Tracking the Swansea University (delayed response) RWC model and the Cabinet office RWC model against actuals

TAC Modelling Sub cell

2nd November 2020

Background

Several different scenarios estimating how COVID-19 would progress this winter were considered and compared to determine which should be agreed as the Reasonable Worst Case (RWC) model for Wales. Since the Swansea University model was seeded to Wales and had various scenarios depending on the time taken to respond to circuit breaker indicators being hit, this model was chosen as the official RWC for Wales in September 2020.

Since then we have been tracking how the actual progression of COVID-19 in terms of cases, admissions, deaths and bed occupancy compares with the outputs the Swansea University delayed response model and Armakuni model (based on the Oxford BDI model).

Summary

This report includes charts conveying how the modelled values from the RWC scenarios compare with the observed values from 1st July to 28th October 2020. The aim of this comparison is to analyse how the model relates to some the key COVID-19 indicators so far. It is not possible to identify which models the indicators will follow in the future.

The number of cases followed the Swansea University model for much of the summer, before starting to rise at the end of August/early September. Since then, the number of cases have been rising faster than the Swansea University Cases and Infections models. As of the week ending 28th October the actual number of cases was higher than the numbers forecast by the Swansea University Cases and Infections models.

The numbers admitted to hospitals with COVID-19 are somewhat volatile, with revisions being made on data from one week to the next. Volatility in these data may be because of outbreaks of COVID-19 in the hospital setting. When an outbreak occurs numbers could increase rapidly, but when an outbreak is controlled numbers could return to pre-outbreak levels. Weekly COVID-19 hospital admissions had been increasing steadily between the weeks ending 19th August and 14th October, but have stabilised a little in the following two weeks. This does not mean that people are not being admitted to hospitals with COVID-19. Rather, it means that the average number of people admitted to hospital with COVID-19 in the most recent week is similar to the number admitted in the previous two weeks. The observed values are still closest to the Armakuni RWC model.

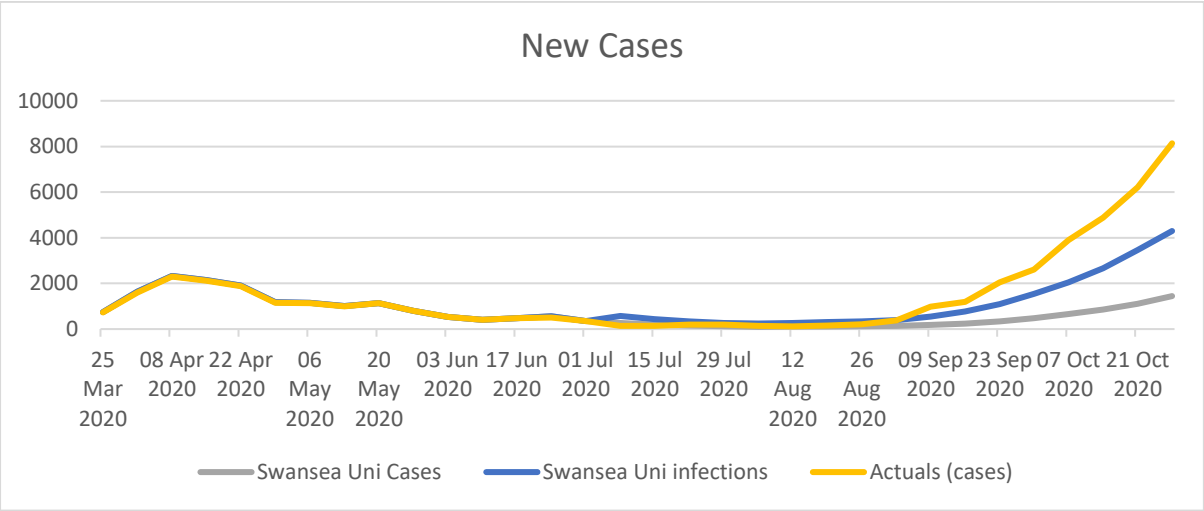
For several weeks during late August and early September the observed total bed occupancy of confirmed COVID-19 patients was very close to Swansea University's low values. Throughout mid-September there was an upturn in the observed value of this indicator, rising earlier than the RWC scenarios forecast. As of the week ending 28th October, the observed values were higher than the selected RWC forecasts. They have been rising at a steady rate for the past 5 weeks.

