COVID-19 impact on crime, March to June 2020

Source: Queensland Police Service unpublished data, extracted 10 July 2020

Key findings

In comparing monthly recorded crime rates during the March–June focus period against the forecast for each offence category it was found:

- After reaching a peak of 977.3 offences per 100,000 persons in January 2020, the total recorded crime rate for Queensland plummeted to a low of 714.0 per 100,000 persons in April (20% lower than the expected rate), when the highest level of restrictions were in place.

- The rates of total recorded offences in all four months from March to June were significantly lower than the forecast estimates (8% lower in March and nearly 20% lower in each of the other three months).

- The lower than expected rates were most evident in recorded property offences, which fell to 35–40% lower than forecast for April to June. This was driven by:
  - unlawful entry with intent / burglary, break and enter rates, which peaked in March 2020 and dropped to half the forecast rate by June, the lowest rate observed for that offence type in 10 years.
  - theft and related offences rates which began to decline earlier, already evident in March when the observed rate first fell below the 95% prediction interval and remaining well outside for the four-month period.

- Rates of recorded person offences were also lower than expected across all four months, with significant differences in April and May, whereas in June the rate returned close to forecast level.
  - The rate for acts intended to cause injury (almost entirely assault) fell below the 95% prediction interval in April only, but robbery, extortion and related offences rates were below from April through to June.

- Rates of recorded other offences performed quite differently over the March–June period, initially declining slightly below the 95% prediction interval in March before returning almost to the forecast rate for April, and exceeding forecasts for May and June. This increase was driven by:
  - illicit drug offences rates which increased 60% overall from March to May, dropping back by 16% in June. The rates in April to June were all above the 95% prediction interval for each month. These offences are examined in detail in a separate paper.

Introduction

Since 11 March 2020, when the World Health Organization declared a global pandemic in response to the global spread of COVID-19, Australian Commonwealth and state and territory governments have implemented border closures, travel restrictions, business closures and social-distancing measures in efforts to contain the spread of the virus.

This brief examines Queensland’s monthly rates of crime reported to or detected by police (hereafter referred to as recorded crime) and assesses the impact of COVID-19 containment measures, with particular focus on the four months from March–June 2020. Historical trends and forecast rates based on monthly data are compared to recent divergences to unearth likely impacts of these measures.

COVID-19 containment measures

Social distancing was implemented and other restrictions introduced in Queensland in March, including directives to work from home wherever possible and maintain a distance of 1.5m from others. On 16 March, all jury trials were suspended indefinitely, and police suspended roadside drink and drug driving tests. This was followed by laws being passed allowing health officials greater powers and $13,000 fines for those who flout their orders. Travel into remote Indigenous communities was also subsequently banned under federal biosecurity laws. By the end of March, non-essential services, including pubs, clubs and restaurants were shut down and the Queensland border closed to all but local residents, essential travellers and freight. Queenslanders faced dramatically tighter restrictions, with a limit of two visitors to a home and travel outside the home banned except for four essential reasons, and breaches punishable by on-the-spot fines of $1,334.50 issued by police. The highest level of restrictions was maintained throughout April. By 22 April, 130,000 Queenslanders were without a job. A staged easing of restrictions commenced from 2 May, and pubs, clubs, restaurants and cafes were permitted to reopen in a limited capacity from 16 May. Due to the success of containment measures to date, Queenslanders were again allowed to travel unrestricted within the state from 31 May.
Method of analysis

Administrative data from Queensland Police Service (QPS) form the basis of the quantitative analyses presented in this report. These data were derived from information on offences recorded in Queensland Police Records and Information Management Exchange (QPRIME).

Forecasting was performed to determine whether the observed offence rates since COVID-19 restrictions were introduced were significantly different to what would be expected if they had not. If the observed rate was outside the 95% prediction interval, it was deemed to be significantly different. The observed rate is also compared to the forecast point estimate as a measure of the size of difference or change between expected and observed rates.

For each forecast model, three forecasting methods were undertaken: an exponential smoothing state space (ETS) model, a non-seasonally adjusted auto-regressive integrated moving average (ARIMA) model, and a seasonally adjusted ARIMA model. Within each model type, the model specification and parameters were automatically selected based on the model with the lowest Akaike’s Information Criterion (AIC). Each of the three resultant models was then compared and the best model chosen based on the best forecast accuracy (i.e. the model with the lowest level of error as measured by the root mean square error (RMSE), mean absolute percentage error (MAPE), and mean absolute scaled error (MASE))\(^1\). Monthly data from July 2014 to June 2019 was used to train the model, with monthly data from July 2019 to February 2020 used to test the model. Once the best model was selected, offence rates were forecast for March, April, May and June 2020, based on monthly data from July 2014 to February 2020\(^2\). As noted previously, COVID-19 restrictions were introduced in the latter half of March 2020, with substantial changes in community mobility in Queensland starting in that month as well. It was therefore decided that March 2020 should be included in forecasting, rather than used as an observed value from which to forecast.

