

An evaluation of measures taken to increase finalisations in the NSW District Criminal Court

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Aim: The aim of this study was to evaluate the effect of various court reforms on the number of finalisations in the NSW District Criminal Court. The specific reforms were an increase in the number of judges, an increase in public defenders, conducting special call-overs and readiness hearings.

Method: Data were obtained from NSW Court Services on the monthly time series of finalisations in the different courts and were analysed using ARIMA time series models.

Results: The additional judges increased monthly total finalisations across the state by approximately 8.5 cases per judge (so approximately 43 cases after all 5 judges had commenced). In many courts, the special call-overs increased finalisations, with increases ranging between 9 and 39 cases (although the special call-over in the Parramatta court did not appear to have an effect). Aside from the special call-overs (which the public defenders have a central role in conducting), the pending caseload did not appear to change after the introduction of the two additional public defenders (although we explore possible reasons for this). The readiness hearings also appeared to have little direct impact on finalisations.

Conclusion: The introduction of the additional judges and special call-overs appears to be associated with increases in monthly finalisations. There did not appear to be a change in the level of the finalisations after the introduction of the readiness hearings or additional public defenders (noting that the public defenders were part of the successful special call-overs), but we acknowledge that there are other benefits these interventions provide that are not considered in this bulletin.

Keywords: Court delay, ARIMA, time series, NSW District Criminal Court.

INTRODUCTION

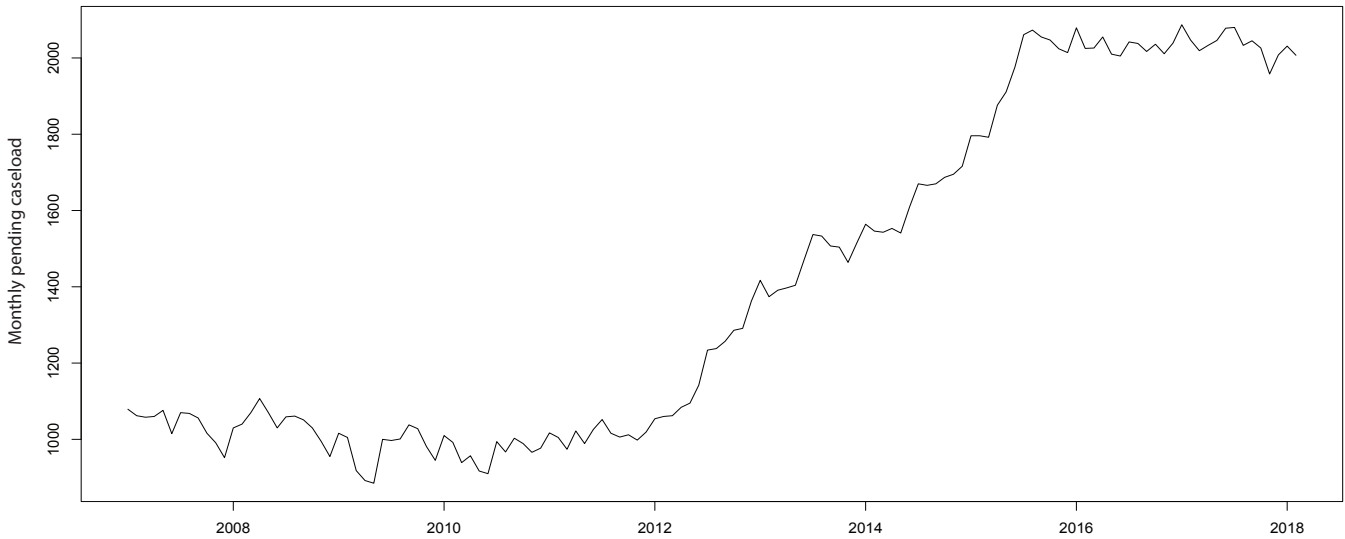
COURT DELAY IN NSW

Court delay is currently a major problem in NSW. The median time between committal and outcome for matters in the NSW District Criminal Court (DCC) rose from 289 days to 376 days for matters proceeding to defended hearings between 2013 and 2017 (NSW Bureau of Crime Statistics and Research, 2018a). This growth was studied by Weatherburn and Fitzgerald (2015), who attributed it to a growth in the number of registrations (i.e. trial committals) relative to the number of finalisations over this period, a development that ultimately resulted in the doubling of the statewide pending caseload between 2012 and 2016, shown in Figure 1.