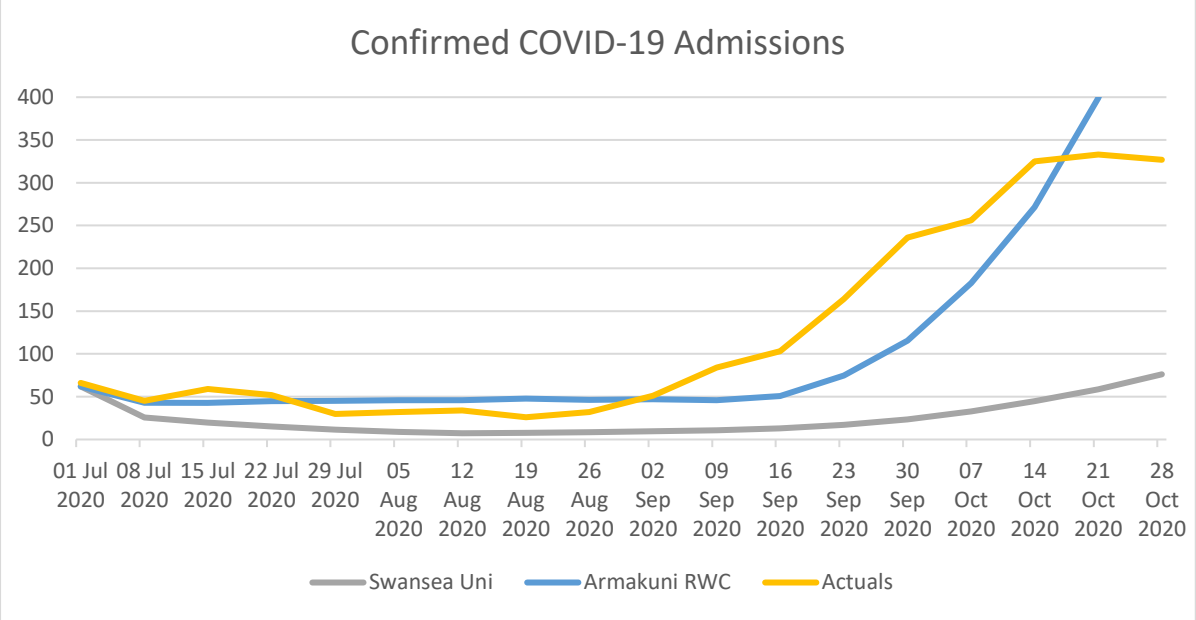
For much of the summer the observed values of ICU bed occupancy of confirmed COVID-19 patients followed the Swansea University forecast quite closely. This indicator still remains relatively low, but in general has been increasing since the week ending 16th September.

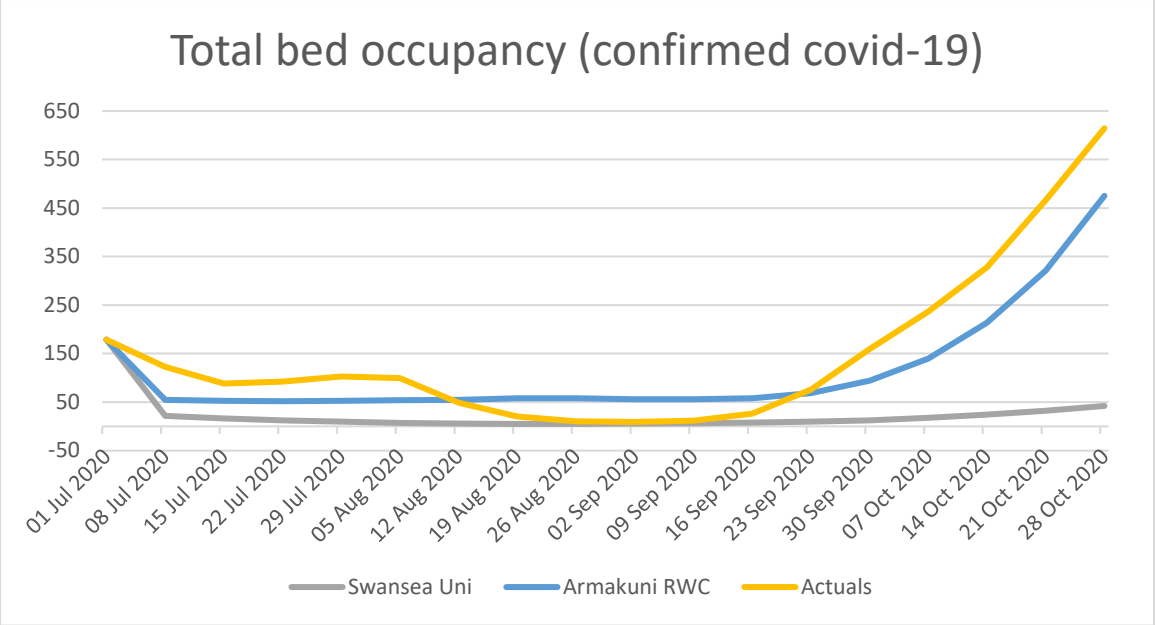
The observed values of (ONS) deaths followed the Swansea University forecast through the last half of August and early September. Other than a decrease in the week ending 14th October this indicator has been rising since week ending 16th September. As with all other indicators, we will continue monitoring this trend closely.