Limitations to the analysis undertaken include:

- The data used for analysis relate to recorded offences and do not provide an accurate and true measure of all offending within Queensland. This is because not all offending is recorded, and not all recorded offences are proven in a court of law. Similarly, any increases or decreases in offending in the data may not be indicative of actual changes in offending, but could rather reflect changes in police detection and community reporting of offences. Other publications may refer to recorded offences as reported offences.
- The use of forecasting based on historical trends relies on the strength of the relationship between past and future values. Where there is volatility or noise in the data, or low rates available for analysis, forecasts can become less reliable and result in wider prediction intervals, making statistical inference difficult. It is also possible that any divergence from the forecast trends is actually due to other factors, unrelated to COVID-19 containment measures, that occurred at the same time as the pandemic. This is probably unlikely, however, and thus any divergence from the forecast trends will be interpreted as providing evidence of the effects of the COVID-19 restrictions.

Please note the following:

- Recorded offence rates are presented monthly per 100,000 estimated resident population.
- When comparing, be aware of the wide variance in scale among the graphs in this paper.
- While the offence rates have been rounded to one decimal place, actual rates were used to calculate the percentage rate change between compared periods.
- Monthly data have been used in the table and graphs to illustrate seasonal variation over the year and to enable examination of each month across the focus period.
- Offence type is based on the Australian and New Zealand Standard Offence Classification (ANZSOC)\(^3\).

\(^1\) The RMSE, MAPE, and MASE provide measures of the forecast error (the difference between an observed value and its forecast), and are therefore useful to evaluate the potential accuracy of a forecast. This was done by testing how well the trained model (July 2014 to June 2019) performed when forecasting the remaining pre-COVID-19 test data (July 2019 to February 2020), with the model with the lowest error values deemed the “best” model.

\(^2\) Due to the large number of forecast models produced for analysis, the model specification and parameters that were ultimately selected for each will not be discussed.

\(^3\) The Australian and New Zealand Standard Offence Classification (ANZSOC) provides a uniform national statistical framework for classifying criminal behaviour in the production and analysis of crime and justice statistics. ([https://www.abs.gov.au/ausstats/abs@.nsf/mf/1234.0](https://www.abs.gov.au/ausstats/abs@.nsf/mf/1234.0))
Overall crime trends

The containment measures implemented for COVID-19 appear to have had a significant impact on the rate of recorded crime in Queensland. During the first half of 2019–20, the recorded crime rate for the state slowly increased until January 2020, when it reached a peak of 977.3 offences per 100,000 persons (Figure 1).

The rate declined in February, as seen in previous years. However, following social distancing measures and other restrictions implemented from mid-March, the total crime rate remained stable before plummeting to 714.0 offences per 100,000 persons in April (20% lower than expected and 27% less than the peak in January 2020). The 8% rate increase observed in May could potentially be attributed to the stage one easing of restrictions commenced at the beginning of the month. However, seasonal factors are also likely to have played a big part in the increase, as evidenced in previous years. Overall, the total crime rate in Queensland in April to June 2020 ranged from 714.0 to 770.5 offences per 100,000 persons, its lowest levels since 2011.

When compared with forecast rates, the observed rates in the four months from March to June 2020 were significantly lower than expected (8% lower in March and nearly 20% lower in each of the following three months). As can be seen in Figure 2, the observed rates fell below the 95% prediction interval for each of these months and it is fair to conclude that this is due to the COVID-19 restrictions.
A closer look reveals that recorded property offences have largely driven the pattern of overall crime rates in 2019–20 (Figure 3), in particular the sharp drop in April, whereas the increase in other offences impacted the overall crime rate more in May and June. Fluctuations in person offences were less influential overall due to lower counts.

**Figure 3** Monthly rates of recorded offences by category, Queensland, 2019–20

As can be seen in Figure 4, rates of recorded person offences were lower than expected across all four months, significantly lower in April but starting to rise again from May. By June the rate had returned close to its forecast level. Of all three offence categories, the lower than expected rates were most pronounced in recorded property offences (Figure 5). In April–June the rates were 35–40% lower than forecast, and showing no indication of returning to the expected level.

