

# Kansas

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## Adequacy of Prenatal Care Utilization Index Kansas, 2008

# Research Summary

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Our Vision – Healthy Kansans Living in Safe and Sustainable Environments

Our Mission – To Protect the Health and Environment of Kansans by Promoting  
Responsible Choices

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## Introduction

Prenatal care is defined as pregnancy-related health care services provided to a woman between conception and delivery. It is important to track because there is a strong association between prenatal care and pregnancy outcome. Pregnant women who receive inadequate care are at increased risk of bearing infants who have low birth weight, are stillborn, or die within the first year of life.<sup>1</sup> This data can be analyzed to suggest population groups and geographic areas in need of intervention, therefore protecting the health of these future Kansans.

Accurate measurement of prenatal care depends on the accuracy of the index used. Beginning with 1998 data, the Kansas Department of Health and Environment (KDHE) transitioned from a modified Kessner Index to the Adequacy of Prenatal Care Utilization (APNCU) Index (often referred to as the Kotelchuck Index).<sup>2</sup> This index attempts to characterize prenatal care (PNC) utilization on two independent and distinctive dimensions: adequacy of initiation of PNC and adequacy of received services (once PNC has begun). The index uses information readily available on the Kansas birth certificate (number of prenatal care visits, date of first prenatal visit, date of last menses, and gestational length of pregnancy). The APNCU Index combines these data to characterize adequacy of pregnancy-related health services provided to a woman between conception and delivery. The APNCU categorizes care as inadequate, intermediate, adequate or adequate plus. The index does not assess quality of the prenatal care that is delivered, only its utilization.

This summary is an enhancement of information contained in the 2008 *Annual Summary of Vital Statistics*. Both products can be found at <http://www.kdheks.gov/bphi/>.

<sup>1</sup> C. Arden Mills, Amy Fine, and Sharon Adams-Taylor. *Monitoring Children's Health: Key Indicators* (2<sup>nd</sup> edition), American Public Health Association, 1989.

<sup>2</sup> Kotelchuck M. An Evaluation of the Kessner Adequacy of Prenatal Care Index and a proposed Adequacy of Prenatal Care Utilization Index. *American Journal of Public Health*, 1994; 84:1414-1420.

## Highlights

Beginning in 2005, the collection process for prenatal care data changed. Please see the Technical Notes.

Adequacy of prenatal care utilization could be calculated on 39,508 Kansas resident live births in 2008, compared to 39,055 in 2007 (Figure 1). This represented 94.5 percent of the 41,815 resident births reported. While births decreased by 0.3 percent from 2007, reporting on variables needed to calculate prenatal care utilization improved by 1.2 percent.

Of the 39,508 Kansas resident births for which prenatal care utilization could be calculated in 2008, 77.6 percent received adequate or better prenatal care, including 30.4 percent with adequate-plus care; 22.5 percent received less than adequate prenatal care, including 15.8 percent inadequate care (Table 1).

In 2008, reported inadequate prenatal care utilization decreased by 1.8 percent compared to 2007. However, the percentage of adequate care increased by 5.0 percent.

Among mothers whose prenatal care utilization was classified as inadequate (6,238), the vast majority (5,946) were due to late initiation of care. Only a minority of women (292) who initiated their care within the first four months of care received inadequate care (Figure 1).

Comanche County had the highest percentage of mothers with adequate or better prenatal care (93.3) followed by Gove (90.0) and Pawnee Counties (89.2). Haskell County had the lowest percentage of adequate or better prenatal care (52.8), followed by Lane (52.6) and Cherokee (46.1) Counties (Table 1).

The county with the highest percentage of mothers with inadequate care was Cherokee (40.8), followed by Doniphan (35.0) and Haskell (34.7). Gove and Rawlins Counties had the lowest percentage of inadequate care (0.0), followed by Sheridan County (3.1) (Table 1).

Among mothers of low birth weight infants, 80.0 percent received adequate or better care, while 16.9 percent experienced inadequate care (Table 2).

The proportion of mothers who received adequate or better prenatal care was highest among White non-Hispanic (82.8 percent), followed by Asian/Pacific Islander non-Hispanic (80.9 percent) and Native American non-Hispanic (68.8 percent). The population group with the lowest percent was Hispanic (59.9) (Table 3).

The proportion of mothers reporting inadequate care were Black non-Hispanic (25.1 percent), Native American non-Hispanic (27.1 percent) and Hispanic (28.7 percent). These rates are more than twice that of White non-Hispanic women who experienced inadequate care at a rate of 11.8 percent (Table 3).

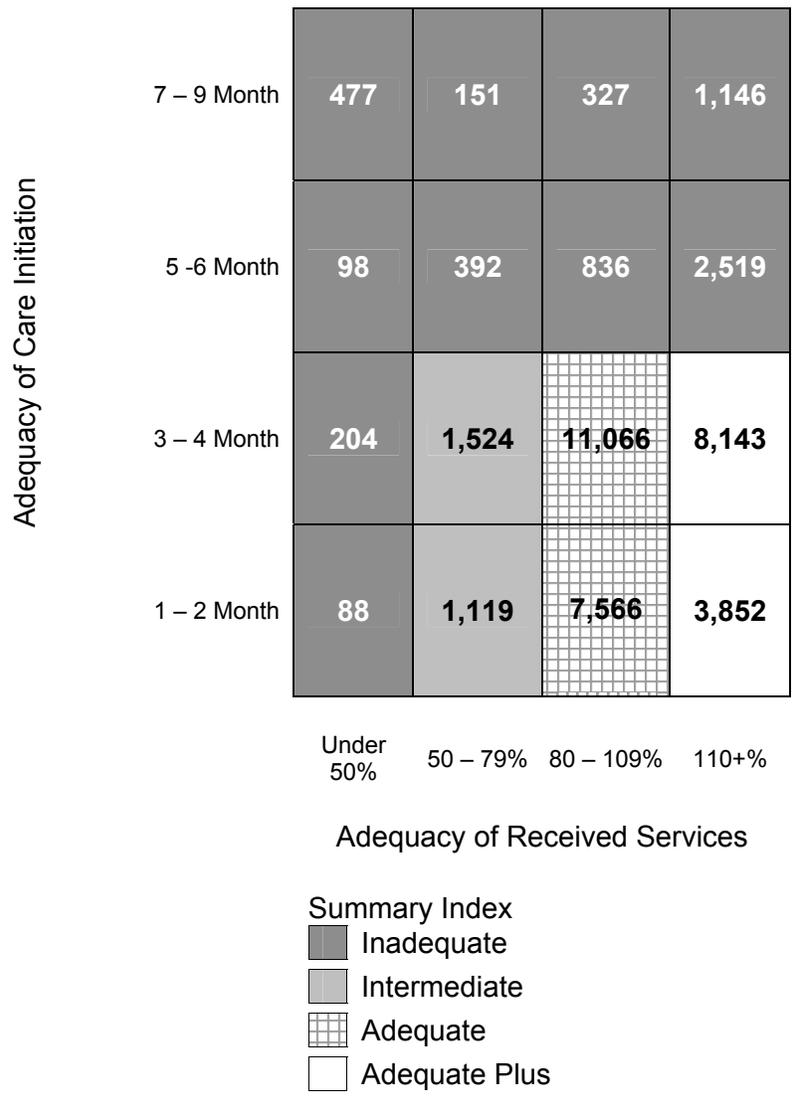
The payer with the highest proportion of mothers who received adequate or adequate plus prenatal care was private insurance (88.6%) followed by Champus/Tricare (79.5%). The payer with the highest proportion of mothers with inadequate prenatal care was self pay (36.6%) (Table 4).