This increase in the pending caseload has been shown to increase court delay (Wan & Weatherburn, 2017), which in turn, contributes to growth in the remand prisoner population. The remand population in NSW grew from 2,723 prisoners in March 2011 to 4,447 prisoners in December 2017 (NSW Bureau of Crime Statistics and Research, 2018b).

Court delay has been a recurring problem in NSW and numerous attempts have been made in the past to bring the problem under control (see Coopers & Lybrand WD Scott, 1989; Kuan, 2004; NSW Bureau of Crime Statistics and Research, 1989; and Weatherburn & Baker, 2000). In an effort to deal with the current problem, the NSW Government announced a \$39 million package as part of the NSW state budget in 2016-2017, which was intended to fund the appointment of three new District Court judges, two new public defenders and extra sittings in regional areas (NSW Government, 2016).

Figure 1. Monthly pending caseload in the NSW District Criminal Court, Jan 2007 - Feb 2018



THE CURRENT REFORMS

A new suite of reforms have been implemented in various districts across NSW in 2016 and 2017, with four key elements.

1. Creation of additional sitting weeks (including the appointment of additional judges).
2. Special call-overs – days in district criminal courts where the public defenders try to negotiate with defendants awaiting trial in an attempt to finalise multiple matters on that day.
3. Readiness hearings for long trials – a system of hearings and case management for trials with a 'long' expected duration (see below for more details regarding length of 'long' trials) to ensure that both the prosecution and the defence are ready to proceed on the start date for the trial.
4. Appointment of additional public defenders.

Some additional sitting weeks were created in various registries by removing the court vacation periods, some were created through the appointment of acting judges, and some were created by employing additional judges across the state. The additional sitting weeks, and the additional public defenders were expected to reduce the backlog by expanding the capacity of the DCC to hear and dispose of more cases. The special call-overs were intended to increase guilty pleas on a particular day, creating one-off increases in finalisations. The readiness hearings were intended to increase efficiency in longer trials by ensuring both the prosecution and the defence were ready to proceed on the trial start date. It was expected that the increase in efficiency would first-and-foremost reduce the duration of these longer trials, and

(as a consequence), there would be more court time available to hear cases. In addition, it was also hypothesised that some additional guilty pleas would occur during case management. These two benefits may have increased finalisations.

Pursuant to (1), two judges were appointed on the 11th of April 2016, while three more were appointed, respectively, on the 8th, 15th and 22nd of August 2016. Pursuant to (4), additional public defenders were appointed in Tamworth/Armidale on the 15th of August, 2016 and in Sydney on the 15th of May, 2017.¹ However, given that public defenders are often temporarily re-located based on their workloads, it is more appropriate to think of these appointments as two additional appointments of public defenders in NSW overall on these dates, rather than these public defenders being localised to these regions. Pursuant to (2), targeted call-overs were held in Parramatta on the 30th of May 2016, in Coffs Harbour on the 14th of November 2016, in Gosford on the 28th of November, in Port Macquarie on the 27th of March 2017, in Newcastle on the 17th of July 2017, in Wollongong on the 7th of August 2017, in Sydney in November 2017 and in Lismore in November 2016 and November 2017 (although preparations were being made by the public defenders well before the days of the call-overs). Pursuant to (3), readiness hearings were held between the 17th of June 2016 and the 2nd of May 2017 for all matters in Sydney proceeding to indictment with a trial estimate of greater than four weeks, before being extended to all trials estimated to be greater than 3 weeks on the 2nd of May 2017. Table 1 shows the timetable of the proposed reforms and the courts which would have been affected by them.

