Adequacy of Prenatal Care Utilization Index
Kansas, 2011

Research Summary

Kansas Department of Health and Environment
Division of Public Health
Bureau of Epidemiology and Public Health Informatics
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http://www.kdheks.gov/bephi/
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Our Vision – Healthy Kansans Living in Safe and Sustainable Environments

Our Mission – To protect and improve the health and environment of all Kansans
Executive Summary

Improving family health is an essential role for public health agencies. Tracking the quantity of prenatal care pregnant women receive through the Adequacy of Prenatal Care Utilization Index (APNCU), enables public health to identify inequities in the provision of care. Using birth certificate information, Kansas Department of Health and Environment (KDHE) calculates APNCU using methods developed by Dr. Milton Kotelchuck. In 2011 prenatal care described as inadequate decreased by 9.2 percent compared to 2010. Adequate care increased by 2.4 percent. While Kansas’ level of adequate care (81.8%) is better than the Healthy People 2020 target of 77.6 percent, inequities by population group and pay source continue.

Introduction

Maintaining and improving family health is an essential component of the public health mission of the Kansas Department of Health and Environment. Facilitating healthy pregnancies and positive birth outcomes pays dividends to Kansas society in the form of reduced maternal and infant mortality and children capable of learning and growing into productive members of society. It is in this role the department, through the Division of Public Health’s Bureau of Epidemiology and Public Health Informatics (BEPHI), provides this report in order that progress in the provision of adequate prenatal care can be monitored.

Prenatal care is a flexible package of services for pregnant women up to the delivery of an infant. It includes physician or midwife monitoring the progress of the pregnancy, examinations for common complications of pregnancy such as edema and preeclampsia, and basic dietary and lifestyle advice [1].
A typical prenatal visit may include any or all of the following elements: weight measurement, blood pressure measurement, measurement of the uterus to check for proper growth of the fetus, physical examination of the mother to detect problems or discomforts, urine tests to detect diabetes, preeclampsia or edema, fetal heart rate measurement, and various screening tests, such as blood tests to check for anemia. Prenatal care is important because potential problems that endanger the mother or her infant can be discovered and treated before delivery or even prevented altogether [2].

Inadequate prenatal care has been associated with pre-term delivery low birth weight and small for gestation infants [3,4]. It has also been linked with a higher overall net cost per pregnancy for mother and newborn care combined [5].

Adequate prenatal care is one of the national goals laid out in the Healthy People 2020 program: “MICH-10: Increase the proportion of pregnant women who receive early and adequate prenatal care.” The target is that 77.6 percent of pregnant women will receive early and adequate prenatal care by the year 2020 [6].

The purpose of this report is to inform policy makers, local health departments, program managers, and the public of the extent to which adequate prenatal care is provided to pregnant women in Kansas, and to indicate disparities in the provision of that care. The BEPHI has published the adequacy of prenatal care utilization index report since 1998.

**Methods**

KDHE, through the Office of Vital Statistics, receives reports of births that occur in Kansas. Reporting of Kansas vital events to KDHE is mandated by law (K.S.A. 65-102, K.S.A. 65-2422b, K.S.A. 65-445). The filing of birth and death records began in 1911. Births to Kansas residents that occurred in other states are received via Interstate Jurisdictional Exchange. All statistics reported are based on births to women who were Kansas residents.

KDHE collects birth certificate information consistent with the 2003 U.S. Standard Certificate. Data collected since 2005 is based on the standard certificate as modified for use in Kansas. BEPHI uses an 18 month reporting period when creating an analytical file. Thus all births that occur in a given year – reporting during that year or the first six months of the year following – are included in the analytical file. Data used in this report are for 2011 births. The analytical file is considered 99.99 percent complete.

All birth records undergo a two-step quality improvement process. In the Office of Vital Statistics, paper certificates are manually reviewed by staff for missing or illogical information. The Vital Statistics Data Analysis section performs computerized checks of the data on an ongoing basis and once prior to closing the analytical file. Corrections or imputation occurs to geographic information, sex of the child, and mother’s age. See the technical notes for the [2011 Kansas Annual Summary of Vital Statistics](#) for more information [7].
Statistical tabulations were created using SAS version 9.3 software. One of the tables contained in this report was also included in the *Kansas Annual Summary of Vital Statistics*. The repetition is done to enhance the utility of this report to readers.

Accurate measurement of prenatal care depends upon the accuracy of the index used. Beginning with 1998 data, KDHE transitioned from a modified Kessner Index to the Adequacy of Prenatal Care Utilization (APNCU) Index, often referred to as the Kotelchuck Index [8]. This index characterizes prenatal care (PNC) utilization on two independent and distinctive dimensions: adequacy of initiation of PNC and adequacy of utilization 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 Index categorizes care as inadequate, intermediate, adequate, or adequate plus (for more details see the Technical Notes).

