



Kansas

Adequacy of Prenatal Care
Utilization Index
Kansas, 2006

Research Summary

Division of Health

**Center for Health and Environmental Statistics
Kansas Department of Health and Environment**

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Our Vision – Healthy Kansans Living in Safe and Sustainable Environments

As the state’s environmental protection and public health agency, KDHE promotes responsible choices to protect the health and environment for all Kansans. Through education, direct services, and the assessment of data and trends, coupled with policy development and enforcement, KDHE will improve health and quality of life. We prevent illness, injuries and foster a safe and sustainable environment for the people of Kansas

Introduction

Prenatal care is defined as pregnancy-related health care services provided to a women 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.¹ 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).² 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 2006 *Annual Summary of Vital Statistics*. Both products can be found at: <http://www.kdheks.gov/ches/index.html>.

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Technical Notes

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

² 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

The collection process for prenatal care data has changed. Please see the Technical Notes.

Of the 36,832 Kansas resident live births reporting prenatal care in 2006, 78.4 percent received adequate or better prenatal care, including 33.1 percent with adequate-plus care; 21.6 percent received less than adequate prenatal care, including 14.6 percent with inadequate care.

Among mothers whose prenatal care utilization was classified as inadequate (5,363), the vast majority (5,084) were due to late initiation of care. In other words, only a minority of women (279) who initiated their care within the first four months of care received inadequate care.

Comanche county had the highest percentage of mothers with adequate or better prenatal care (92.3) followed by Decatur (88.9) and Mitchell counties (88.4). Cheyenne county had the lowest percentage of adequate or better prenatal care (37.5), followed by Clark (55.0) and Hamilton (55.8) counties.

The county with the highest percentage of mothers with inadequate care was Morton (35.0) followed by Hamilton (30.2) and Seward (30.2). Comanche, Decatur and Logan counties had the lowest percentage of inadequate care (0.0), followed by Mitchell (3.3) and Smith (3.5) counties.

Among mothers of low birth weight infants, nearly 80 (79.4) percent received adequate or better care, while 16.5 percent exhibited inadequate care use.

The proportion of mothers who received adequate or better prenatal care was highest among White Non-Hispanic (83.2 percent), followed by Asian/Pacific Islander Non-Hispanic (80.6 percent) and Other Non-Hispanic (74.8 percent). The population group with the lowest percent was Hispanic (61.5).

The proportion of mothers with inadequate care among Black Non-Hispanic (23.8 percent), Native American Non-Hispanic (23.9 percent) and Hispanic (28.5 percent) were more than twice that of White Non-Hispanic (10.7 percent) population.

**Adequacy of Prenatal Care Utilization Index
Kansas Residents*, 2006**

Adequacy of Care Initiation	7-9 Month	423	128	290	916
	5-6 Month	79	375	750	2,123
	3-4 Month	162	1,330	8,275	6,377
	1-2 Month	117	1,251	8,402	5,834
		Under 50%	50-79%	80-109%	110+%
		Adequacy of Received Services			

Summary Index

- Inadequate
- Intermediate
- Adequate
- Adequate Plus

*Includes only the 36,832 Kansas resident live births for which number of prenatal visits, date of first prenatal visit and date of last menses were reported on the the birth certificate.

Adequacy of Prenatal Care Utilization (APNCU) Index
By County of Residence
Kansas, 2006