Among first births, the percent of mothers with adequate or adequate plus prenatal care (80.0) was 5.4 percent greater than among second or higher live births (75.9) (Table 5).

Among first births, the percent of mothers with inadequate prenatal care (13.3) was 22.9 percent less than among second or higher live births (17.3) (Table 5).

In all age groups, the proportion of mothers with inadequate prenatal care among second and higher order live births was significantly greater than among mothers of first births (Table 5).

Figure 1. Adequacy of Prenatal Care Utilization Index  
 Kansas Residents\*, 2008



\* Includes only the 39,508 Kansas resident births for which the number of prenatal visits, date of first prenatal visit, and the date of last menses were reported on the birth certificate.

Table 1. Adequacy of Prenatal Care Utilization (APNCU) Index  
By County of Residence  
Kansas, 2008

County of Residence	Live Births*	APNCU Category**								Not Stated***
		Adequate Plus		Adequate		Intermediate		Inadequate		
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	
Kansas.....	41,815	11,995	30.4	18,632	47.2	2,643	6.7	6,238	15.8	2,307
Allen.....	183	71	41.5	64	37.4	14	8.2	22	12.9	12
Anderson.....	112	37	33.9	52	47.7	13	11.9	7	6.4	3
Atchison.....	204	71	43.0	64	38.8	6	3.6	24	14.5	39
Barber.....	69	19	28.4	32	47.8	2	3.0	14	20.9	2
Barton.....	383	156	41.6	147	39.2	15	4.0	57	15.2	8
Bourbon.....	239	121	54.5	55	24.8	8	3.6	38	17.1	17
Brown.....	155	39	26.7	67	45.9	10	6.8	30	20.5	9
Butler.....	840	186	22.6	491	59.7	34	4.1	111	13.5	18
Chase.....	29	9	32.1	14	50.0	2	7.1	3	10.7	1
Chautauqua.....	45	15	46.9	9	28.1	2	6.3	6	18.8	13
Cherokee.....	295	19	25.0	16	21.1	10	13.2	31	40.8	219
Cheyenne.....	22	11	52.4	7	33.3	2	9.5	1	4.8	1
Clark.....	26	10	38.5	13	50.0	0	0.0	3	11.5	0
Clay.....	100	33	34.7	40	42.1	9	9.5	13	13.7	5
Cloud.....	127	32	25.6	62	49.6	13	10.4	18	14.4	2
Coffey.....	99	42	43.3	37	38.1	8	8.2	10	10.3	2
Comanche.....	15	5	33.3	9	60.0	0	0.0	1	6.7	0
Cowley.....	505	190	38.5	170	34.5	19	3.9	114	23.1	12
Crawford.....	529	140	30.0	182	39.0	58	12.4	87	18.6	62
Decatur.....	16	4	26.7	6	40.0	1	6.7	4	26.7	1
Dickinson.....	221	61	28.0	120	55.0	13	6.0	24	11.0	3
Doniphan.....	84	5	25.0	6	30.0	2	10.0	7	35.0	64
Douglas.....	1,273	580	46.4	465	37.2	35	2.8	170	13.6	23
Edwards.....	34	12	35.3	16	47.1	1	2.9	5	14.7	0
Elk.....	25	5	21.7	11	47.8	1	4.3	6	26.1	2
Ellis.....	385	118	31.1	193	50.8	34	8.9	35	9.2	5
Ellsworth.....	50	4	8.0	36	72.0	2	4.0	8	16.0	0
Finney.....	791	186	23.7	239	30.4	126	16.1	234	29.8	6
Ford.....	724	173	24.3	260	36.5	84	11.8	196	27.5	11
Franklin.....	333	112	33.6	156	46.8	10	3.0	55	16.5	0
Geary.....	803	218	27.6	325	41.1	68	8.6	179	22.7	13
Gove.....	30	14	46.7	13	43.3	3	10.0	0	0.0	0
Graham.....	24	11	45.8	9	37.5	2	8.3	2	8.3	0
Grant.....	145	15	11.1	65	48.1	19	14.1	36	26.7	10
Gray.....	96	26	27.1	36	37.5	13	13.5	21	21.9	0
Greeley.....	14	5	35.7	6	42.9	1	7.1	2	14.3	0
Greenwood.....	86	23	26.7	45	52.3	2	2.3	16	18.6	0
Hamilton.....	43	9	22.0	17	41.5	3	7.3	12	29.3	2
Harper.....	74	18	24.7	38	52.1	1	1.4	16	21.9	1
Harvey.....	466	193	42.3	191	41.9	6	1.3	66	14.5	10
Haskell.....	77	11	15.3	27	37.5	9	12.5	25	34.7	5
Hodgeman.....	23	8	34.8	12	52.2	1	4.3	2	8.7	0
Jackson.....	175	54	31.6	82	48.0	12	7.0	23	13.5	4
Jefferson.....	196	97	51.9	63	33.7	9	4.8	18	9.6	9
Jewell.....	26	8	30.8	10	38.5	3	11.5	5	19.2	0
Johnson.....	7,843	2,628	36.5	3,411	47.4	520	7.2	638	8.9	646
Kearny.....	59	8	13.8	28	48.3	6	10.3	16	27.6	1
Kingman.....	91	18	21.4	51	60.7	2	2.4	13	15.5	7
Kiowa.....	23	10	43.5	6	26.1	3	13.0	4	17.4	0
Labette.....	294	87	36.7	89	37.6	16	6.8	45	19.0	57
Lane.....	19	3	15.8	7	36.8	4	21.1	5	26.3	0
Leavenworth.....	961	338	37.4	398	44.0	75	8.3	93	10.3	57
Lincoln.....	39	10	25.6	22	56.4	1	2.6	6	15.4	0
Linn.....	114	50	45.9	37	33.9	4	3.7	18	16.5	5
Logan.....	20	7	35.0	8	40.0	0	0.0	5	25.0	0