The APNCU Index does not assess the quality of prenatal care that is delivered, only its utilization. Assessing the quality of the services provided would require more information than is provided on the Kansas standard birth certificate.

**Results & Discussion**

Only selected findings are discussed in this section. Other tables and figures are provided to meet evaluation requirements by county or other characteristics.

Adequacy of prenatal care utilization was calculated on 37,773 Kansas resident live births in 2011, compared to 38,823 in 2010 (Figure 1). This represents 95.0 percent of the 39,628 resident births reported in 2011. Total live births decreased by 2.1 percent from 2010, and variables needed to calculate prenatal care utilization index also declined by 2.7 percent in 2011.

Of the 37,773 Kansas resident births for which prenatal care utilization could be calculated in 2011, 81.8 percent received adequate or better prenatal care, including 32.3 percent with adequate-plus care. This level of adequate or better prenatal care meets the target established by Healthy People 2020 (77.6%). Approximately eighteen percent (18.2%) received less than adequate prenatal care, 12.9 percent inadequate care and 5.3 percent intermediate care (Table 1).

In 2011, reported inadequate prenatal care utilization decreased by 9.2 percent compared to 2010. The percentage of adequate care increased by 0.6 percent and adequate-plus care utilizations increased by 6.5 percent (Table 1).

Among mothers whose prenatal care utilization was classified as inadequate (4,858), the vast majority (4,643) were due to late initiation of care. Only a minority of women
who initiated their care within the first four months of pregnancy received inadequate care (Figure 1).

Among mothers of infants with low birth weight, 82.9 percent received adequate or better care, while 13.9 percent experienced inadequate care (Table 2).

The proportion of mothers who received adequate or better prenatal care was highest among White non-Hispanics (86.2%), followed by Asian/Pacific Islander non-Hispanics (80.4%) and Other non-Hispanics (76.4%). The population group with the lowest percent was Hispanics with 66.4 percent receiving adequate or better prenatal care (Table 3).

The proportion of mothers reporting inadequate care was highest among Hispanics (24.8%), Black non-Hispanics (22.3%), and Native American non-Hispanics (20.5%). These rates are more than twice that of White non-Hispanic women, who experienced inadequate care at a rate of 9.3 percent (Table 3).

The payor with the highest proportion of mothers who received adequate or adequate plus prenatal care was private insurance (91.4%) followed by Champus/TRICARE (82.1%). The payor with the highest proportion of mothers with inadequate prenatal care was self pay (30.6%) (Table 4).

Among first births, the percent of mothers with adequate or adequate plus prenatal care (84.4%) was 5.1 percent greater than among second or higher live births (80.3%) (Table 5).

Among first births, the percent of mothers with inadequate prenatal care (10.8%) was 23.4 percent less than among second or higher live births (14.1%) (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).

References


Detailed Tables, Figures, and Appendix

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1. Adequacy of Prenatal Care Utilization (APNCU) Index by County of Residence, Kansas, 2011.
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1. Certificate of Live Birth
## Table 1. Adequacy of Prenatal Care Utilization (APNCU) Index by County of Residence

**Kansas, 2011**

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† APNCU Category: Adequate Plus, Adequate, Intermediate, Inadequate, Not Stated.
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<td>Stafford</td>
<td>45</td>
<td>17 38.6</td>
<td>23 52.3</td>
<td>1 2.3</td>
<td>3 6.8</td>
<td>1</td>
</tr>
<tr>
<td>Stanton</td>
<td>29</td>
<td>6 21.4</td>
<td>19 67.9</td>
<td>1 3.6</td>
<td>2 7.1</td>
<td>1</td>
</tr>
<tr>
<td>Stevens</td>
<td>84</td>
<td>22 26.5</td>
<td>34 41.0</td>
<td>8 9.6</td>
<td>19 22.9</td>
<td>1</td>
</tr>
<tr>
<td>Sumner</td>
<td>263</td>
<td>70 28.0</td>
<td>144 57.6</td>
<td>12 4.8</td>
<td>24 9.6</td>
<td>13</td>
</tr>
<tr>
<td>Thomas</td>
<td>99</td>
<td>46 46.9</td>
<td>36 36.7</td>
<td>4 4.1</td>
<td>12 12.2</td>
<td>1</td>
</tr>
<tr>
<td>Trego</td>
<td>27</td>
<td>8 29.6</td>
<td>13 48.1</td>
<td>5 18.5</td>
<td>1 3.7</td>
<td>0</td>
</tr>
<tr>
<td>Wabaunsee</td>
<td>83</td>
<td>32 41.0</td>
<td>37 47.4</td>
<td>4 5.1</td>
<td>5 6.4</td>
<td>5</td>
</tr>
<tr>
<td>Wallace</td>
<td>16</td>
<td>7 38.9</td>
<td>9 50.0</td>
<td>1 5.6</td>
<td>1 3.8</td>
<td>0</td>
</tr>
<tr>
<td>Washington</td>
<td>61</td>
<td>16 27.1</td>
<td>30 50.8</td>
<td>8 13.6</td>
<td>5 8.5</td>
<td>2</td>
</tr>
<tr>
<td>Wichita</td>
<td>23</td>
<td>8 38.1</td>
<td>7 33.3</td>
<td>1 4.8</td>
<td>5 23.8</td>
<td>2</td>
</tr>
<tr>
<td>Wilson</td>
<td>114</td>
<td>39 35.1</td>
<td>53 47.7</td>
<td>6 5.4</td>
<td>13 11.7</td>
<td>3</td>
</tr>
<tr>
<td>Woodson</td>
<td>31</td>
<td>13 43.3</td>
<td>14 46.7</td>
<td>0 0.0</td>
<td>3 10.0</td>
<td>1</td>
</tr>
<tr>
<td>Wyandotte</td>
<td>2,732</td>
<td>707 30.2</td>
<td>930 39.7</td>
<td>183 7.8</td>
<td>524 22.4</td>
<td>388</td>
</tr>
</tbody>
</table>

