

## 2012 Minnesota Infant Mortality Data Book

This data book provides trends in infant mortality in Minnesota. The source of these data is the linked birth and death records of infants who died before their first birthday and were residents of Minnesota when they were born and when they died. The birth record is linked to the death record to gather as much information possible on the experience of the mother and infant during pregnancy and at birth. These data are presented by the year of the infant's birth not year they died.



January 2014  
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**Section 1: Overall Infant Mortality Rates (IMR) per 1,000 Births by Year of Birth, Minnesota**

**Table 1 and Figure 1: Infant Death Rate (IMR) per 1,000 Births, Minnesota and United States, 2000-2012 (Birth Year)**

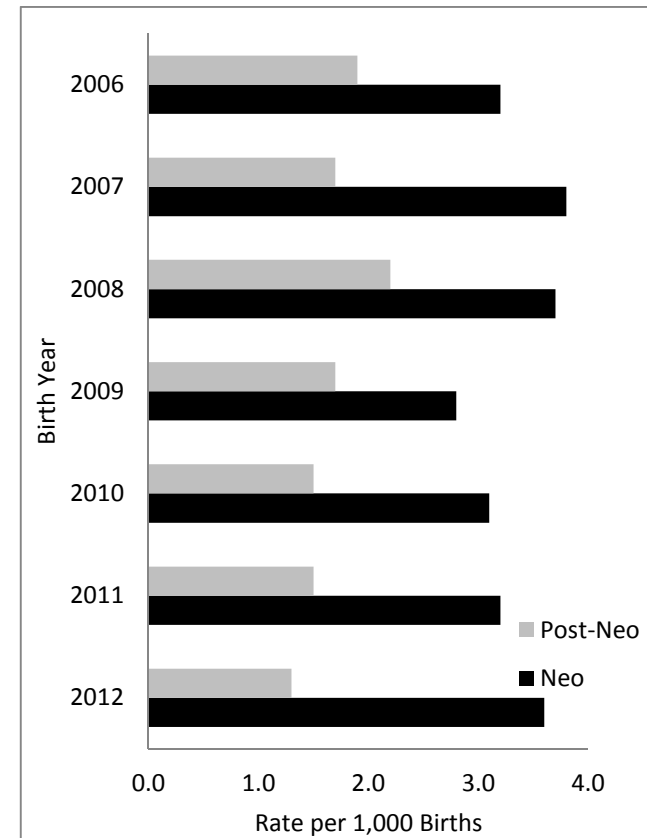
Birth Year	Minnesota			United States		
	Deaths	Births	IMR	Deaths	Births	IMR
2000	380	67,451	5.6	27,960	4,058,882	6.9
2001	346	66,617	5.2	27,523	4,026,036	6.8
2002	353	68,037	5.2	27,970	4,021,825	7.0
2003	324	70,053	4.6	27,995	4,090,007	6.8
2004	325	70,614	4.6	27,860	4,112,055	6.8
2005	370	70,920	5.2	28,384	4,138,573	6.9
2006	375	73,515	5.1	28,509	4,265,593	6.7
2007	404	73,675	5.5	29,153	4,316,233	6.8
2008	429	72,382	5.9	28,075	4,247,726	6.6
2009	315	70,083	4.5	26,408	4,130,665	6.4
2010	313	68,407	4.6	24,572	3,999,386	6.1
2011	324	68,416	4.7	24,001	3,999,386	6.1
2012	340	68,783	4.9	23,654	3,952,841	6.0

Source: Minnesota Department of Health, Center for Health Statistics and Centers for Disease Control and Prevention, WONDER, Linked Birth/Infant Death Records (note US data are by year of death)

**Table 2: Infant Mortality Rate, Overall and by Age of Infant at Death, Minnesota 1990-2012 (Birth Year)**

Birth Year	Overall IMR MN			Age of Infant at Death			
	Deaths	Births	MN Rate	Neo Deaths	Post-Neo Deaths	Neo IMR	Post-Neo IMR
1990	487	67,986	7.2	288	199	4.2	2.9
1991	495	67,037	7.4	301	194	4.5	2.9
1992	447	65,591	6.8	287	160	4.4	2.4
1993	481	64,646	7.4	308	172	4.8	2.7
1994	430	64,277	6.7	279	151	4.3	2.3
1995	452	63,259	7.1	271	181	4.3	2.9
1996	376	63,682	5.9	240	135	3.8	2.1
1997	374	64,491	5.8	241	132	3.7	2.0
1998	386	65,207	5.9	264	122	4.0	1.9
1999	402	65,953	6.1	265	137	4.0	2.1
2000	380	67,451	5.6	249	129	3.7	1.9
2001	346	66,617	5.2	232	114	3.5	1.7
2002	353	68,037	5.2	240	113	3.5	1.7
2003	324	70,053	4.6	218	106	3.1	1.5
2004	325	70,614	4.6	222	103	3.1	1.5
2005	370	70,920	5.2	238	132	3.4	1.9
2006	375	73,515	5.1	237	138	3.2	1.9
2007	404	73,675	5.5	279	125	3.8	1.7
2008	429	72,382	5.9	271	158	3.7	2.2
2009	315	70,083	4.5	193	122	2.8	1.7
2010	313	68,407	4.6	212	101	3.1	1.5
2011	324	68,416	4.7	221	103	3.2	1.5
2012	340	68,783	4.9	247	92	3.6	1.3

