

# The Massachusetts Standard Certificate of Death: Data and Public Health Uses



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Bureau for Health Information, Statistics, Research and Evaluation

Massachusetts Department of Public Health



Portions of this presentation were provided by  
Centers for Disease Control and Prevention  
National Center for Health Statistics

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# Outline

- Cause of Death and Manner
- Demographic and Cause of Death Coding
- Data Uses
- Reports of Fetal Death
- Vitals Information Processing (VIP) System

# Why do it right?

- 1. Completion of the death certificate is the final act of care given to a patient and provides closure to the family**
- 2. The death certificate is much more than just an administrative document**

# Standard format for reporting cause of death

## Part I. Diseases, injuries, or complications that caused the death

Approximate interval between onset and death

Immediate cause	a. <u>Condition which directly preceded death</u>	_____
	Due to (or as a consequence of)	
Sequentially list conditions, if any, leading to the immediate cause with underlying cause last	b. _____	_____
	Due to (or as a consequence of)	
	c. _____	_____
	Due to (or as a consequence of)	
d. _____	_____	

## Part II. Other significant conditions contributing to death but not resulting in the underlying cause

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## Immediate cause of death – Part I, line (a)

- **The disease or complication which directly preceded death**
- **There must always be an entry on line I(a)**

# Standard format for reporting cause of death

## Part I. Diseases, injuries, or complications that caused the death

Approximate interval between onset and death

Immediate cause	a. _____	_____
	Due to (or as a consequence of)	
Sequentially list conditions, if any, leading to the immediate cause with underlying cause last.	b. <b>Antecedent condition</b>	_____
	Due to (or as a consequence of)	
	c. <b>Underlying cause</b>	_____
	Due to (or as a consequence of)	
	d. _____	_____

## Part II. Other significant conditions contributing to death but not resulting in the underlying cause

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## **Antecedent causes**

**(conditions, if any, leading to immediate cause)**

**– Part I, lines (b), (c) and (d)**

- Reported conditions should be in a logical sequence in terms of time, etiology and/or pathology**
- If more lines are needed “due to” can be written between conditions on the same line –the sequence should not be continued into Part II**

# Underlying Cause of Death

**The disease that initiated the train of morbid events leading directly to death**

**or...**

- **The circumstances of the accident or violence that produced the fatal injury**

## Interval between onset and death

- For each condition reported, the interval between the presumed onset of the condition (not the date of diagnosis) and the date of death should be reported
- Terms “unknown” or “approximately” are OK when necessary

# Standard format for reporting cause of death

Part I. Diseases, injuries, or complications that caused the death

Approximate interval between onset and death

Immediate cause	a. _____	_____
	Due to (or as a consequence of)	
Sequentially list conditions, if any, leading to the immediate cause with underlying cause last.	b. _____	_____
	Due to (or as a consequence of)	
	c. _____	_____
	Due to (or as a consequence of)	
	d. _____	_____

Part II. Other significant conditions contributing to death but not resulting in the underlying cause

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## Other significant conditions – Part II

- **Other important diseases or conditions that were present at the time of death and that may have contributed to death, but were not directly related to the underlying cause of death should be reported in Part II**

# Manner of Death

- Must never be left blank
- Only one allowed
- It is the physician's best "reasonable medical certainty"

(INSTRUCTIONS ON REVERSE SIDE)

FOR USE BY  
PHYSICIANS AND  
MEDICAL EXAMINERS



STATE USE ONLY	
2010	
4c Hosp	
5 Type	
6 Hlsp	15 Race
5041	
10 Age	
15 Resid	
15 Out-State	
23 Disp	
31-32	Autop
34 Manner	
35c Work Inj	
35f Place	
36-37 Cert	
40a Pron	

DECEDENT

INFORMANT

DISPOSITION

CERTIFIER

Pronouncement of Death  
Form (R-302) on File:

DECEDENT - NAME	
1 PLACE OF DEATH	
New Be	
4a PLACE OF DEATH	
HOSPITAL:	
<input checked="" type="checkbox"/> Inpatient <input type="checkbox"/> E	
5 WAS DECEDENT	
(If yes, Specify P	
<input type="checkbox"/> NO <input checked="" type="checkbox"/> YES	
8a Specify:	
AGE - Last Birth	
(Yrs.)	
10a	
MARRIED, NEVE	
WIDOWED OR D	
Never Ma	
12 RESIDENCE - N	
126 V	
15a	
FATHER - FULL	
16 Jonat	
INFORMANT'S N	
Carmer	
20	
23 METHOD OF	
<input checked="" type="checkbox"/> BURIAL	
<input type="checkbox"/> ENTOMBMEN	
<input type="checkbox"/> DONATION	
PLACE OF DISPO	
St. Jo	
26a	
DATE OF DISPO	
(M O Y) 0 2 0 8	
27	
29 PART I - Enter	
List of	
IMMEDIATE CAU	
disease or condit	
in death)	
Sequentially list co	
any, leading to im	
cause. Enter UND	
CAUSE (disease &	
initiated events re	
death) LAST	
PART II - Other si	
30	
MED. EXAM.	
NOTIFIED?	
(Yes or No)	
y	
33	
DESCRIBE HOW	
35d	
36a To th	
caus	
(Signature	
and Title)	

# Demographic Coding

- In preparation for data entry, RVRS staff code:
  - Hospital
  - Place of death
  - Hispanic Origin/ Race
  - Age if under 1 year
  - Place of injury
  - Out of state residence code