**Figure 4** Monthly rates of recorded person offences, actual rates and ARIMA forecasts

**Figure 5** Monthly rates of recorded property offences, actual rates and ARIMA forecasts
The rate of recorded other offences was below the 95% prediction interval for March, but returned close to the forecast level in April before exceeding it in May (Figure 6). However, overall, this category of offences remained within the 95% prediction interval throughout April to June.

**Figure 6 Monthly rates of recorded other offences, actual rates and ETS forecasts**

![Graph showing monthly rates of recorded other offences, actual rates and ETS forecasts.](image)

**Recorded crime rates by ANZSOC division**

Table 1 presents the monthly rates of recorded offences by ANZSOC division for the four months from March to June 2020, with the observed rates compared with forecasts, and any significant difference found. Some observed rates appear to be much lower than the forecast rates, however, if the rate falls within the 95% prediction interval it is deemed not to be significantly different. Of particular interest are those offences which displayed significant increases or decreases in rates during the period when COVID-19 restrictions were in place.

Within recorded person offences, the rate for division 02 Acts intended to cause injury was lower than expected in April but returned to within the expected range in May and June, whereas the rates for division 06 Robbery, extortion and related offences remained significantly lower than expected from April through to June.

In terms of recorded property offences, significantly lower rates were evident over a prolonged period for recorded offences in divisions 08 Theft and related offences, 06 Robbery, extortion and related offences, 07 Unlawful entry with intent/burglary, break and enter and 12 Property damage and environmental pollution.

As for recorded other offences, the rates for division 13 Public order offences were also significantly lower than expected during April and June, although in May the rate fell within the 95% prediction interval and therefore within the forecast range. The rates for division 14 Traffic and vehicle regulatory offences were significantly lower in March and April but back to normal range in May and June.

These offences are explored in more detail in the following pages.

Contrary to the pattern seen for all other offence divisions, higher than forecast rates are evident for division 10 Illicit drug offences in April May and June. A detailed analysis of illicit drug offences over this period is presented in a separate brief.

The increase seen in rates for division 16 Miscellaneous offences is based on low counts and may be due to an increase in public health and safety offences relating to COVID-19, however this was not clear within the data.

Despite some other observed rates falling just above or below the 95% prediction interval in March and June, these were considered more likely to be anomalous and less likely to be a result of COVID-19 restrictions.
## Monthly rates of recorded offences by ANZSOC division, forecast rate versus actual rate