Table 1. Adequacy of Prenatal Care Utilization (APNCU) Index  
by County of Residence  
Kansas, 2008

County of Residence	Live Births*	APNCU Category**								Not Stated***
		Adequate Plus		Adequate		Intermediate		Inadequate		
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	
Lyon.....	494	145	30.1	179	37.1	35	7.3	123	25.5	12
Marion.....	123	45	36.6	63	51.2	6	4.9	9	7.3	0
Marshall.....	131	44	33.6	60	45.8	13	9.9	14	10.7	0
McPherson.....	381	154	40.8	181	48.0	14	3.7	28	7.4	4
Meade.....	66	12	21.1	22	38.6	5	8.8	18	31.6	9
Miami.....	392	148	38.2	172	44.4	23	5.9	44	11.4	5
Mitchell.....	69	14	20.3	40	58.0	5	7.2	10	14.5	0
Montgomery.....	504	135	32.3	172	41.1	45	10.8	66	15.8	86
Morris.....	58	21	36.8	28	49.1	3	5.3	5	8.8	1
Morton.....	43	6	15.4	17	43.6	3	7.7	13	33.3	4
Nemaha.....	122	33	27.7	62	52.1	13	10.9	11	9.2	3
Neosho.....	217	88	43.1	87	42.6	4	2.0	25	12.3	13
Ness.....	35	9	25.7	18	51.4	3	8.6	5	14.3	0
Norton.....	41	17	42.5	13	32.5	6	15.0	4	10.0	1
Osage.....	203	96	48.0	73	36.5	11	5.5	20	10.0	3
Osborne.....	43	13	30.2	21	48.8	2	4.7	7	16.3	0
Ottawa.....	58	9	15.5	44	75.9	2	3.4	3	5.2	0
Pawnee.....	71	29	44.6	29	44.6	2	3.1	5	7.7	6
Phillips.....	58	16	28.1	26	45.6	8	14.0	7	12.3	1
Pottawatomie.....	340	139	41.9	130	39.2	19	5.7	44	13.3	8
Pratt.....	142	36	26.3	71	51.8	10	7.3	20	14.6	5
Rawlins.....	22	8	36.4	10	45.5	4	18.2	0	0.0	0
Reno.....	851	310	38.3	316	39.0	35	4.3	149	18.4	41
Republic.....	53	14	26.4	27	50.9	2	3.8	10	18.9	0
Rice.....	116	36	31.9	44	38.9	8	7.1	25	22.1	3
Riley.....	1,061	422	40.2	415	39.6	69	6.6	143	13.6	12
Rooks.....	52	11	22.0	24	48.0	3	6.0	12	24.0	2
Rush.....	31	10	32.3	15	48.4	2	6.5	4	12.9	0
Russell.....	84	18	22.2	46	56.8	9	11.1	8	9.9	3
Saline.....	846	143	17.1	531	63.6	58	6.9	103	12.3	11
Scott.....	71	23	32.9	21	30.0	6	8.6	20	28.6	1
Sedgwick.....	8,262	1,338	16.7	5,006	62.5	228	2.8	1,436	17.9	254
Seward.....	561	114	24.1	164	34.7	36	7.6	159	33.6	88
Shawnee.....	2,566	1,038	41.8	935	37.7	150	6.0	359	14.5	84
Sheridan.....	32	6	18.8	23	71.9	2	6.3	1	3.1	0
Sherman.....	86	25	31.3	37	46.3	8	10.0	10	12.5	6
Smith.....	35	14	42.4	15	45.5	3	9.1	1	3.0	2
Stafford.....	49	16	33.3	23	47.9	0	0.0	9	18.8	1
Stanton.....	43	12	31.6	14	36.8	2	5.3	10	26.3	5
Stevens.....	86	9	12.3	36	49.3	13	17.8	15	20.5	13
Sumner.....	333	83	25.4	182	55.7	6	1.8	56	17.1	6
Thomas.....	108	46	42.6	42	38.9	5	4.6	15	13.9	0
Trego.....	30	10	33.3	13	43.3	5	16.7	2	6.7	0
Wabaunsee.....	83	32	40.0	33	41.3	2	2.5	13	16.3	3
Wallace.....	14	3	21.4	7	50.0	1	7.1	3	21.4	0
Washington.....	57	18	33.3	26	48.1	6	11.1	4	7.4	3
Wichita.....	25	9	37.5	8	33.3	2	8.3	5	20.8	1
Wilson.....	136	48	36.1	56	42.1	6	4.5	23	17.3	3
Woodson.....	27	7	25.9	12	44.4	5	18.5	3	11.1	0
Wyandotte.....	2,850	628	24.0	1,008	38.6	418	16.0	559	21.4	237

\*Includes only Kansas resident live births for which number of prenatal visits, date of first prenatal visit and date of last menses were reported on the birth certificate.

\*\*See Technical Notes

\*\*\*Number of live births with insufficient information (Not Stated) to calculate APNCU. Residence data.

Table 2. Number and Percent of Live Births by Birth Weight by Adequacy of Prenatal Care Utilization (APNCU) Index Kansas, 2008

Birth Weight (Grams)	Live Births*	APNCU Category								Not Stated**
		Adequate Plus		Adequate		Intermediate		Inadequate		
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	
Total.....	39,508	11,995	30.4	18,632	47.2	2,643	6.7	6,238	15.8	2,307
Under 2,500(Low).....	2,729	1,603	58.7	582	21.3	82	3.0	462	16.9	285
2,500-4,499(Normal)...	36,354	10,289	28.3	17,815	49.0	2,527	7.0	5,723	15.7	1,993
4,500 and Over(High)...	415	98	23.6	233	56.1	34	8.2	50	12.0	28
Not Stated.....	10	5	n/a	2	n/a	0	n/a	3	n/a	1

n/a Not applicable

\*Includes only Kansas resident live births for which number of prenatal visits, date of first prenatal visit and date of last menses were reported on the birth certificate.

\*\* Number of live births with insufficient information (Not Stated) to calculate APNCU. Residence data.

