

Australia's persistently high rate of early-term prelabour Caesarean delivery

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SUPPLEMENTARY MATERIAL

Supplementary Table S1: Frequency and percentage of term prelabour Caesarean deliveries at each week of gestational age by country and year of birth - Australian states (2005–2016), England (2006/07–2016/17) and the United States of America (2006–2016)

Over the study period, the trend in early-term prelabour Caesarean deliveries was statistically significant in Australia ($z = -14.27$, $P < 0.001$), England ($z = -60.29$, $P < 0.001$) and the United States of America ($z = -219.67$, $P < 0.001$). ETPCD rate = prelabour caesarean deliveries at early term (37⁰-38⁶ weeks of gestation) as a percentage of all prelabour caesarean deliveries at term (37⁰-40⁶ weeks).

Australian states: Singleton prelabour Caesarean deliveries from 2005–2016										
Year	37 weeks		38 weeks		39 weeks		40 weeks		Total	
	n	%	n	%	n	%	n	%	n	ETPCD rate %
2005	3,578	9.15	18,485	47.28	13,226	33.83	3,804	9.73	39,093	56.44
2006	3,892	9.35	19,657	47.20	14,334	34.42	3,764	9.04	41,647	56.54
2007	3,998	9.26	19,885	46.07	15,586	36.11	3,698	8.57	43,167	55.33
2008	3,925	8.99	19,198	43.97	16,699	38.25	3,841	8.80	43,663	52.96
2009	4,229	9.47	19,250	43.10	17,304	38.74	3,884	8.70	44,667	52.56
2010	4,444	9.86	19,260	42.73	17,623	39.10	3,745	8.31	45,072	52.59
2011	4,631	9.99	19,976	43.11	18,043	38.94	3,691	7.96	46,341	53.10
2012	5,186	10.66	20,726	42.61	18,998	39.06	3,728	7.66	48,638	53.28
2013	5,280	10.79	20,925	42.75	19,283	39.39	3,463	7.07	48,951	53.53
2014	5,684	11.17	21,443	42.13	20,295	39.87	3,479	6.83	50,901	53.29
2015	6,004	11.82	21,357	42.04	20,090	39.55	3,349	6.59	50,800	53.86
2016	6,336	11.93	21,263	40.04	21,671	40.81	3,830	7.21	53,100	51.98
Total	57,187	10.28	241,425	43.42	213,152	38.33	44,276	7.96	556,040	53.70

England: Singleton and multiple prelabour^B Caesarean deliveries with known gestational age

Year ^A	37 weeks		38 weeks		39 weeks		40 weeks		Total	
	n	%	n	%	n	%	n	%	n	ETPCD rate %
2006-07	3,091	11.43	9,940	36.76	11,189	41.38	2,820	10.43	27,040	48.19
2007-08	3,171	11.63	9,944	36.48	11,249	41.26	2,898	10.63	27,262	48.11
2008-09	4,349	11.32	13,121	34.15	16,509	42.97	4,445	11.57	38,424	45.47
2009-10	5,033	11.19	14,701	32.67	20,286	45.09	4,975	11.06	44,995	43.86
2010-11	5,260	10.86	15,126	31.23	22,540	46.53	5,512	11.38	48,438	42.09
2011-12	5,569	10.61	15,203	28.96	25,409	48.39	6,323	12.04	52,504	39.56
2012-13	5,947	10.80	14,826	26.92	28,268	51.32	6,038	10.96	55,079	37.71
2013-14	6,175	11.54	13,657	25.52	28,007	52.33	5,681	10.61	53,520	37.06
2014-15	6,480	12.05	13,360	24.85	28,636	53.26	5,291	9.84	53,767	36.90
2015-16	7,100	12.44	13,485	23.62	30,895	54.13	5,600	9.81	57,080	36.06
2016-17	7,817	12.85	13,562	22.30	33,263	54.70	6,171	10.15	60,813	35.16
Total	59,992	11.56	146,925	28.31	256,251	49.38	55,754	10.74	518,922	39.87

