UAB evaluation of the Alabama Medicaid's Agency Performance Improvement Project "Reducing the Risk of Preterm Birth/17 Alpha Hydroxyprogesterone Caproate".

Janet Bronstein, Ph.D. and Sally Engler, B. A.

Introduction

Preterm birth is a significant problem in Alabama. The 2014 preterm birth report cards published by the March of Dimes listed Alabama as having a preterm birth rate of 15.1%, earning the state an "F' grade, along with Mississippi, Louisiana and Puerto Rico. Preterm births have serious long term health sequelae and are much more costly, due to high costs for initial and subsequent hospitalizations, physician care and long term therapies. Because Medicaid covers more than 50% of the deliveries in Alabama, preventing preterm births is an important priority for Alabama Medicaid.

In recent years a promising new therapy has been introduced, which clinical trials suggest can reduce the likelihood of a preterm birth: progesterone supplementation during pregnancy. Studies indicate that injections of progesterone treatment are most beneficial for women with singleton (not multiple) pregnancies, for women who have had previous spontaneous preterm births. The treatment is in the form of weekly injections, beginning in mid-second trimester. A measure of a shortened cervix at about 16 weeks of a singleton pregnancy, determined with ultrasound measurements, is an indication for vaginal progesterone treatment (Norwitz and Caughey, Progesterone Supplementation and the Prevention of Preterm Birth, Review of Obstetrics and Gynecology, 2011;4(2):60-72)

The Alabama Medicaid Maternity Care Program adopted a Performance Improvement Project (PIP) for the 2013-2014 period entitled "Reducing the Risk of Preterm Birth/17 Alpha Hydroxyprogesterone Caproate". The project involved identifying women with singleton pregnancies who had previous spontaneous preterm births, counseling them about the availability of progesterone treatment, and forwarding the information to the women's delivery provider. These activities took place between February 1 and September 30th 2013. Subsequently, these women were followed to record whether they received progesterone treatment from their providers, the gestational age at delivery of their infant and whether the infant received treatment in an NICU. The overall goal was to increase the number of at-risk women covered by Medicaid who have the opportunity to make a choice about receiving progesterone injections.

Evaluation

This evaluation uses two sources of data. First, we examine claims data during Fiscal Years 2011-2014 from the Medicaid DSS system to determine (1) the portion of women receiving progesterone injections in these Fiscal Years, the average number of injections per woman, and total costs, (2) the portion of preterm births in Fiscal Years 2011-2014 , (3) the portion of preterm births to women who did and did not receive progesterone injections in these Fiscal Years, and (4) the number of infants receiving care in neonatal intensive care units in these Fiscal Years. Indication of an increase in use of progesterone injection treatment in 2013 will be taken as evidence of the positive impact of the PIP. While it is hoped that an increase in the treatment

will be associated with a decrease in preterm births, this may be difficult to ascertain using claims data.

The second source of data used here is the data collected by the Maternity Care Districts participating in the PIP. These data provide records of women who screened positive for referral because they had a singleton pregnancy and a previous spontaneous preterm birth. We show the portion of these clients who received counseling and referral to the delivery provider. We also show whether the woman actually received progesterone injections. It is not possible to ascertain, for those who did not receive injections, whether this was their choice or the recommendation of their provider. We then compare the gestational age at delivery for these at risk women who did and did not receive progesterone injections, and assess the use of neonatal intensive care for the infants of the screened women.

Part 1: Analysis of Claims Data (Claims Query Methods are posted at the end of report)

Table 1.1 shows the portion of women with deliveries in each fiscal year who received one or more progesterone injections. Statewide, the portion of women receiving injections more than tripled (from 196 to 634) over the four fiscal years. The only District without an increase was District 8, Choctaw, Marengo and Sumter counties. All of the other Districts began experiencing an increase in women receiving progesterone injections in Fiscal Year 2012, and all continued to see an increase between Fiscal Year 2013 and 2014.