Source: Bureau of Public Health Informatics  
Kansas Department of Health and Environment

Table 3. Number and Percent of Live Births by Population Groups by Adequacy of Prenatal Care Utilization (APNCU) Index Kansas, 2008

Population Groups	Live Births*	APNCU Category												Not Stated***	
		Adequate Plus		Adequate		Intermediate		Inadequate				Number	Percent		
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent				
Total.....	39,508	11,995	30.4	18,632	47.2	2,643	6.7	6,238	15.8						2,307
White Non-Hispanic.....	28,214	9,437	33.4	13,948	49.4	1,509	5.3	3,320	11.8						1,649
Black Non-Hispanic.....	2,756	678	24.6	1,142	41.4	244	8.9	692	25.1						180
Native American	240	59	24.6	106	44.2	10	4.2	65	27.1						25
Non-Hispanic.....															
Asian/Pacific Islander	1,134	322	28.4	595	52.5	76	6.7	141	12.4						58
Non-Hispanic.....															
Other Non-Hispanic** .....	708	194	27.4	281	39.7	66	9.3	167	23.6						38
Hispanic Any Race.....	6,434	1,301	20.2	2,552	39.7	735	11.4	1,846	28.7						347
Not Stated.....	22	4	n/a	8	n/a	3	n/a	7	n/a						10

n/a Not applicable

\*Includes only Kansas resident live births for which number of prenatal visits, date of first prenatal visit and date of last menses were reported on the birth certificate.

\*\*Includes multiple races

\*\*\*Number of live births with insufficient information (Not Stated) to calculate APNCU. Residence data.

Source: Bureau of Public Health Informatics  
Kansas Department of Health and Environment

Table 4. Number and Percent of Live Births by Payer by Adequacy of Prenatal Care Utilization (APNCU) Index Kansas, 2008.

Payer	Live Births*	APNCU Category										Not Stated**
		Adequate Plus		Adequate		Intermediate		Inadequate		Number	Percent	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent			
Total	39,508	11,995	30.4	18,632	47.2	2,643	6.7	6,238	15.8	2,307		
Medicaid	10,403	3,146	30.2	3,848	37.0	765	7.4	2,644	25.4	286		
Private Insurance	21,003	7,389	35.2	11,222	53.4	1,044	5.0	1,348	6.4	326		
Self Pay	3,309	477	14.4	1,193	36.1	429	13.0	1,210	36.6	164		
Champus/Tricare	1,677	463	27.6	870	51.9	144	8.6	200	11.9	28		
Other Government	2,212	361	16.3	1,183	53.5	103	4.7	565	25.5	93		
Other/Unknown	904	159	17.6	316	35.0	158	17.5	271	30.0	1,410		

\*Includes only Kansas resident live births for which number of prenatal visits, date of first prenatal visit and date of last menses were reported on the birth certificate.

\*\* Number of live births with insufficient information (Not Stated) to calculate APNCU. Residence data.

Source: Bureau of Public Health Informatics  
Kansas Department of Health and Environment

Table 5. Number and Percent of Live Births by Birth Order by Age Group of the Mother by Adequacy of Prenatal Care Utilization (APNCU) Index Kansas, 2008

Birth Order	Live Births*	APNCU Category										Not Stated**
		Adequate Plus		Adequate		Intermediate		Inadequate		Number	Percent	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent			
First Live Births												
Total	15,066	4,704	31.2	7,355	48.8	997	6.6	2,010	13.3			780
Age Groups												
10-14	35	6	n/a	9	n/a	5	n/a	15	n/a			5
15-19	3,373	867	25.7	1,412	41.9	296	8.8	798	23.7			169
20-24	5,215	1,539	29.5	2,568	49.2	325	6.2	783	15.0			208
25-29	4,058	1,397	34.4	2,125	52.4	250	6.2	286	7.0			228
30-34	1,746	644	36.9	920	52.7	94	5.4	88	5.0			112
35 and Over	639	251	39.3	321	50.2	27	4.2	40	6.3			58
Second and Higher Order Live Births												
Total	24,442	7,291	29.8	11,277	46.1	1,646	6.7	4,228	17.3			1,527
Age Groups												
10-14	0	0	0.0	0	0.0	0	0.0	0	0.0			0
15-19	794	176	22.2	228	28.7	72	9.1	318	40.1			63
20-24	5,807	1,534	26.4	2,343	40.3	423	7.3	1,507	26.0			322
25-29	8,003	2,369	29.6	3,819	47.7	536	6.7	1,279	16.0			479
30-34	6,427	2,094	32.6	3,210	49.9	409	6.4	714	11.1			397
35 and Over	3,411	1,118	32.8	1,677	49.2	206	6.0	410	12.0			266

n/a The number is too small to calculate percent (<20).

\*Includes only Kansas resident live births for which number of prenatal visits, date of first prenatal visit and date of last menses were reported on the birth certificate.

\*\*Number of live births with insufficient information (Not Stated) to calculate APNCU. Residence data.

Source: Bureau of Public Health Informatics  
Kansas Department of Health and Environment.

## Technical Notes

Preparation of the Adequacy of Prenatal Care Utilization Index requires the use of information from four fields on the birth certificate and a value for the month care began calculated from the difference of the date of first prenatal care visit and the date of last menses. If any of these values are unknown or can't be calculated, the Index value will be not stated. The data elements used for the calculation, database field names, and item numbers from the standard Kansas Birth Certificate are:

- Number of prenatal care visits, from birth certificate – NPREV (Item 49)
- Month prenatal care visits began – Calculated from DOFP and LMP, from birth certificate (Items 47 & 50)
- Sex of infant, from birth certificate – SEX (Item 4)
- Gestational age, from birth certificate – OWGEST (Item 51)
- Birth weight in grams, from birth certificate – BWG (Item 5)

**2005 Revisions to Certificates** Beginning with the reporting of 2005 data, Kansas implemented the latest revision of the U.S. standard live birth certificate.

Please note that not all states have implemented the use of the new certificate format. Therefore, items which were added or significantly revised will most likely not have information provided for Kansas residents who had births in another state. In such cases, the non-responses are shown as “not stated” (N.S.) in the tables and have been removed from totals when calculating percentages.

Certain data elements (see below) used in the Adequacy of Prenatal Care Utilization Index (APNCU) have changed considerably with the use of the revised birth certificate. These changes can affect comparability with previous years APNCU data.

**Prenatal care visits** In previous years, the mother or prenatal care provider reported the month of pregnancy in which the mother began prenatal care. As of 2005, this item was replaced by the exact dates of first and last prenatal visit. Therefore, the month prenatal care began is now calculated from the last normal menses date and the date of first prenatal care visit. Unfortunately, because exact dates are harder to get, the month prenatal care began now has high numbers of missing data. The missing data have been removed from totals when calculating percentages.