For the most part, it was difficult to establish where the additional judges were implemented, so rather than try to discern in

Table 1. Summary of reform timelines by DCC

District	Apr 16	May 16	Jun 16	Jul 16	Aug 16	Sep 16	Oct 16	Nov 16	Dec 16	Jan 17	Feb 17	Mar 17	Apr 17	May 17	Jun 17	Jul 17	Aug 17	Sep 17	Oct 17	Nov 17
State	2 additional judges				Three more additional judges															
	One additional public defender (Tamworth/Armidale)								Second additional public defender (Sydney)											
Sydney	Readiness hearings																		Special call-over	
Parramatta	Special call-over																			
Newcastle																Special call-over				
Gosford								Special call-over												
Newcastle regions ^a											Special call-over									
Wollongong																Special call-over				
Lismore ^b								Special call-over												Special call-over
Dubbo																				
Wagga Wagga																				

^a The Newcastle regions is an aggregation of regional courts in the Newcastle registry, which includes Port Macquarie.

^b The Lismore court time series includes ALL courts in the Lismore registry, include both the Lismore and Coffs Harbour courts.

which registry each judge was sitting at a given time, it was assumed that there would be an effect in ALL registries from the five additional judges. There were some instances where a more refined approach could be taken. For instance, based on personal communication with the NSW District Court, it could be established that the additional judges which commenced in April 2016 were solely based in the Parramatta DCC. Therefore, we could assume that there was no effect from these judges in other courts before August 2016, and that the additional judges were present in Parramatta from April 2016.

THE CURRENT STUDY

While it is intuitive that additional judges should help court delay, empirical evidence for this has been mixed (see Church, 1982; Economides, Haug, & McIntyre, 2015). Further, while there have been instances of successful court management improvements (Rahman, Poynton, & Weatherburn, 2017), the success of a strategy also is dependent on its implementation so we cannot be certain that the special call-overs and readiness hearings will be effective without empirical research. Given the current issues with court delay in NSW, it is imperative to determine whether these reforms have had an effect. The aim of this study, therefore, is to investigate if these reforms have been successful in increasing the finalisations in the relevant DCCs, as this will reduce the pending caseload, which has been shown to effect court delay (Wan & Weatherburn, 2017).

METHOD

DATA

Data on the monthly number of finalised matters between January 2007 and February 2018 were sourced from NSW Court Services. Monthly finalisations data were used as opposed to monthly pending caseload data to determine the effectiveness of the different reforms, as the effect of each reform on the backlog would occur through an increase in finalisations. However, while an increase in finalisations should lead to a decrease in the pending caseload, the pending caseload is also highly dependent on the number of registered trials each month, which is independent of any of the proposed reforms. Therefore, we examined finalisations data to determine the effectiveness of the reforms.

Where possible, the time series for the relevant individual courts was chosen for analysis. However, in the available data, some courts have been aggregated together due to the low numbers. In particular, Port Macquarie is counted as part of the 'Newcastle regional courts' time series, and both Coffs Harbour and Lismore are counted as part of the 'Lismore courts' time series. Therefore, these aggregated series were used in place of time series for the individual courts in this case.

ANALYSIS

All analyses for this study were conducted using interrupted time series ARIMA models. Using the notation given by Enders (2015)

these models took the form:

$$Y_t = \beta_0 + \beta X_t + \delta I_t + n_t \tag{1}$$

with

$$(1-B)^d n_t = \sum_{i=1}^p \phi_i B^i n_t + \sum_{j=1}^q \theta_j B^j e_t \tag{2}$$

and

$$\beta X_t = X_{t-1} \tag{3}$$

Where Y_t was the value of the time series at month t , β_0 is the intercept and βX_t is a matrix of all appropriate covariates at time t . The covariates included were an overall deterministic trend and monthly dummy variables to control for seasonarity. I_t is the variable describing the considered intervention, and δ is the coefficient of interest (these are explained below). The variable n_t is the residual at time t , described by the ARIMA (p, d, q) process given in equation (2). The order of the ARIMA process was determined using the Augmented Dickey-Fuller (ADF) test to determine if differencing was required (i.e. to determine the value of d), and the number of moving average (MA) and autoregressive (AR) lags (q and p respectively) were determined using autocorrelation function (ACF) and partial autocorrelation function (PACF) plots respectively. The Ljung-Box test was used to determine if any significant autocorrelations in the residuals persisted after including the required AR and MA terms.

