Davidson County
Child Death Review Team Report
2007

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Preface

There were 109* resident children of Davidson County under the age of 18 who died in 2007. Of those deaths, 106* were reviewed by the Davidson County Child Death Review Team (CDRT); of the deaths not reviewed 3 deaths occurred out of state, and records were not available for the team to review. To better understand how and why these children died, the CDRT has been empowered by Mayoral Executive Order to review every death of a child under the age of 18 who is a resident of Davidson County with the following goals in mind:

1. Identify factors that put a child at risk of injury or death.

2. Share information among agencies that provide services to children and families or that investigate child deaths.

3. Improve local investigations of unexpected/unexplained child deaths by participating agencies.

4. Improve existing services and service delivery systems and identify areas in the community that require additional services.

5. Identify trends relevant to child injury and death.

6. Educate the public about the causes of child injury and death while also defining the public's role in helping to prevent such tragedies.

This report presents key findings from the CDRT and makes recommendations to help prevent future deaths of children in Davidson County.

*After review, one death was determined to be a resident of Williamson County. As it was reviewed by the Davidson County Team, it is included in this report. Additionally, one death was later determined to be a fetal death, but is also included in this report.

Executive Summary

KEY FINDINGS

- In 2007, 109* resident children of Davidson County died.
- 3 deaths occurred out of state, and due to an inability to retrieve copies of the death certificates, these 3 deaths were not reviewed by the CDRT.
- The CDRT agreed with the manner of death indicated on the death certificate in 96.2% of the cases.
- The CDRT determined the manner of death of the 106* cases reviewed as follows:
    - 68 deaths (64.2%) were due to natural causes:
        - 24 (35.3%): illness or other natural cause
        - 44 (64.7%): prematurity.
    - 18 deaths (17.0%) were due to unintentional injuries:
        - 7 (38.9%): vehicular deaths
        - 8 (44.4%): suffocation
        - 2 (11.1%): fall or crush
        - 1 (5.6%): cocaine-induced premature birth.
    - 8 deaths (7.5%) were due to homicide.
    - 2 deaths (1.9%) were due to suicide.
    - 10 (9.4%) deaths were undetermined.
        - The manner of 8 deaths (7.5%) could not be determined.
        - 2 deaths (1.9%) were undetermined due to suspicious circumstances.
- 78 of all deaths (73.6%) occurred among children less than one year old, and of those, 32 deaths (30.2%) survived less than one day after birth.
- Among children less than a year old, 59 deaths (75.6%) were due to natural causes.
- 8 deaths (7.5%) occurred among children aged 1-5, and of those 12.5% (1 death) was due to natural causes and 62.5% (5 deaths) were due to unintentional injury.
- 65 deaths (61.3%) occurred among male children.
- 48 deaths (45.3%) occurred among black children.
- 15 deaths (14.2%) occurred among Hispanics.

Executive Summary (continued)