**Figure 2: Infant Mortality Rate for Neonatal and Post Neonatal Deaths, Minnesota 2006-2012 (Birth Year)**

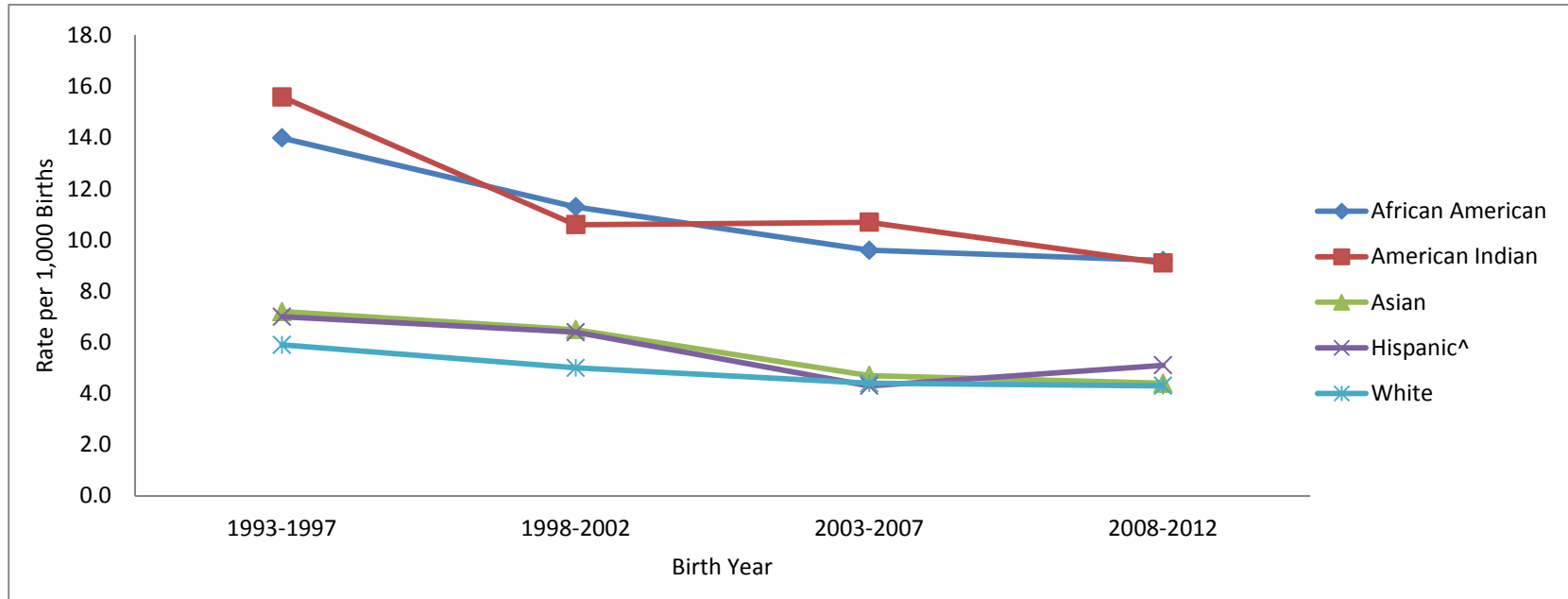


Source: Minnesota Department of Health, Center for Health Statistics  
 Neo – Infant deaths occurring in the neonatal period (less than 28 days old)  
 Post-Neo – Infant deaths occurring in the post-neonatal period (between 28 and 364 days old)

