Appendix (For Online Publication Only)

A Outpatient Utilization

Outpatient utilization is measured using a 2 week recall window in the 2001 Health and Welfare Survey, but using a 1 month recall window in the 2003-5 survey. Here, we present the results for outpatient utilization analogous to inpatient utilization. Table A presents the table of means of outpatient utilization before and after the 30 Baht program. Similar to the inpatient results, the MWS group has the largest increase in outpatient utilization. The increase of 0.06 is a 40% change in the utilization measure, in contrast to an increase of 0.03 (equal to a 34% increase) for the control group. Thus the increase in the MWS group is not only larger in levels than the control group, but also larger in proportions. Thus, if the impact of the change in reporting window has either a level or a proportional effect, the results suggest the program led to an increase in outpatient utilization for the MWS group. However, these results should be interpreted with caution because the change in reporting window clearly had an impact on the reported utilization measure. If it had no effect, then one would expect an increase in utilization closer to 50% (because of the movement from 2 weeks to 1 month), perhaps slightly less than 50% to account for multiple visits within a month. Instead, the increase in utilization is far less than 50% for all groups.

B Motivating a Provincial-level Specification

We can motivate our provincial-level regressions from individual-level regression specifications. If we observed obtain individual-level infant mortality data along with individual-level health scheme information (i.e. MWS, UNINS, CONTROL), we could run a regression of the death of an infant conditional on birth in the past year, d_{igt}, using the difference-in-difference specification,

$$\begin{aligned} d_{igt} &= \beta^{UNINS} * 10 * UNINS_g * Post30_t + \beta^{MWS} * 10 * MWS_g * Post30_t + \\ &\quad + \alpha_t + \kappa_g + \eta_{igt} \end{aligned} \tag{3}$$

where we multiply the terms UNINS and MWS by 10 for comparability to the 1/1000 infant mortality rate which we use below. To move from an individual-level regression to a provincial-level regression, we can average equation (3) across individuals in each province, yielding

$$
\begin{aligned}
infantmort_{pt} &= \beta^{UNINS} * \mu_p^{UNINS} * Post30_t + \beta^{MWS} \mu_p^{MWS} * Post30_t + \\
&\quad + \alpha_t + \gamma^{MWS} \mu_p^{MWS} + \gamma^{UNINS} \mu_p^{UNINS} + \bar{\eta}_{pt} \qquad (4)
\end{aligned}
$$

where $infantmort_{pt}$ is the 1/1000 infant mortality rate in province p in year t, μ_p^{UNINS} is the fraction of the province which is previously uninsured, and μ_p^{MWS} is the fraction of the province previously enrolled in the MWS program. In principle, with data on the provincial shares, μ_p^{UNINS} and μ_p^{MWS}, one could estimate the impact for both the MWS and previously uninsured. However, in practice, μ_p^{UNINS} and μ_p^{MWS} are highly negatively correlated (-0.85), a mechanical result of the fact that the sum of the fractions enrolled in MWS, UNINS, and CONTROL must equal 1. Therefore, with our data from just 76 provinces, we cannot separately identify the impact on both the MWS and UNINS.

Instead, we devise an empirical strategy to identify a *lower bound* for the impact of the 30 Baht program on the infant mortality on the MWS group. Our primary specification is given by

$$
infantmort_{pt} = \beta^{FracMWS} \mu_p^{MWS} * Post30_t + \gamma_p + \alpha_t + \varepsilon_{pt} \qquad (5)
$$

where we include provincial fixed effects, γ_p, and year fixed effects, α_t. Figure 2 plots the distribution of μ_p^{MWS}, showing substantial variation with a standard deviation of 0.11 (largely reflecting the unequal distribution of income across provinces). In some specifications we will also include time-varying provincial characteristics, which will consist of provincial-level GDP and 1-year lagged GDP.