United States of America: Singleton prelabour Caesarean deliveries ^c										
Year	37 weeks		38 weeks		39 weeks		40 weeks		Total	
	n	%	n	%	n	%	n	%	n	ETPCD rate %
2006	45,712	14.05	108,515	33.36	116,038	35.67	55,039	16.92	325,304	47.41
2007	53,029	14.00	125,673	33.18	138,173	36.48	61,937	16.35	378,812	47.17
2008	58,985	13.53	134,291	30.80	170,340	39.06	72,440	16.61	436,056	44.32
2009	60,127	13.24	134,412	29.61	184,720	40.69	74,722	16.46	453,981	42.85
2010	63,299	12.81	136,123	27.54	214,522	43.40	80,337	16.25	494,281	40.35
2011	66,333	12.33	134,877	25.06	249,248	46.32	87,660	16.29	538,118	37.39
2012	67,858	12.12	127,258	22.73	271,071	48.42	93,668	16.73	559,855	34.85
2013	70,417	12.17	127,594	22.05	285,351	49.32	95,171	16.45	578,533	34.23
2014	77,814	12.44	135,161	21.61	310,923	49.72	101,419	16.22	625,317	34.06
2015	81,561	12.81	135,541	21.29	317,206	49.83	102,269	16.07	636,577	34.10
2016	84,789	13.23	134,589	21.00	320,062	49.93	101,556	15.84	640,996	34.22
Total	729,924	12.88	1,434,034	25.30	2,577,654	45.48	926,218	16.34	5,667,830	38.18

^A For English births, each year ends on 31 March.

^B English data includes Caesarean deliveries with no labour plus previously planned elective Caesarean deliveries performed immediately after the onset of labour.

^C Prelabour Caesarean deliveries were identified using the “trial of labour” data field in the USA birth files. This data field was phased in progressively across US states from 2003–2016 and was available for approximately half of caesarean deliveries in 2006 and all Caesarean deliveries by 2016.⁵⁷

Supplementary Table S2: Frequency and percentage of term singleton prelabour Caesarean deliveries at each week of gestational age by Australian state, hospital sector and year of birth, 2005-2016

The twelve-year trend in prelabour Caesarean deliveries at early term (37⁰-38⁶ weeks of gestation) was statistically significant in New South Wales public hospitals ($z = -13.11, P < 0.001$), New South Wales private hospitals ($z = 15.31, P < 0.001$), Victorian public hospitals ($z = -17.93, P < 0.001$), Victorian private hospitals ($z = 3.79, P < 0.001$), Queensland public hospitals ($z = -8.08, P < 0.001$), Queensland private hospitals ($z = 9.97, P < 0.001$), South Australian public hospitals ($z = -7.74, P < 0.001$), South Australian private hospitals ($z = 9.87, P < 0.001$), Western Australian public hospitals ($z = -19.18, P < 0.001$), Western Australian private hospitals ($z = -9.60, P < 0.001$) and Tasmanian public hospitals ($z = 1.97, P = 0.049$) but not Tasmanian private hospitals ($z = 1.58, P = 0.115$).