Table 1.1. Progesterone Use among Those with Deliveries by Fiscal Year

	FY 11		FY 12		FY 13		FY 14	
Maternity District	Number	% of all deliveries	Number	% deliveries	Number	% deliveries	Number	% deliveries
Statewide	196	0.62	383	1.15	463	1.44	634	2.00
1	8	0.60	19	1.47	14	1.07	20	1.60
2	22	0.54	60	1.52	61	1.50	72	1.78
3	4	0.18	15	0.67	30	1.32	46	2.00
4	3	0.18	19	1.12	27	1.58	37	2.28
5	71	0.99	95	1.34	98	1.38	155	2.34
6	8	0.66	43	3.31	31	2.57	14	1.21
7	0	0.00	1	0.45	4	1.81	7	3.30
8	1	0.29	1	0.29	1	0.27	0	0.00
9	2	0.28	5	0.73	6	0.93	13	2.22
10	21	0.62	37	1.13	57	1.72	78	2.34
11	13	0.75	19	1.09	30	1.68	44	2.45
12	18	0.81	28	1.29	38	1.75	41	1.87
13	8	0.47	15	0.86	23	1.38	48	2.96
14	17	0.49	26	0.76	43	1.25	59	1.71

Table 1.2 shows that expenditures on progesterone increased dramatically over the time period, both because of the increase in the number of users, as shown in Table 1.1, and because each woman received more doses of the treatment. Each individual claim was counted as a dose.

Table 1.2. Mean Doses (number of claims) and Total Costs of Progesterone by Fiscal Year

	FY 11		FY 12		FY 13		FY 14	
	Mean doses per person	Total Paid	Mean doses per person	Total Paid	Mean doses per person	Total Paid	Mean doses per person	Total Paid
State-wide	4.3	$41,028	4.7	$93,884	7.5	$5,687,228	11.4	$10,445,817
1	3.5	$596	4.8	$1,853	8.5	$192,923	12.0	$375,681
2	5.1	$4,582	4.6	$10,263	7.0	$723,417	9.3	$1,181,491
3	1.5	$303	4.7	$3,630	7.0	$400,980	9.7	$676,945
4	3.0	$486	5.2	$8,084	5.9	$275,169	12.1	$534,180
5	3.9	$15,756	5.5	$26,371	8.5	$1,122,474	15.5	$2,821,428
6	2.9	$1,279	2.7	$15,236	5.8	$409,872	12.6	$241,354
7	0	0	4.0	$492	10.2	$61,090	9.6	$111,685
8	2.0	$144	12.0	$395	4.0	$15,112	4.0	$15,112
9	2.5	$386	3.8	$1,280	8.7	$81,994	9.8	$237,548
10	4.7	$4,105	3.3	$5,375	8.7	$770,173	9.9	$169,544
11	5.1	$5,334	3.9	$7,058	6.3	$315,624	9.2	$710,308
12	6.6	$3,998	5.0	$5,656	7.0	$485,937	8.1	$625,780
13	4.4	$660	7.9	$4,205	7.7	$261,762	11.5	$909,747
14	4.1	$3,299	3.3	$3,784	7.0	$570,670	10.4	$864,846

Table 1.3 shows additional claims for progesterone identified for women without delivery claims in the fiscal year. This could occur if the women left the Medicaid program before delivery, or if she has a miscarriage during the pregnancy. Again, the trend is for an increase in progesterone use across the fiscal years.

Table 1.3. Use and Costs of Progesterone for Women Without Deliveries by Fiscal Year

Maternity District	FY 11		FY 12		FY 13		FY 14	
	Number	Total Paid	Number	Total Paid	Number	Total Paid	Number	Total Paid
Statewide	24	$158	30	$1,394	67	$113,646	111	$501,052
1	1	0	0	0	3	0	3	$42,139
2	2	0	2	0	10	$7,556	9	$6,921
3	0	0	4	0	3	0	11	$13,842
4	1	0	1	0	4	$22,668	6	$49,695
5	4	$158	7	$362	17	$30,224	30	$124,560
6	2	0	1	0	2	$15,112	1	0
7	0	0	1	$164	1	0	1	$10,374