| N.S. | 1   | 0   | n/a | 0   | n/a | 1   | n/a | 0   | n/a | 0   | n/a | 0   |

* Total number of live births in 2011.
† 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. This number is subtracted from total live births for percent calculation.

See Technical Notes

Source: Bureau of Epidemiology and Public Health Informatics

Kansas Department of Health and Environment
Table 2. Number and Percent of Live Births by Birth Weight
by Adequacy of Prenatal Care Utilization (APNCU) Index
Kansas, 2011

<table>
<thead>
<tr>
<th>Birth Weight (Grams)</th>
<th>Live Births*</th>
<th>Adequate Plus</th>
<th>Adequate</th>
<th>Intermediate</th>
<th>Inadequate</th>
<th>Not Stated†</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>Total..................</td>
<td>37,772</td>
<td>12,210</td>
<td>32.3</td>
<td>18,686</td>
<td>49.5</td>
<td>2,018</td>
</tr>
<tr>
<td>Under 2,500 (Low).....</td>
<td>2,535</td>
<td>1,568</td>
<td>61.9</td>
<td>532</td>
<td>21.0</td>
<td>82</td>
</tr>
<tr>
<td>2,500-4,499 (Normal)...</td>
<td>34,819</td>
<td>10,521</td>
<td>30.2</td>
<td>17,935</td>
<td>51.5</td>
<td>1,912</td>
</tr>
<tr>
<td>4,500 and Over (High)...</td>
<td>414</td>
<td>118</td>
<td>28.5</td>
<td>219</td>
<td>52.9</td>
<td>24</td>
</tr>
<tr>
<td>Not Stated...............</td>
<td>4</td>
<td>3</td>
<td>n/a</td>
<td>0</td>
<td>n/a</td>
<td>0</td>
</tr>
</tbody>
</table>

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 Epidemiology and 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, 2011

<table>
<thead>
<tr>
<th>Population Groups</th>
<th>Live Births*</th>
<th>APNCU Category</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
|                   |             | Adequate Plus  | Adequate | Intermediate | Inadequate | Not Stated
|                   |             | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent |
| Total             | 37,773      | 12,210 | 32.3    | 18,686 | 49.5    | 2,018  | 5.3     | 4,859  | 12.9    | 1,855  |        |
| White Non-Hispanic| 27,518      | 9,548  | 34.7    | 14,163 | 51.5    | 1,252  | 4.5     | 2,555  | 9.3     | 864    |        |
| Black Non-Hispanic| 2,454       | 713    | 29.1    | 1,053  | 42.9    | 141    | 5.7     | 547    | 22.3    | 254    |        |
| Native American   |             |        |         |        |         |        |         |        |         |        |        |
| Non-Hispanic      | 219         | 65     | 29.7    | 91     | 41.6    | 18     | 8.2     | 45     | 20.5    | 10     |        |
| Asian/Pacific Islander |        |        |         |        |         |        |         |        |         |        |        |
| Non-Hispanic      | 1,087       | 325    | 29.9    | 549    | 50.5    | 64     | 5.9     | 149    | 13.7    | 45     |        |
| Other Non-Hispanic| 757         | 245    | 32.4    | 333    | 44.0    | 39     | 5.2     | 140    | 18.5    | 105    |        |
| Hispanic Any Race | 5,723       | 1,313  | 22.9    | 2,490  | 43.5    | 502    | 8.8     | 1,418  | 24.8    | 570    |        |
| Not Stated        | 15          | 1      | n/a     | 7      | n/a     | 2      | n/a     | 5      | n/a     | 7      |        |

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.
Source: Bureau of Epidemiology and Public Health Informatics
Kansas Department of Health and Environment
Table 4. Number and Percent of Live Births by Selected Payor Groups 
by Adequacy of Prenatal Care Utilization (APNCU) Index 
Kansas, 2011.