## Section 2: Infant Mortality Rates (IMR) by Characteristic of Mother

**Table 3 and Figure 3: Infant Mortality Rate by Race/Ethnicity of Mother, Minnesota 1992-2012 (Birth Year)**

Birth Year*	African American			American Indian			Asian			Hispanic (can be any race)			White		
	Deaths	Births	IMR	Deaths	Births	IMR	Deaths	Births	IMR	Deaths	Births	IMR	Deaths	Births	IMR
1993-1997	209	14,969	14.0	87	5,579	15.6	94	12,972	7.2	70	9,963	7.0	1,675	283,474	5.9
1998-2002	241	21,330	11.3	65	6,160	10.6	110	16,873	6.5	124	19,333	6.4	1,419	285,748	5.0
2003-2007	286	29,831	9.6	76	7,129	10.7	102	21,856	4.7	119	27,641	4.3	1,236	278,898	4.4
2008-2012	308	33,633	9.2	66	7,225	9.1	112	25,192	4.4	133	25,870	5.1	1,124	262,168	4.3



Source: Minnesota Department of Health, Center for Health Statistics

\*Number of events was too small for Hispanics, American Indians and Asians to present single year rates.

^Can be any race

**Table 4: Infant Mortality Rate by Age of Mother, Minnesota 1990-2012 (Birth Year)**

Birth Year	Age of Mother								
	Deaths			Births			IMR		
	15-19	20-34	35-44	15-19	20-34	35-44	15-19	20-34	35-44
1990	73	381	32	5,337	56,139	6,372	13.7	6.8	5.0
1991	64	379	46	5,343	54,799	6,763	12.0	6.9	6.8
1992	64	331	49	5,208	53,194	7,038	12.3	6.2	7.0
1993	62	354	64	5,214	52,025	7,264	11.9	6.8	8.8
1994	50	313	61	5,331	50,980	7,805	9.4	6.1	7.8
1995	59	337	54	5,215	49,627	8,277	11.3	6.8	6.5
1996	50	268	53	5,414	49,484	8,623	9.2	5.4	6.1
1997	46	276	49	5,582	49,791	8,961	8.2	5.5	5.5
1998	52	257	76	5,597	50,014	9,429	9.3	5.1	8.1
1999	47	286	67	5,425	50,688	9,659	8.7	5.6	6.9
2000	59	266	52	5,396	51,749	10,118	10.9	5.1	5.1
2001	44	245	55	5,056	51,232	10,125	8.7	4.8	5.4
2002	38	268	45	5,082	52,609	10,169	7.5	5.1	4.4
2003	31	246	46	4,892	54,443	10,550	6.3	4.5	4.4
2004	26	240	58	4,919	54,818	10,694	5.3	4.4	5.4
2005	39	281	49	4,780	55,012	10,961	8.2	5.1	4.5
2006	48	260	66	5,087	57,119	11,104	9.4	4.6	5.9
2007	51	284	64	5,182	57,718	10,582	9.8	4.9	6.0
2008	40	328	60	4,878	57,000	10,289	8.2	5.8	5.8
2009	41	230	44	4,383	56,018	10,049	9.4	4.1	4.4
2010	30	238	44	4,023	54,408	9,816	7.5	4.4	4.5
2011	22	258	42	3,467	54,819	9,946	6.3	4.7	4.2
2012	37	251	51	3,297	55,290	10,153	11.2	4.5	5.0

Source: Minnesota Department of Health, Center for Health Statistics

**Table 5: Infant Mortality Rate by Marital Status of Mother, Minnesota 1990-2012 (Birth Year)**

Birth Year	Marital Status					
	Deaths		Births		IMR	
	Married	Not Married	Married	Not Married	Married	Not Married
1990	299	188	53,795	14,191	5.6	13.2
1991	315	180	52,056	14,974	6.1	12.0
1992	277	170	50,527	15,050	5.5	11.3
1993	318	163	49,547	15,088	6.4	10.8
1994	279	151	48,777	15,491	5.7	9.7
1995	281	171	48,039	15,208	5.8	11.2
1996	230	146	47,833	15,849	4.8	9.2
1997	237	137	48,269	16,205	4.9	8.5
1998	255	131	48,449	16,734	5.3	7.8
1999	236	166	48,976	16,965	4.8	9.8
2000	226	154	50,092	17,334	4.5	8.9
2001	209	137	49,418	17,182	4.2	8.0
2002	200	152	49,314	18,707	4.1	8.1
2003	203	120	50,642	19,391	4.0	6.2
2004	198	121	50,165	20,414	3.9	5.9
2005	210	157	49,850	21,042	4.2	7.5
2006	200	175	50,200	23,297	4.0	7.5
2007	222	179	49,580	24,076	4.5	7.4
2008	228	199	48,237	24,134	4.7	8.2
2009	157	157	46,929	23,675	3.3	6.6
2010	161	152	45,744	22,654	3.5	6.7
2011	177	147	45,951	22,429	3.9	6.6
2012	186	153	45,980	22,790	4.0	6.7