As a result of changes in reporting, levels of prenatal care utilization based on the new revised data are lower than those based on data from previous certificates. For example, 2004 data for Kansas indicates that 86.5 percent of residents began care in the first trimester compared to 73.1 percent based on the 2008 data derived from the revised birth certificate. The APNCU showed an increase in the proportion of women receiving less than adequate care between 2004 (18.7 percent) and 2008 (22.5 percent). Much of the difference between 2004 and 2008 is related to changes in reporting and not to changes in prenatal care utilization. Accordingly, prenatal care data in this report is not directly comparable to data collected from previous certificates.

**Race-Ethnicity** The revised certificate contains significant changes in the way self-reported race and ethnicity is collected. The race item was revised to allow the reporting of multiple races and can capture up to 15 categories and eight literal entries. In addition, Hispanic origin is now collected as a separate question from ancestry. These changes were implemented to provide a better picture of the nation's variation in race and Hispanic origin. The expanded racial and origin categories are compliant with the provisions of the Statistical Policy Directive No. 15, Race and Ethnic Standards for

## Technical Notes (cont.)

Federal Statistics and Administrative Reporting, issued by the Office of Management and Budget (OMB) in 1997.

For this report, race and Hispanic origin categories are combined and labeled as population groups. Self-reported single race data are utilized for White Non-Hispanic, Black Non-Hispanic, Native American Non-Hispanic, Asian/Pacific Islander Non-Hispanic, and Other Non-Hispanic. If more than one racial category is checked, the person's race is classified as "Multiple" and is collapsed into the Other Non-Hispanic category. Data shown for Hispanic persons include all persons of Hispanic origin of any race. These particular groupings are categories that reflect the cultural and ethnic identities of subgroups of the population commonly addressed in the public health field and on which health disparities can be measured.

### Criteria for the Kansas Adequacy of Prenatal Care Utilization (APNCU) Index

#### I. Month prenatal care began (Adequacy of Initiation of Prenatal Care)

Adequate Plus: 1<sup>st</sup> or 2<sup>nd</sup> month

Adequate: 3<sup>rd</sup> or 4<sup>th</sup> month

Intermediate: 5<sup>th</sup> or 6<sup>th</sup> month

Inadequate: 7<sup>th</sup> month or later, or no prenatal care

#### II. Proportion of the number of visits recommended by the American College of Obstetricians and Gynecologists (ACOG) received from the time prenatal care began until delivery (Adequacy of Received Services)

Adequate Plus: 110% or more

Adequate: 80% - 109%

Intermediate: 50% - 79%

Inadequate: less than 50%

#### III. Summary Adequacy of Prenatal Care Utilization Index

Adequate Plus: Prenatal care begun by the 4<sup>th</sup> month and 110% or more of recommended visits received

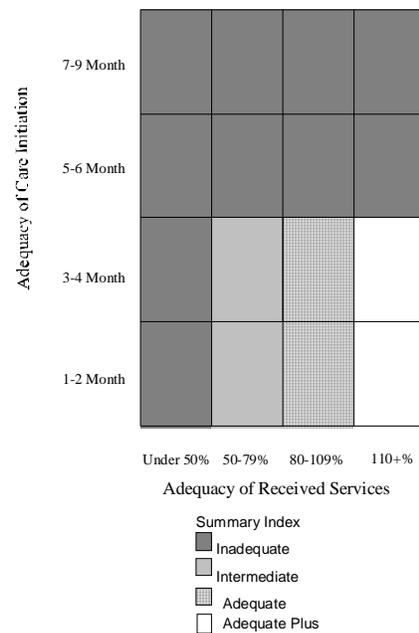
Adequate: Prenatal care begun by the 4<sup>th</sup> month and 80% - 109% of recommended visits received

Intermediate: Prenatal care begun by the 4<sup>th</sup> month and 50% - 79% of recommended visits received

Inadequate: Prenatal care begun after the 4<sup>th</sup> month or less than 50% of recommended visits received

**APNCU Reference:** Kotelchuck M. An evaluation of the Kessner Adequacy of Prenatal Care Index and a proposed Adequacy of Prenatal Care Utilization Index. *American Journal of Public Health*, 1994; 84:1414-1420.

Adequacy of Prenatal Care Utilization Index Matrix



## Definitions

Adequacy of Prenatal Care Utilization (APNCU) Index:	An assessment of the adequacy of prenatal care measured by the APNCU Index (often referred to as the Kotelchuck Index), a composite measure based on gestational age of the newborn, the trimester prenatal care began, and the number of prenatal visits made.
Adequacy of Received Services:	A measure of the adequacy of prenatal services received based on when care began in the pregnancy.
Adequacy of Care Initiation:	A measure of the adequacy of prenatal care services based on the number of prenatal care visits during the pregnancy.
Live Birth:	The complete expulsion or extraction of a product of human conception from its mother, irrespective of the duration of pregnancy, that, after such expulsion or extraction, shows any evidence of life such as breathing, heartbeat, pulsation of the umbilical cord, or voluntary muscle movement, whether or not the umbilical cord has been cut or the placenta attached.
Low Birth Weight:	Weight of a fetus or infant at delivery which is less than 2,500 grams (less than five pounds, 8 ounces).
Very Low Birth Weight:	Weight of a fetus or infant at delivery which is less than 1,500 grams (less than 3 pounds, 5 ounces).
Population Group:	A reporting matrix of race and Hispanic origin (ethnicity) information comprised of distinct categories.