New South Wales																		
Year	37 weeks				38 weeks				39 weeks				40 weeks				Total	
	Public		Private		Public		Private		Public		Private		Public		Private		Public	Private
	n	%	n	%	n	%	N	%	n	%	n	%	n	%	n	%	n	n
2005	639	8.60	290	6.25	2,726	36.70	1,978	42.63	3,205	43.15	1,800	38.79	857	11.54	572	12.33	7,427	4,640
2006	676	8.45	369	7.46	3,012	37.67	2,070	41.86	3,443	43.06	1,952	39.47	865	10.82	554	11.20	7,996	4,945
2007	690	8.36	391	7.54	3,087	37.42	2,108	40.66	3,667	44.45	2,103	40.56	806	9.77	583	11.24	8,250	5,185
2008	626	7.59	356	6.66	2,803	33.99	2,130	39.87	4,004	48.55	2,262	42.34	814	9.87	594	11.12	8,247	5,342
2009	732	8.72	405	7.15	2,746	32.73	2,189	38.62	4,136	49.29	2,430	42.87	777	9.26	644	11.36	8,391	5,668
2010	722	8.52	464	8.08	2,824	33.32	2,233	38.90	4,123	48.64	2,443	42.56	807	9.52	600	10.45	8,476	5,740
2011	820	9.09	455	7.63	3,003	33.27	2,362	39.62	4,392	48.66	2,534	42.51	810	8.98	610	10.23	9,025	5,961
2012	917	10.04	581	9.23	2,962	32.44	2,404	38.18	4,496	49.24	2,645	42.00	755	8.27	667	10.59	9,130	6,297
2013	899	9.99	578	9.44	2,990	33.21	2,511	40.99	4,439	49.31	2,490	40.65	674	7.49	547	8.93	9,002	6,126
2014	997	10.43	631	9.80	3,105	32.49	2,762	42.90	4,790	50.12	2,561	39.78	665	6.96	484	7.52	9,557	6,438
2015	1,028	10.78	661	10.32	3,114	32.66	3,014	47.06	4,717	49.47	2,277	35.55	677	7.10	453	7.07	9,536	6,405
2016	970	9.72	777	11.51	2,362	23.66	3,104	45.99	5,505	55.15	2,398	35.53	1,144	11.46	471	6.98	9,981	6,750
Total	9,716	9.25	5,958	8.57	34,734	33.07	28,865	41.53	50,917	48.48	27,895	40.14	9,651	9.19	6,779	9.75	105,018	69,497

Victoria																		
Year	37 weeks				38 weeks				39 weeks				40 weeks				Total	
	Public		Private		Public		Private		Public		Private		Public		Private		Public	Private
	n	%	n	%	n	%	N	%	n	%	n	%	n	%	n	%	n	n
2005	630	11.29	421	10.25	2,761	49.50	2,091	50.91	1,666	29.87	1,241	30.22	521	9.34	354	8.62	5,578	4,107
2006	710	11.77	418	9.66	2,957	49.02	2,210	51.09	1,826	30.27	1,328	30.70	539	8.94	370	8.55	6,032	4,326
2007	701	11.29	470	10.39	3,029	48.79	2,266	50.11	1,981	31.91	1,417	31.34	497	8.01	369	8.16	6,208	4,522
2008	692	11.41	472	10.36	2,854	47.06	2,301	50.50	1,996	32.91	1,392	30.55	523	8.62	391	8.58	6,065	4,556
2009	679	10.88	567	12.07	2,955	47.36	2,435	51.85	2,067	33.13	1,288	27.43	538	8.62	406	8.65	6,239	4,696
2010	749	11.71	579	12.04	2,936	45.91	2,470	51.38	2,240	35.03	1,383	28.77	470	7.35	375	7.80	6,395	4,807
2011	731	10.90	562	12.09	3,170	47.29	2,357	50.70	2,334	34.82	1,369	29.45	469	7.00	361	7.77	6,704	4,649
2012	857	11.76	630	12.33	3,230	44.33	2,670	52.26	2,658	36.48	1,377	26.95	542	7.44	432	8.46	7,287	5,109
2013	919	12.03	642	12.62	3,277	42.88	2,595	51.00	2,899	37.94	1,471	28.91	547	7.16	380	7.47	7,642	5,088
2014	965	11.83	618	12.49	3,353	41.12	2,558	51.71	3,199	39.23	1,419	28.68	637	7.81	352	7.12	8,154	4,947
2015	1,116	13.14	675	13.47	3,341	39.34	2,481	49.52	3,367	39.64	1,484	29.62	669	7.88	370	7.39	8,493	5,010
2016	1,180	13.02	675	13.36	3,497	38.59	2,440	48.30	3,706	40.89	1,559	30.86	680	7.50	378	7.48	9,063	5,052
Total	9,929	11.84	6,729	11.83	37,360	44.55	28,874	50.77	29,939	35.70	16,728	29.41	6,632	7.91	4,538	7.98	83,860	56,869