County of Residence	Live Births*	APNCU Category**								Not Stated
		Adequate Plus		Adequate		Intermediate		Inadequate		
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	
Kansas.....	36,832	12,211	33.1	16,677	45.3	2,581	7.0	5,363	14.6	4,064
Allen.....	186	97	52.1	55	29.6	10	5.4	24	12.9	7
Anderson.....	94	48	51.1	28	29.8	3	3.2	15	15.9	3
Atchison.....	178	63	35.4	74	41.6	11	6.2	30	16.8	48
Barber.....	60	9	15.0	34	56.7	6	10.0	11	18.3	3
Barton.....	367	87	23.7	193	52.6	22	6.0	65	17.7	17
Bourbon.....	207	131	63.3	43	20.8	4	1.9	29	14.0	20
Brown.....	132	38	28.8	67	50.8	15	11.3	12	9.1	9
Butler.....	716	152	21.2	445	62.2	36	5.0	83	11.6	50
Chase.....	32	11	34.4	15	46.9	0	0.0	6	18.7	1
Chautauqua.....	25	9	36.0	9	36.0	2	8.0	5	20.0	15
Cherokee.....	34	13	38.3	10	29.4	1	2.9	10	29.4	236
Cheyenne.....	8	0	0.0	3	37.5	3	37.5	2	25.0	9
Clark.....	20	2	10.0	9	45.0	5	25.0	4	20.0	1
Clay.....	125	41	32.8	59	47.2	16	12.8	9	7.2	5
Cloud.....	121	27	22.3	64	52.9	15	12.4	15	12.4	2
Coffey.....	82	27	32.9	39	47.6	8	9.8	8	9.7	8
Comanche.....	13	3	23.1	9	69.2	1	7.7	0	0.0	0
Cowley.....	430	155	36.0	177	41.2	22	5.1	76	17.7	26
Crawford.....	303	139	45.9	107	35.3	19	6.3	38	12.5	214
Decatur.....	18	1	5.6	15	83.3	2	11.1	0	0.0	1
Dickinson.....	222	60	27.0	114	51.4	14	6.3	34	15.3	3
Doniphan.....	23	10	43.5	6	26.1	2	8.7	5	21.7	67
Douglas.....	1,208	520	43.0	466	38.6	77	6.4	145	12.0	49
Edwards.....	50	17	34.0	20	40.0	3	6.0	10	20.0	1
Elk.....	32	12	37.5	14	43.8	2	6.2	4	12.5	3
Ellis.....	338	95	28.1	177	52.4	34	10.0	32	9.5	7
Ellsworth.....	54	21	38.9	24	44.4	3	5.6	6	11.1	0
Finney.....	747	207	27.7	236	31.6	105	14.1	199	26.6	14
Ford.....	643	174	27.1	224	34.8	87	13.5	158	24.6	8
Franklin.....	379	164	43.3	142	37.4	17	4.5	56	14.8	4
Geary.....	607	159	26.2	282	46.5	79	13.0	87	14.3	22
Gove.....	26	8	30.8	9	34.6	2	7.7	7	26.9	1
Graham.....	20	1	5.0	12	60.0	5	25.0	2	10.0	1
Grant.....	127	37	29.1	45	35.4	21	16.6	24	18.9	24
Gray.....	101	32	31.7	48	47.5	10	9.9	11	10.9	0
Greeley.....	11	3	27.3	6	54.5	1	9.1	1	9.1	0
Greenwood.....	72	21	29.2	34	47.2	3	4.2	14	19.4	3
Hamilton.....	43	7	16.3	17	39.5	6	14.0	13	30.2	0
Harper.....	73	13	17.8	50	68.5	4	5.5	6	8.2	11
Harvey.....	441	200	45.3	152	34.5	23	5.2	66	15.0	10
Haskell.....	67	10	14.9	29	43.3	13	19.4	15	22.4	1
Hodgeman.....	14	2	14.3	8	57.1	2	14.3	2	14.3	0
Jackson.....	178	61	34.3	72	40.4	16	9.0	29	16.3	4
Jefferson.....	205	82	40.0	83	40.5	16	7.8	24	11.7	14
Jewell.....	26	9	34.6	11	42.3	1	3.9	5	19.2	0
Johnson.....	6,820	3,567	52.3	2,373	34.8	351	5.1	529	7.8	902
Kearny.....	67	15	22.4	24	35.8	11	16.4	17	25.4	0
Kingman.....	76	11	14.5	49	64.5	5	6.6	11	14.4	7
Kiowa.....	32	10	31.3	14	43.7	3	9.4	5	15.6	0
Labette.....	226	97	42.9	88	38.9	14	6.2	27	12.0	76
Lane.....	21	5	23.8	8	38.1	2	9.5	6	28.6	1
Leavenworth.....	848	396	46.7	319	37.6	48	5.7	85	10.0	126
Lincoln.....	41	9	22.0	26	63.4	0	0.0	6	14.6	0
Linn.....	99	45	45.4	31	31.3	6	6.1	17	17.2	4
Logan.....	30	8	26.7	18	60.0	4	13.3	0	0.0	2

Adequacy of Prenatal Care Utilization (APNCU) Index
By County of Residence
Kansas, 2006