Kansas Department of Health and Environment  
Office of Vital Statistics

**CERTIFICATE OF LIVE BIRTH**

115-

State File Number

1. CHILD'S NAME (First, Middle, Last, Suffix)		2. DATE OF BIRTH (Month, Day, Year)		3. TIME OF BIRTH  M	
4. SEX	5. BIRTH WEIGHT (Grams)	6. CITY, TOWN, OR LOCATION OF BIRTH		7. COUNTY OF BIRTH	
8. PLACE OF BIRTH <input type="checkbox"/> Hospital <input type="checkbox"/> Freestanding Birthing Center <input type="checkbox"/> Home Birth <input type="checkbox"/> Clinic/Doctor's Office <input type="checkbox"/> Other (Specify) _____			9. FACILITY NAME (If not institution, give street and number)		
10. I CERTIFY THAT THE STATED INFORMATION CONCERNING THIS CHILD IS TRUE TO THE BEST OF MY KNOWLEDGE AND BELIEF.  Certifier's Signature > _____		11. DATE SIGNED (Month, Day, Year)		12. ATTENDANT'S NAME AND TITLE (Type) Name _____ <input type="checkbox"/> M.D. <input type="checkbox"/> D.O. <input type="checkbox"/> C.N.M. <input type="checkbox"/> Other Midwife <input type="checkbox"/> Other (Specify) _____	
13. Certifier's Name and Title (Type) Name _____ <input type="checkbox"/> M.D. <input type="checkbox"/> D.O. <input type="checkbox"/> Hosp Adm. <input type="checkbox"/> C.N.M. <input type="checkbox"/> Other Midwife <input type="checkbox"/> Other (Specify) _____			14. ATTENDANT'S MAILING ADDRESS (Street and Number or Rural Route, City, or Town, State, Zip Code)		
15. MOTHER'S CURRENT LEGAL NAME (First, Middle, Last, Suffix)			16. MOTHER'S LAST NAME PRIOR TO FIRST MARRIAGE		
17. DATE OF BIRTH (Month, Day, Year)		18. BIRTHPLACE (State, Territory, or Foreign Country)		19. PRESENT RESIDENCE-STATE	
20. COUNTY		21. CITY, TOWN, OR LOCATION		22. STREET AND NUMBER OF PRESENT RESIDENCE	
23. ZIP CODE		24. INSIDE CITY LIMITS? <input type="checkbox"/> YES <input type="checkbox"/> NO		25. MOTHER'S MAILING ADDRESS (If same as residence, leave blank)	
26. FATHER'S CURRENT LEGAL NAME (First, Middle, Last, Suffix)			27. DATE OF BIRTH (Month, Day, Year)		28. BIRTHPLACE (State, Territory, or Foreign Country)
29. PARENTS REQUEST SOCIAL SECURITY NUMBER ISSUANCE? <input type="checkbox"/> YES <input type="checkbox"/> NO			30. IMMUNIZATION REGISTRY I wish to enroll my child in the Immunization Registry <input type="checkbox"/> YES <input type="checkbox"/> NO		
31. I CERTIFY THAT THE PERSONAL INFORMATION PROVIDED ON THE CERTIFICATE IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.  Signature of Parent (or Other Informant) > _____			32. DATE SIGNED (Month, Day, Year)		33. DATE FILED BY STATE REGISTRAR (Month, Day, Year) (Vital Statistics only)

**Note: Shaded boxes used for Kotelchuck calculation**

34. IF HOME BIRTH, WAS DELIVERY PLANNED AT HOME? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown					
35. MOTHER'S SOCIAL SECURITY NUMBER			36. FATHER'S SOCIAL SECURITY NUMBER		
37a. WAS MOTHER EVER MARRIED? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown		37b. MOTHER MARRIED? (At birth, conception or any time between) <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown			
37c. IF NO, HAS PATERNITY ACKNOWLEDGMENT BEEN SIGNED? <input type="checkbox"/> Yes <input type="checkbox"/> No		37d. MOTHER REFUSES TO GIVE HUSBAND'S INFORMATION <input type="checkbox"/> Yes <input type="checkbox"/> No			
38. WHAT IS THE PRIMARY LANGUAGE SPOKEN IN THE HOME? <input type="checkbox"/> English <input type="checkbox"/> Spanish <input type="checkbox"/> Vietnamese <input type="checkbox"/> German <input type="checkbox"/> French <input type="checkbox"/> Russian <input type="checkbox"/> Ukrainian <input type="checkbox"/> Mandarin <input type="checkbox"/> Cantonese <input type="checkbox"/> Sign Language <input type="checkbox"/> Other (Specify) _____					
39. PARENT'S HISPANIC ORIGIN (Check the box or boxes that best describes whether the parent is Spanish, Hispanic, or Latino. Check the "No" box if the parent is not Spanish, Hispanic, or Latino.)		40. PARENT'S RACE (Check one or more races to indicate what you consider yourself to be.)			
39a. MOTHER <input type="checkbox"/> No, not Spanish/Hispanic/Latina <input type="checkbox"/> Yes, Mexican/Mexican American/Chicana <input type="checkbox"/> Yes, Puerto Rican <input type="checkbox"/> Yes, Cuban <input type="checkbox"/> Yes, Central American <input type="checkbox"/> Yes, South American <input type="checkbox"/> Yes, other Spanish/Hispanic/Latina (Specify) _____ <input type="checkbox"/> Unknown		39b. FATHER <input type="checkbox"/> No, not Spanish/Hispanic/Latino <input type="checkbox"/> Yes, Mexican/Mexican American/Chicano <input type="checkbox"/> Yes, Puerto Rican <input type="checkbox"/> Yes, Cuban <input type="checkbox"/> Yes, Central American <input type="checkbox"/> Yes, South American <input type="checkbox"/> Yes, other Spanish/Hispanic/Latino (Specify) _____ <input type="checkbox"/> Unknown		40a. MOTHER <input type="checkbox"/> White <input type="checkbox"/> Black or African American <input type="checkbox"/> American Indian or Alaska Native (Name of the enrolled or principal tribes) _____ <input type="checkbox"/> Asian Indian <input type="checkbox"/> Chinese <input type="checkbox"/> Filipino <input type="checkbox"/> Japanese <input type="checkbox"/> Korean <input type="checkbox"/> Vietnamese <input type="checkbox"/> Other Asian (Specify) _____ <input type="checkbox"/> Native Hawaiian <input type="checkbox"/> Guamanian or Chamorro <input type="checkbox"/> Samoan <input type="checkbox"/> Other Pacific Islander (Specify) _____ <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> Unknown	