The assumed effect of each reform was assumed to be either a ‘pulse change’ or a ‘level change’. ‘Pulse changes’ were modelled by setting I_t to the value of 1 in the month where the reform took place and 0 for all other months. ‘Level changes’ were modelled by setting I_t as a dummy variable taking the value 0 before the reform was implemented and 1 afterwards. This means that δ can be interpreted as the spike in the monthly average number finalisations (for pulse changes), or the change in the baseline

average (for level changes). The unit of this variable is cases.

Whether a reform was modelled as a pulse or level change was dependent on how the reform was supposed to work. For example, the additional judges and public defenders are expected to increase the capacity of a registry to hear cases. Therefore, it was expected that this would result in a level change in case finalisations – the capacity to hear cases would increase by a fixed amount. By contrast, the special call-overs would take place in one month, and would simply result in a number of additional finalisations that month, without having any lasting effects on the number of finalisations in subsequent months. We therefore treat this intervention as a ‘pulse’ intervention – that is, the intervention only has an effect in the month in which it takes place. Table 2 shows how each reform was modelled on the different time series.

All ARIMA models were fitted using the ‘arima’ function in R version 3.4.3.

Table 2. Assumed effects of each reform

Reform	Assumed effect
Additional judges	Level
Additional public defenders	Level
Special call-overs	Pulse
Readiness hearings	Level

RESULTS

DESCRIPTIVE ANALYSIS

Figures 2 and 3 shows the plotted time-series for the finalisations in each relevant court, with the relevant interventions displayed as dashed vertical lines. Recall that the court of Port Macquarie

Figure 2. Monthly finalisations in the NSW District Criminal Court, Jan 2007 – Feb 2018

