

Bargaining Over Labor: Do Patients have any Power?*

by

Joshua S. Gans
Melbourne Business School
University of Melbourne
www.mbs.edu/jgans/
J.Gans@unimelb.edu.au

and

Andrew Leigh
Research School of Social Sciences
Australian National University
<http://econrsss.anu.edu.au/~aleigh/>
andrew.leigh@anu.edu.au

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Abstract

Using data on births from Australia, we estimate the level of patient bargaining power in negotiations over birth timing. In doing so, we exploit the fact that parents do not like to have children born on the “inauspicious” dates of February 29 and April 1. We show that, in general, the birth rate is lower on these dates, and argue that this reflects parent preferences. When these inauspicious dates about a weekend, this creates a potential conflict between avoiding the inauspicious date, and avoiding the weekend. We find that in approximately three-quarters of cases, this conflict is resolved in favor of the physician. This suggests that while doctors have more power than patients, patients are sometimes able to influence medical decisions for non-medical reasons.

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1. Introduction

It is generally thought that physicians have power to determine patient treatment (in all its facets) for medical reasons and that these take precedent over non-medical motivations for treatment. This issue has emerged in relation to elective cesarean procedures and choices of these over vaginal birth with official pronouncements discouraging this choice for non-medical or convenience purposes.¹ However, there is also evidence that the timing of births themselves may be somewhat motivated by non-medical factors (Dickert-Conlin and Chandra, 1999; Lo, 2003; Gans and Leigh, 2006a). This has called into question the degree of physician power in driving treatment decisions.

The difficulty with previous studies of birth timing is that they identify reasons why patients might impact on scheduling but, at the same time, do not offer any reason why physicians might object to these based on medical grounds. The shifting that occurred was based on individual tax incentives (Dickert-Conlin and Chandra, 1999; Gans and Leigh, 2006a) or cultural factors (Lo, 2003) each of which may not have impacted on medical criteria. Absent any conflict, it should not be surprising that patient preferences might be taken into account. As such, these studies do not provide conclusive evidence of patient power as they do not identify necessarily conflictual situations.

In this paper, we propose a test of the relative bargaining power of physicians and patients over birth timing. The basic idea is as follows. First, we begin with the well studied notion of a ‘weekend effect’ in birth timing; that is, as elective birth procedures

¹ See, for example, ACOG, 1999 and NIH, 2006.

(elective cesareans and inducements) have become more widespread, fewer of such births are scheduled for weekends than for weekdays. As documented by Chandra et.al. (2004) and Gans and Leigh (2006b), the number of births occurring on weekends and major holidays is significantly lower than during the week. Moreover, this decline has been increasing over time. A likely medical explanation lies in the cost of securing medical staff on weekends. As the share of births that are ‘planned’ (inducements or elective cesarean procedures) have risen it has become easier for hospitals to schedule births on weekdays.^{2,3}

Second, we identify days of the year whereby patient preferences might be strong for non-medical reasons. We identify the April 1 and February 29 as generating systematically fewer births. There appears to be no medical reason for this and hence, we conclude that this represents a pure patient preference to avoid inauspicious dates.⁴

Finally, we identify situations where patient preferences for avoiding inauspicious dates and physician preferences for avoiding weekends coincide. When these inauspicious dates occur on a Monday or Friday (abutting a weekend), patients may have a stronger preference for a weekend birth. Heterogeneity in these dates across years allows us to estimate the effect of increased conflict on the birth timing outcome; in

² There is a possibility that the systematic weekend effect could represent patient preferences and we comment on how this affects the interpretation of our results below.

³ It is possible that weekend effects could be a result of non-medical preferences of doctors (Brown, 1996). However, even in this case, our estimates identify the power of doctors over patients when a conflict of timing occurs.

⁴ The first study to identify the impact of inauspicious and auspicious dates on birth timing was Lo (2003). Using a single year (1998) of birth data from Taiwan, Lo demonstrates that Chinese preferences over certain dates significantly impacted upon birth timing and in particular whether cesareans were performed on those days or not. Our study differs in that it considers many years of data (allowing us to identify the impact of inauspicious days that fall on weekends versus weekdays) but also in that we look at birth timing rather than cesareans performed (that data not being available for Australia).

particular, whether physician or patient preferences ‘win out.’ This provides us with an estimate of the relative power of physicians over patients in bargaining over labor.