Figure 1. Number of Deaths by Manner of Death and Sex, Davidson County, TN 2007

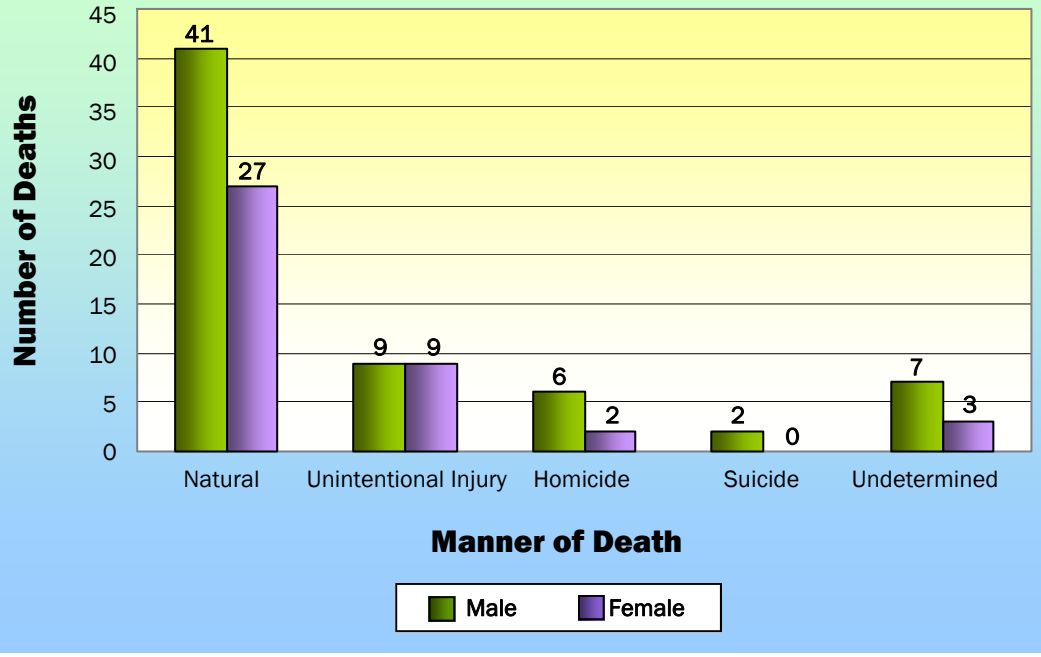
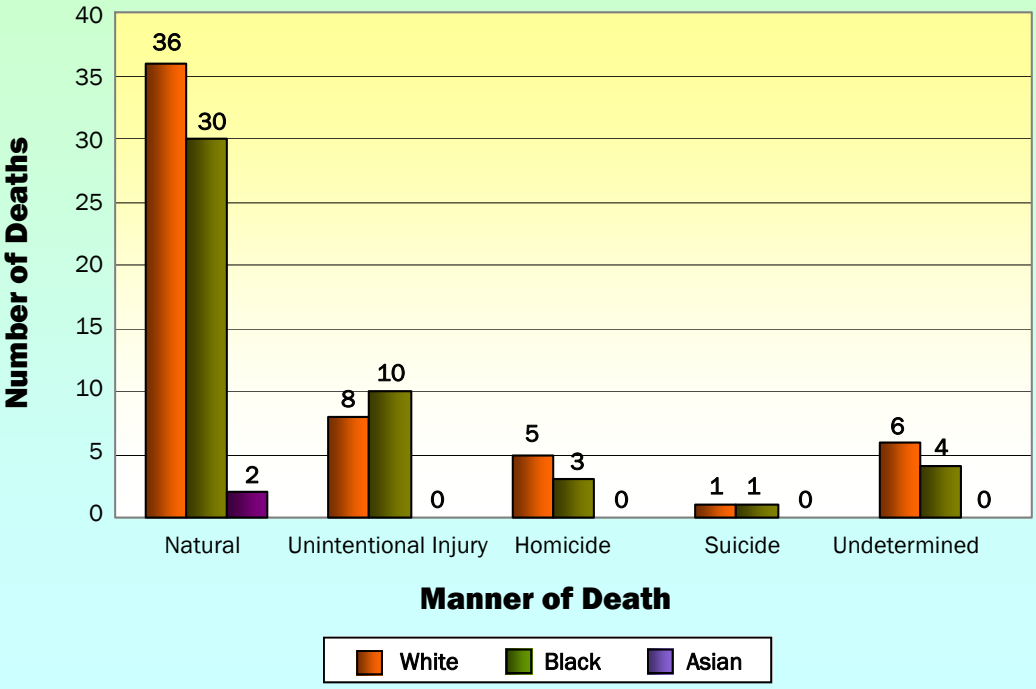
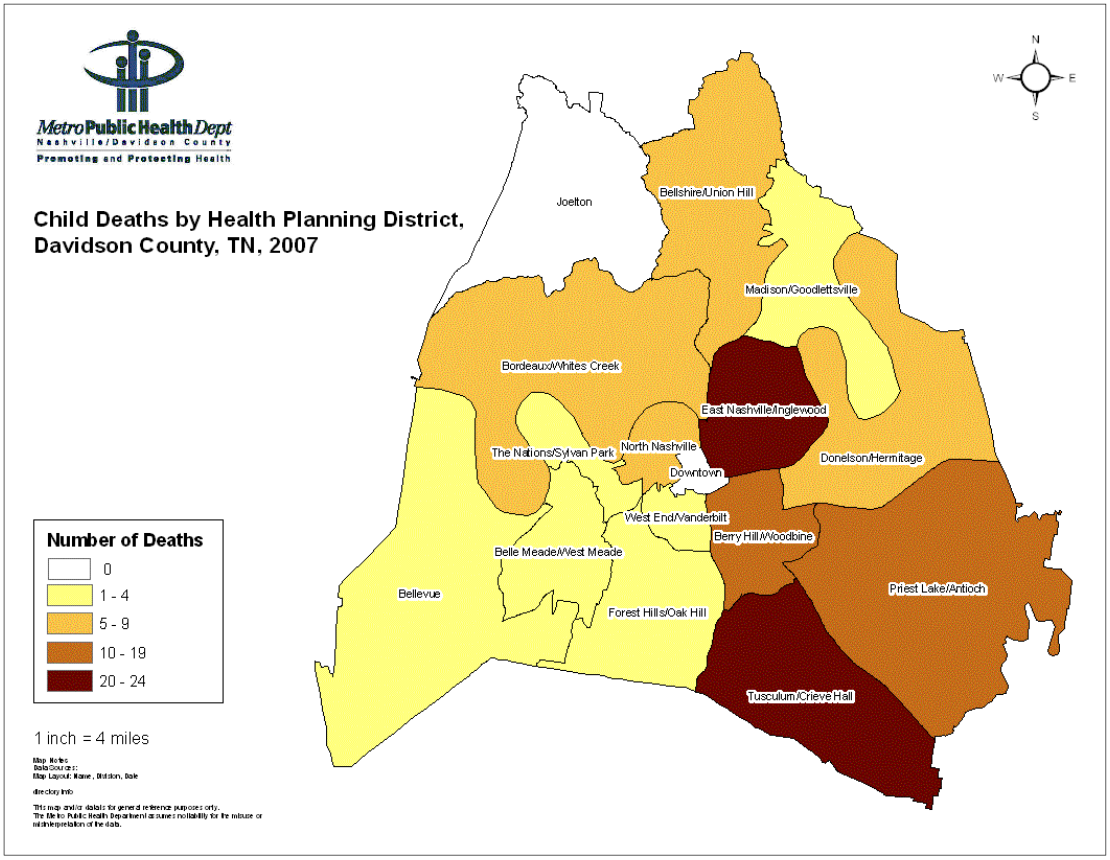