Maternity District	FY 11		FY 12		FY 13		FY 14	
	Number	Total Paid	Number	Total Paid	Number	Total Paid	Number	Total Paid
8	0	0	0	0	4	0	0	0
9	2	0	1	0	0	0	1	0
10	0	0	1	$72	7	$15,417	11	$34,937
11	0	0	2	$506	2	0	8	$13
12	3	0	2	$72	4	$7,566	11	$55,362
13	2	0	1	0	6	$15,112	11	$90,557
14	7	0	7	$217	4	0	8	$83,024

In sum then, Medicaid expenditures on progesterone during the prenatal period rose from $41,186 to $10,946,869 between Fiscal Year 2011 and Fiscal Year 2014.

Table 1.4 shows the rates of preterm birth in each Maternity District over the four fiscal years. Preterm births were identified by diagnosis codes on maternal hospital discharges and linked with files that UAB maintains of all deliveries in the state. (These delivery files are maintained for use in a separate evaluation project that UAB conducts for Plan First program.) This approach identifies preterm births reliably, but does not necessarily identify all preterm births, if the coding was not used on the delivery hospital claim. The table shows that, using this identification approach, delivery discharges coded as preterm births declined by 18.7% over the four years. The largest drop occurred between Fiscal Year 2012 and Fiscal Year 2013. Declines from Fiscal Year 2011 to Fiscal Year 2014 were observed in Maternity Districts 1, 5, 8, 10, 11, 12 and 14, and very dramatically in District 9, which had one quarter of deliveries coded as preterm in Fiscal Years 2011 and 2012, and rates of 3% and 2% in Fiscal Years 2013 and 2014.

Table 1.4. Preterm Delivery Rates across Fiscal Years

Maternity District	FY 11		FY 12		FY 13		FY 14	
	Total Births	% with preterm DX	Total Births	% with preterm DX	Total Births	% with preterm DX	Total Births	% with preterm DX
Statewide	31,463	3.64	31,241	3.58	31,266	2.51	30,508	2.96
1	1,343	2.53	1,295	2.24	1,313	1.83	1,249	2.00
2	4,067	1.82	3,953	2.50	4,057	1.43	4,042	1.90
3	2,228	2.65	2,252	2.66	2,276	2.45	2,295	3.49
4	1,684	3.27	1,702	2.88	1,712	2.45	1,621	3.76
5	7,136	2.61	7,114	2.45	7,102	1.96	6,628	2.58
6	1,221	4.42	1,301	4.30	1,207	5.55	1,158	5.53
7	258	4.26	221	5.43	221	4.98	212	4.25
8	341	5.87	350	6.29	367	4.36	328	5.18
9	711	24.75	683	23.43	642	3.27	586	2.22
10	3,374	4.77	3,281	4.48	3,307	4.08	3,336	3.90
11	1,735	3.52	1,749	3.83	1,783	2.47	1,795	3.34
12	2,216	2.80	2,172	2.85	2,167	2.26	2,189	2.74

Maternity District	FY 11		FY 12		FY 13		FY 14	
	Total Births	% with preterm DX	Total Births	% with preterm DX	Total Births	% with preterm DX	Total Births	% with preterm DX
13	1,687	2.19	1,745	3.09	1,670	2.51	1,621	2.65
14	3,462	4.48	3,423	3.71	3,442	2.76	3,448	2.70

Table 1.5 compares the portion of preterm births between women who did and did not receive progesterone treatments during pregnancy. As would be expected, women receiving progesterone had more preterm births, as they are by definition at higher risk for preterm birth.