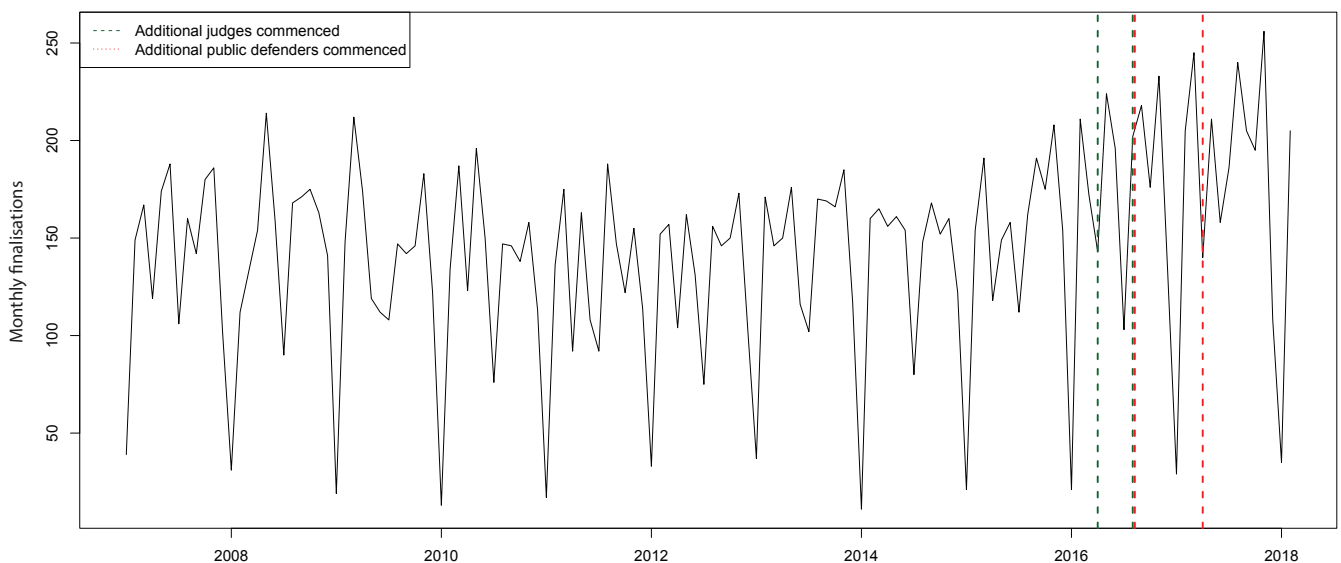
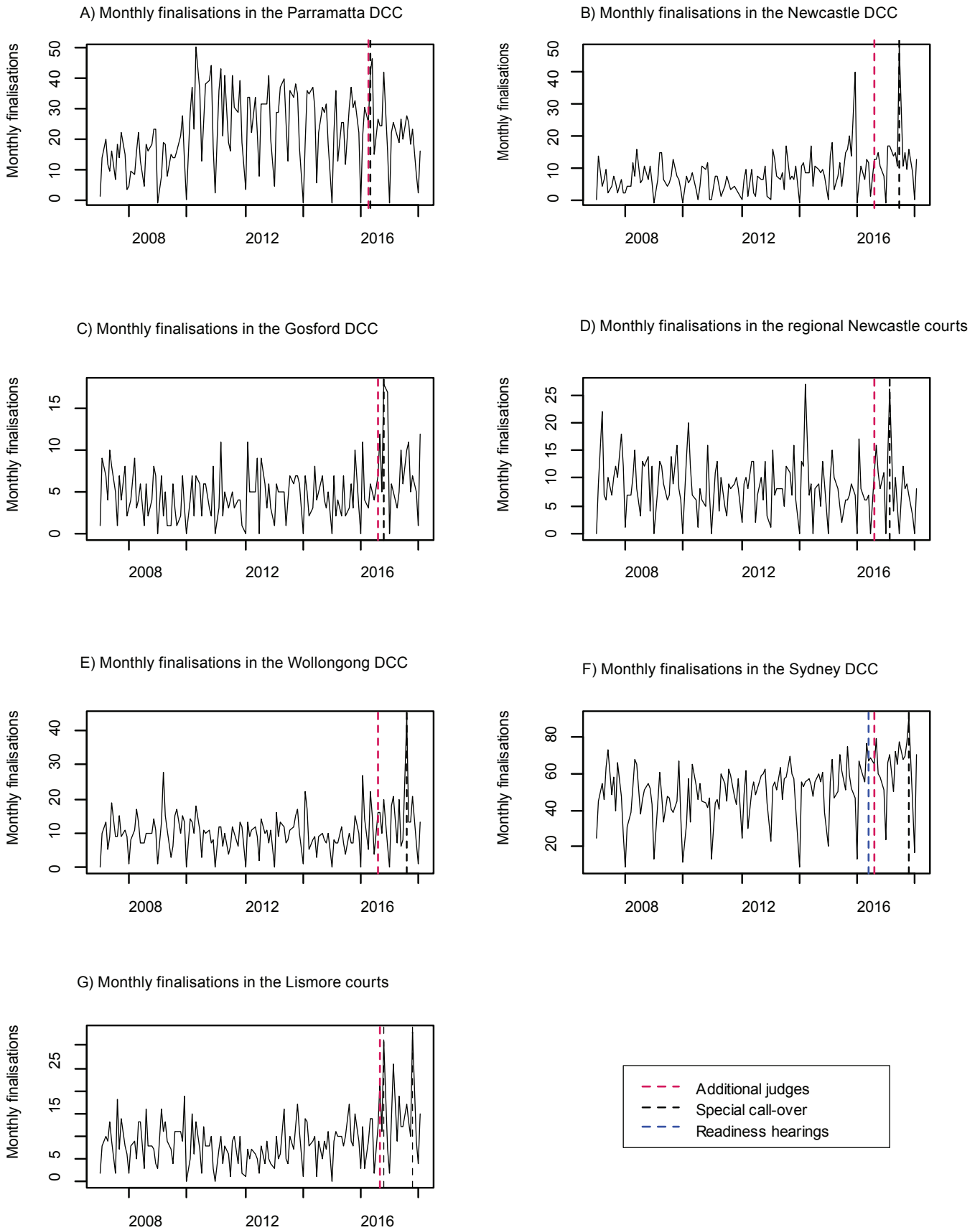


Figure 3. Monthly finalisations in the different courts, Jan 2007 – Feb 2018



is (along with some other courts) aggregated into a single time series referred to as the regional Newcastle courts. Similarly, the Lismore courts time series includes both the Lismore and Coffs Harbour courts (among others).