<table>
<thead>
<tr>
<th>Recorded offence rate per 100,000 persons</th>
<th>March 2020</th>
<th>Actual</th>
<th>Significant difference</th>
<th>April 2020</th>
<th>Actual</th>
<th>Significant difference</th>
<th>May 2020</th>
<th>Actual</th>
<th>Significant difference</th>
<th>June 2020</th>
<th>Actual</th>
<th>Significant difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ANZSOC Division</strong></td>
<td>Forecast</td>
<td>Actual</td>
<td></td>
<td>Forecast</td>
<td>Actual</td>
<td></td>
<td>Forecast</td>
<td>Actual</td>
<td></td>
<td>Forecast</td>
<td>Actual</td>
<td></td>
</tr>
<tr>
<td>01 Homicide and related offences</td>
<td>0.2</td>
<td>0.2</td>
<td></td>
<td>0.2</td>
<td>0.1</td>
<td>Lower</td>
<td>0.2</td>
<td>0.2</td>
<td></td>
<td>0.2</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>02 Acts intended to cause injury</td>
<td>44.0</td>
<td>43.8</td>
<td></td>
<td>38.5</td>
<td>32.9</td>
<td>Lower</td>
<td>39.0</td>
<td>35.6</td>
<td></td>
<td>38.2</td>
<td>38.1</td>
<td></td>
</tr>
<tr>
<td>03 Sexual assault and related offences</td>
<td>13.5</td>
<td>11.9</td>
<td></td>
<td>13.5</td>
<td>11.1</td>
<td>Lower</td>
<td>13.5</td>
<td>11.6</td>
<td></td>
<td>13.5</td>
<td>13.6</td>
<td></td>
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<tr>
<td>04 Dangerous or negligent acts endangering persons</td>
<td>8.7</td>
<td>10.3</td>
<td>Higher</td>
<td>8.4</td>
<td>9.5</td>
<td></td>
<td>8.6</td>
<td>8.7</td>
<td></td>
<td>8.5</td>
<td>9.0</td>
<td></td>
</tr>
<tr>
<td>05 Abduction, harassment and other offences against the person</td>
<td>0.5</td>
<td>0.6</td>
<td></td>
<td>0.5</td>
<td>0.6</td>
<td></td>
<td>0.5</td>
<td>0.4</td>
<td></td>
<td>0.5</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>06 Robbery, extortion and related offences</td>
<td>4.7</td>
<td>4.6</td>
<td></td>
<td>4.8</td>
<td>2.7</td>
<td>Lower</td>
<td>4.8</td>
<td>2.7</td>
<td>Lower</td>
<td>4.9</td>
<td>3.0</td>
<td>Lower</td>
</tr>
<tr>
<td>07 Unlawful entry with intent/burglary, break and enter</td>
<td>87.1</td>
<td>90.9</td>
<td>Lower</td>
<td>87.1</td>
<td>55.9</td>
<td>Lower</td>
<td>87.1</td>
<td>46.7</td>
<td>Lower</td>
<td>87.1</td>
<td>45.4</td>
<td>Lower</td>
</tr>
<tr>
<td>08 Theft and related offences</td>
<td>316.2</td>
<td>288.3</td>
<td>Lower</td>
<td>308.5</td>
<td>189.0</td>
<td>Lower</td>
<td>328.7</td>
<td>175.3</td>
<td>Lower</td>
<td>319.5</td>
<td>172.4</td>
<td>Lower</td>
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<td>09 Fraud, deception and related offences</td>
<td>48.0</td>
<td>40.1</td>
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<td>48.0</td>
<td>33.4</td>
<td></td>
<td>48.0</td>
<td>44.6</td>
<td></td>
<td>48.0</td>
<td>40.2</td>
<td></td>
</tr>
<tr>
<td>10 Illicit drug offences</td>
<td>141.3</td>
<td>119.8</td>
<td></td>
<td>120.5</td>
<td>146.1</td>
<td>Higher</td>
<td>148.3</td>
<td>191.2</td>
<td>Higher</td>
<td>134.5</td>
<td>160.8</td>
<td>Higher</td>
</tr>
<tr>
<td>11 Prohibited and regulated weapons and explosives offences</td>
<td>14.3</td>
<td>12.9</td>
<td>Higher</td>
<td>11.6</td>
<td>13.0</td>
<td></td>
<td>13.7</td>
<td>15.2</td>
<td></td>
<td>13.1</td>
<td>13.6</td>
<td></td>
</tr>
<tr>
<td>12 Property damage and environmental pollution</td>
<td>67.4</td>
<td>64.7</td>
<td></td>
<td>63.5</td>
<td>49.2</td>
<td>Lower</td>
<td>62.4</td>
<td>48.9</td>
<td>Lower</td>
<td>61.5</td>
<td>52.6</td>
<td>Lower</td>
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<td>13 Public order offences</td>
<td>53.4</td>
<td>49.4</td>
<td></td>
<td>45.6</td>
<td>35.2</td>
<td>Lower</td>
<td>44.4</td>
<td>37.9</td>
<td></td>
<td>49.2</td>
<td>37.5</td>
<td>Lower</td>
</tr>
<tr>
<td>14 Traffic and vehicle regulatory offences</td>
<td>64.6</td>
<td>54.2</td>
<td>Lower</td>
<td>56.0</td>
<td>43.8</td>
<td>Lower</td>
<td>63.9</td>
<td>58.0</td>
<td></td>
<td>61.7</td>
<td>58.4</td>
<td></td>
</tr>
<tr>
<td>15 Offences against justice procedures, government security and government operations</td>
<td>108.5</td>
<td>98.5</td>
<td>Lower</td>
<td>95.4</td>
<td>88.6</td>
<td></td>
<td>98.3</td>
<td>90.8</td>
<td></td>
<td>94.9</td>
<td>92.1</td>
<td></td>
</tr>
<tr>
<td>16 Miscellaneous offences</td>
<td>1.6</td>
<td>1.4</td>
<td></td>
<td>1.6</td>
<td>2.9</td>
<td></td>
<td>1.6</td>
<td>2.5</td>
<td></td>
<td>1.6</td>
<td>3.4</td>
<td>Higher</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>971.8</td>
<td>891.5</td>
<td>Lower</td>
<td>858.0</td>
<td>714.0</td>
<td>Lower</td>
<td>926.2</td>
<td>770.5</td>
<td>Lower</td>
<td>885.9</td>
<td>741.0</td>
<td>Lower</td>
</tr>
</tbody>
</table>

Note: The difference between a forecast rate and an actual rate is considered significant only if the actual rate is higher or lower than the 95% prediction interval.
Division 02 – Acts intended to cause injury
For the 9 months from July 2019 to March 2020, the monthly rate of recorded acts intended to cause injury (comprising almost entirely assault) maintained a higher or similar level to the same period in previous years, peaking in November 2019 at 44.8 offences per 100,000 persons. In April, when COVID-related restrictions were at their tightest and pubs, clubs and other social venues and the Queensland border were closed, the rate dropped to 32.9 offences per 100,000 persons, 14% below the forecast level, and outside the 95% prediction interval. In May and June, when restrictions began to ease, the rate rose steadily back to the expected rate of 38.1 offences per 100,000 persons.