✓  
IMPORTANT REQUEST TO DATA ENTRY:  
PLEASE KEY VERIFY 100%

*Bill McMichael*  
PREPARED BY

D.P.H. KEYE  
MAR02A

JOB NAME

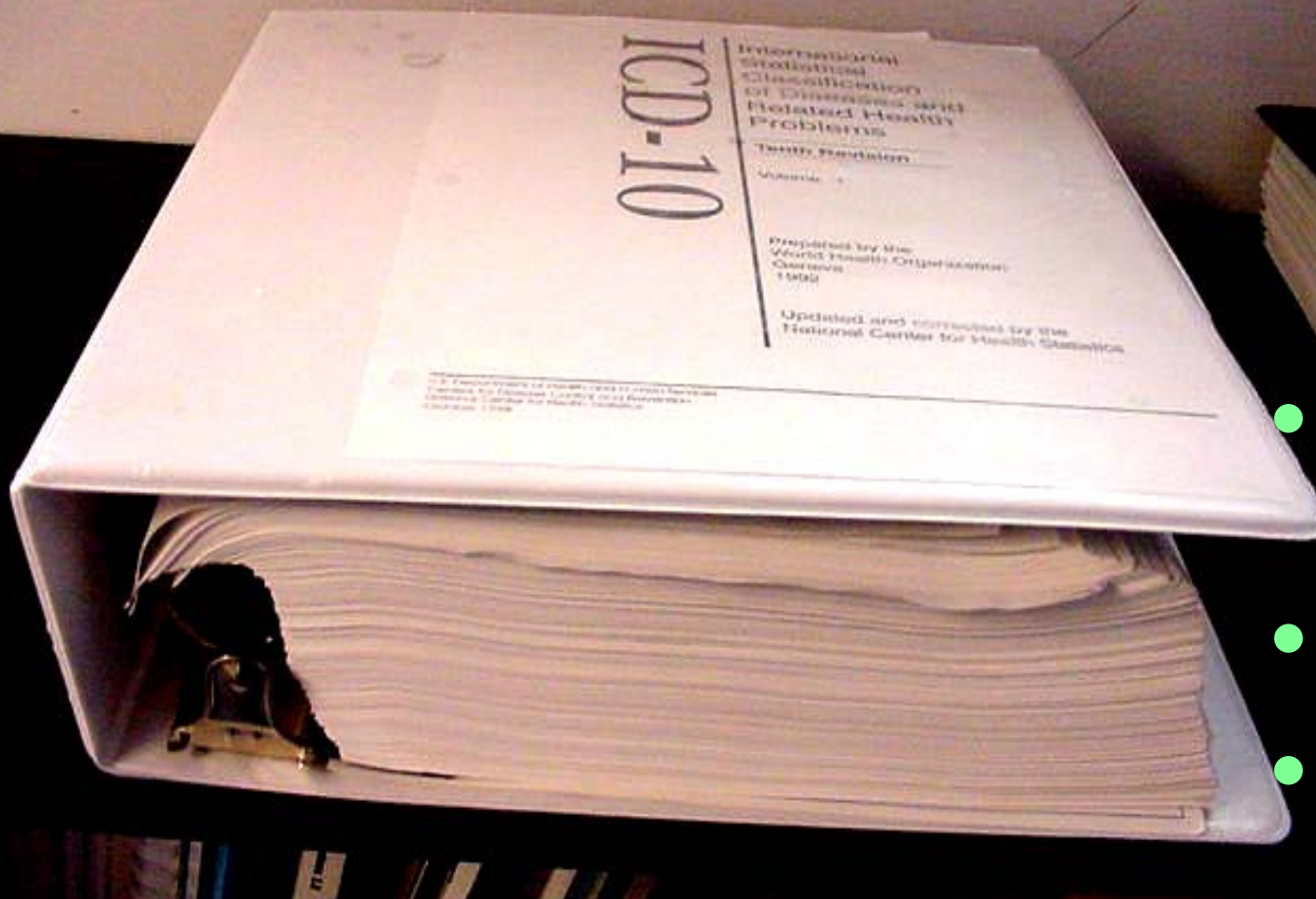
BATCH NUMBER

83  
VESMO

PROGRAM

- Records are data entered by DPH IT
- Shipments tracked - separate demographic & medical
- Index created
- Statistical database merged on mainframe

# Cause of Death Coding



- Trained “nosologists”
- SuperMICAR
- Underlying cause of death
- ICD-10 in 1999

## & More Processing...

- Infant Death Match
- Edits - Internal & Federal
- Out-of-State coding for Massachusetts residents
- Interstate Exchange for non-MA residents
- NCHS Samples

# How Information Is Used

- Information from the death certificate, including the cause of death, is used to generate official mortality statistics such as:
  - Life expectancy
  - Deaths and death rates by cause of death, geographic area and socio-demographic characteristics
  - Leading causes of death
  - Infant and maternal mortality rates

# How Information Is Used

- **Mortality statistics generated from death certificates are used to:**
  - Assess the general health of the population
  - Examine medical problems which may be found among specific groups of people
  - Indicate areas in which medical research may have the greatest impact on reducing mortality
  - Allocate medical services, funding, and other resources