There are a few points to note from Figure 2. Firstly, the state-wide finalisations appear to increase following the commencement of the additional judges. Secondly, while there appears to be a slight increase in the number of finalisations after the commencement of the additional public defenders, it is hard to determine if this rise is simply due to the rise in finalisations after the additional judges commenced. One trend that does appear to be more prominent is the effect of special call-overs. In most cases, there does appear to be an increase in finalisations in the month where the special call-overs take place. The exception to this appears to be in Parramatta. While the special call-over in the Sydney DCC appears to have had minimal effect, keep in mind that the Sydney DCC has a much higher volume of cases than the other courts, so the increase in finalisations in the special call-over month in Sydney is of similar magnitude to the special call-overs in other courts.

ADF tests were performed on all series to determine if differencing was required², and MA and AR terms were included

as appropriate based on the ACF and PACF plots respectively. This information on each of the models is included in Table A1 in the appendix.

MODEL RESULTS

Table 3 shows the results from the ARIMA models for each intervention. It can be seen that finalisations were significantly higher after the commencement of the additional judges across the state, by approximately 8.5 cases per judge. While Figure 2 appeared to show that finalisations were also higher after the public defenders commenced, no significant increase following the commencement of the public defenders was found. The special call-overs were found to be associated with significant spikes in finalisations in Newcastle, Gosford, Port Macquarie, Wollongong, Sydney, Lismore/Coffs Harbour and Lismore alone of 39, 9, 14, 33, 25, 17 and 20 cases respectively (note that since the first Lismore special call-over coincided with the Coffs Harbour special call-over, and these courts were part of the same time series, the estimate from these special call-overs is combined into one collective effect). The special call-over in Parramatta was found to have no significant impact on finalisations. The readiness hearings were also found not to have a significant association with finalisations in the Sydney District Court.

Table 3. Model results for the interventions

Intervention type	Court/Region	Assumed effect	Estimate	Standard Error	Test statistic	p-value ^a
Additional judges	State	Level	8.506	2.903	2.930	.004 **
Additional public defenders	State	Level	-0.229	9.041	-0.025	.980
Special call-over	Parramatta	Pulse	3.330	5.570	0.598	.550
Special call-over	Newcastle	Pulse	39.112	4.793	8.160	<.001 ***
Special call-over	Gosford	Pulse	9.465	2.654	3.566	<.001 ***
Special call-over	Port Macquarie ^b	Pulse	13.939	3.608	3.864	<.001 ***
Special call-over	Wollongong	Pulse	33.333	3.404	9.793	<.001 ***
Readiness hearings	Sydney	Level	8.215	6.454	1.273	.206
Special call-over	Sydney	Pulse	25.008	9.099	2.748	.007 **
Special call-over	Lismore/Coffs Harbour ^c	Pulse	16.906	3.299	5.124	<.001 ***
Special call-over	Lismore	Pulse	19.729	3.414	5.778	<.001 ***

^a Stars indicate levels of significance; * .05, **.01, ***.001

^b The Port Macquarie courts is counted as part of the 'Newcastle regional courts' time series

^c The Coffs Harbour court is counted as part of the Lismore court time series.

DISCUSSION

Multiple reforms have been recently implemented in an attempt to reduce the number of pending cases in the NSW DCC. These include the appointment of additional judges, additional public defenders, special call-overs and readiness hearings, which were introduced in various courts across the state. We examined how effective the various reforms were by looking at time series data of finalisations in the various courts.