Queensland

Year	37 weeks				38 weeks				39 weeks				40 weeks				Total	
	Public		Private		Public		Private		Public		Private		Public		Private		Public	Private
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	n
2005	347	8.15	408	8.35	1,898	44.59	2,604	53.32	1,617	37.98	1,501	30.73	395	9.28	371	7.60	4,257	4,884
2006	371	8.09	446	8.66	2,030	44.25	2,735	53.08	1,800	39.23	1,610	31.24	387	8.44	362	7.03	4,588	5,153
2007	384	7.87	433	8.11	1,962	40.20	2,925	54.77	2,155	44.15	1,654	30.97	380	7.79	329	6.16	4,881	5,341
2008	378	7.49	454	8.50	1,842	36.50	2,762	51.69	2,414	47.84	1,788	33.46	412	8.16	339	6.34	5,046	5,343
2009	433	8.52	510	9.16	1,696	33.37	2,852	51.23	2,547	50.11	1,842	33.09	407	8.01	363	6.52	5,083	5,567
2010	396	8.00	577	10.14	1,550	31.29	2,928	51.48	2,662	53.75	1,756	30.87	345	6.97	427	7.51	4,953	5,688
2011	478	9.07	592	11.17	1,876	35.58	2,803	52.88	2,556	48.48	1,547	29.18	362	6.87	359	6.77	5,272	5,301
2012	517	9.46	660	12.04	1,840	33.66	2,959	53.96	2,824	51.66	1,485	27.08	286	5.23	380	6.93	5,467	5,484
2013	545	9.68	614	11.19	1,906	33.85	2,982	54.36	2,872	51.01	1,494	27.23	307	5.45	396	7.22	5,630	5,486
2014	604	10.50	646	11.90	1,925	33.47	2,915	53.68	2,919	50.76	1,517	27.94	303	5.27	352	6.48	5,751	5,430
2015	629	10.98	639	12.39	1,979	34.56	2,773	53.78	2,845	49.68	1,446	28.04	274	4.78	298	5.78	5,727	5,156
2016	731	12.03	700	13.35	2,073	34.13	2,788	53.17	2,972	48.93	1,471	28.05	298	4.91	285	5.43	6,074	5,244
Total	5,813	9.27	6,679	10.42	22,577	35.99	34,026	53.10	30,183	48.12	19,111	29.83	4,156	6.63	4,261	6.65	62,729	64,077

South Australia

Year	37 weeks				38 weeks				39 weeks				40 weeks				Total	
	Public		Private		Public		Private		Public		Private		Public		Private		Public	Private
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	n
2005	121	8.18	64	6.19	742	50.17	468	45.26	446	30.16	383	37.04	170	11.49	119	11.51	1,479	1,034
2006	156	9.62	100	9.07	804	49.60	526	47.69	516	31.83	383	34.72	145	8.95	94	8.52	1,621	1,103
2007	155	9.31	78	6.40	772	46.39	532	43.64	569	34.19	483	39.62	168	10.10	126	10.34	1,664	1,219
2008	146	8.38	79	6.96	734	42.11	522	45.99	654	37.52	417	36.74	209	11.99	117	10.31	1,743	1,135
2009	175	9.57	98	8.36	732	40.04	527	44.97	739	40.43	442	37.71	182	9.96	105	8.96	1,828	1,172
2010	156	8.86	110	9.62	714	40.57	535	46.77	706	40.11	421	36.80	184	10.45	78	6.82	1,760	1,144
2011	180	9.45	94	8.17	774	40.65	551	47.91	770	40.44	417	36.26	180	9.45	88	7.65	1,904	1,150
2012	215	10.66	96	9.02	841	41.72	532	50.00	799	39.63	370	34.77	161	7.99	66	6.20	2,016	1,064
2013	196	9.57	118	11.09	868	42.36	540	50.75	853	41.63	335	31.48	132	6.44	71	6.67	2,049	1,064
2014	239	11.08	117	10.47	854	39.57	595	53.27	914	42.35	343	30.71	151	7.00	62	5.55	2,158	1,117
2015	238	10.82	127	11.63	801	36.41	540	49.45	1,008	45.82	352	32.23	153	6.95	73	6.68	2,200	1,092
2016	258	11.87	110	10.14	817	37.60	604	55.67	970	44.64	323	29.77	128	5.89	48	4.42	2,173	1,085
Total	2,235	9.89	1,191	8.90	9,453	41.84	6,472	48.37	8,944	39.58	4,669	34.90	1,963	8.69	1,047	7.83	22,595	13,379