**Table 6: Infant Mortality Rate by Birthplace of Mother, Minnesota 1990-2012 (Birth Year)**

Birth Year	Birthplace of Mother					
	Deaths		Births		IMR	
	Foreign Born	U.S. Born	Foreign Born	U.S. Born	Foreign Born	U.S. Born
1990	24	460	3,641	64,299	6.6	7.2
1991	25	468	3,824	63,161	6.5	7.4
1992	32	412	4,040	61,487	7.9	6.7
1993	36	442	4,334	60,250	8.3	7.3
1994	42	376	4,619	59,460	9.1	6.3
1995	34	411	5,010	58,021	6.8	7.1
1996	39	329	5,611	57,947	7.0	5.7
1997	33	329	6,427	57,990	5.1	5.7
1998	44	335	6,951	58,178	6.3	5.8
1999	54	337	7,829	57,966	6.9	5.8
2000	61	314	9,149	58,228	6.7	5.4
2001	61	274	9,886	56,612	6.2	4.8
2002	52	292	10,534	57,394	4.9	5.1
2003	40	279	11,189	58,761	3.6	4.7
2004	47	264	11,734	58,734	4.0	4.5
2005	77	286	12,403	58,387	6.2	4.9
2006	67	299	13,022	60,175	5.1	5.0
2007	57	336	13,273	60,141	4.3	5.6
2008	84	339	13,336	58,897	6.3	5.8
2009	61	253	12,757	57,751	4.8	4.4
2010	49	259	12,260	56,049	4.0	4.6
2011	55	269	11,806	56,610	4.7	4.8
2012	51	289	12,202	56,581	4.2	5.1

Source: Minnesota Department of Health, Center for Health Statistics

**Table 7: Infant Mortality Rate by Number of Years of Mother's Education, Minnesota 1990-2012 (Birth Year)**

Birth Year	Mother's Education								
	Deaths			Births			IMR		
	Less than 12 years	12-15 years	16 years or more	Less than 12 years	12-15 years	16 years or more	Less than 12 years	12-15 years	16 years or more
1990	88	266	83	6,739	42,195	16,022	13.1	6.3	5.2
1991	78	294	86	6,733	41,175	16,484	11.6	7.1	5.2
1992	72	264	76	6,486	39,704	16,928	11.1	6.6	4.5
1993	77	278	94	6,569	38,746	17,319	11.7	7.2	5.4
1994	68	229	90	6,280	37,760	17,514	10.8	6.1	5.1
1995	77	253	102	6,281	36,483	18,457	12.3	6.9	5.5
1996	56	216	82	6,382	35,680	20,199	8.8	6.1	4.1
1997	55	222	72	6,557	36,040	20,595	8.4	6.2	3.5
1998	62	194	101	6,751	35,833	21,159	9.2	5.4	4.8
1999	60	216	93	7,028	35,347	22,126	8.5	6.1	4.2
2000	64	205	86	7,150	36,081	22,702	9.0	5.7	3.8
2001	65	161	88	7,043	34,717	23,239	9.2	4.6	3.8
2002	50	198	88	7,455	35,308	24,101	6.7	5.6	3.7
2003	50	175	84	7,349	35,921	25,558	6.8	4.9	3.3
2004	47	159	84	7,520	35,629	26,079	6.3	4.5	3.2
2005	50	211	82	7,552	36,016	25,842	6.6	5.9	3.2
2006	49	194	93	8,207	36,873	26,437	6.0	5.3	3.5
2007	48	204	114	8,038	36,776	26,968	6.0	5.5	4.2
2008	58	246	98	7,767	36,203	26,814	7.5	6.8	3.7
2009	53	169	75	7,481	35,028	26,747	7.1	4.8	2.8
2010	40	166	91	6,851	33,328	26,697	5.8	5.0	3.4
2011*	52	175	90	7,281	34,237	26,259	7.1	5.1	3.4
2012*	49	183	102	7,479	34,299	26,324	6.6	5.3	3.9