<table>
<thead>
<tr>
<th>Pay Source</th>
<th>Live Births*</th>
<th>APNCU Category</th>
<th>Adequate Plus</th>
<th>Adequate</th>
<th>Intermediate</th>
<th>Inadequate</th>
<th>Not Stated†</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
</tr>
<tr>
<td>Total</td>
<td>37,773</td>
<td></td>
<td>12,210</td>
<td>32.3</td>
<td>18,686</td>
<td>49.5</td>
<td>2,018</td>
</tr>
<tr>
<td>Medicaid</td>
<td>12,630</td>
<td></td>
<td>3,825</td>
<td>30.3</td>
<td>5,331</td>
<td>42.2</td>
<td>732</td>
</tr>
<tr>
<td>Private Insurance</td>
<td>19,604</td>
<td></td>
<td>7,220</td>
<td>36.8</td>
<td>10,695</td>
<td>54.6</td>
<td>770</td>
</tr>
<tr>
<td>Self Pay</td>
<td>2,510</td>
<td></td>
<td>414</td>
<td>16.5</td>
<td>1,110</td>
<td>44.2</td>
<td>217</td>
</tr>
<tr>
<td>Champus/Tricare</td>
<td>2,064</td>
<td></td>
<td>535</td>
<td>25.9</td>
<td>1,160</td>
<td>56.2</td>
<td>189</td>
</tr>
<tr>
<td>Other Government</td>
<td>223</td>
<td></td>
<td>67</td>
<td>30.0</td>
<td>92</td>
<td>41.3</td>
<td>18</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>742</td>
<td></td>
<td>149</td>
<td>20.1</td>
<td>298</td>
<td>40.2</td>
<td>92</td>
</tr>
</tbody>
</table>

*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 Epidemiology and 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, 2011

<table>
<thead>
<tr>
<th>Birth Order</th>
<th>Live Births*</th>
<th>Adequate Plus</th>
<th>Adequate</th>
<th>Intermediate</th>
<th>Inadequate</th>
<th>Not Stated**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>First Live Births</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>14,260</td>
<td>33.8</td>
<td>7,222</td>
<td>50.6</td>
<td>682</td>
<td>4.8</td>
</tr>
<tr>
<td>Age Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-14</td>
<td>44</td>
<td>10</td>
<td>n/a</td>
<td>0</td>
<td>20</td>
<td>7</td>
</tr>
<tr>
<td>15-19</td>
<td>2,659</td>
<td>27.8</td>
<td>1,202</td>
<td>45.2</td>
<td>169</td>
<td>4.4</td>
</tr>
<tr>
<td>20-24</td>
<td>4,666</td>
<td>31.8</td>
<td>2,323</td>
<td>49.8</td>
<td>241</td>
<td>5.2</td>
</tr>
<tr>
<td>25-29</td>
<td>4,272</td>
<td>35.4</td>
<td>2,326</td>
<td>54.4</td>
<td>190</td>
<td>4.4</td>
</tr>
<tr>
<td>30-34</td>
<td>1,965</td>
<td>40.4</td>
<td>1,038</td>
<td>52.8</td>
<td>53</td>
<td>2.7</td>
</tr>
<tr>
<td>35 and Over</td>
<td>654</td>
<td>41.6</td>
<td>319</td>
<td>48.8</td>
<td>29</td>
<td>n/a</td>
</tr>
<tr>
<td>Total</td>
<td>23,512</td>
<td>31.5</td>
<td>11,464</td>
<td>48.8</td>
<td>1,336</td>
<td>5.7</td>
</tr>
<tr>
<td>Age Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-19</td>
<td>641</td>
<td>24.6</td>
<td>224</td>
<td>34.9</td>
<td>51</td>
<td>8.0</td>
</tr>
<tr>
<td>20-24</td>
<td>5,105</td>
<td>27.5</td>
<td>2,250</td>
<td>44.1</td>
<td>342</td>
<td>6.7</td>
</tr>
<tr>
<td>25-29</td>
<td>7,705</td>
<td>31.4</td>
<td>3,832</td>
<td>49.7</td>
<td>462</td>
<td>6.0</td>
</tr>
<tr>
<td>30-34</td>
<td>6,714</td>
<td>33.1</td>
<td>3,516</td>
<td>52.4</td>
<td>314</td>
<td>4.7</td>
</tr>
<tr>
<td>35 and Over</td>
<td>3,347</td>
<td>35.6</td>
<td>1,642</td>
<td>49.1</td>
<td>167</td>
<td>5.0</td>
</tr>
</tbody>
</table>

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 Epidemiology and Public Health Informatics
Kansas Department of Health and Environment.
Table 6. Number and Percent of Live Births by Age Group of the Mother by Adequacy of Prenatal Care Utilization (APNCU) Index
Kansas, 2011