Table 1.5. Preterm Births among Those Receiving or Not Receiving Progesterone Treatment

Maternity District	FY 11		FY 12		FY 13		FY 14	
	% Preterm without Treat-ment	% Preterm with Treat-ment	% Preterm without Treat-ment	% Preterm with Treat-ment	% Preterm without Treat-ment	% Preterm with Treat-ment	% Preterm without Treat-ment	% Preterm with Treat-ment
Statewide	3.61	8.67	3.52	8.36	2.44	7.13	2.78	11.51
1	2.55	0.00	2.12	10.53	1.85	0.00	1.79	15.00
2	1.80	4.55	2.41	8.33	1.30	9.84	1.81	6.94
3	2.65	0.00	2.59	13.33	1.78	6.67	3.33	10.87
4	3.27	0.00	2.79	10.53	2.37	7.41	3.72	5.41
5	2.53	9.86	2.39	6.32	1.90	6.12	2.29	14.84
6	4.37	12.50	4.21	6.98	5.27	16.13	5.24	28.57
7	4.26	0.00	5.45	0.00	5.07	0.00	3.41	28.57
8	5.88	0.00	6.30	0.00	4.37	0.00	5.18	0
9	24.68	50.00	23.45	20.00	3.30	0.00	2.09	7.69
10	4.77	4.76	4.44	8.11	4.03	7.02	3.81	7.69
11	3.48	7.69	3.82	5.26	2.45	3.33	3.03	15.91
12	2.64	22.22	2.66	17.86	2.21	5.26	2.65	7.32
13	2.20	0.00	3.12	0.00	2.49	4.35	2.35	12.50
14	4.47	5.88	3.68	7.69	2.68	9.30	2.57	10.17

Finally, we identified infants in each fiscal year who had either a hospital claim with a diagnosis of preterm birth or a medical claim with a procedure code for intensive care treatment, or both. Table 1.6 shows that the portion of all births in the year that had any type of NICU treatment was relatively the same across Fiscal Years 11, 12 and 13, and appeared to increase in Fiscal Year 14. Thus, there is no evidence that the increased use of progesterone treatment or the lower rates of preterm birth resulted in less use of neonatal intensive care.

Table 1.6. Portion of Infants with NICU Treatment across Fiscal Years

Maternity District	FY 11		FY 12		FY 13		FY 14	
	Newborns with NICU Care	% All Births	Newborns with NICU Care	% All Births	Newborns with NICU Care	% All Births	Newborns with NICU Care	% All Births
Statewide	3,542	11.3	3,507	11.2	3,502	11.2	3,838	12.6
1	105	7.8	93	7.2	102	7.8	131	10.5
2	409	10.1	439	11.1	447	11.0	468	11.6
3	163	7.3	129	5.7	159	7.0	188	8.2
4	256	15.2	244	14.3	238	13.9	261	16.1
5	964	13.5	976	13.7	962	13.5	993	15.0
6	122	10.0	143	11.0	117	9.7	111	9.6
7	30	11.6	35	15.8	27	12.2	37	17.5
8	27	7.9	43	12.3	30	8.2	30	9.1
9	58	8.2	65	9.5	71	11.1	53	9.0
10	472	14.0	474	14.4	455	13.8	541	16.2
11	130	7.5	143	8.2	169	9.5	173	9.6
12	223	10.1	193	8.9	198	9.1	230	10.5
13	117	6.9	101	5.8	113	6.8	127	7.8
14	466	13.5	429	12.5	414	12.0	495	14.4

Summary of Findings from Claims Data

The claims data show that use of progesterone during pregnancy has increased dramatically over the last four years, but the trend towards more use was in place before the PIP in the Maternity Districts began. Preterm birth rates also seem to be declining, but this is not reflected in a decrease in NICU care.

Part 2: Data Collected for the Performance Improvement Project

Between February 1 and September 30, 2013, 1,477 women with previous preterm deliveries were screened in the 14 Maternity Districts. Table 2.1 shows that slightly more than half of them met the criteria for counseling about progesterone and referral to their delivery physician. Based on the screening tool, this means that their previous preterm birth was not indicated due to maternal complications; those who were screened but not referred had previous preterm births for other reasons and thus were not candidates for progesterone injections. The portion of screened women who met the criteria for counseling and referral is fairly similar across districts, except in District 8, where 75% met the criteria.