County of Residence	Live Births*	APNCU Category**								Not Stated
		Adequate Plus		Adequate		Intermediate		Inadequate		
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	
Lyon.....	533	171	32.1	215	40.3	31	5.8	116	21.8	5
Marion.....	115	46	40.0	54	47.0	3	2.6	12	10.4	3
Marshall.....	118	38	32.2	61	51.7	8	6.8	11	9.3	1
McPherson.....	361	128	35.5	189	52.3	15	4.2	29	8.0	8
Meade.....	43	5	11.6	19	44.2	7	16.3	12	27.9	7
Miami.....	383	170	44.4	159	41.5	20	5.2	34	8.9	15
Mitchell.....	60	15	25.0	38	63.4	5	8.3	2	3.3	1
Montgomery.....	372	165	44.4	102	27.4	28	7.5	77	20.7	115
Morris.....	47	9	19.1	25	53.2	2	4.3	11	23.4	1
Morton.....	40	10	25.0	14	35.0	2	5.0	14	35.0	12
Nemaha.....	120	35	29.2	68	56.7	3	2.5	14	11.6	6
Neosho.....	209	114	54.5	66	31.6	5	2.4	24	11.5	19
Ness.....	28	4	14.3	15	53.6	1	3.6	8	28.5	3
Norton.....	48	12	25.0	25	52.1	9	18.7	2	4.2	2
Osage.....	180	69	38.3	70	38.9	18	10.0	23	12.8	9
Osborne.....	30	8	26.7	16	53.3	1	3.3	5	16.7	1
Ottawa.....	65	18	27.7	33	50.8	8	12.3	6	9.2	3
Pawnee.....	58	27	46.6	24	41.4	2	3.4	5	8.6	1
Phillips.....	54	16	29.6	24	44.5	6	11.1	8	14.8	2
Pottawatomie.....	321	113	35.2	155	48.3	17	5.3	36	11.2	13
Pratt.....	124	36	29.0	55	44.3	8	6.5	25	20.2	6
Rawlins.....	23	5	21.7	12	52.2	1	4.4	5	21.7	1
Reno.....	867	270	31.1	428	49.4	54	6.2	115	13.3	9
Republic.....	51	16	31.4	25	49.0	4	7.8	6	11.8	0
Rice.....	116	30	25.9	52	44.8	10	8.6	24	20.7	1
Riley.....	1,037	266	25.7	493	47.5	140	13.5	138	13.3	29
Rooks.....	59	18	30.5	31	52.5	4	6.8	6	10.2	3
Rush.....	28	3	10.7	17	60.7	5	17.9	3	10.7	1
Russell.....	64	14	21.9	35	54.7	6	9.4	9	14.0	2
Saline.....	778	209	26.9	405	52.1	58	7.4	106	13.6	18
Scott.....	73	24	32.9	22	30.1	5	6.9	22	30.1	0
Sedgwick.....	7,172	739	10.3	4,904	68.4	409	5.7	1,120	15.6	755
Seward.....	437	93	21.3	167	38.2	45	10.3	132	30.2	77
Shawnee.....	2,427	1,036	42.7	894	36.8	152	6.3	345	14.2	138
Sheridan.....	33	9	27.3	15	45.5	5	15.1	4	12.1	2
Sherman.....	68	20	29.4	25	36.8	11	16.2	12	17.6	11
Smith.....	29	7	24.1	18	62.1	3	10.3	1	3.5	0
Stafford.....	44	14	31.8	19	43.2	3	6.8	8	18.2	1
Stanton.....	21	3	14.3	11	52.4	4	19.0	3	14.3	6
Stevens.....	75	14	18.7	31	41.3	8	10.7	22	29.3	12
Sumner.....	276	46	16.7	163	59.1	16	5.8	51	18.4	22
Thomas.....	103	34	33.0	48	46.6	8	7.8	13	12.6	5
Trego.....	27	1	3.7	18	66.7	3	11.1	5	18.5	0
Wabaunsee.....	78	32	41.0	33	42.3	4	5.1	9	11.6	1
Wallace.....	16	5	31.3	8	50.0	1	6.2	2	12.5	0
Washington.....	50	20	40.0	20	40.0	8	16.0	2	4.0	2
Wichita.....	43	10	23.3	19	44.2	2	4.6	12	27.9	1
Wilson.....	123	57	46.4	41	33.3	7	5.7	18	14.6	20
Woodson.....	38	18	47.4	12	31.6	2	5.2	6	15.8	2
Wyandotte.....	2,249	848	37.7	598	26.6	213	9.5	590	26.2	672

*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
Residence data.