Division 06 – Robbery, extortion and related offences
During 2019–20, the rate of recorded robbery, extortion and related offences has trended higher than the previous five years. From March to April 2020, the rate decreased 40% before stabilising in the following two months. When compared with the forecast, the rates in April and May were over 40% lower than expected. While in June the rate started to pick up, it was still 39% lower than the expected rate. Within division 06, subdivision 061 Robbery made up over 95% of the offence counts and was the main driver of the trend.
Division 07 – Unlawful entry with intent / burglary, break and enter

Over the years, particularly in January to March 2020, the rate of recorded unlawful entry with intent / burglary, break and enter offences has increased steadily and reached a peak of 90.9 offences per 100,000 persons in March 2020. However, from April, the rate dropped steadily to reach a low of 45.4 offences per 100,000 persons in June, which is not only more than 50% lower than the peak but also the lowest June rate for this offence type in 10 years. The monthly rates from April to June 2020 were found to be 36% to 48% lower than the expected range.

Figure 9 Monthly rates of recorded offences, actual rates and ETS forecasts

Division 08 – Theft and related offences

Overall, the monthly rate of theft and related offences during 2019–20 has trended higher than in the preceding five years. From March to April 2020, the rate decreased 34%, followed by a further 7% decline in May 2020. The rates for April, May and June were the lowest in the 6-year time series. The monthly rates from April to June were 39% to 46% lower than the expected range.

Figure 10 Monthly rates of recorded offences, actual rates and ARIMA forecasts
Within division 08, subdivision 081 Motor vehicle theft and related offences made up around one-third of all offences. In contrast to the overall theft offences pattern, the rate of motor vehicle theft in March 2020 was significantly higher than expected but fell over the following two months to reach half the rate forecast for June. The rate of offences in subdivision 082 Theft (except motor vehicles), however, dropped dramatically in March and April but stabilised in May and June.

**Division 10 – Illicit drug offences**

In the two months from March to May 2020, the rate of recorded illicit drug offences increased 60% overall, followed by a 16% fall in June, resulting in an overall increase of 34% in three months. Compared with forecasts, the rates in April, May and June fell above the 95% prediction interval and were deemed to be significantly higher than expected.

A detailed analysis of illicit drug offences over this period is presented in a separate brief.
Division 12 – Property damage and environmental pollution

Recorded offences for property damage and environmental pollution during the reporting period wholly comprised subdivision 121 Property damage. The rate dropped 24% from March to April 2020, stabilised in May, and began rising in June (up 8%), resulting in an overall decrease of 19% over three months. May’s rate, at 48.9 offences per 100,000 persons, was the lowest in 10 years for that month. The monthly rates from April to June 2020 were all found to be significantly lower than forecast (between 15% to 23% lower than the expected rates).

Division 13 – Public order offences

The rate of public order offences has been decreasing steadily over several years, however the recent rates were significantly lower than the forecast rates. April and June rates were almost one-quarter lower than expected while in May the rate was 15% lower than expected, and narrowly fell within the 95% prediction interval. Within division 13, subdivision 132 Disorderly conduct contributed over 80% of the offence counts and shared a similar pattern.
Division 14 – Traffic and vehicle regulatory offences

The rate of recorded traffic and vehicle regulatory offences has been decreasing overall in recent years, but the larger than usual decline began in February 2020, before COVID-19 restrictions were imposed. The slight increase in March followed a similar pattern to the same period in 2019 but was 16% lower than expected and fell below the 95% prediction interval. A further large drop in April resulted in the rate reaching a 10-year low of 43.8 offences per 100,000 persons, which is significantly lower than both the forecast estimate for April and the corresponding period in 2019 (−22% and −32% respectively). However, a 33% increase in May saw the rate return to within the expected range.

Figure 16 Monthly rates of recorded offences, actual rates and ETS forecasts

Within division 14, drink driving offences make up approximately 98% of offences under subdivision 143 Regulatory driving offences and was the major driver of the lower than expected rates. The suspension in mid-March of roadside drink and drug driving tests by police, coupled with the closure of pubs, clubs and other social venues are likely to have had a significant impact on this offence type in March and April.

Figure 17 Monthly rates of recorded offences, actual rates and ARIMA forecasts