Using daily births data over a 29-year period from Australia, we apply our test. We find that when there is a conflict, in approximately three-quarters of cases, this conflict is resolved in favor of the inauspicious weekday. This suggests that while physicians have greater relative power it is not absolute and patient preferences can drive birth timing decisions for non-medical reasons.

The remainder of this paper is structured as follows. In Section 2, we show the trends in weekend births and identify inauspicious days. In Section 3, we present estimates of the relative bargaining power of doctors and patients. Section 4 concludes.

2. Weekend Births and Inauspicious Days

To analyze births patterns in Australia, we use daily data on all babies born in Australia between 1975 and 2003. These data are collected by state and territory births registries, and compiled by Australian Bureau of Statistics.⁵ They cover all recorded births from January 1, 1975 to December 31, 2003.⁶ While the birth rate in Australia has declined over this period, the number of births has remained relatively constant (there were 232,678 births in 1975, and 243,216 births in 2003). We, therefore, opt to focus on

⁵ We were unable to obtain similar data from the other main source of births data in Australia – hospital reports collected by the Australian Institute of Health and Welfare (AIHW). As McDonald (2005) has shown, the recent divergence between the two series raises concerns about their use for tracking aggregate trends in the birth rate. However, since our study focuses on day-to-day changes in the number of births, we believe it is extremely unlikely that using the ABS series instead of the AIHW series will bias our results.

⁶ Births data for 2004 are also available but due to a reporting lag, are incomplete for the last few weeks of that year. For this reason, we drop that entire year from our sample.

the raw number of births, rather than on the birth rate (births/population).⁷ This has the added advantage that we do not introduce noise into our series through mis-measurement of the total population, which is only available on a monthly basis.

Before introducing our methodology to estimate physician-patient bargaining power it is useful to document patterns in weekend births in our dataset and establish the validity of the inauspicious days we have identified.