Number and Percent of Live Births by Birth Weight
By Adequacy of Prenatal Care Utilization (APNCU) Index
Kansas, 2006

Birth Weight (Grams)	Live Births*	APNCU Category								Not Stated
		Adequate Plus		Adequate		Intermediate		Inadequate		
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	
Total.....	36,832	12,211	33.1	16,677	45.3	2,581	7.0	5,363	14.6	4,064
Under 2,500(Low).....	2,448	1,401	57.2	543	22.2	100	4.1	404	16.5	494
2,500-4,499(Normal)...	34,010	10,704	31.5	15,946	46.9	2,446	7.2	4,914	14.4	3,530
4,500 and Over(High).	371	104	28.0	187	50.4	35	9.5	45	12.1	40
Not Stated.....	3	2	n/a	1	n/a	0	n/a	0	n/a	0

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.

Residence data.

Source: Center for Health & Environmental Statistics
Kansas Department of Health and Environment

Number and Percent of Live Births by Population Groups
By Adequacy of Prenatal Care Utilization (APNCU) Index
Kansas, 2006

Population Groups	Live Births*	APNCU Category								Not Stated
		Adequate Plus		Adequate		Intermediate		Inadequate		
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	
Total.....	36,832	12,211	33.1	16,677	45.3	2,581	7.0	5,363	14.6	4,064
White Non-Hispanic.....	26,837	9,695	36.1	12,635	47.1	1,644	6.1	2,863	10.7	2,555
Black Non-Hispanic.....	2,355	669	28.4	893	37.9	233	9.9	560	23.8	446
Native American Non-Hispanic.....	234	73	31.2	82	35.1	23	9.8	56	23.9	40
Asian/Pacific Islander Non-Hispanic.....	1,062	350	33.0	506	47.6	65	6.1	141	13.3	94
Other Non-Hispanic**	616	204	33.1	257	41.7	42	6.8	113	18.4	62
Hispanic***	5,710	1,215	21.3	2,296	40.2	573	10.0	1,626	28.5	858
Not Stated.....	18	5	n/a	8	n/a	1	n/a	4	n/a	9

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

***Hispanic origin can be of any race

Residence data.

Source: Center for Health & Environmental Statistics
Kansas Department of Health and Environment

Technical Notes

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. 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 75.0 percent based on the 2006 revised data. The APNCU showed a small increase in the proportion of women receiving less than adequate care between 2004 (18.7 percent) and 2006 (21.6 percent). Much of the difference between 2004 and 2006 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 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.

Technical Notes (Cont.)

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

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

- Adequate Plus: 1st or 2nd month
- Adequate: 3rd or 4th month
- Intermediate: 5th or 6th month
- Inadequate: 7th month or later, or no prenatal care

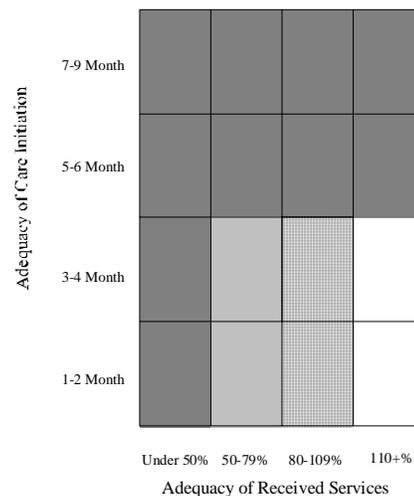
II. Proportion of the number of visits recommended by the American College of Obstetricians and Gynecologists (ACOG) received from the time prenatal care began until delivery (Adequacy of Received Services)

- 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 4th month and 110% or more of recommended visits received
- Adequate: Prenatal care begun by the 4th month and 80% - 109% of recommended visits received
- Intermediate: Prenatal care begun by the 4th month and 50% - 79% of recommended visits received
- Inadequate: Prenatal care begun after the 4th month or less than 50% of recommended visits received

Adequacy of Prenatal Care Utilization Index Matrix



Summary Index
 ■ Inadequate
 ■ Intermediate
 ■ Adequate
 □ Adequate Plus

NOTE: The APNCU Index requires the use of the following data elements reported on the live birth certificate: number of prenatal care visits, date of first prenatal visit, date of last menses and gestational length of pregnancy.

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.