Monthly finalisations across the state did increase by approximately 8.5 cases per judge (so 17 cases in April 2016 and a further 26 cases in August 2016) after the introduction of the additional judges, indicating that this reform seems to have performed as hoped. The special call-overs also appear to have had the desired effect, although the evidence is more mixed. Significant increases in the finalisations were found after the special call-overs in Newcastle, Gosford, Port Macquarie, Wollongong, Sydney, and Lismore/Coffs Harbour, ranging from 9 cases in Gosford to 39 cases in Newcastle. The special call-over in Parramatta was not found to have had a significant effect. It is also worth noting that it is often the case that the finalisations resulting from the special call-overs can take a few days (and, in some cases, up to several months) to be completed, so it is possible that we have under-estimated the effect sizes of the special call-overs in some cases. However, the majority of cases from the special call-overs are finalised soon afterwards, therefore, this under-estimation should be minimal. There were three instances where the special call-over occurred near the end of the month, meaning that if there were delays in finalisation of even a week, some of the finalisations from this special call-over could occur in the following month, making the under-stating slightly more significant. This could have occurred for the special call-overs in Gosford, Parramatta and Port Macquarie. Looking at the relevant panels for Figure 3 (A, C and D for Parramatta, Gosford and Newcastle regional courts respectively), the Parramatta and Gosford time series do also seem to be high in the month following the special call-over. Recall however, that even when possibly understating this effect, the special call-overs for Gosford and Port Macquarie were found to be effective, and even with the higher following month in Parramatta, the finalisations seem to be within the normal fluctuations of the time series.

The results are less positive for the public defenders and the readiness hearings. There was no significant change in the number of finalisations after the commencement of the public defenders. However, there are two important caveats surrounding this finding. Firstly, in total, only two additional public defenders were appointed, which translates to an increase of only 8% to the total public defenders state-wide. Secondly, as stated earlier, the public defenders are central to the special call-overs, which we

found had strong effects in a number of courts. The readiness hearings also showed no association with changes in the pending caseload in Sydney. However, it is worth noting that these hearings are only targeted at trials whose duration was greater than 3 weeks. In 2016, this accounted for approximately 13% of all trials, so the proportion of all trials targeted by this intervention is quite small. Furthermore, the intended main effect of these trials was to reduce trial durations for long trials. We could not analyse if this had occurred with our data, leaving an avenue for further research.

While these results are interesting, the close timing of many of the interventions seriously hampered our ability to identify the effect of each individual reform. For example, the first additional public defender commenced in the same month that the second wave of additional judges commenced. To separate out these effects, we had to assume that all the judges had similar sized effects, as well as all the public defenders having similar sized effects, so that estimates could be made from the early judges and the late public defenders (the judges and public defenders which didn't overlap). Furthermore, in some courts (such as Parramatta for example), the special call-over took place very close to the commencement of the additional judges. While the assumption that the special call-overs act as a pulse intervention allows us to try and separate these effects, again, if this assumption doesn't hold, then the different effects will be hard to discern. And in the case of the Lismore and Coffs Harbour special call-overs, both occurred in the same month, and would affect the same time series, so the effects these two special call-overs had could not be separated.

The other main limitation of the study is that there could be unobservable effects which influence finalisations in various courts. This limitation would particularly affect our conclusions relating to the additional judges, additional public defenders and readiness hearings (our inferences for special call-overs are somewhat safeguarded against this, as these were performed in different courts at different times, and similar effects were found).

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NOTES

1. A public defender based in Port Macquarie/Taree was also upgraded from a temporary position to a permanent position on September 5th, 2016.
2. The Zivot-Andrews test, which tests for the presence of unit roots while allowing for a structural break of unknown timing in the series, was also performed. In all cases, the result of the Zivot-Andrews test was found to agree with the result of the ADF test.

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APPENDIX

Table A1 shows the differencing, included trends, AR and MA terms for the different models. Note that if differencing was not required, and no AR or MA terms were necessary, a linear model was used.

Table A1. Model results for the interventions

Court/Region	Differenced?	AR terms	MA terms
State	No	0	0
Parramatta	No	1,3,6	0
Newcastle	No	0	0
Gosford	No	0	0
Newcastle Regions	No	0	0
Wollongong	No	1	4,6
Sydney	No	0	0
Lismore Courts	Yes	10,12	0