From equations (4) and (2), it is clear that

$$
\beta^{FracMWS} = \beta^{MWS} + cov\left(\mu_p^{MWS}, \mu_p^{UNINS}\right) \beta^{UNINS} \qquad (6)
$$

Provided that the 30 Baht program did not lead to an increase in infant mortality, we will have $\beta^{UNINS} \leq 0$. Since $cov\left(\mu_p^{MWS}, \mu_p^{UNINS}\right) < 0$ (the correlation is -0.85), it is clear that $\beta^{FracMWS} \geq \beta^{MWS}$, so that $\beta^{FracMWS}$ understates the true impact of the 30 Baht program on the infant mortality of the MWS group.

C Robustness

Table C1 presents the mean infant mortality rate by year in our sample, alongside the infant mortality rate as reported by the World Development Indicators, published by the World Bank. As we can see, there is considerable discrepency, with the vital statistics generally ranging between 6 and 7 and slightly increasing over time; whereas the World Bank estimates range from 16 in 1998/1997, falling to 12 in 2008.

The world bank estimates rely on two Thailand sources of primary data: the vital statistics (analyzed above) and summary birth histories conducted in both the 2000 Census and 2005/6 Survey of Population Change. In addition to these data sources, they conduct analyses and make adjustments to arrive at a national estimate. Therefore, the difference between the vital statistics estimates and the development indicators arise from a combination of the incorporation of the summary birth history information and from any adjustments/analyses made by the World Bank. A comprehensive assessment of these adjustments is not the primary goal of this paper, but in this appendix we supplement the 30 Baht analysis using vital statistics registries with an analysis of these summary birth histories conducted in national surveys before and after the 30 Baht program.

Summary birth histories ask women the total number of births they have ever had and how many of these children are still alive. They do not ask any information about a specific birth or death; only the two aggregate numbers. While these surveys are a common source of information for calculating the infant mortality rate in a country, they are effectively a measure of the "stock" of deaths, as opposed to the "flow" of deaths. Thus, they are not particularly well-suited to analyzing the high-frequency impact of the program on the infant mortality rate. Thus, we only use these surveys for an analysis of the robustness of our results.

We obtained two surveys that contain summary birth histories on a national scale before and after 30 Baht. From 2000, we obtained a 1% sample of the national Population and Housing Census (PHC), a standard decennial census of Thai citizens. From 2005/2006, we obtained the Survey of Population Change (SPC2005-6), a survey focusing on a representative sample of households within each province. While the Thai census is a large scale undertaking conducted every ten years, the survey of population change is a smaller-scale survey conducted in between censuses.

One a priori concern is that the SPC2005-6 is known to have fairly substantial under-reporting of deaths. Porapakkham et al. (2010) provides a comparison of the SPC2005-6 with the vital statistics records for a specific surveillance site. Of the 1,236 deaths found in the vital statistics registry for this site, 286 were not found in the SPC. Conversely, of the 1,044 deaths found in the SPC, 94 were not found in the vital statistics. This suggests the SPC may suffer significantly greater measurement error than the vital statistics registry. Moreover, there is some evidence that SPC2005-6 under-reporting is greater for younger aged deaths (Porapakkham et al. (2010)). We return to this issue when discussing our results.

As mentioned above, a downside of these surveys relative to the vital statistics is that the do not provide details about the year of birth or death. To address this limitation, we analyze differential patterns of death across the age distribution before and after 30 Baht. In particular, we focus our analysis on relatively younger mothers who, in the 2005/6 survey, are most likely to have had their children in the years after 30 Baht began in 2001.

Figure C1 plots the age distribution of women who have given birth to at least one child. The birth rate begins to increase significantly in the early 20s with few births below age 20. So, we focus on the set of women aged 25 or below in both the 2000 and 2005/6 surveys, with the implicit assumption that most of the births reported in the 2005/6 survey occurred during the time after the 30 Baht program began.

Within each year, t, and province, p, we construct the fraction of children that have died,

$$Rate_{pt} = \frac{\#Died_{pt}}{\#Born_{pt}}$$

and then analyze the relationship between $Rate_{pt}$ and $FracMWS_p$ across provinces both before 30 Baht (in the 2000 Census) and after 30 Baht (in the 2005/6 survey).