Figure 2. Number of Deaths by Manner of Death and Race, Davidson County, TN 2007



Executive Summary (continued)

- 16 cases (15.1%) had prior involvement with child protective services.
- Child abuse or neglect were noted in 3 cases (2.8%).
- Delay in obtaining medical treatment was found to be a factor in 6 cases (5.7%).
- Of the 106 cases reviewed, 27 (25.5%) were judged to be preventable deaths.



- The two health planning districts with the highest frequency of child deaths in 2007 were Tusculum/Crieve Hall and East Nashville/Inglewood.
- The two health planning districts with the 2nd highest frequency of child deaths were Berry Hill/Woodbine and Priest Lake/Antioch.

Executive Summary (continued)

Each year, the CDRT makes recommendations for policy, infrastructure, and service changes based on the results of child death investigations in an effort to prevent future childhood mortality. In 2007, the CDRT made the following recommendations:

1. The Medical Examiner's office should schedule grand rounds at local hospitals to clarify which cases require an autopsy and which cases may be declined by the ME's office. These grand rounds should also include instruction in the proper way to complete death certificates.

2. Health Department staff should prepare letters to doctors explaining errors on birth and death certificates that the team identifies. Physicians should be asked to sign a letter requesting that State Vital Records make the necessary corrections.

3. Data listed on birth certificates would be more accurate if birth records were completed just prior to discharge. This would allow time to record any birth defects that may show up after birth but prior to discharge.