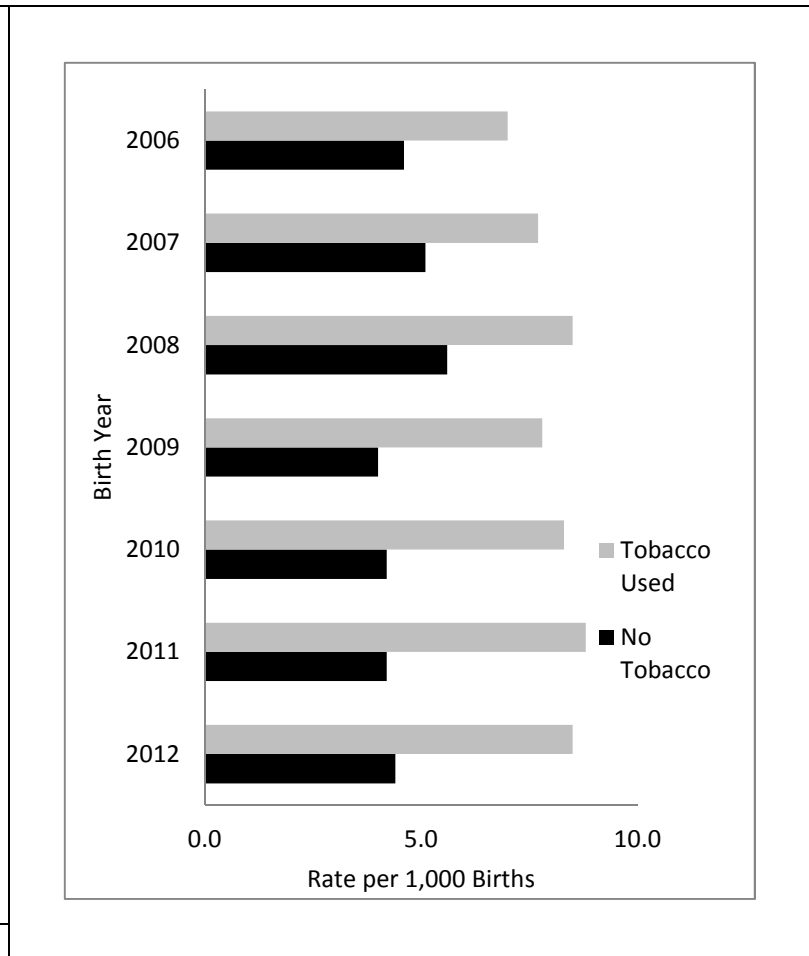
Source: Minnesota Department of Health, Center for Health Statistics

\*In 2011 the education question on the birth record changed, results from 2011 and on may not be directly comparable to previous years. See birth record changes at the end of this document.



**Table 8 and Figure 8: Infant Mortality Rate by Tobacco Use of Mother during Pregnancy, Minnesota 1990-2012 (Birth Year)**

Birth Year	Tobacco Use during Pregnancy					
	Deaths		Births		IMR	
	No Tobacco	Tobacco Used	No Tobacco	Tobacco Used	No Tobacco	Tobacco Used
1990	325	107	54,261	10,178	6.0	10.5
1991	341	116	53,540	9,705	6.4	12.0
1992	298	96	51,946	9,301	5.7	10.3
1993	349	82	52,033	8,761	6.7	9.4
1994	303	83	52,624	8,456	5.8	9.8
1995	325	102	52,660	8,142	6.2	12.5
1996	281	59	53,046	7,989	5.3	7.4
1997	264	78	52,861	7,859	5.0	9.9
1998	273	62	53,182	7,523	5.1	8.2
1999	284	67	54,454	7,301	5.2	9.2
2000	277	48	56,338	7,043	4.9	6.8
2001	233	50	54,328	6,853	4.3	7.3
2002	262	58	57,578	6,725	4.6	8.6
2003	251	46	60,092	6,713	4.2	6.9
2004	256	47	62,225	6,742	4.1	7.0
2005	288	50	62,496	6,561	4.6	7.6
2006	303	47	65,231	6,713	4.6	7.0
2007	332	54	65,010	7,036	5.1	7.7
2008	357	60	63,928	7,085	5.6	8.5
2009	252	54	62,964	6,910	4.0	7.8
2010	254	56	61,041	6,750	4.2	8.3
2011*	254	64	60,305	7,490	4.2	8.8
2012*	269	66	61,616	7,320	4.4	8.5



Source: Minnesota Department of Health, Center for Health Statistics \*In 2011 the question on tobacco use during pregnancy changed on the birth record, results from 2011 and on may not be directly comparable to previous years. See Birth Record Changes at the end of this document.