Table 2.1. Portion of Screened Women Who Met Criteria for Counseling and Referral

Maternity District	**Eligible for Counseling about Progesterone**	n	%
1	Yes, met criteria	52	65.8%
	No, did not meet criteria	27	34.2%
	Total	79	100.0%
2	Yes	119	55.3%
	No	96	44.7%
	Total	215	100.0%
3	Yes	61	56.5%
	No	47	43.5%
	Total	108	100.0%
4	Yes	33	41.8%
	No	46	58.2%
	Total	79	100.0%
5	Yes	105	42.5%
	No	142	57.5%
	Total	247	100.0%
6	Yes	43	56.6%
	No	33	43.4%
	Total	76	100.0%
7	Yes	2	40.0%
	No	3	60.0%
	Total	5	100.0%
8	Yes	27	75.0%
	No	9	25.0%
	Total	36	100.0%
9	Yes	25	52.1%
	No	23	47.9%
	Total	48	100.0%
10	Yes	87	57.2%
	No	65	42.8%
	Total	152	100.0%
11	Yes	68	66.7%
	No	34	33.3%
	Total	102	100.0%
12	Yes	67	54.9%
	No	55	45.1%
	Total	122	100.0%
13	Yes	57	62.6%
	No	34	37.4%
	Total	91	100.0%
14	Yes	65	55.6%
	No	52	44.4%

Maternity District	**Eligible for Counseling about Progesterone**	n	%
	Total	117	100.0%
Total	Yes	811	54.9%
	No	666	45.1%
	Total	1,477	100.0%

Only two women who met the criteria for eligibility were NOT referred on to their delivery provider, – one in District 3 and one in District 14.

Table 2.2 shows that about 18% of the women who were screened and referred to their delivery physicians for possible progesterone treatment received this treatment. In addition, about 8% of women who were screened but not referred to their delivery provider because they did not meet the criteria also received progesterone treatment. The numbers recorded here, 184 total women receiving progesterone treatment, represent about 36% of all women who had claims filed for progesterone treatment in Fiscal Year 2013, as shown in Table 1.1. This is partly because the PIP ran for only 8 months of the year. However, it also suggests that some women received progesterone treatments from their providers even if they were not screened as eligible in the project.

In calculating the percent of women receiving progesterone treatment, women whose pregnancies ended prior to 16 weeks are excluded because they were no longer candidates at the recommended starting point for the treatments.

Table 2.2. Portion of Screened Women who Received Progesterone Treatment

	Met Criteria and Referred		Not Referred		Total	
Progesterone Use	n	%	n	%	n	%
Yes	133	17.8%	51	8.3%	184	13.5%
No	614	82.2%	566	91.7%	1,180	86.5%
Subtotal for applicable P17 cases	747	100%	617	100%	1,364	100%
Progesterone use n/a given SAB, MC or ≤16 week Gestational Age at delivery	63	7.8%	49	7.4%	112	7.6%
Total	810*		666	100.0%	1,476	100.0%

*One referral had missing data for P17 usage due to dropping out of the program.

Table 2.3 shows the portion of women in each District who received progesterone treatments. Both those referred and those not referred are shown. There is considerable variation across districts in the portion of referred women who received treatment. It is not known whether the

women who did not receive treatment declined it when offered, or whether their provider decided not to provide the treatment. Again, women with pregnancy loss before 16 weeks are excluded from this count.

Table 2.3. Portion of Women Receiving Progesterone Treatment by District

Maternity District	Met Criteria and Referred			Not Referred		
	N Total	N received Progesterone	% received Progesterone	N Total	N received Progesterone	% received Progesterone
Statewide	747	133	17.8%	617	51	8.3%
1	48	8	16.7%	25	6	24.0%
2	110	14	12.7%	88	6	6.8%
3	52	6	11.5%	41	4	9.8%
4	31	12	38.7%	42	5	11.9%
5	99	21	21.2%	130	11	8.5%
6	41	3	7.3%	32	3	9.4%
7	2	1	50.0%	3	0	0.0%
8	27	0[1]	0.0%	8	0[1]	0.0%
9	22	4	18.2%	21	1	4.8%
10	80	14	17.5%	59	6	10.2%
11	63	20	31.7%	32	0	0.0%
12	54	8	14.8%	52	3	5.8%
13	54	17	31.5%	32	1	3.1%
14	64	5	7.8%	52	5	9.6%

[1] Follow up data was not available for District 8.