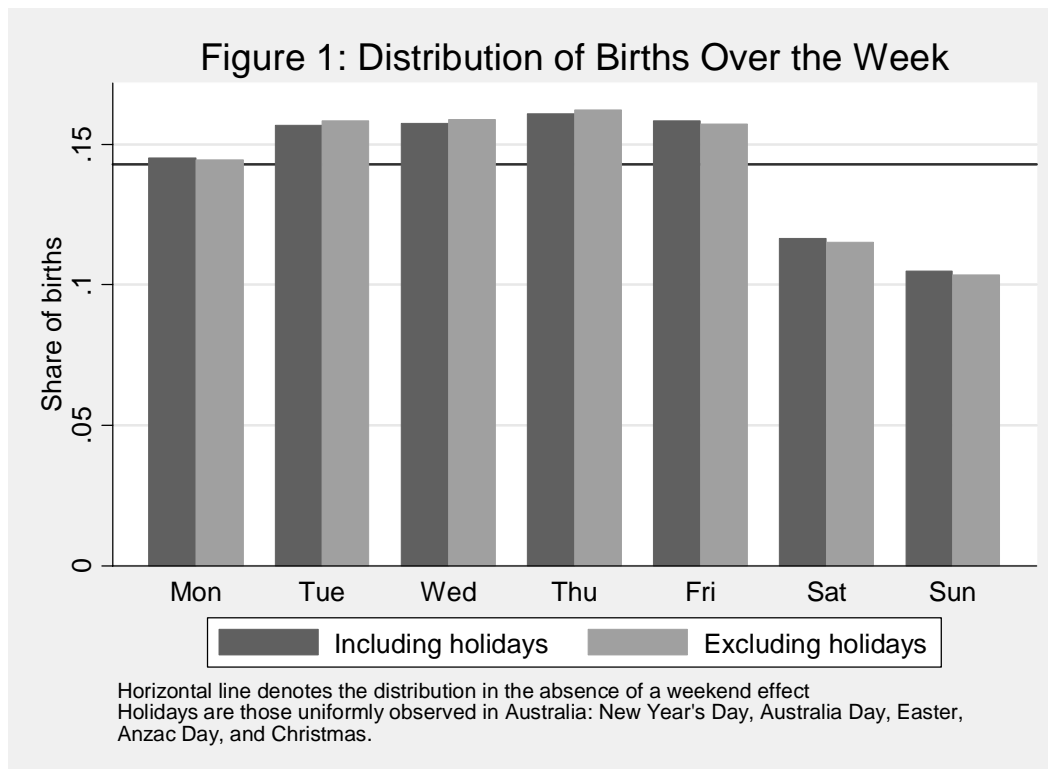
Weekend Births

To begin, we outline the patterns of weekend births. Figure 1 shows the distribution of births across the week. Under a uniform distribution (shown by the solid line), 14.3 percent of babies would be born on each day of the week. The actual data show that 15-16 percent of births occur on weekdays, but only 10-12 percent on weekends. Excluding public holidays makes no substantive difference to the analysis.

As in the United States, the “weekend effect” has grown larger over time. In 1975, 20 percent fewer births occurred on weekends than would be expected from a uniform distribution. In 2003, 29 percent fewer births occurred on weekends than an even distribution would predict. We discuss these trends in more detail in Gans and Leigh (2006b). The magnitude of the Australian weekend effect is similar to Chandra et.al. (2004), who found that the weekend effect in the US widened from -10 percent in 1973 to -25 percent in 1999.⁸

⁷ In addition, because we have a full census of births over a long time period, we find no advantage to constructing an “index of occurrence” as our dependent variable (cf: Chandra et.al.). Such an index would measure the ratio of the number of births on a day to the average daily number of births in that year.

⁸ Indeed, we cannot reject that the weekend birth effect has followed precisely the same trajectory in both countries over time. In 1999, the weekend effect for Australia was -25 percent (including public holidays) or -24 percent (excluding public holidays).



Inauspicious Days

We turn now to the issue of patient preferences in birth timing. To identify this, we hypothesise that parents may have preferences over auspicious or inauspicious dates. In Appendix 1, we show our estimates of birth patterns on 12 possible dates. From these, we selected two – February 29 and April 1. Our rationale for selecting this pair of dates is threefold. First, we find a highly significant fall in births on these dates. Second, it seems highly likely that the fall is driven by patient preferences rather than physician preferences. And third, these dates fall on different days of the week, allowing us to see how they interact with weekends.

It is not difficult to envisage why parents might avoid having their child born on February 29 or April 1. Since February 29 only occurs every four years, people born on

that date must celebrate their birthday on another date in non-leap years. Parents might, therefore, think that their child would be better off not being born in February 29. April 1 is an ‘inauspicious’ date, since parents might plausibly feel that having their child born on “April Fool’s Day” has the potential to stigmatize the child at school, and in later life. In that respect, there is a case that these motives represent parental concern for their children’s well-being in the long-term rather than any short-term motives such as convenience.

Since births are likely to only be ‘moved’ a small number of days, parental aversion to having their child born on February 29 and April 1 is likely to lead to an increase in the number of births on the days before and after. In the case of February 29, one would expect this to lead to an increase in the number of births on February 28 and March 1 in leap years. Likewise, parental aversion for an April 1 birthday is likely to lead to an increase in the number of births on March 31 and April 2.

By contrast, we can think of no real reason why physicians (or maternity hospitals) should be averse to delivering babies on either February 29 or April 1. Holding constant the day of the week, doctors (like other employees), should be indifferent between working on these dates and on the dates immediately preceding and following them.⁹

To test the extent to which parents are averse to having their child born on inauspicious dates, we estimate the following regressions, restricting the sample to the potentially inauspicious day, and the days before and afterwards. Formally, we run the regression:

⁹ While we presume that it is unlikely that physicians and hospitals would have a preference about these dates it is possible to come up with reasons such as avoiding computer date difficulties (on February 29) or practical jokes (April 1). We presume here that these effects are small relative to patient preferences.

$$Births_t = \beta I_t^{\sim Inauspicious} + \eta I_t^{DayOfWeek} + \varepsilon_t \quad (1)$$

where $I^{\sim Inauspicious}$ is an indicator variable denoting that the date abuts an “inauspicious” date. In the case of February 29, the variable $I^{\sim Inauspicious}$ equals 0 on February 29, and 1 for the two adjoining days (February 28 and March 1 in leap years). In the case of April 1, the variable $I^{\sim Inauspicious}$ is an indicator equaling 0 for April 1, and 1 for the two adjoining days (31 March and 2 April). The variable $I^{DayOfWeek}$ is an indicator for the day of the week.