Figure C2 presents estimates of a local-linear regression for this relationship for women aged 25 or below. Consistent with the general pattern found in the vital statistics records, we find a dramatic equalization in the death rate across provinces. Indeed, in provinces with low FracMWS, we see very little change in the death rate, but in provinces with high FracMWS, we see a large reduction in the death rate.

Table C2 presents estimates of regressions of the form

$$Rate_{pt} = a + \beta^{Survey} FracMWS_p * Post30_t + cPost30_t + dFracMWS_p + \varepsilon_{pt}$$

where $Post30_t$ is now an indicator for the 2005/6 survey. The coefficient β^{Survey} now captures the change in the birth history death rate in high versus low MWS provinces. The coefficient d captures the pre-30 Baht relationship between infant mortality and FracMWS.

Prior to 30 Baht, we estimate a positive slope of 0.0249* (0.0132) for the sample of women aged <= 25 years old as shown in Column I of Table C (Column II adds province fixed effects). The 95% confidence interval includes our point estimate of 0.0065 from our vital statistics analysis. After 30 Baht, the slope is significantly reduced, consistent with the equalization results found in the vital statistics results. After 30 Baht, we cannot reject a null hypothesis of no significant relationship between $FracMWS_p$ and $Rate_{pt}$. In this sense, the results from the summary birth history data appear to support the results from the vital statistics.

However, further inspection does cause us to be cautious about how strongly one should trust these data. First, the coefficient on FracMWS*Post30 of -0.0415 is four times larger than our estimate from the vital statistics of -0.0065. To be sure, the 95% confidence interval includes -0.0065, but the point estimate is quite a bit larger. Moreover, the implied slope in 2005-6 suggests poorer provinces had lower infant mortality rates than rich provinces. While this could be true, an alternative explanation that we find plausible is that the PHC does a better job at penetrating the poor population because it attempts to obtain 100% response whereas the SPC focuses on a smaller sample of the population and thus has a greater propensity to under-sample the poor, especially in the poorest and most remote area.

In short, we believe our results from the vital statistics registry are quite consistent with our findings in the summary birth history data from the PHC and SPC2005-6. But, we also find evidence that the PHC and SPC2005-6 samples may not be directly comparable, and thus urge caution in any strong interpretation of these results.

Table A: Outpatient Utilization

Group	Pre 30 Baht (2 Week Recall)	Post 30 Baht (1 Month Recall)	Difference
All Groups	0.107766	0.1428431	0.0351***
	(.0038042)	(.0063585)	(0.0047)
CONTROL	0.0981858	0.1321129	0.0339***
	(.0041263)	(.0071196)	(0.0050)
UNINS	0.0871499	0.1080214	0.0209***
	(.0030714)	(.0046958)	(0.0039)
MWS	0.1480749	0.2097444	0.0617***
	(.0046164)	(.0070977)	(0.0069)
Difference			
UNINS - CONTROL	-0.0110***	-0.0241***	-0.0131***
	(0.0030)	(0.0045)	(0.0037)
MWS - CONTROL	0.0499***	0.0776***	0.0277***
	(0.0044)	(0.0055)	(0.0047)

Standard errors clustered by province (70 provinces)

*** p<.01, ** p<.05, * p<.10

Table C1: 1yr Infant Mortality Rate (per 1,000 Births)

Year	Pt Est	Std Err	WB DI
1997	4.6	(0.264)	16
1998	4.7	(0.22)	16
1999	6.7	(0.279)	16
2000	6.2	(0.279)	15
2001	6.2	(0.273)	15
2002	6.3	(0.276)	14
2003	6.9	(0.338)	14
2004	7.2	(0.24)	13
2005	7.3	(0.257)	13
2006	7.1	(0.236)	13
2007	7.0	(0.258)	12
2008	6.8	(0.245)	12

Standard errors clustered by province (76 provinces)

Sources: Ministry of Public Health Vital Statistics Registry; World Development Indicators (1997-2008)

Table C2: Children Died per 1000 Births (Summary Birth Histories)