		40b. FATHER <input type="checkbox"/> White <input type="checkbox"/> Black or African American <input type="checkbox"/> American Indian or Alaska Native (Name of the enrolled or principal tribes) _____ <input type="checkbox"/> Asian Indian <input type="checkbox"/> Chinese <input type="checkbox"/> Filipino <input type="checkbox"/> Japanese <input type="checkbox"/> Korean <input checked="" type="checkbox"/> Vietnamese <input type="checkbox"/> Other Asian (Specify) _____ <input type="checkbox"/> Native Hawaiian <input type="checkbox"/> Guamanian or Chamorro <input type="checkbox"/> Samoan <input type="checkbox"/> Other Pacific Islander (Specify) _____ <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> Unknown			
41. ANCESTRY - What is the parents' ancestry or ethnic origin? - Italian, German, Dominican, Vietnamese, Hmong, French Canadian, etc. (Specify below)			42. OCCUPATION AND BUSINESS/INDUSTRY		
			Occupation	Business/Industry (Do not give name of company.)	
41a. MOTHER		42a. MOTHER (Most recent)		42c. MOTHER	
41b. FATHER		42b. FATHER (Usual)		42d. FATHER	
43. EDUCATION (Check the box that best describes the highest degree or level of school completed at the time of delivery.)					
43a. MOTHER'S EDUCATION		43b. FATHER'S EDUCATION			
<input type="checkbox"/> 8 <sup>th</sup> grade or less <input type="checkbox"/> Some College credit, but no degree <input type="checkbox"/> Unknown <input type="checkbox"/> Master's degree (e.g., MA, MS, MEng, MEd, MSW, MBA)		<input type="checkbox"/> 8 <sup>th</sup> grade or less <input type="checkbox"/> Some College credit, but no degree <input type="checkbox"/> Unknown <input type="checkbox"/> Master's degree (e.g., MA, MS, MEng, MEd, MSW, MBA)		<input type="checkbox"/> 9 <sup>th</sup> - 12 <sup>th</sup> grade; no diploma <input type="checkbox"/> Associate degree (e.g., AA, AS) <input type="checkbox"/> Doctorate (e.g., PhD, EdD) or Professional degree (e.g., MD, DDS, DVM, LLB, JD)	
				<input type="checkbox"/> High school graduate or GED <input type="checkbox"/> Bachelor's degree (e.g., BA, AB, BS)	
44. PREVIOUS LIVE BIRTHS (Do not include this child.)		45. NUMBER OF OTHER OUTCOMES (Spontaneous or induced losses or ectopic or stillbirth pregnancies)		46. PRENATAL CARE? <input type="checkbox"/> Yes <input type="checkbox"/> No	47. DATE OF FIRST PRENATAL CARE VISIT (Month, Day, Year)
44a. Now living Number _____ <input type="checkbox"/> None	44b. Now dead Number _____ <input type="checkbox"/> None	45a. Before 20 weeks Number _____ <input type="checkbox"/> None	45b. 20 weeks & over Number _____ <input type="checkbox"/> None	48. DATE OF LAST PRENATAL CARE VISIT (Month, Day, Year)	
44c. DATE OF LAST LIVE BIRTH (Month, Year)		45c. DATE OF LAST OTHER PREGNANCY OUTCOME (Month, Year)		49. PRENATAL VISITS-Total Number (If none, enter "0")	
50. DATE LAST NORMAL MENSES BEGAN (Month, Day, Year)		51. OBSTETRIC ESTIMATE OF GESTATION (Completed Weeks)			
52. PLURALITY-Single, Twin, Triplet, etc. (Specify)	53. IF NOT A SINGLE BIRTH - Born First, Second, Third, etc. (Specify)	54. TOTAL LIVE BIRTHS AT THIS DELIVERY	55. IS INFANT ALIVE AT THE TIME OF THIS REPORT? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown		56. IS INFANT BEING BREAST-FED AT DISCHARGE? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
57. CIGARETTE SMOKING BEFORE & DURING PREGNANCY: Did mother smoke 3 mos. before or during pregnancy? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown For each time period, enter either the number of cigarettes or the number of packs of cigarettes smoked. If none, enter "0". Average number of cigarettes or packs of cigarettes smoked per day: No. No. Three months before pregnancy: _____ cigarettes or _____ packs First three months of pregnancy: _____ cigarettes or _____ packs Second three months of pregnancy: _____ cigarettes or _____ packs Third Trimester of pregnancy: _____ cigarettes or _____ packs			58. PRINCIPAL SOURCE OF PAYMENT FOR THIS DELIVERY <input type="checkbox"/> Medicaid <input type="checkbox"/> Private/Employer Ins. <input type="checkbox"/> Self-pay <input type="checkbox"/> Indian Health Service <input type="checkbox"/> CHAMPUS/TRICARE <input type="checkbox"/> Other government <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> Unknown		
			59. MOTHER'S MEDICAL RECORD NO.	60. NEWBORN'S MEDICAL RECORD NO.	
61. MOTHER TRANSFERRED IN FOR DELIVERY DUE TO MATERNAL, MEDICAL, OR FETAL INDICATIONS? <input type="checkbox"/> Yes <input type="checkbox"/> No (If yes, enter facility name) FACILITY TRANSFERRED FROM:			62. INFANT TRANSFERRED (Within 24 hours of delivery) <input type="checkbox"/> Yes <input type="checkbox"/> No (If yes, enter facility name) FACILITY TRANSFERRED TO:		