4. The CDRT also requests that someone from legal counsel with the Department of Children's Services join the Nashville Child Death Review Team. There is a concern that the DA's office may not be getting complete and accurate information on a timely basis.

The Child Death Review Process

When a child dies:

- The birth and death certificates are sent from the Tennessee Department of Health (TDH) Child Fatality Review Staff to the Metro Public Health Department (MPHD) Child Death Review Team data coordinator. These data are supplemented by records from the MPHD Office of Vital Records.

- Copies of the birth and death records are sent to the Team members.

- All Team members search their agency/hospital files and bring either the records or case summaries to Team meetings. Available records are requested from programs within MPHD (HUGS, Healthy Start, WIC, etc.).

- The Team meets once a month. At these meetings, each case is reviewed and the TDH data collection form is completed.

- The Team reviews available information and comes to a consensus on whether the child death was preventable. A preventable death is defined as one in which some action or actions from individuals or systems would have alleviated the circumstances that led to an individual child death.

- The data coordinator enters the data obtained from the meetings into a database and sends the completed data collection forms to the TDH Child Fatality Review Program.

- An annual report is produced. The purpose of the report is to disseminate findings and assist in the development of data-driven recommendations for the prevention of child deaths.

Deaths Due to Natural Causes

Key Findings

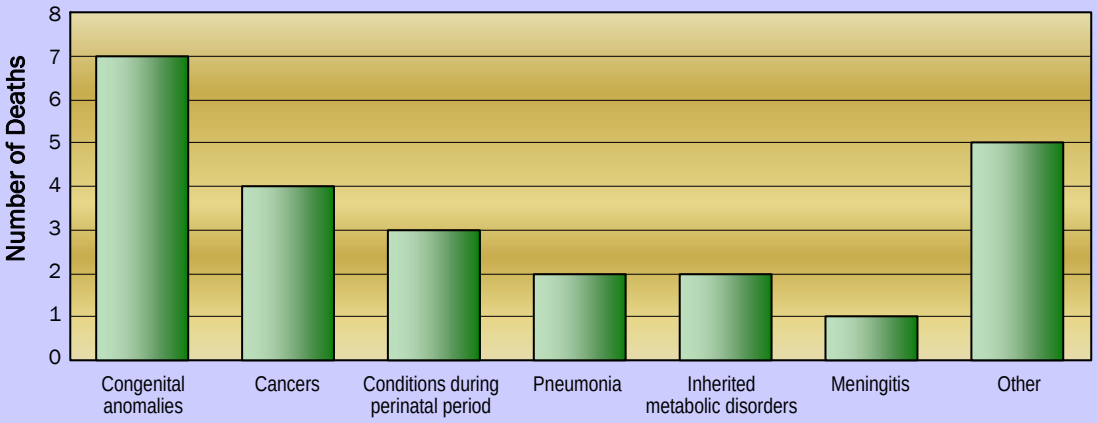
- In 2007, there were 68 child deaths due to natural causes, representing 64.2% of reviewed child deaths.
- 59 deaths (86.8%) occurred among children less than one year of age.
- Among the 59 infant deaths, 32 (54.2%) occurred among newborns less than one day old, 14 (23.7%) occurred among infants between one and twenty eight days old, and 13 (22.0%) occurred among infants between ages of one month and one year.
- 41 (60.3%) natural deaths occurred among males.
- 36 (52.9%) occurred among whites, 30 (44.1%) occurred among blacks, and 2 (2.9%) occurred among Asians.
- 9 (13.2%) natural deaths occurred among Hispanics.