Western Australia

Year	37 weeks				38 weeks				39 weeks				40 weeks				Total	
	Public		Private		Public		Private		Public		Private		Public		Private		Public	Private
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	n
2005	280	12.08	309	11.25	1,269	54.77	1,652	60.14	577	24.90	575	20.93	191	8.24	211	7.68	2,317	2,747
2006	251	10.63	326	11.46	1,298	54.98	1,712	60.20	614	26.01	600	21.10	198	8.39	206	7.24	2,361	2,844
2007	268	11.96	359	12.26	1,183	52.79	1,678	57.31	626	27.93	673	22.98	164	7.32	218	7.45	2,241	2,928
2008	270	10.75	374	12.91	1,262	50.26	1,639	56.60	781	31.10	699	24.14	198	7.89	184	6.35	2,511	2,896
2009	226	9.64	334	11.40	1,171	49.94	1,618	55.20	757	32.28	757	25.83	191	8.14	222	7.57	2,345	2,931
2010	267	11.05	323	10.94	1,150	47.60	1,613	54.64	809	33.49	798	27.03	190	7.86	218	7.38	2,416	2,952
2011	313	11.75	300	10.43	1,180	44.29	1,506	52.36	978	36.71	876	30.46	193	7.24	194	6.75	2,664	2,876
2012	306	10.85	323	10.24	1,210	42.89	1,706	54.11	1,140	40.41	909	28.83	165	5.85	215	6.82	2,821	3,153
2013	312	10.95	342	10.84	1,205	42.30	1,676	53.12	1,157	40.61	957	30.33	175	6.14	180	5.71	2,849	3,155
2014	349	11.09	397	11.74	1,313	41.74	1,737	51.34	1,294	41.13	1,025	30.30	190	6.04	224	6.62	3,146	3,383
2015	408	12.70	355	11.36	1,229	38.26	1,712	54.77	1,401	43.62	909	29.08	174	5.42	150	4.80	3,212	3,126
2016	387	10.96	407	12.56	1,433	40.58	1,709	52.73	1,542	43.67	942	29.07	169	4.79	183	5.65	3,531	3,241
Total	3,637	11.22	4,149	11.45	14,903	45.98	19,958	55.08	11,676	36.02	9,720	26.83	2,198	6.78	2,405	6.64	32,414	36,232