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Live Births*</th>
<th>APNCU Category</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Not Stated†</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Adequate Plus</td>
<td>Adequate</td>
<td>Intermediate</td>
<td>Inadequate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
</tr>
<tr>
<td>Total</td>
<td>37,772</td>
<td>12,210</td>
<td>32.3</td>
<td>18,686</td>
<td>49.5</td>
<td>2,018</td>
<td>5.3</td>
<td>4,858</td>
</tr>
<tr>
<td>10-14</td>
<td>44</td>
<td>10</td>
<td>n/a</td>
<td>14</td>
<td>n/a</td>
<td>0</td>
<td>n/a</td>
<td>20</td>
</tr>
<tr>
<td>15-19</td>
<td>3,300</td>
<td>898</td>
<td>27.2</td>
<td>1,426</td>
<td>43.2</td>
<td>220</td>
<td>6.7</td>
<td>756</td>
</tr>
<tr>
<td>20-24</td>
<td>9,771</td>
<td>2,889</td>
<td>29.6</td>
<td>4,573</td>
<td>46.8</td>
<td>583</td>
<td>6.0</td>
<td>1,726</td>
</tr>
<tr>
<td>25-29</td>
<td>11,977</td>
<td>3,934</td>
<td>32.8</td>
<td>6,158</td>
<td>51.4</td>
<td>652</td>
<td>5.4</td>
<td>1,233</td>
</tr>
<tr>
<td>30-34</td>
<td>8,679</td>
<td>3,015</td>
<td>34.7</td>
<td>4,554</td>
<td>52.5</td>
<td>367</td>
<td>4.2</td>
<td>743</td>
</tr>
<tr>
<td>35 and Over</td>
<td>4,001</td>
<td>1,464</td>
<td>36.6</td>
<td>1,961</td>
<td>49.0</td>
<td>196</td>
<td>n/a</td>
<td>380</td>
</tr>
</tbody>
</table>

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 Epidemiology and Public Health Informatics
Kansas Department of Health and Environment.
Figure 1. Number of Live Births by APNCU, Kansas*, 2011

<table>
<thead>
<tr>
<th>Adequacy of Received Services</th>
<th>Under 50%</th>
<th>50 – 79%</th>
<th>80 – 109%</th>
<th>110+%</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 – 9 Month</td>
<td>425</td>
<td>131</td>
<td>272</td>
<td>900</td>
<td>1,728</td>
</tr>
<tr>
<td>5 – 6 Month</td>
<td>51</td>
<td>271</td>
<td>661</td>
<td>1,932</td>
<td>2,915</td>
</tr>
<tr>
<td>3 – 4 Month</td>
<td>147</td>
<td>1,099</td>
<td>10,021</td>
<td>7,721</td>
<td>18,988</td>
</tr>
<tr>
<td>1 – 2 Month</td>
<td>69</td>
<td>919</td>
<td>8,665</td>
<td>4,489</td>
<td>14,142</td>
</tr>
<tr>
<td>Total</td>
<td>692</td>
<td>2,420</td>
<td>19,619</td>
<td>15,042</td>
<td>37,773</td>
</tr>
</tbody>
</table>

Summary Index
- Inadequate
- Intermediate
- Adequate
- Adequate Plus

* Includes only the 37,773 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.
Figure 2. Percent of APNCU by Birth Weight, Kansas, 2011

- **Adequate Plus**
- **Adequate**
- **Intermediate**
- **Inadequate**

<table>
<thead>
<tr>
<th>Birth Weight in Grams</th>
<th>Percent of weight group in APNCU group</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 2,500</td>
<td>21.0</td>
</tr>
<tr>
<td>2,500-4,499</td>
<td>30.2</td>
</tr>
<tr>
<td>≥ 4,500</td>
<td>52.9</td>
</tr>
</tbody>
</table>

Residence Data
Figure 3. Percent of APNCU by Population Group, Kansas, 2011

- **Adequate Plus**
- **Adequate**
- **Intermediate**
- **Inadequate**

Population Group

<table>
<thead>
<tr>
<th>Population Group</th>
<th>White NH</th>
<th>Black NH</th>
<th>Asian/PI NH</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of popu.</td>
<td>34.7</td>
<td>29.1</td>
<td>22.3</td>
<td>22.9</td>
</tr>
<tr>
<td>in APNCU class</td>
<td>4.5</td>
<td>9.3</td>
<td>5.7</td>
<td>8.8</td>
</tr>
<tr>
<td>Percent of popu.</td>
<td>51.5</td>
<td>42.9</td>
<td>29.9</td>
<td>43.5</td>
</tr>
<tr>
<td>in APNCU class</td>
<td>9.3</td>
<td>22.9</td>
<td>5.9</td>
<td>24.8</td>
</tr>
</tbody>
</table>

Residence Data
Figure 4. Percent of APNCU by Selected Delivery Payor Groups, Kansas, 2011
Technical Notes

Preparation of the Adequacy of Prenatal Care Utilization Index requires the use of information from four items on the birth certificate and a calculated 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– NPREV (Item 49)
- Month prenatal care visits began – Calculated from DOFP and DLMP (Items 47 & 50)
- Sex of infant – ISEX (Item 4)
- Gestational age – OWGEST (Item 51)
- Birth weight in grams – 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.