It is important for our strategy below that we define the indicator variable as *Not February 29*, and *Not April 1* (rather than *February 29* and *April 1*). To the extent that parents dislike inauspicious dates, then these beta coefficients will be positive, as births will be shifted off these two inauspicious dates, and onto the adjoining days.

To avoid any seasonal effects, each regression is estimated using only three days of data per year. For February 29, we use births data from February 28 to March 1 on all leap years from 1976-2000 (21 observations). For April 1, we use births data from March 31 to April 2 in all years from 1975-2003. To avoid confounding effects of the Easter holidays, we drop from our analysis any dates that fall during the Easter holiday period. For our April 1 analysis, we have a total of 73 observations.¹⁰

Table 1 shows the results of estimating these regressions. We present four different specifications – expressing the dependent variable in unlogged levels, unlogged differences, logged levels, and logged differences. In each case, we find effects that are statistically and substantively significant, as well as being quite consistent across

¹⁰ In Australia, the days from Good Friday to Easter Monday are designated as public holidays. Since our focus is on identifying weekend effects, we exclude from our analysis the dates 31 March, 1 April and 2 April, if they fall between Good Friday and Easter Monday. Specifically, we exclude the following 14 dates from our analysis: 3/31/75, 4/1/83, 4/2/83, 3/31/86, 4/1/88, 4/2/88, 3/31/91, 4/1/91, 4/1/94, 4/2/94, 3/31/97, 4/2/99, 3/31/02, 4/1/02. Our results are qualitatively unaffected if we do not exclude these dates.

specifications. Between 74 and 111 births are moved off these inauspicious dates, which is equivalent to 11-16 percent of all babies who would have been born on these dates.

Table 1: Do Parents Avoid Inauspicious Dates?

Panel A: Dependent variable is number of births

	(1)	(2)	(3)	(4)
	<u>Levels</u>		<u>Differences</u>	
Not Feb 29	73.857*** [22.500]		109.857*** [22.935]	
Not April 1		75.860*** [11.661]		85.376*** [15.376]
Observations	21	73	21	73
R-squared	0.862	0.833	0.838	0.781

Panel B: Dependent variable is log(number of births)

	<u>Levels</u>		<u>Differences</u>	
Not Feb 29	0.109*** [0.034]		0.160*** [0.032]	
Not April 1		0.108*** [0.017]		0.122*** [0.023]
Observations	21	73	21	73
R-squared	0.871	0.869	0.867	0.815

Notes: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. All specifications include day of week fixed effects. Feb 29 sample is restricted to Feb 28, Feb 29 and March 1 on leap years. April 1 sample is restricted to March 31, April 1 and April 2.

Has the share of births that are shifted off February 29 and April 1 grown over time? To test this, we interact the *Not Feb 29* and *Not April 1* terms with a linear year term (results not shown). This interaction term is positive and statistically significant, indicating that the “Not Feb 29” effect has grown by about 3 births (or 0.5 percentage points) per year; while the “Not April 1” effect has increased by about 2 births (or 0.3 percentage points) per year.

3. Estimating Bargaining Power

We are now in a position to describe and implement our methodology for measuring physician-patient relative bargaining power. We first utilise a simple bargaining model to motivate our approach. We then describe our estimation strategy before presenting our results.

Bargaining model

In this simple model, we suppose that a single doctor and a single patient are negotiating over one of two days upon which to have a birth. We assume that the marginal benefit that the patient has for day 1 (a weekend) over day 2 (a potentially inauspicious day) is Δ_p while the doctor's marginal preference is $-\Delta_D$. We assume that $\Delta_D \geq 0$ while with probability ρ , $\Delta_p > 0$ otherwise $\Delta_p \leq 0$. Thus, with probability $1-\rho$ there is no conflict and day 2 is chosen.¹¹

If there is a conflict then the patient and doctor bargain over days 1 and 2. We utilise the Nash bargaining solution (Nash, 1950) assuming that instead of engaging in explicit payments the doctor and patient agree to a randomization rule; that is, they negotiate over the choice of p which is the probability that the birth takes place on day 1 (the patient's preferred day). Let $\alpha \in [0,1]$ be a measure of the patient's bargaining power. Then, the doctor and patient solve: $\max_p (p\Delta_p)^\alpha ((1-p)\Delta_D)^{1-\alpha}$. This yields the first order condition:

¹¹ Each of these parameters is specific to individual patient-doctor negotiations but we drop any subscript for notational simplicity.

$$\begin{aligned}
\alpha p^{\alpha-1} (1-p)^{1-\alpha} \Delta_p^\alpha \Delta_D^{1-\alpha} &= p^\alpha (1-\alpha) (1-p)^{-\alpha} \Delta_p^\alpha \Delta_D^{1-\alpha} \\
\Rightarrow \alpha(1-p) &= (1-\alpha)p \Rightarrow \alpha - \alpha p = p - \alpha p \\
\Rightarrow p^* &= \alpha
\end{aligned} \tag{2}$$

Thus, by measuring p (the probability that a patient ‘wins’ conditional on their being a conflict) we have an estimate of the patient’s bargaining power. We can also test whether this is significantly different from 0.¹²

Estimation Procedure

To estimate the strength of relative patient bargaining power we proceed on the assumption that the effects observed in Table 1 reflect only parental preferences, and focus on a particular scenario: instances in which our inauspicious dates (February 29 and April 1) happen to fall on a Friday or Monday. Such instances provide a natural experiment that allows us to compare the bargaining power of doctors and patients when there is a conflict. We utilize the incidence of these inauspicious dates falling on a weekday as a measure of $1-p$; the probability that there is no conflict.

We now estimate the following regression:

$$Births_t = \beta I_t^{\sim Inauspicious} + \gamma I_t^{\sim Inauspicious} * I_t^{Weekend} + \eta I_t^{DayOfWeek} + \varepsilon_t \tag{3}$$

In this equation, β represents the extent to which births are shifted onto the days that adjoin inauspicious dates (February 28 and March 1 in leap years; March 31 and April 2 in all years), when those dates occur during the week. γ represents the differential effect

¹² This model is simplified because we effectively normalise the utility a doctor or patient has for their non-preferred days to 0. If instead, the patient’s and doctor’s utilities from having the birth on day 2 were u_p and u_D respectively then $p^* = \max \left[\alpha \frac{u_D}{\Delta_D} - \frac{u_p}{\Delta_p}, 0 \right]$. Notice then that even if $\alpha = 0$, then it still may be the case that births are shifted from inauspicious days to weekends if $\Delta_p < 0$; that is, patients prefer not to have babies on weekends too. In practice, we believe that it is unlikely that patients will prefer weekday births, since a weekend birth will generally involve shorter travel times to the hospital and lower foregone earnings for the father, but not affect the size of the medical bill.

when these dates fall on a weekend. (Since the regression includes day of week fixed effects, it is unnecessary to include a separate weekend indicator.) Thus, $\beta + \gamma$ is the number of births shifted off inauspicious dates if that date occurs on a weekend.

Given this, our estimate of p – the probability that the patient wins if there is a conflict – is as follows:

$$\begin{aligned}
 p &= 1 - \text{Prob Patient Losses on an Inauspicious Day on a Friday or Monday} \\
 &= 1 - \frac{\beta - (\beta + \gamma)}{\beta} \\
 &= 1 + \frac{\gamma}{\beta}
 \end{aligned} \tag{4}$$

Intuitively, if 100 births are shifted when April 2 is a weekday ($\beta = 100$), and only 25 births are shifted when April 2 is a weekend ($\gamma = -75$), then the probability of not shifting the date when April 2 is a weekend - assuming that they would have shifted if it was a weekday - must be 75%. Thus, the probability that the patient loses is $-\gamma/\beta$ while the probability that the patient wins is $1 + \gamma/\beta$.

Results

The results of this estimation are shown in Table 2. In all specifications, the coefficients on *Not Feb 29* and *Not April 1* are larger than in Table 1, indicating that parents' propensity to shift births off inauspicious dates is larger on weekdays. However, the interaction terms are large and negative, indicating that parents are much less able to shift births off "inauspicious dates" when the adjoining date is a weekend. In seven of the eight specifications, the interaction term is statistically significant at the 10 percent level or better.