Tasmania

Year	37 weeks				38 weeks				39 weeks				40 weeks				Total	
	Public		Private		Public		Private		Public		Private		Public		Private		Public	Private
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	n
2005	42	11.51	27	10.47	159	43.56	137	53.10	139	38.08	76	29.46	25	6.85	18	6.98	365	258
2006	37	8.45	32	13.33	184	42.01	119	49.58	196	44.75	66	27.50	21	4.79	23	9.58	438	240
2007	28	6.85	41	12.85	164	40.10	179	56.11	186	45.48	72	22.57	31	7.58	27	8.46	409	319
2008	38	8.43	40	12.20	166	36.81	183	55.79	211	46.78	81	24.70	36	7.98	24	7.32	451	328
2009	32	7.79	38	11.31	150	36.50	179	53.27	206	50.12	93	27.68	23	5.60	26	7.74	411	336
2010	48	11.48	53	16.41	140	33.49	167	51.70	199	47.61	83	25.70	31	7.42	20	6.19	418	323
2011	47	10.31	59	15.57	183	40.13	211	55.67	186	40.79	84	22.16	40	8.77	25	6.60	456	379
2012	33	7.60	51	13.56	165	38.02	207	55.05	202	46.54	93	24.73	34	7.83	25	6.65	434	376
2013	43	8.83	72	19.30	204	41.89	171	45.84	206	42.30	110	29.49	34	6.98	20	5.36	487	373
2014	50	11.16	71	19.09	158	35.27	168	45.16	209	46.65	105	28.23	31	6.92	28	7.53	448	372
2015	65	13.21	63	17.95	196	39.84	177	50.43	191	38.82	93	26.50	40	8.13	18	5.13	492	351
2016	67	12.93	74	19.07	231	44.59	205	52.84	195	37.64	88	22.68	25	4.83	21	5.41	518	388
Total	530	9.95	621	15.36	2,100	39.42	2,103	52.02	2,326	43.66	1,044	25.82	371	6.96	275	6.80	5,327	4,043

All States																		
Year	37 weeks				38 weeks				39 weeks				40 weeks				Total	
	Public		Private		Public		Private		Public		Private		Public		Private		Public	Private
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	n
2005	2,059	9.61	1,519	8.60	9,555	44.60	8,930	50.54	7,650	35.71	5,576	31.56	2,159	10.08	1,645	9.31	21,423	17,670
2006	2,201	9.55	1,691	9.09	10,285	44.65	9,372	50.36	8,395	36.44	5,939	31.91	2,155	9.35	1,609	8.65	23,036	18,611
2007	2,226	9.41	1,772	9.08	10,197	43.11	9,688	49.65	9,184	38.83	6,402	32.81	2,046	8.65	1,652	8.47	23,653	19,514
2008	2,150	8.93	1,775	9.06	9,661	40.15	9,537	48.66	10,060	41.81	6,639	33.87	2,192	9.11	1,649	8.41	24,063	19,600
2009	2,277	9.37	1,952	9.58	9,450	38.89	9,800	48.11	10,452	43.02	6,852	33.64	2,118	8.72	1,766	8.67	24,297	20,370
2010	2,338	9.57	2,106	10.20	9,314	38.14	9,946	48.16	10,739	43.98	6,884	33.33	2,027	8.30	1,718	8.32	24,418	20,654
2011	2,569	9.87	2,062	10.15	10,186	39.14	9,790	48.19	11,216	43.10	6,827	33.60	2,054	7.89	1,637	8.06	26,025	20,316
2012	2,845	10.48	2,341	10.90	10,248	37.74	10,478	48.77	12,119	44.63	6,879	32.02	1,943	7.16	1,785	8.31	27,155	21,483
2013	2,914	10.54	2,366	11.11	10,450	37.78	10,475	49.20	12,426	44.93	6,857	32.20	1,869	6.76	1,594	7.49	27,659	21,292
2014	3,204	10.97	2,480	11.44	10,708	36.65	10,735	49.50	13,325	45.61	6,970	32.14	1,977	6.77	1,502	6.93	29,214	21,687
2015	3,484	11.75	2,520	11.92	10,660	35.94	10,697	50.60	13,529	45.61	6,561	31.04	1,987	6.70	1,362	6.44	29,660	21,140
2016	3,593	11.46	2,743	12.61	10,413	33.23	10,850	49.86	14,890	47.51	6,781	31.16	2,444	7.80	1,386	6.37	31,340	21,760
Total	31,860	10.21	25,327	10.38	121,127	38.83	120,298	49.28	133,985	42.95	79,167	32.43	24,971	8.00	19,305	7.91	311,943	244,097