A total of 32 women initially screened for progesterone counseling and referral left the Medicaid program before their delivery. These women were either lost to follow-up, dropped out or never showed for care following screening or referral. Table 2.4 shows the gestational age at birth distribution of the remaining 1,445 women, overall and separately by whether or not they met the criteria and were referred or were not referred for progesterone treatment. Slightly more than one third of the women either had a miscarriage or delivered before term. The women who were referred and those who were not referred had approximately the same rates of miscarriage and preterm births.

Table 2.4. Gestational Age Distribution of Screened Population

	Met Criteria and Referred		Not Referred		Overall Population	
	n	%	n	%	n	%
SAB, Miscarriage or delivery < 16 weeks	65	8.0%	51	7.7%	116	7.9%
Delivery 20-26 weeks	20	2.5%	15	2.3%	35	2.4%
Delivery 27-33 weeks	58	7.2%	43	6.5%	101	6.8%
Delivery 34-36 weeks	149	18.4%	112	16.8%	261	17.7%
Delivery 37 weeks or later	503	62.0%	429	64.4%	932	63.1%
Subtotal for program participants or non-participants with gestational age data	795	98.1%	650	97.7%	1,445	97.9%
Dropped out, Lost to Follow-up after Initial Screening/ Referral	16	2.0%	16	2.4%	32	2.2%
Total Screened	811	100.0%	666	100.0%	1,477	100.0%

Table 2.5 shows the gestational age distribution for women who did and did not receive progesterone treatments, in the group counseled and referred and those not referred. The category of spontaneous miscarriage or delivery at less than 16 weeks is removed from this count. Similar to the claims data shown in Table 1.5, this table shows that women who received progesterone treatments had higher preterm birth rates than women who did not. This may be because they were at higher risk in ways that cannot be taken into account here.

Table 2.5. Distribution of Gestational Age for Women Receiving or Not Receiving Progesterone Treatment

	Met Criteria and Referred				Not Referred			
	Had Progesterone Treatments		Did NOT Have Progesterone Treatments		Had Progesterone Treatments		Did NOT Have Progesterone Treatments	
	n	%	n	%	n	%	n	%
Delivery at 20-26 weeks	5	3.8%	15	2.5%	0	0	15	2.7%
Delivery at 27-33 weeks	15	11.3%	43	7.2%	8	15.7%	36	6.6%
Delivery at 34-36 weeks	29	21.8%	120	20.1%	18	35.3%	94	17.1%
Delivery at 37 weeks or later	84	63.2%	419	70.2%	25	49.0%	404	73.6%
Total	133	100.0%	597	100.0%	51	100.0%	548	100%

*One non-referral had missing data for delivery gestational age.

Overall, almost 15% of newborns of the screened population received NICU care (198 of 1329). This is slightly higher than the statewide average for all deliveries, as shown in Table 1.6, but is understandable, given that this screened population includes women with prior preterm births and is therefore at higher risk. Table 2.6 shows that within the screened population, for both the counseled and referred and the not referred group, more of the women receiving progesterone treatment had infants with NICU use.

Table 2.6. NICU Use for Newborns of Screened Population

Baby went to NICU?	Met Criteria and Referred				Not Referred				Total Screened with Delivery outcomes data			
	Had Progesterone Treatments		Did NOT Have Progesterone Treatments		Had Progesterone Treatments		Did NOT Have Progesterone Treatments		Had Progesterone Treatments		Did NOT Have Progesterone Treatments	
	n	%	n	%	n	%	n	%	n	%	n	%
Yes	24	18.0	78	13.1	15	29.4	81	14.8	39	21.2	159	13.9
No	105	78.9	512	85.8	36	70.6	459	83.8	141	76.6	971	84.8
Baby Died	4	3.0	5	0.8	0	0.0	6	1.1	4	2.2	11	1.0
Missing Data	0	0.0	2	0.3	0	0.0	2	0.4	0	0.0	4	0.3
Total	133	100	597	100	51	100	548	100.0	184	100	1,145	100

*One non-referral had missing data for delivery gestational age.