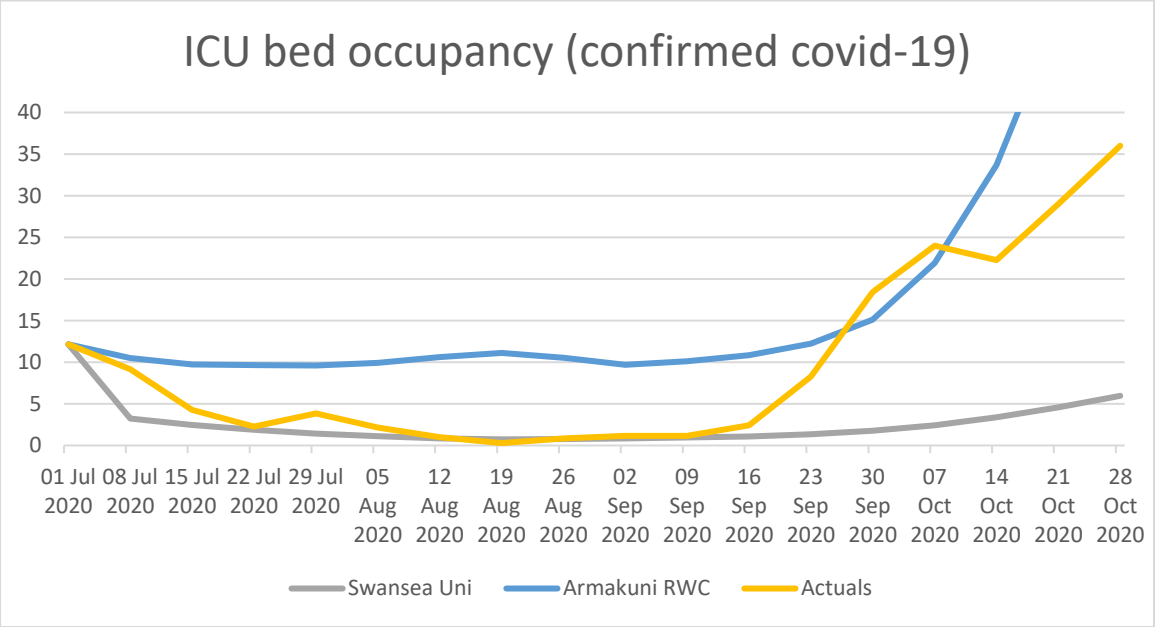
Within TAC we are also looking at more short and medium term forecasts based on the most recent data, and updating the models we use to pick up the changes in incidence that have been observed since the end of August.