Illness or Other Natural Causes

- There were 24 child deaths due to illness or other natural cause, representing 35.3% of child deaths due to natural causes and 22.6% of all child deaths.
- 16 (66.7%) deaths occurred among children less than one year of age.
- 13 (54.2%) deaths occurred among males.
- 12 (50.0%) occurred among whites, 11 (45.8%) occurred among blacks, and 1 (4.2%) occurred among other races.
- The causes of natural death due to illness or other natural cause are as follows:
    - 7 (29.2%): congenital anomalies
    - 4 (16.7%): cancer
    - 3 (12.5%): conditions that arose during the perinatal period (perinatal period is defined as the period immediately before and after birth – 22 weeks gestation to 7 days after birth.)
    - 2 (8.3%): pneumonia
    - 2 (8.3%): inherited metabolic disorders
    - 1 (4.2%): meningitis

Deaths Due to Natural Causes

Figure 4. Causes of Death Due to Illness and Other Natural Causes
Davidson County, TN 2007



Prematurity

- 44 infants died from complications of prematurity, representing 64.7% of child deaths due to natural causes and 41.5% of all reviewed child deaths.
- 23 (52.3%) deaths due to prematurity had a gestational age of 22 weeks or fewer, while 18 (40.9%) had a gestational age between 23 and 37 weeks. Gestational age was unknown for 3 (6.8%) premature deaths.
- Among deaths due to prematurity to infants born at fewer than 22 weeks gestation, 21 (91.3%) died within the first 24 hours after birth, and 18 (78.3%) weighed less than 500 grams.
- Among deaths to infants born at 23 to 37 weeks gestational age, 8 (44.4%) died between 1 and 28 days after delivery, and 14 (77.8%) weighed between 500 and 1,499 grams.
- 24 (54.5%) deaths due to prematurity occurred among whites, 19 (43.2%) occurred among blacks, and 1 (2.3%) occurred among Asians.

Sudden Infant Death Syndrome (SIDS)

Due to a change in classification, the manner of SIDS deaths is now listed as "Undetermined." Future reports will include a section on 'sleep-related' deaths.

Deaths Due to Unintentional Injury

Key Findings

- 18 children died as a result of unintentional injuries, representing 17.0% of all reviewed deaths.
- 7 (38.9%) deaths occurred among children less than 1 year of age, and 5 (27.8%) deaths occurred among children aged 1 to 5 years.
- 10 (55.6%) deaths occurred among blacks, and 8 (44.4%) deaths occurred among whites.
- 9 (50.0%) deaths occurred among females.

Motor Vehicle Crashes

- 7 children died in motor vehicle crashes, representing 38.9% of child deaths due to unintentional injuries and 6.6% of all reviewed child deaths.
- 4 of these 7 deaths (57.1%) occurred among males.
- 4 (57.1%) occurred among whites, and 3 (42.9%) deaths occurred among blacks.
- 4 (57.1%) deaths occurred among children aged 13-17 years, and 2 (28.6%) deaths occurred among children 1 to 5 years of age.
- The victim was a passenger in 4 of the 7 cases (57.1%), the driver in 2 cases (28.6%), and a pedestrian in 1 case (14.3%).
- Due to the age of the victim, a car seat should have been used in 2 cases (28.6%). A car seat was present and used correctly in 1 case, and not present but needed in 1 case.
- In the 5 (71.4%) instances where seatbelt use would have been appropriate (the child was a passenger or driver of the vehicle):
    - In 3 cases, the seatbelt was present in the vehicle but not used.
    - In 2 cases, the seatbelt was used correctly.
- In reference to the vehicle that contained the victim at the time of the incident:
    - The driver was impaired in 1 case.
    - Excessive or unsafe speed was indicated in 2 cases.

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Deaths Due to Unintentional Injury

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  - ♦ Other violations were reported in 3 cases, including 1 case where the driver failed to keep in the proper lane and struck an on-coming vehicle (resulting in 2 child deaths, one in each car), 1 case which involved a failure to yield to opposing traffic when making a left-hand turn, and 1 case where a teenager was driving with a permit without adult supervision.
- Wet road conditions were cited in 1 case. Normal road conditions were cited in all 6 other cases.

Other Unintentional Injuries

- 1 death was the result of a fall.
- 1 death resulted from a crush injury.
- 1 death resulted from prematurity induced by cocaine
- 8 deaths resulted from accidental suffocation/asphyxiation.
- In 4 deaths, the child was found wedged between a sleeping surface and a wall.
- 5 deaths involved improper sleeping environments.
- 2 deaths involved co-sleeping with an adult.
- 1 death involved smoking exposure.
- 2 deaths involved improper sleep position.