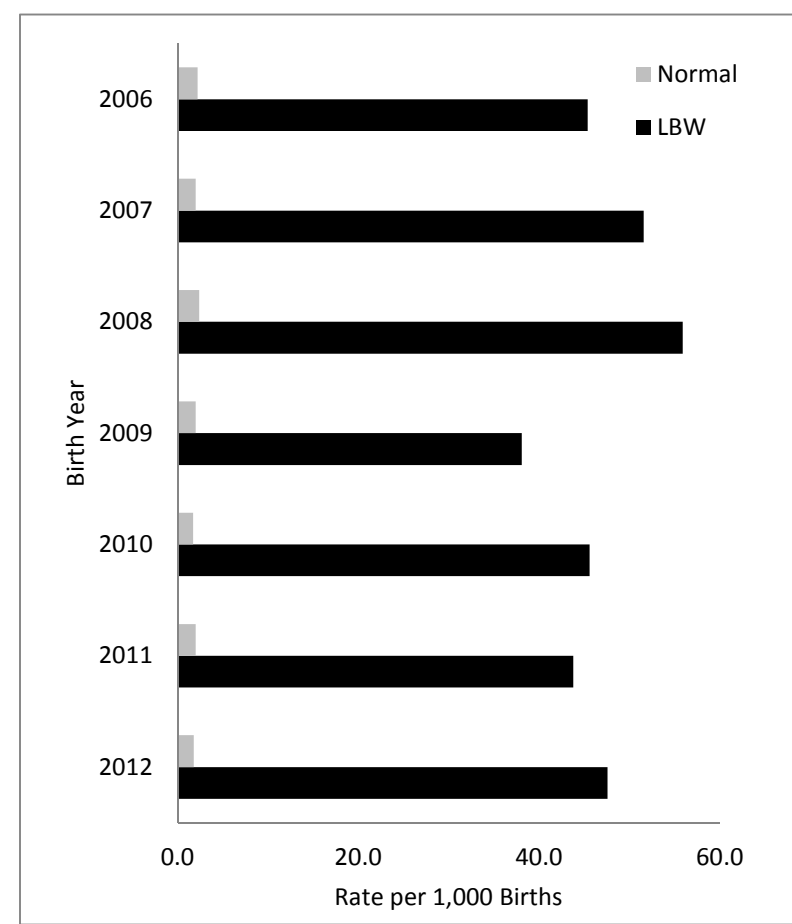
<b>Table 9: Infant Mortality Rate by Prenatal Care, Minnesota 1990-2012 (Birth Year)</b>							<b>Table 10: Infant Mortality Rate by Number of Infants, Minnesota 1990-2012 (Birth Year)</b>						
Birth Year	Prenatal Care Initiated in the First Trimester			Adequate or Intensive Prenatal Care (GINDEX)*			Singleton			Multiple (e.g., twin or triplet)			
	Deaths	Births	IMR	Deaths	Births	IMR	Deaths	Births	IMR	Deaths	Births	IMR	
1990	292	51,348	5.7	234	44,146	5.3	420	66,399	6.3	67	1,587	42.2	
1991	314	51,064	6.1	247	44,139	5.6	425	65,447	6.5	70	1,590	44.0	
1992	294	51,045	5.8	224	43,873	5.1	378	63,994	5.9	69	1,597	43.2	
1993	337	51,487	6.5	257	43,873	5.9	430	63,037	6.8	51	1,608	31.7	
1994	287	51,257	5.6	208	43,359	4.8	365	62,479	5.8	65	1,792	36.3	
1995	313	50,898	6.1	235	43,301	5.4	388	61,431	6.3	64	1,819	35.2	
1996	269	50,671	5.3	212	43,367	4.9	333	61,766	5.4	43	1,907	22.5	
1997	256	51,597	5.0	202	43,897	4.6	327	62,447	5.2	47	2,044	23.0	
1998	280	52,009	5.4	201	43,881	4.6	316	63,094	5.0	70	2,109	33.2	
1999	275	52,172	5.3	204	43,337	4.7	359	63,829	5.6	43	2,122	20.3	
2000	256	53,946	4.7	184	44,406	4.1	328	65,083	5.0	52	2,365	22.0	
2001	246	54,090	4.5	165	44,659	3.7	283	64,299	4.4	63	2,309	27.3	
2002	258	55,987	4.6	173	46,437	3.7	288	65,661	4.4	65	2,370	27.4	
2003	232	57,935	4.0	178	48,753	3.7	269	67,634	4.0	55	2,416	22.8	
2004	254	58,410	4.3	180	48,982	3.7	284	68,112	4.2	41	2,501	16.4	
2005	283	58,125	4.9	182	48,521	3.8	325	68,422	4.7	45	2,498	18.0	
2006	282	59,928	4.7	188	49,671	3.8	323	71,066	4.5	52	2,449	21.2	
2007	284	60,085	4.7	185	49,816	3.7	323	71,124	4.5	80	2,540	31.5	
2008	332	60,180	5.5	234	50,424	4.6	351	69,817	5.0	78	2,554	30.5	
2009	248	59,342	4.2	180	49,338	3.6	270	68,012	4.0	45	2,599	17.3	
2010	248	57,975	4.3	178	49,451	3.6	271	65,979	4.1	42	2,428	17.3	
2011	234	54,232	4.3	159	47,201	3.4	277	65,979	4.2	47	2,436	19.3	
2012	245	51,115	4.4	179	49,350	3.6	293	66,307	4.4	47	2,476	19.0	