Month prenatal care began  
Prior to 2005, the mother or prenatal care provider reported the month of pregnancy when the mother began prenatal care. Beginning in 2005, this approach was replaced by one that subtracted the last normal menses date from the date of first prenatal care visit. Because exact dates are harder to get, month prenatal care began is missing more often. Records missing this information 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 74.1 percent based on the 2009 data derived from the revised birth certificate. The APNCU showed an increase in the proportion of women receiving less than adequate care between 2004 (18.6 percent) and 2009 (21.0 percent). Much of the difference between 2004 and 2009 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 are 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.

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


**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.
1. CHILD’S NAME (First, Middle, Last, Suffix) | 2. DATE OF BIRTH (Month, Day, Year) | 3. TIME OF BIRTH

4. SEX

5. BIRTH WEIGHT (Grams)

6. CITY, TOWN, OR LOCATION OF BIRTH

7. COUNTY OF BIRTH

8. PLACE OF BIRTH
   - Hospital
   - Freestanding Birthing Center
   - Home Birth
   - Clinic/Doctor’s Office
   - 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
   - M.D.
   - D.O.
   - C.N.M.
   - Other Midwife
   - Other (Specify)

13. Certifier’s Name and Title (Type)
   - Name
   - M.D.
   - D.O.
   - Hosp Adm.
   - C.N.M.
   - Other Midwife
   - 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?
   - Yes
   - 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?
   - Yes
   - No

30. IMMUNIZATION REGISTRY
   - I wish to enroll my child in the Immunization Registry
   - Yes
   - 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)
### 34. IF HOME BIRTH, WAS DELIVERY PLANNED AT HOME?  
- Yes  
- No  
- Unknown

### 35. MOTHER’S SOCIAL SECURITY NUMBER

### 36. FATHER’S SOCIAL SECURITY NUMBER

### 37a. WAS MOTHER EVER MARRIED?  
- Yes  
- No  
- Unknown

### 37b. MOTHER MARRIED? (At birth, conception or any time between)  
- Yes  
- No  
- Unknown

### 37c. IF NO, HAS PATERNITY ACKNOWLEDGMENT BEEN SIGNED?  
- Yes  
- No  
- Unknown

### 38. WHAT IS THE PRIMARY LANGUAGE SPOKEN IN THE HOME?  
- English  
- Spanish  
- Vietnamese  
- German  
- French

### 39. PARENT’S HISPANIC ORIGIN

#### 39a. MOTHER
- No, not Spanish/Hispanic/Latina  
- Yes, Mexican/Mexican American/Chicana  
- Yes, Puerto Rican  
- Yes, Cuban  
- Yes, Central American  
- Yes, South American  
- Yes, other Spanish/Hispanic/Latina (Specify)_

#### 39b. FATHER
- No, not Spanish/Hispanic/Latina  
- Yes, Mexican/Mexican American/Chicana  
- Yes, Puerto Rican  
- Yes, Cuban  
- Yes, Central American  
- Yes, South American  
- Yes, other Spanish/Hispanic/Latina (Specify)_

### 40. PARENT’S RACE

#### 40a. MOTHER
- White  
- Black or African American  
- American Indian or Alaska Native (Name of the enrolled or principal tribes)  
- Asian Indian  
- Chinese  
- Filipino  
- Japanese  
- Korean  
- Vietnamese  
- Other Asian (Specify)  

#### 40b. FATHER
- White  
- Black or African American  
- American Indian or Alaska Native (Name of the enrolled or principal tribes)  
- Asian Indian  
- Chinese  
- Filipino  
- Japanese  
- Korean  
- Vietnamese  
- Other Asian (Specify)

### 41. ANCESTRY - What is the parents’ ancestry or ethnic origin?- Italian, German, Dominican, Vietnamese, Hmong, French Canadian, etc. (Specify below)

#### 41a. MOTHER
- Italian  
- German  
- Dominican  
- Vietnamese  
- Hmong  
- French Canadian  
- Other (Specify)_

#### 41b. FATHER
- Italian  
- German  
- Dominican  
- Vietnamese  
- Hmong  
- French Canadian  
- Other (Specify)_

### 42. OCCUPATION AND BUSINESS/INDUSTRY

#### Occupation

#### Business/Industry (Do not give name of company.)

### 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
- 8th grade or less  
- Some College credit, but no degree  
- Master’s degree (e.g., MA, MS, MEng, Med, MSW, MBA)  
- 9th - 12th grade; no diploma  
- Associate degree (e.g., AA,AS)  
- Bachelor’s degree (e.g., BA, AB, BS)  
- Doctorate (e.g., PhD, EdD) or Professional degree (e.g., MD, DDS, DVM, LLB, JD)