Deaths Due to Violence: Homicide and Suicide

Key Findings

- There were 8 cases of homicide and 2 cases of suicide in 2007 (10 violent deaths), representing 9.4% of all reviewed childhood deaths.
- 4 (40.0%) deaths by homicide occurred among children aged 13 to 17 years.
- 6 (60.0%) homicide cases occurred among males.
- 5 (50.0%) homicides occurred among whites, and 3 (30.0%) occurred among blacks.
- 4 (40.0%) homicides occurred among Hispanics
- 2 (20.0%) homicide deaths were the result of stabbing
- 2 (20.0%) homicide deaths were the result of gunshot wounds
    - gang involvement was cited in both
    - illegal substance use was cited in one
- 3 (30.0%) homicide deaths were the result of physical child abuse
    - 2 involved beating by a parent and partner
    - 1 involved beating by a caretaker
- Both suicides were the result of hanging

Note: Percentages are calculated based on total violent deaths.

Comparison to Selected Counties

Key Findings, Infant Mortality

Table 1. Infant Mortality Rates by Race of Mother For Selected Counties, 2007

	Rate*		
County	**All**	**White**	**Black**
Davidson County, TN (Nashville)	8.0	6.9	10.6
Jefferson County, AL (Birmingham)	12.5	9.6	15.4‡
Tuscaloosa County, AL (Tuscaloosa)	16.2	10.3	25.6
Lee County, FL (Fort Myers)	7.3	6.0	18.0
Hamilton County, TN (Chattanooga)^	9.7	6.4	16.9
Knox County, TN (Knoxville)^	4.7	3.7	12.4
Madison County, TN (Jackson)^	11.6	6.1	19.4
Shelby County, TN (Memphis)^	12.7	5.8	17.8
Mecklenburg, NC (Charlotte)	6.5	4.7	11.1

*Infant mortality rates are per 1,000 live births.

^Data provided by the Tennessee Department of Health.

‡Includes Black and Other

- Tuscaloosa County, AL had both the highest overall infant mortality rate of the Metro areas compared with 16.2 deaths per 1,000 live births, and the highest black infant mortality rate (25.6 deaths per 1,000 live births).
- The black infant mortality rate in Davidson County, TN (10.6) was 1.5 times higher than the white rate (6.9).
- Davidson County, TN had the lowest black infant mortality rate (10.6) of the areas compared, and Knox County, TN had the lowest white infant mortality rate (3.7). Knox County, TN had the lowest infant mortality rate overall (4.7).

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Comparison to Selected Counties (continued)

Key Findings, Child Mortality

Table 2. Number of Deaths, Population, and Age-Specific Mortality Rates For Children Aged 1 to 17 Years For Selected Counties, 2007

County	Number of Deaths	Population	Rate*
Davidson County, TN (Nashville)	28	124,662	22.5
Lee County, FL (Fort Myers)	29	119,396	24.3
Hamilton County, TN (Chattanooga)^	17	‡	25.9
Knox County, TN (Knoxville)^	14	‡	16.4
Madison County, TN (Jackson)^	6	‡	26.6
Shelby County, TN (Memphis)^	63	‡	26.6
Mecklenburg County, NC (Charlotte)	46	222,743	20.7

*Age-specific mortality rates are per 100,000 population.

^Data provided by the Tennessee Department of Health.

‡Data not available.

- Of the metropolitan counties compared, Knox County, TN has the lowest mortality rate per 100,000 population (16.4) for children aged 1 to 17, while Shelby County and Madison County had the highest rate (26.6).
- The mortality rate for children aged 1 to 17 years in Davidson County, TN in 2007 was 22.5 per 100,000 population.

Team Accomplishments and Recommendations

The CDRT reviewed 106* child deaths in 2007. Additionally, the work of the Team assisted law enforcement and the District Attorney's office in processing cases with legal repercussions.