Source: Minnesota Department of Health, Center for Health Statistics  
 \*Prenatal care starting in the 1<sup>st</sup> trimester and the woman having an adequate number of visits based on the infant's gestational age at birth.

### Section 3: Infant Mortality Rates (IMR) by Characteristic of Infant

**Table 11 and Figure 11: Infant Mortality Rate by Birth Weight, Minnesota 1990-2012 (Birth Year)**

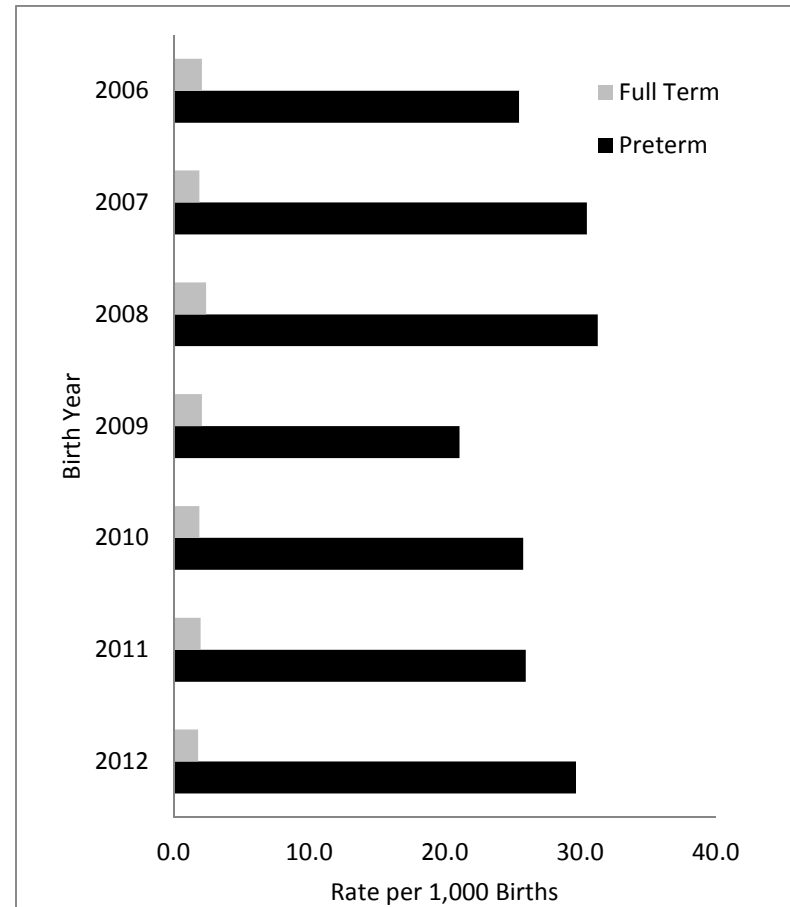
Birth Year	Birth Weight					
	Deaths		Births		Rate	
	LBW	Normal	LBW	Normal	LBW	Normal
1990	272	214	3,443	64,497	79.0	3.3
1991	265	218	3,579	63,394	74.0	3.4
1992	251	192	3,414	62,152	73.5	3.1
1993	243	231	3,537	61,070	68.7	3.8
1994	242	187	3,651	60,591	66.3	3.1
1995	240	210	3,717	59,520	64.6	3.5
1996	198	174	3,716	59,953	53.3	2.9
1997	212	155	3,801	60,652	55.8	2.6
1998	225	149	3,806	61,364	59.1	2.4
1999	234	166	4,016	61,902	58.3	2.7
2000	236	138	4,139	63,263	57.0	2.2
2001	210	131	4,179	62,408	50.3	2.1
2002	222	125	4,282	63,728	51.8	2.0
2003	192	127	4,418	65,605	43.5	1.9
2004	176	142	4,645	65,949	37.9	2.2
2005	228	140	4,685	66,214	48.7	2.1
2006	220	150	4,849	68,647	45.4	2.2
2007	257	138	4,982	68,669	51.6	2.0
2008	260	161	4,655	67,701	55.9	2.4
2009	177	134	4,645	65,943	38.1	2.0
2010	202	109	4,429	63,907	45.6	1.7
2011	193	125	4,404	63,957	43.8	2.0
2012	217	115	4,563	64,186	47.6	1.8