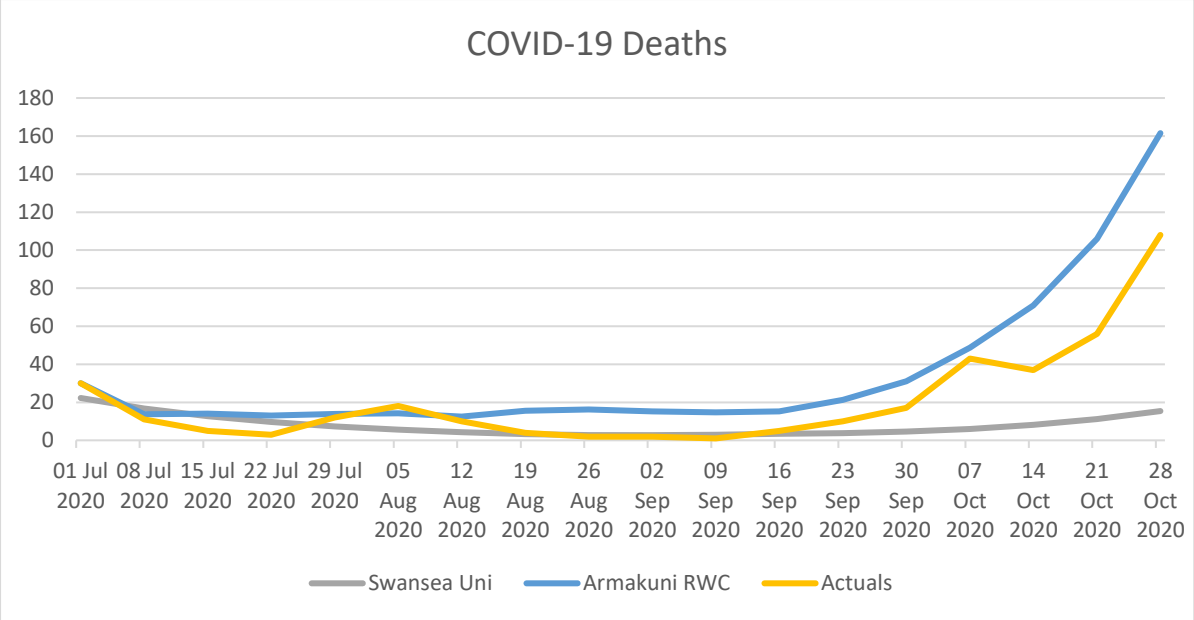
Charts comparing the Swansea University delayed model, Armakuni (based on Oxford BDI) and actuals from 1st July to 28th October 2020






Total bed occupancy (confirmed covid-19)
650
550
450
350
250
150
50
-50
01 Jul 2020
08 Jul 2020
15 Jul 2020
22 Jul 2020
29 Jul 2020
05 Aug 2020
12 Aug 2020
19 Aug 2020
26 Aug 2020
02 Sep 2020
09 Sep 2020
16 Sep 2020
23 Sep 2020
30 Sep 2020
07 Oct 2020
14 Oct 2020
21 Oct 2020
28 Oct 2020
Swansea Uni
Armakuni RWC
Actuals


ICU bed occupancy (confirmed covid-19)
40
35
30
25
20
15
10
5
0
01 Jul 2020
08 Jul 2020
15 Jul 2020
22 Jul 2020
29 Jul 2020
05 Aug 2020
12 Aug 2020
19 Aug 2020
26 Aug 2020
02 Sep 2020
09 Sep 2020
16 Sep 2020
23 Sep 2020
30 Sep 2020
07 Oct 2020
14 Oct 2020
21 Oct 2020
28 Oct 2020
Swansea Uni
Armakuni RWC
Actuals



Notes for charts

1. The confirmed cases, hospital admissions and number of COVID-19 deaths use a 7 day rolling sum whereas the bed occupancy charts using a 7 day rolling average.
2. Cases for the Swansea University delayed model refers to the number of symptomatic people with COVID-19 whereas the actuals refers to cases where COVID-19 has been confirmed with a positive test.
3. Hospital admissions refers to patients confirmed to have COVID-19. The source for the real data is PHW.
4. There are 2 real sources shown for the actual deaths: PHW and ONS. It does not include deaths which are not captured in headline data, additional COVID-19 deaths that could occur due to lack of NHS capacity, or other excess deaths.
5. Total Bed occupancy refers to the total number of hospital beds occupied (including ICU beds) for COVID-19 confirmed patients.
6. ICU bed occupancy refers to number of ICU beds occupied by COVID-19 confirmed patients. The real data uses the NWIS invasive ventilator beds as the source for this.