In light of the number of infant deaths in Davidson County and the subsequent reviews by the CDRT, Metro Public Health Department has instituted the Fetal and Infant Mortality Review (FIMR) to gather additional and more complete information on the fetal and infant deaths in Davidson County in order to identify the main issues causing fetal and infant mortality. In 2007, MPHD held a successful Project Blossom Conference. Community participants that completed a survey stated that they gained knowledge about infant mortality.

The CDRT met with the State Registrar and Director of the Office of Vital Records to gain a better understanding of what is required to correct inaccurate data on birth and death certificates.

In 2007, the CDRT decided to address the issue of incomplete and inaccurate data within the Vital Records system. To that end, the CDRT makes the following recommendations:

1. The Medical Examiner's office should schedule grand rounds at local hospitals in order to clarify which cases require an autopsy and which cases may be declined by the ME's office. These grand rounds should also include instruction in the proper way to complete death certificates.
2. Health Department staff should prepare letters to doctors explaining errors on birth and death certificates that the team identifies. Physicians should be asked to sign a letter requesting that State Vital Records make the necessary corrections.
3. Data listed on birth certificates would be more accurate if birth records were completed just prior to discharge. This would allow time to record any birth defects that may show up after birth but prior to discharge.

The CDRT also recommends that someone from legal counsel with the Department of Children' Services should join the Nashville Child Death Review Team. There is a concern that the DA's office may not be getting complete and accurate information on a timely basis.

Child Death Review Team Members for 2007

Dr. Kimberlee Wyche-Etheridge
Director, Bureau of Family, Youth and Infant Health
Metro Public Health Department
Child Death Review Team, Chair

Dr. Bruce Levy
State Medical Examiner
Child Death Review Team, Co-Chair

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Vanderbilt Children's Hospital

Table 3. Number and Percentage of Deaths by Manner of Death by Age, Race, and Sex, Davidson County, Tennessee, 2007

	Total		Age							Sex		Race			Ethnicity	
			Detail of Cases < 1 year			All Cases										
Manner of Death	N	%	<1 day	1-28 days	29-364 days	< 1 year	1-5 years	6-12 years	13-17 years	Male	Female	White	Black	Asian	Non-Hispanic	Hispanic
Natural	68	64.2	32	14	13	59	1	5	3	41	27	36	30	2	59	9
Unintentional Injury	18	17.0	0	1	6	7	5	1	5	9	9	8	10	0	16	2
Homicide	8	7.5	0	0	3	3	1	0	4	6	2	5	3	0	6	2
Suicide	2	1.9	0	0	0	0	0	1	1	2	0	1	1	0	2	0
Undeter-mined[1]	2	1.9	0	0	1	1	1	0	0	2	0	1	1	0	1	1
Not Deter-mined[2]	8	7.6	0	0	8	8	0	0	0	5	3	5	3	0	7	1
Total	106	100.0	32	15	31	78	8	7	13	65	41	56	48	2	91	15
Percentage*	100.0		30.2	14.2	29.2	73.6	7.5	6.6	12.3	61.3	38.7	52.8	45.3	1.9	85.8	14.2

*Percentage of total deaths

[1]Undetermined due to suspicious circumstances

[2]Could not be determined

Table 4. Number and Percentage of Deaths by Manner of Death and Maternal Age, Davidson County, Tennessee, 2007

	Total		Maternal Age					
Manner of Death	N	%	13-14	15-17	18-19	20-29	30-39	40+
Natural	63	66.3	0	2	1	37	22	1
Unintentional Injury	15	15.8	1	0	2	7	4	1
Homicide	6	6.3	0	0	2	3	1	0
Suicide	1	1.1	0	0	0	0	1	0
Undetermined[1]	1	1.1	0	0	0	1	0	0
Not Determined[2]	9	9.5	0	1	1	6	1	0
Total[3]	95	100.0	1	3	6	54	29	2
Percentage*	100.0		1.1	3.2	6.3	56.8	30.5	2.1

*Percentage of total deaths

[1]Undetermined due to suspicious circumstances

[2]Could not be determined

[3]Maternal age was not reported for 11 deaths. These deaths are excluded from this portion of the analysis.