#### 43b. FATHER’S EDUCATION
- 8th grade or less  
- Some College credit, but no degree  
- Master’s degree (e.g., MA, MS, MEng, Med, MSW, MBA)  
- 9th - 12th grade; no diploma  
- Associate degree (e.g., AA,AS)  
- Bachelor’s degree (e.g., BA, AB, BS)  
- Doctorate (e.g., PhD, EdD) or Professional degree (e.g., MD, DDS, DVM, LLB, JD)

### 44. PREVIOUS LIVE BIRTHS

#### 44a. Now living

#### 44b. Now dead

### 45. NUMBER OF OTHER OUTCOMES (Spontaneous or induced losses or ectopic or stillbirth pregnancies)

### 46. PRENATAL CARE?

- Yes  
- No

### 47. DATE OF FIRST PRENATAL CARE VISIT (Month, Day, Year)

### 48. DATE OF LAST PRENATAL CARE VISIT (Month, Day, 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?

- Yes  
- No  
- Unknown

### 56. IS INFANT BEING BREAST-FED AT DISCHARGE?

- Yes  
- No  
- Unknown

### 57. CIGARETTE SMOKING BEFORE & DURING PREGNANCY: Did mother smoke

- 3 mos. before or during pregnancy?  
- Yes  
- No  
- Unknown

For each time period, enter either the number of cigarettes or the number of packs of cigarettes smoked per day during each time period. If none, enter "0".

Average number of cigarettes or packs of cigarettes smoked per day for each period:

- Number of cigarettes or packs

Three months before pregnancy:  
- Number of cigarettes or packs

First three months of pregnancy:  
- Number of cigarettes or packs

Second three months of pregnancy:  
- Number of cigarettes or packs

Third Trimester of pregnancy:  
- Number of cigarettes or packs

### 58. PRINCIPAL SOURCE OF PAYMENT FOR THIS DELIVERY

- Medicaid  
- Private/Employer Ins.  
- Self-pay  
- Indian Health Service  
- CHAMPUS/TRICARE  
- Other (Specify)  

### 59. MOTHER’S MEDICAL RECORD NO.

### 60. NEWBORN’S MEDICAL RECORD NO.

### 61. MOTHER TRANSFERRED IN FOR DELIVERY DUE TO MATERNAL, MEDICAL, OR

### 62. INFANT TRANSFERRED (Within 24 hours of delivery)
FETAL INDICATIONS?  ☐ Yes  ☐ No (if yes, enter facility name)  ☐ Yes  ☐ No (if yes, enter facility name)
FACILITY TRANSFERRED FROM:
FACILITY TRANSFERRED TO:

63. NUTRITION OF MOTHER
1. Height ______
2. Prepregnancy Weight ______
3. Weight at delivery ______
4. Did mother get WIC food for herself? Yes _____ No _____
   Unknown _____

64. MEDICAL RISK FACTORS
(Check all that apply.)
1. ☐ Diabetes, prepregnancy
2. ☐ Diabetes, gestational
3. ☐ Hypertension
   ☐ Prepregnancy (Chronic)
   ☐ Gestational (PIH, preeclampsia)
   ☐ Eclampsia
4. ☐ Previous preterm birth
5. ☐ Other previous poor pregnancy outcome (SGA, perinatal death, etc.)
6. ☐ Vaginal bleeding during this pregnancy prior to labor
7. ☐ Pregnancy resulted from infertility treatment (If yes, check all that apply.)
   ☐ Fertility-enhancing drugs, Artificial insemination or Intrauterine insemination
   ☐ Assisted reproductive technology (e.g. in vitro fertilization (IVF), gamete intrafallopian transfer (GIFT))
8. ☐ Mother had a previous cesarean delivery, if yes, how many? Number: ______
9. ☐ Alcohol use
   No. of drinks per week: ______
10. ☐ None of the above

65. METHOD OF DELIVERY
1. Forces attempted? Yes _____ No _____
   Successful Yes _____ No _____
2. Vacuum extraction attempted? Yes _____ No _____
   Successful Yes _____ No _____
3. Fetal presentation at delivery
   ☐ Cephalic
   ☐ Breech
   ☐ Other
4. Final route and method of delivery (check one)
   ☐ Vaginal/spontaneous
   ☐ Vaginal/forceps
   ☐ Vaginal/vacuum
   ☐ Cesarean, if cesarean was a trial of labor attempted? Yes _____ No _____

