Gisela might be peeking at the statistics actuaries look at for humans. Or perhaps she has compiled her own data set based on over 150 dogs and puppies that she has fostered.



22 April 2022