Table 2: Parents Versus Doctors**Panel A: Dependent variable is number of births**

	(1)	(2)	(3)	(4)
	<u>Levels</u>		<u>Differences</u>	
Not Feb 29	100.300*** [19.234]		136.500*** [23.630]	
Not Feb 29*Weekend	-92.550* [45.820]		-93.250** [36.490]	
Not April 1		99.043*** [14.079]		110.001*** [18.803]
Not April 1*Weekend		-77.793*** [19.921]		-82.630*** [27.792]
Observations	21	73	21	73
R-squared	0.908	0.852	0.872	0.799
<i>Implied doctor power share (-γ/β)</i>	92%	79%	68%	75%
<i>F-Test that doctor power share is 100% (P-value)</i>	0.428	0.073	0.079	0.099

Panel B: Dependent variable is log(number of births)

	<u>Levels</u>		<u>Differences</u>	
Not Feb 29	0.144*** [0.027]		0.200*** [0.032]	
Not Feb 29*Weekend	-0.125 [0.081]		-0.138** [0.050]	
Not April 1		0.135*** [0.019]		0.150*** [0.028]
Not April 1*Weekend		-0.093*** [0.034]		-0.097** [0.043]
Observations	21	73	21	73
R-squared	0.906	0.881	0.897	0.824
<i>Implied doctor power share (-γ/β)</i>	87%	69%	69%	64%
<i>F-Test that doctor power share is 100% (P-value)</i>	0.402	0.073	0.072	0.064

Notes: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. All specifications include day of week fixed effects. Feb 29 sample is restricted to Feb 28, Feb 29 and March 1 on leap years. April 1 sample is restricted to March 31, April 1 and April 2. F-tests are against the null that $-\gamma/\beta=1$. We use a one-tailed test, since we assume that doctors' power share cannot exceed 100%.

If we regard β (the coefficient on *Not Feb 29* and *Not April 1*) as reflecting parent preferences, and γ (the coefficient on *Not Feb 29*Weekend* and *Not April 1*Weekend*) as

reflecting doctor preferences, then we can estimate the relative bargaining strength of each side as $-\gamma/\beta$. These estimates are shown in the second-last row of each panel. Ranging from 65% to 92%, these estimates suggest that when the preferences of doctors conflict with the preferences of patients, the issue is resolved in favor of the doctor approximately three-quarters of the time.

In the last row of each panel, we test the hypothesis that doctors have 100 percent of the power (formally, a one-tailed test of the hypothesis that $-\gamma/\beta=1$). In column (1), the p-values are around 0.4, while all other specifications are statistically significant at the 10 percent level. These results suggest that doctors do not have all the power to choose the timing of births.

4. Conclusion

At some point in their lives, many people will find themselves in conflict with their physician over the manner or timing of their treatment. Yet there exists surprisingly little quantitative evidence of the relative power balance in such situations. Our analysis focuses on a particular conflict – occasions when parents and physicians bargain over the timing of births. By exploiting the fact that parents are averse to having their child born on February 29 and April 1, we test what happens when parents' desire to avoid an inauspicious birthdate conflicts with doctors' desire to avoid working on a weekend.

Our results suggest that in approximately three-quarters of cases, the physician's views prevail over those of the patient. However, we find evidence that patients win in approximately one-quarter of instances. This suggests that most of the power – but perhaps not all – rests with the doctor. From the patient's perspective, bargaining over

labor is not a hopeless case, but a parent's odds of winning are well below their chances of correctly guessing their child's sex.

One potential reason for the power imbalance is the fact that weekend births are costlier for hospitals and disliked by physicians – yet the amount that patients or their insurers pay is typically the same on weekdays or weekends. Indeed, while most of the babies in our sample were delivered in public hospitals, even parents in the private system are generally unable to pay more to secure a weekend birth. A healthcare pricing system that enabled hospitals to impose differential costs on parents for weekday or weekend births has the potential to increase the wellbeing of doctors and patients alike.

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Appendix 1: Testing Auspicious and Inauspicious Dates

To test the extent of auspicious and inauspicious dates on births, we use daily birth count data from 1975-2003 to analyze the impact of 12 particular dates. We excluded from our analysis dates that are designated as nationwide public holidays in Australia, since it is quite likely that public holidays will have an independent effect on the birth rate.

Our dates are of two types – those that fall on different days of the week, depending on the year (Type I), and those that always fall on the same day of the week (Type II).