66. OBSTETRICAL PROCEDURES
(Check all that apply.)
1. ☐ Cervical cerclage
2. ☐ Tocolysis
3. External cephalic version:
   ☐ Successful
   ☐ Failed
4. ☐ None of the above

67. ONSET OF LABOR
(Check all that apply.)
1. ☐ Premature Rupture of the Membranes (prolonged, ≥ 12 hours)
2. ☐ Precipitous Labor (< 3 hrs)
3. ☐ Prolonged Labor (≥ 20 hrs)
4. ☐ None of the above

68. CHARACTERISTICS OF LABOR AND DELIVERY
(Check all that apply.)
1. ☐ Induction of labor
2. ☐ Augmentation of labor
3. ☐ Non-vertex presentation
4. ☐ Steroids (glucocorticoids) for fetal lung maturation received by the mother prior to delivery
5. ☐ Antibiotics received by the mother during labor
6. ☐ Clinical chorioamnionitis diagnosed during labor or maternal temperature ≥ 38 C (100.4 F)
7. ☐ Moderate/heavy meconium stained amniotic fluid
8. ☐ Fetal intolerance of labor: (examples: in-utero resuscitative measures, further fetal assessment, or operative delivery)
9. ☐ Episiotomy or spinal anesthesia during labor
10. ☐ None of the above

69. MATERNAL/MORBIDITY
(These are complications associated with labor and delivery.)
1. ☐ Maternal transfusion
2. ☐ Third or fourth degree perineal laceration
3. ☐ Ruptured uterus
4. ☐ Unplanned hysterectomy
5. ☐ Admission to intensive care unit
6. ☐ Unplanned operating room procedure following delivery
7. ☐ None of the above

70. INFECTIONS PRESENT AND/OR TREATED
(During this pregnancy, check all that apply.)
1. ☐ Gonorrhea
2. ☐ Syphilis
3. ☐ Herpes Simplex Virus (HSV)
4. ☐ Chlamydia
5. ☐ Hepatitis B
6. ☐ Hepatitis C
7. ☐ AIDS or HIV antibody
8. ☐ Unknown

71. ABNORMAL CONDITIONS OF NEWBORN
(Check all that apply.)
1. ☐ Assisted ventilation required immediately following delivery
2. ☐ Assisted ventilation required for more than six hours
3. ☐ NICU admission
4. ☐ Newborn given surfactant replacement therapy
5. ☐ Antibiotics received by the newborn for suspected neonatal sepsis
6. ☐ Seizure or serious neurologic dysfunction
7. ☐ Significant birth injury (skeletal fracture/s, peripheral nerve injury, and/or soft tissue/solid organ hemorrhage which requires intervention
8. ☐ None of the above

72. VACCINES ADMINISTERED TO NEWBORN
1. ☐ Hepatitis B Date Given: __________
2. ☐ Other* Specify: __________________________
   Date Given: __________

73. APGAR SCORE
1 min 5 min 10 min

74. CONGENITAL ANOMALIES OF THE NEWBORN
(Check all that apply.)
1. ☐ Anencephaly
2. ☐ Meningomyelocele/Spina bifida
3. ☐ Cyanotic congenital heart disease
4. ☐ Congenital diaphragmatic hernia
5. ☐ Omphalocele
6. ☐ Gastrochisis
7. ☐ Limb reduction defect (excluding congenital amputation and dwarfing syndromes)
8. ☐ Cleft Lip with or without Cleft Palate
9. ☐ Cleft Palate alone
10. ☐ Down Syndrome
   ☐ Karyotype confirmed
   ☐ Karyotype pending
11. ☐ Suspected chromosomal disorder
   ☐ Karyotype confirmed
   ☐ Karyotype pending
12. ☐ Hypospadias
13. ☐ Fetal alcohol syndrome
14. ☐ Other congenital anomalies (Specify) __________________________
15. ☐ None of the above

---

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Parent's Telephone Number: ______________________

<table>
<thead>
<tr>
<th>CHILD'S NAME</th>
<th>MOTHER'S NAME</th>
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Test required by K.S.A. 65-153f 153G
Serological Test Made:

- 1st
- 2nd
- 3rd (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

Kit Number ____________________

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

<table>
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<tr>
<th>First</th>
<th>Middle</th>
<th>Last</th>
<th>Title (MD, DO, etc.)</th>
</tr>
</thead>
</table>

If screening accomplished, Date hearing screened:

Month / Day / Year

Right ear: Pass
Left ear: Pass
Refer for further testing
Refer for further testing

Physiologic equipment used: OAE AABR ABR

If screening not accomplished, one reason:

- b – missed appointment
- c – could not test
- d – deceased
- i – incomplete test
- m – Infant discharged before screening
- n – transferred to NICU
- o – other
- r – did not consent
- s – scheduled but not completed
- t – transferred to another hospital
- u – no information
- x – invalid results