Age Sample	Age <= 25	
	I	II
FracMWS*Post30	-0.0415**	-0.0415*
	(0.0163)	(0.0231)
FracMWS	0.0249*	
	(0.0132)	
Post30	0.0093	0.0093
	(0.0058)	(0.0082)
Specification		
Year Dummy	X	X
Province FE		X

Standard errors clustered by province (76 provinces)

*** p<.01, ** p<.05, * p<.10

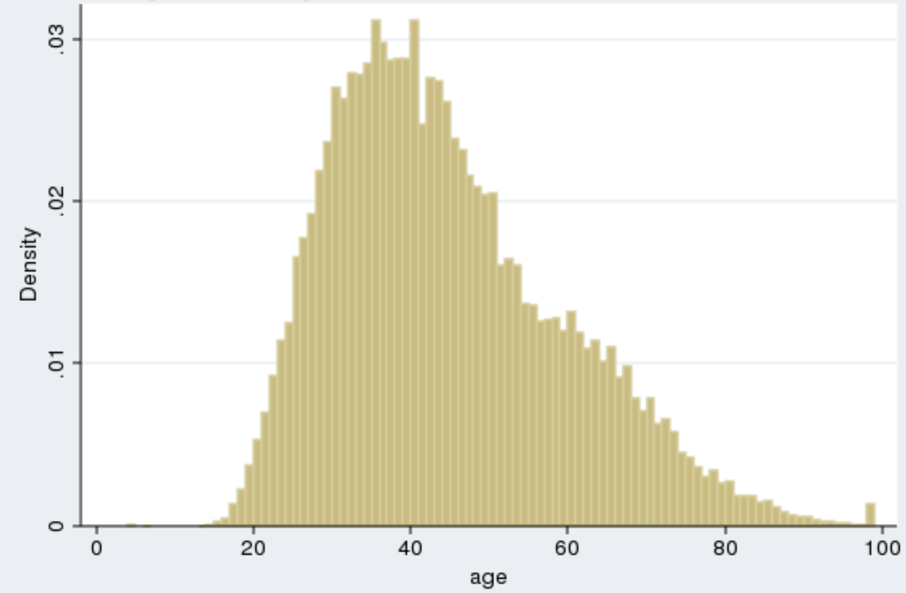

Figure C1: Age Distribution for those with >= 1 Child

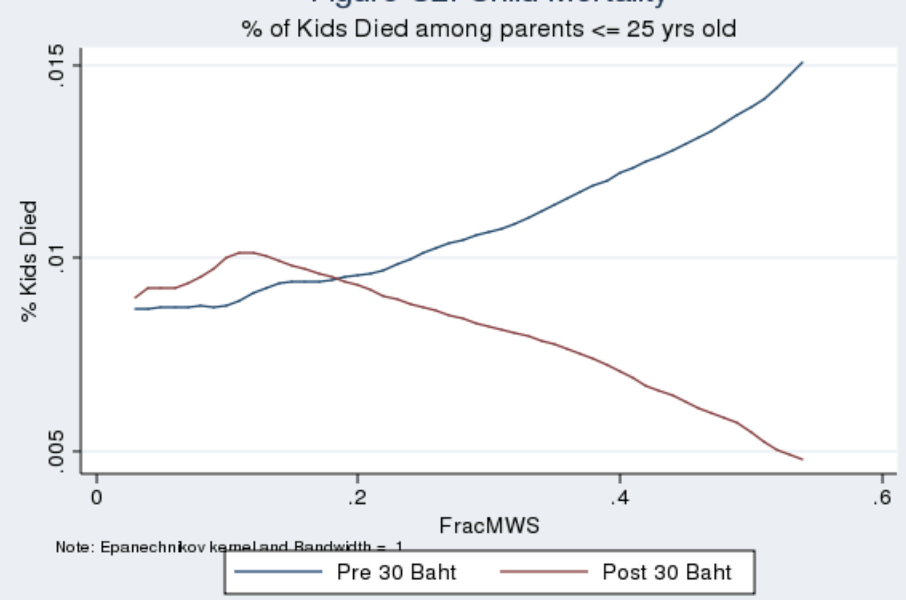

Figure C2: Child Mortality