Type I dates:

- Chinese New Year
- Valentine’s Day (February 14)
- Leap Year (February 29)
- April Fool’s Day (April 1)
- May Day (May 1)
- Halloween (October 31)
- Remembrance Day (November 11)

Type II dates:

- Mother’s Day (2nd Sunday in May)
- Father’s Day (1st Sunday in September)
- Melbourne Cup Day (1st Tuesday in November)
- Friday 13th
- Federal Election dates (the election date is chosen by the governing party, but elections are always held on a Saturday)

Our identification strategy differs for these two types of dates. For Type I dates, we compare the number of births on the day immediately before and the day immediately after, in a regression with day of week fixed effects. For example, our February 14 effect is identified from a dummy variable equal to 1 on February 14, and 0 on February 13 and 15.

For Type II dates, we compare the number of births on the day with the number of births on the same day the previous and following weeks. For example, our Mother’s Day effect is identified from a dummy equal to 1 on Mother’s Day, and 0 on the Sunday a week before Mother’s Day and the Sunday a week after Mother’s Day.

In all cases, we estimate the effect using two dependent variables: the raw birth rate and the log of the birth rate. Our sample size is 21 for February 29, 33 for Federal Elections, 147 for Friday 13th, and 87 for all other dates.

The results are shown in Table A1. We find statistically significant effects for five of the twelve dates: February 14, February 29, April 1, Melbourne Cup Day and Friday 13th. However, we believe that three of these dates are unsuitable for our analysis, for the following reasons.

- **February 14:** The rise in births on Valentine's Day is only marginally significant, and may be confounded by doctors' preferences to avoid delivering a baby on Valentine's Day.
- **Melbourne Cup Day:** Since the Melbourne Cup horserace is watched by physicians and patients alike, we cannot be sure that the drop reflects patient preferences (this is further complicated by the fact that the day is a public holiday in the state of Victoria, where one in four Australians live).
- **Friday 13th:** Although the Friday 13th effect is large, we are concerned that it may not be possible to rule out the hypothesis that the drop is partially due to superstition among doctors. More importantly, since Friday 13th by definition always falls on the same day of the week, we cannot apply our methodology, which is based on using the quasi-random variation in the day of the week of inauspicious dates to identify a conflict between patient and physician preferences.

We therefore restrict our analysis to just two inauspicious dates: February 29 and April 1.

Table A1: Auspicious and Inauspicious Dates**Panel A: Dates that fall on different days of the week**

Date	Chinese NY	Feb 14	Feb 29	April 1	May 1	Oct 31	Nov 11
Births	-6.873 [9.740]	19.431* [9.968]	-73.857*** [22.500]	-83.707*** [13.455]	9.166 [8.912]	-6.75 [10.820]	-3.241 [10.073]
Observations	87	87	21	87	87	87	87
R-squared	0.844	0.829	0.862	0.76	0.863	0.84	0.844

Panel B: Dates that fall on a consistent day of the week

Date	Mother's Day	Father's Day	Melbourne Cup	Friday 13th	Federal Elections
Births	8.155 [9.098]	2.362 [8.803]	-30.483*** [9.535]	-55.296*** [10.611]	17.591 [16.529]
Observations	87	87	87	147	33
R-squared	0.01	0.001	0.094	0.17	0.036

Panel C: Dates that fall on different days of the week

Date	Chinese NY	Feb 14	Feb 29	April 1	May 1	Oct 31	Nov 11
Log(Births)	-0.014 [0.015]	0.029** [0.014]	-0.109*** [0.034]	-0.123*** [0.021]	0.013 [0.013]	-0.011 [0.016]	-0.007 [0.016]
Observations	87	87	21	87	87	87	87
R-squared	0.859	0.85	0.871	0.777	0.885	0.865	0.862

Panel D: Dates that fall on a consistent day of the week

Date	Mother's Day	Father's Day	Melbourne Cup	Friday 13th	Federal Elections
Log(Births)	0.015 [0.018]	0.006 [0.018]	-0.042*** [0.014]	-0.077*** [0.016]	0.032 [0.030]
Observations	87	87	87	147	33
R-squared	0.009	0.001	0.092	0.167	0.035

Notes: Robust standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. Panels A and C compare with the previous and following days, and include day of week fixed effects. Panels B and D compare with the day 7 days before and the day 7 days afterwards.