Table 2.7 shows use of NICU care by gestational age. In general, within gestational age categories, infants whose mothers received progesterone treatments more commonly also received NICU care.

Table 2.7. Gestational Age and NICU Care.

		Yes, Referred						No, Not Referred					
		Had Progesterone Treatments		Did NOT Have Progesterone Treatments		Total		Had Progesterone Treatments		Did NOT Have Progesterone Treatments		Total	
Baby to NICU?		n	%	n	%	n	%	n	%	n	%	n	%
Delivery at 20-26 weeks	Yes	1	20.0	9	60.0	10	50.0	0	0.0	9	60.0	9	60.0
	No	0	0.0	2	13.3	2	10.0	0	0.0	2	13.3	2	13.3
	Baby died	4	80.0	3	20.0	7	35.0	0	0.0	3	20.0	3	20.0
	Missing Data	0	0.0	1	6.7	1	5.0	0	0.0	1	6.7	1	6.7
	Total	5	100	15	100	20	100	0	0.0	15	100	15	100

		Yes, Referred						No, Not Referred					
		Had Progesterone Treatments		Did NOT Have Progesterone Treatments		Total		Had Progesterone Treatments		Did NOT Have Progesterone Treatments		Total	
Baby to NICU?		n	%	n	%	n	%	n	%	n	%	n	%
Delivery at 27-33 weeks	Yes	14	93.3	30	69.8	44	75.9	8	100	25	71.4	33	76.7
	No	1	6.7	11	25.6	12	20.7	0	0.0	8	22.9	8	18.6
	Baby died	0	0.0	1	2.3	1	1.7	0	0.0	2	5.7	2	4.7
	Missing Data	0	0.0	1	2.3	1	1.7	0	0.0	0	0.0	0	0.0
	Total	15	100	43	100	58	100	8	100	35	100	43	100
Delivery at 34-36 weeks	Yes	7	24.1	25	20.8	32	21.5	6	33.3	30	31.9	36	32.1
	No	22	75.9	94	78.3	116	77.9	12	66.7	63	67.0	75	67.0
	Baby died	0	0.0	1	0.8	1	0.7	0	0.0	0	0.0	0	0.0
	Missing Data	0	0.0	0	0.0	0	0.0	0	0.0	1	1.1	1	0.9
	Total	29	100	120	100	149	100	18	100	94	100	112	100
Delivery at 37 weeks or later	Yes	2	2.4	14	3.3	16	3.2	1	4.0	17	4.2	18	4.2
	No	82	97.6	405	96.7	487	96.8	24	96.0	386	95.5	410	95.6
	Baby died	0	0.0	0	0.0	0	0.0	0	0.0	1	0.2	1	0.2
	Total	84	100	419	100	503	100	25	100	404	100	429	100
Total	Yes	24	18.0	78	13.1	102	14.0	15	29.4	81	14.8	96	16.0
	No	105	78.9	512	85.8	617	84.5	36	70.6	459	83.8	495	82.6
	Baby died	4	3.0	5	0.8	9	1.2	0	0.0	6	1.1	6	1.0
	Missing Data	0	0.0	2	0.3	2	.3	0	0.0	2	0.4	2	0.3
	Total	**133**	100	**597**	100	730	100	**51**	100	**548**	100	599	100

*One non-referral had missing data for delivery gestational age.

Summary of Findings from PIP Data

Over the eight months of the program, a total of 1,477 women screened positive for a prior preterm birth, and 811 of these, those whose previous birth was not associated with maternal complications such as hypertension, were counseled about progesterone treatment. The screening instruments for these 811 women were sent to their delivering providers, so that they could be considered for progesterone treatment. Of these 811 women, 133 eventually received progesterone treatment. Excluding 65 women who miscarried earlier in their pregnancy, these 133 women represent 17.8% of all of the women considered to be eligible for progesterone treatment. In addition, of the 666 women who were screened but not counseled or referred, 51 did receive progesterone treatment. Excluding the 49 women who miscarried earlier in their pregnancies, these 51 women represent 8.3% of women screened but not counseled or referred for progesterone treatment.