Table 5. Number and Percentage of Deaths Due to Natural Causes by Age, Sex, and Race, Davidson County, Tennessee, 2007

	Total		Age							Sex		Race			Ethnicity	
			Detail of Cases < 1 year			All Cases										
Cause of Death	N	%	<1 day	1-28 days	29-364 days	< 1 year	1-5 years	6-12 years	13-17 years	Male	Female	White	Black	Asian	Non-Hispanic	Hispanic
Illness or Other Natural Cause	24	35.3	4	5	7	16	1	4	3	13	11	12	11	1	21	3
Prematurity	44	64.7	28	9	6	43	0	1	0	28	16	24	19	1	38	6
Total	68	100.0	32	14	13	59	1	5	3	41	27	36	30	2	59	9
Percentage*	100.0		47.1	20.6	19.1	86.8	1.5	7.4	4.4	60.3	39.7	52.9	44.1	2.9	86.8	13.2

*Percentage of total natural deaths

Table 6. Number and Percentage of Deaths Due to Prematurity by Gestational Age, Age at Death, Birth Weight, Sex, and Race, Davidson County, Tennessee 2007

	Total		Age			Birth weight in grams					Sex		Race			Ethnicity	
Gestational Age	N	%	<1 day	1-28 days	29-364 days	< 500	500-1499	1500-2499	2500+	Unknown	Male	Female	White	Black	Asian	Non-Hispanic	Hispanic
22 weeks or less	23	52.3	21	1	1	18	4	0	0	1	14	9	15	7	1	21	2
23 - 37 weeks	18	40.9	5	8	5	3	14	1	0	0	12	6	8	10	0	15	3
Unknown	3	6.8	2	1	0	0	3	0	0	0	2	1	1	2	0	2	1
Total[1]	44	100.0	28	10	6	21	21	1	0	1	28	16	24	19	1	38	6
Percentage[2]	100.0		63.6	22.7	13.6	47.7	47.7	2.3	0.0	2.3	63.6	36.4	54.5	43.2	2.3	86.4	13.6

[1]Total excludes one case whose cause of death was prematurity but whose manner was deemed by the CDR team to be accidental due to cocaine induction.

[2]Percentage of total deaths due to prematurity

Table 7. Number and Percentage of Deaths Due to Unintentional Unjury by Age, Sex, Race, and Ethnicity, Davidson County, Tennessee 2007

	Total		Age				Sex		Race		Ethnicity	
Cause of Death	N	%	< 1 year	1-5 years	6-12 years	13-17 years	Male	Female	White	Black	Non-Hispanic	Hispanic
Vehicular	7	38.9	0	2	1	4	4	3	4	3	7	0
Suffocation	8	44.4	6	2	0	0	2	6	4	4	6	2
Fall/Crush	2	11.1	0	1	0	1	2	0	0	2	2	0
Other*	1	5.6	1	0	0	0	1	0	0	1	1	0
Total	18	100.0	7	5	1	5	9	9	8	10	16	2
Percentage**	100.0		38.9	27.8	5.6	27.8	50.0	50.0	44.4	55.6	88.9	11.1

*One accidental death due to a cocaine-induced premature birth

**Percentage of total deaths due to unintentional injury

Table 8. Number and Percentage of Deaths Due to Violence by Age, Sex, Race, and Ethnicity, Davidson County, Tennessee, 2007

		Total		Age				Sex		Race		Ethnicity	
				All Cases									
Manner of Death	Cause of Death	N	%	< 1 year	1-5 years	6-12 years	13-17 years	Male	Female	White	Black	Non-Hispanic	Hispanic
Homicide	Firearm	2	20.0	0	0	0	2	1	1	0	2	2	0
	Inflicted Injury	6	60.0	3	1	0	2	5	1	5	1	2	4
Suicide	Suffocation	2	20.0	0	0	1	1	2	0	1	1	2	0
	Total	10	100.0	3	1	1	5	8	2	6	4	6	4
	Percentage[1]	100.0		30.0	10.0	10.0	50.0	80.0	20.0	60.0	40.0	60.0	40.0

[1]Percentage of total deaths due to violence