CHILD'S NAME \_\_\_\_\_

MOTHER'S NAME \_\_\_\_\_

PRENATAL (Birth)	LABOR-DELIVERY/NEWBORN				
<b>63. NUTRITION OF MOTHER</b> 1. Height _____ 2. Prepregnancy Weight _____ 3. Weight at delivery _____ 4. Did mother get WIC food for herself? Yes _____ No _____ Unknown _____	<b>66. OBSTETRICAL PROCEDURES</b> (Check all that apply.) 1. <input type="checkbox"/> Cervical cerclage 2. <input type="checkbox"/> Tocolysis 3. External cephalic version: <input type="checkbox"/> Successful <input type="checkbox"/> Failed 4. <input type="checkbox"/> None of the above	<b>70. INFECTIONS PRESENT AND/OR TREATED</b> (During this pregnancy, check all that apply.) 1. <input type="checkbox"/> Gonorrhea 2. <input type="checkbox"/> Syphilis 3. <input type="checkbox"/> Herpes Simplex Virus (HSV) 4. <input type="checkbox"/> Chlamydia 5. <input type="checkbox"/> Hepatitis B 6. <input type="checkbox"/> Hepatitis C 7. <input type="checkbox"/> AIDS or HIV antibody 8. <input type="checkbox"/> None of the above			
<b>64. MEDICAL RISK FACTORS</b> (Check all that apply.) 1. <input type="checkbox"/> Diabetes, prepregnancy 2. <input type="checkbox"/> Diabetes, gestational 3. Hypertension <input type="checkbox"/> Prepregnancy (Chronic) <input type="checkbox"/> Gestational (PIH, preeclampsia) <input type="checkbox"/> Eclampsia 4. <input type="checkbox"/> Previous preterm birth 5. <input type="checkbox"/> Other previous poor pregnancy outcome (SGA, perinatal death, etc.) 6. <input type="checkbox"/> Vaginal bleeding during this pregnancy prior to labor 7. <input type="checkbox"/> Pregnancy resulted from infertility treatment (If yes, check all that apply.) <input type="checkbox"/> Fertility-enhancing drugs, Artificial insemination or Intrauterine insemination <input type="checkbox"/> Assisted reproductive technology (e.g. in vitro fertilization (IVF), gamete intrafallopian transfer (GIFT)) 8. <input type="checkbox"/> Mother had a previous cesarean delivery, if yes, how many? Number: _____ 9. <input type="checkbox"/> Alcohol use No. of drinks per week: _____ 10. <input type="checkbox"/> None of the above	<b>67. ONSET OF LABOR</b> (Check all that apply.) 1. <input type="checkbox"/> Premature Rupture of the Membranes (prolonged, $\geq 12$ hours) 2. <input type="checkbox"/> Precipitous Labor (< 3 hrs) 3. <input type="checkbox"/> Prolonged Labor ( $\geq 20$ hrs) 4. <input type="checkbox"/> None of the above	<b>71. ABNORMAL CONDITIONS OF NEWBORN</b> (Check all that apply) 1. <input type="checkbox"/> Assisted ventilation required immediately following delivery 2. <input type="checkbox"/> Assisted ventilation required for more than six hours 3. <input type="checkbox"/> NICU admission 4. <input type="checkbox"/> Newborn given surfactant replacement therapy 5. <input type="checkbox"/> Antibiotics received by the newborn for suspected neonatal sepsis 6. <input type="checkbox"/> Seizure or serious neurologic dysfunction 7. <input type="checkbox"/> Significant birth injury (skeletal fracture(s), peripheral nerve injury, and/or soft tissue/solid organ hemorrhage) which requires intervention 8. <input type="checkbox"/> None of the above			
<b>65. METHOD OF DELIVERY</b> 1. Forceps attempted? Yes _____ No _____ Successful Yes _____ No _____ 2. Vacuum extraction attempted? Yes _____ No _____ Successful Yes _____ No _____ 3. Fetal presentation at delivery <input type="checkbox"/> Cephalic <input type="checkbox"/> Breech <input type="checkbox"/> Other 4. Final route and method of delivery (check one) <input type="checkbox"/> Vaginal/spontaneous <input type="checkbox"/> Vaginal/forceps <input type="checkbox"/> Vaginal/vacuum <input type="checkbox"/> Cesarean, if cesarean was a trial of labor attempted? Yes _____ No _____	<b>68. CHARACTERISTICS OF LABOR AND DELIVERY</b> (Check all that apply.) 1. <input type="checkbox"/> Induction of labor 2. <input type="checkbox"/> Augmentation of labor 3. <input type="checkbox"/> Non-vertex presentation 4. <input type="checkbox"/> Steroids (glucocorticoids) for fetal lung maturation received by the mother prior to delivery 5. <input type="checkbox"/> Antibiotics received by the mother during labor 6. <input type="checkbox"/> Clinical chorioamnionitis diagnosed during labor or maternal temperature $\geq 38$ C (100.4 F) 7. <input type="checkbox"/> Moderate/heavy meconium staining of the amniotic fluid 8. <input type="checkbox"/> Fetal intolerance of labor: (examples: in-utero resuscitative measures, further fetal assessment, or operative delivery) 9. <input type="checkbox"/> Epidural or spinal anesthesia during labor 10. <input checked="" type="checkbox"/> None of the above	<b>72. VACCINES ADMINISTERED TO NEWBORN</b> 1. <input type="checkbox"/> Hepatitis B Date Given: _____ 2. <input type="checkbox"/> Other* Specify: _____ Date Given: _____			
<b>73. APGAR SCORE</b>					
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; text-align: center;">1 min</td> <td style="width: 33%; text-align: center;">5 min</td> <td style="width: 33%; text-align: center;">10 min</td> </tr> </table>			1 min	5 min	10 min
1 min	5 min	10 min			
<b>74. CONGENITAL ANOMALIES OF THE NEWBORN</b> (Check all that apply.) 1. <input type="checkbox"/> Anencephaly 2. <input type="checkbox"/> Meningocele/Spina bifida 3. <input type="checkbox"/> Cyanotic congenital heart disease 4. <input type="checkbox"/> Congenital diaphragmatic hernia 5. <input type="checkbox"/> Omphalocele 6. <input type="checkbox"/> Gastroschisis 7. <input type="checkbox"/> Limb reduction defect (excluding congenital amputation and dwarfing syndromes) 8. <input type="checkbox"/> Cleft Lip with or without Cleft Palate 9. <input type="checkbox"/> Cleft Palate alone 10. <input type="checkbox"/> Down Syndrome <input type="checkbox"/> Karyotype confirmed <input type="checkbox"/> Karyotype pending 11. <input type="checkbox"/> Suspected chromosomal disorder <input type="checkbox"/> Karyotype confirmed <input type="checkbox"/> Karyotype pending 12. <input type="checkbox"/> Hypospadias 13. <input type="checkbox"/> Fetal alcohol syndrome 14. <input type="checkbox"/> Other congenital anomalies (Specify) _____ 15. <input type="checkbox"/> None of the above					
<b>69. MATERNAL MORBIDITY</b> (Check all that apply.) (These are complications associated with labor and delivery.) 1. <input type="checkbox"/> Maternal transfusion 2. <input type="checkbox"/> Third or fourth degree perineal laceration 3. <input type="checkbox"/> Ruptured uterus 4. <input type="checkbox"/> Unplanned hysterectomy 5. <input type="checkbox"/> Admission to intensive care unit 6. <input type="checkbox"/> Unplanned operating room procedure following delivery 7. <input type="checkbox"/> None of the above					

CHILD'S NAME \_\_\_\_\_

MOTHER'S NAME \_\_\_\_\_

Test required by K.S.A. 65-153f 153G Serological Test Made:  _____ 1 <sup>st</sup> _____ 2 <sup>nd</sup> _____ 3 <sup>rd</sup> (Trimester)  _____ At Delivery _____ Not Performed  If no test made, state reason:		Test required by K.S.A. 65-180 Infant Neonatal Screening specimen taken:  _____ Yes _____ No  If no test made, state reason:		Test required by K.S.A. 65-1157A Newborn Hearing Screening Accomplished:  _____ Yes _____ No			
Infant's patient number:							
Infant's Primary Care Physician							
First		Middle		Last		Title (MD, DO, etc.)	
If screening accomplished, Date hearing screened _____ / _____ / _____ Month Day Year			The results of the hearing screening ✓:				
			Right ear: _____ Pass		_____ Refer for further testing		
			Left ear: _____ Pass		_____ Refer for further testing		
Physiologic equipment used ✓: _____ OAE _____ AABR _____ ABR							
If screening not accomplished, ✓ one reason:							
_____ b – missed appointment		_____ o – other					
_____ c – could not test		_____ r – did not consent					
_____ d – deceased		_____ s – scheduled but not completed					
_____ i – Incomplete test		_____ t – transferred to another hospital					
_____ m – infant discharged before screening		_____ u – no information					
_____ n – transferred to NICU		_____ x – invalid results					