In both groups, about 37% of women had either miscarriages or preterm deliveries. In both the referred and not referred groups, more of the women who received progesterone treatments had preterm deliveries, compared to the women who did not receive treatments. Overall, about 15% of the newborns of the screened women received NICU care, including 21% of the newborns of those who received progesterone treatment and 14% of the newborns of those who did not receive progesterone treatment.

Conclusions

Between Fiscal Year 2011 and Fiscal Year 2014 there was a significant increase in the portion of Medicaid maternity clients who received prenatal injection progesterone treatment. The trend towards increased use was already underway when the Medicaid Maternity Performance Improvement Project got underway in February 2013. Because there was a significant increase in use of progesterone between Fiscal Year 2011 and Fiscal Year 2012, before the PIP began, it is unlikely that the program itself was responsible for the increase in use of this treatment. However, the PIP served to educate providers regarding Medicaid coverage and process for coordinating prenatal injection progesterone treatment. Referral/Prescription Forms and educational materials were distributed to subcontractors during the course of the project.

The use of progesterone recorded in the PIP data sheets for this project were considerably lower than the use recorded in claims data. This suggests that the physicians providing care to the Medicaid Maternity population are conducting their own screening and making independent decisions about whether to offer progesterone treatment during pregnancy. This is also suggested by the fact that 8% of the screened women who were not counseled and referred for treatment still received progesterone treatment.

Note that it is possible that more than 18% of the women who were counseled and referred did in fact receive progesterone treatments, if the treatments provided were not recorded in the medical records used by the Districts to measure use for this data collection activity.

Both claims data and the recording of gestational age at birth in the data sheet suggest that preterm birth rates are higher for women who receive progesterone, compared to those who did not. This is to be expected, given that these women are at higher risk for preterm delivery. Overall estimates from claims data suggest that preterm birth rates for the population have declined over the past four years. It is possible that increased provision of prenatal progesterone to high risk women played a role in this decline. However, there is no strong indication that NICU use has diminished. However, it is important to note that there are many other variables beyond the scope of this program that could impact NICU use.

The Performance Improvement Project established three baseline measures for quality improvement as a result of the project: (1) a 2% reduction in NICU use, (2) 100% screening and counseling of women with prior spontaneous preterm births, and (3) 90% receipt of progesterone for those women referred to their delivery providers. In this regards, we find:

1. No indication of a decrease in use of NICUs within the program.
2. 99.8% counseling and referral of women screened as eligible for progesterone treatment.
3. 18% provision of progesterone treatment for those screened as eligible for treatment.

However, we did identify a 200%+ increase in the number of maternity cases receiving progesterone treatment in Medicaid between Fiscal Year 2011 and Fiscal Year 2014, based on claims data.

Claims Query Methods:

Conditions set for Query of claims during FY11 thru FY14 for:

1. **Progesterone Use among Those with Deliveries by Fiscal Year (Mothers)**
   Header ICD-9 Diagnosis Codes: V2341, 96372, 99211, V2341 - V2349 with procedure codes J1725, J3490, J2675 and Q2042 OR NDC code 64011-0243-01 or 64011-243. Another query with Generic Sequence Codes 50866 and 3267 selected.
2. **Preterm Delivery Rates across Fiscal Years (Mothers)**
   Inpatient claims for 644 *Early or threatened labor* [used matches pattern "%644"]
3. **Preterm Births (Babies)**
   ICD9 (diagnosis codes) for preterm deliveries: 765.00, 765.01, 765.02, 765.03, 765.04, 765.05, 765.06, 765.07, 765.08, 765.10, 765.11, 765.12, 765.13, 765.14, 765.15, 765.16, 765.17, 765.18, 765.19, 765.20, 765.21, 765.22, 765.23, 765.24, 765.25, 765.26, 765.27, 765.28 (all decimal points removed).
4. **Portion of Infants with NICU Treatment across Fiscal Years (Babies)**
   Age at FDOS less than 1 year; Procedure codes between 99468 and 99480 AND revenue codes 0172 – 0174, 0179.