Source: Minnesota Department of Health, Center for Health Statistics  
 LBW – less than 2,500 grams at birth  
 Normal – 2,500 grams or more

**Table 12 and Figure 12: Infant Mortality Rate by Gestational Age, Minnesota 1990-2012 (Birth Year)**

Birth Year	Gestational Age					
	Deaths		Births		Rate	
	Preterm	Full Term	Preterm	Full Term	Preterm	Full Term
1990	201	196	4,678	56,648	43.0	3.5
1991	219	196	4,999	56,129	43.8	3.5
1992	214	164	4,937	55,458	43.3	3.0
1993	199	204	5,099	54,607	39.0	3.7
1994	188	162	4,987	53,564	37.7	3.0
1995	170	188	5,036	52,823	33.8	3.6
1996	158	156	5,157	52,883	30.6	2.9
1997	167	145	5,163	53,172	32.3	2.7
1998	170	134	5,226	52,923	32.5	2.5
1999	170	142	5,218	52,701	32.6	2.7
2000	190	117	5,496	53,812	34.6	2.2
2001	157	119	5,575	53,721	28.2	2.2
2002	184	108	5,825	55,347	31.6	2.0
2003	154	111	6,210	56,540	24.8	2.0
2004	142	120	6,475	56,830	21.9	2.1
2005	176	110	6,558	56,424	26.8	1.9
2006	168	120	6,591	57,570	25.5	2.1
2007	193	109	6,330	57,223	30.5	1.9
2008	192	137	6,134	57,483	31.3	2.4
2009	128	122	6,053	56,869	21.1	2.1
2010	159	106	6,156	56,448	25.8	1.9
2011	154	109	5,933	55,770	26.0	2.0
2012	194	106	6,534	59,011	29.7	1.8



Source: Minnesota Department of Health, Center for Health Statistics  
 Preterm – Less than 37 weeks gestation  
 Full Term – 37 weeks or more gestation

## Section 4: Birth Record Changes

### Mother's Education

Prior to March 2011 mothers were asked to indicate the number of years of education. In March 2011 this item was replaced by the following:

Please check the box that best describes your highest level of education completed at the time of this baby's birth:

- |  |  |
|--|--|
| <input type="checkbox"/> 8th grade or less                     | <input type="checkbox"/> Associate degree (e.g. AA, AS)  |
| <input type="checkbox"/> 9th – 12th grade, no diploma          | <input type="checkbox"/> Bachelor's degree (e.g. BA, BS)   |
| <input type="checkbox"/> High school graduate or GED completed | <input type="checkbox"/> Master's degree (e.g. MA, MS, MEng, MEd, MSW, MBA)                            |
| <input type="checkbox"/> Some college credit, but no degree    | <input type="checkbox"/> Doctorate (e.g. PhD, EdD) or Professional degree (e.g. MD, DDS, DVM, LLB, JD) |

To trend education, the 2011 levels of education were converted to:

- 8th gr or less and 9-12th gr no diploma = 0 to 11 years
- High school grad/GED and associate's degree = 12 years to 15 years
- Bachelor's, master's and doctorate degrees = 16 or more

### Tobacco Use

Prior to March 2011, mothers were asked if they used tobacco during pregnancy, and then were asked to indicate the average number of cigarettes per day. The new item is as follows:

Did you smoke cigarettes 3 months before or during this pregnancy?

If yes, indicate number of cigarettes or packs per day:

\_\_3 months before \_\_First trimester \_\_Second trimester \_\_Third trimester

To trend the tobacco variable, the 2011 data excluded all mothers who smoked only 3 months before pregnancy.

## Infant Mortality Resources at the Minnesota Department of Health

Minnesota infant mortality statistics:

<http://www.health.state.mn.us/divs/chs/infantmortality/index.html>

Infant Mortality Reduction Initiative

<http://www.health.state.mn.us/divs/fh/mch/mortality/index.html>

## Infant Mortality Resources at the Centers for Disease Control and Prevention

National Center for Health Statistics – Linked Birth and Infant Death Data

<http://www.cdc.gov/nchs/linked.htm>

Reproductive Health – Infant Mortality

<http://www.cdc.gov/reproductivehealth/MaternalInfantHealth/InfantMortality.htm>

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*The Minnesota Center for Health Statistics collects, analyzes and disseminates data on the health of Minnesotans to help develop public health policies and programs.*

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