# A Wealth of Uses...



*(and much more)*

# Child Fatality Review

- M.G.L. Chapter 38: Section 2A

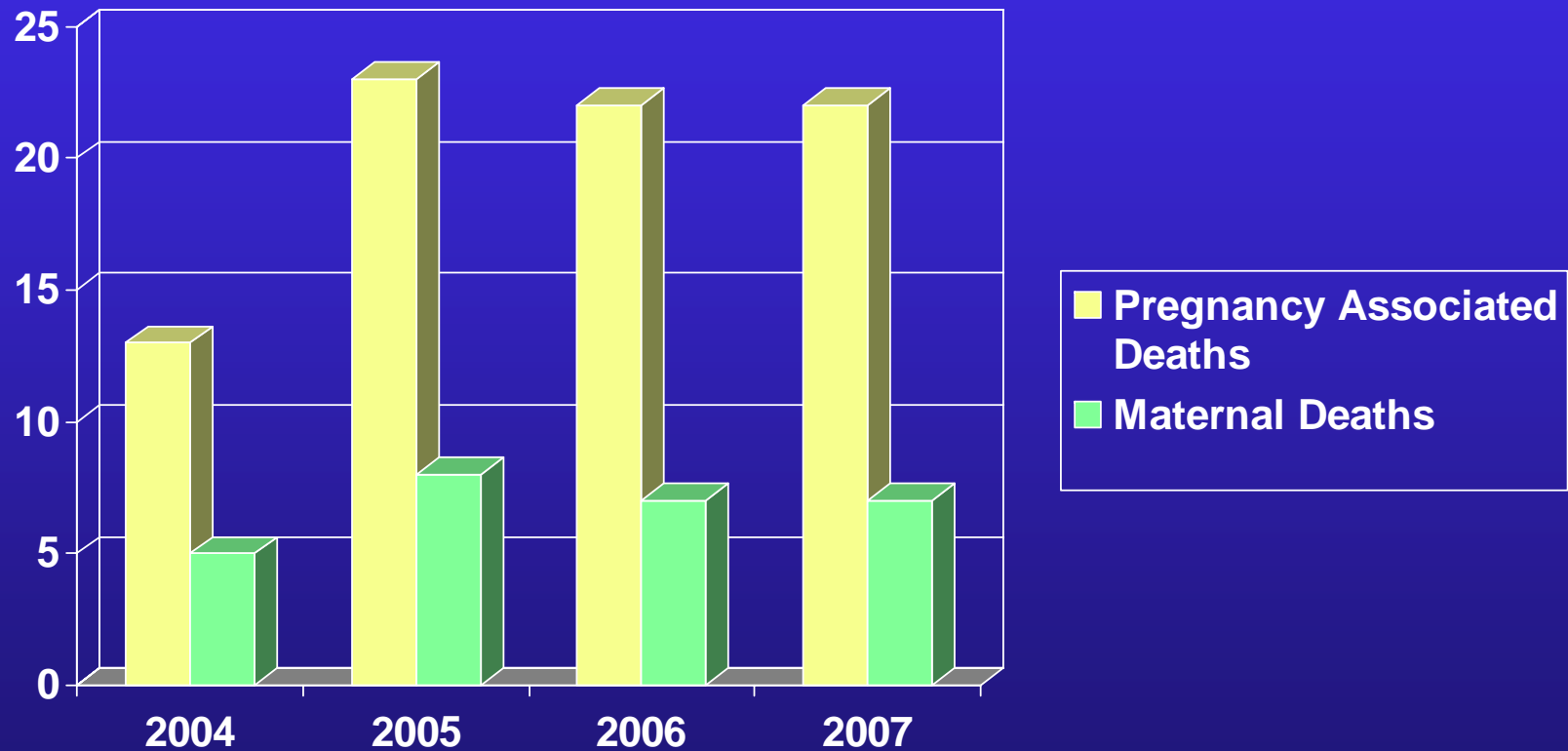
Purpose of the team shall be to decrease the incidence of preventable child fatalities...

- Multidisciplinary Teams
- RVRS provides death certificates for individuals under 18 and birth data for children under one year on a monthly basis

# Maternal Mortality Review

- Pregnancy associated deaths
- Maternal death
- Case ascertainment
  - Division of Health Care Quality
  - RVRS
- Clinicians review cases

# Number of Pregnancy Associated and maternal Deaths, Massachusetts: 2004-2007



# Publications and Statistics

- The Registry's PD1 (Annual Report of Vital Statistics) is the oldest continuously published public document in the U.S. RVRS has a full set of PD1s from 1842 to the most recent

## BIRTHS, MARRIAGES AND DEATHS.

TABLE II.—CONTINUED.

Cities and Towns.	Popul'n.	Marr.	Bths.	Dths.	Cities and Towns.	Popul'n.	Marr.	Bths.	Dths.
Hadley, - - -	1814	-	-	-	Bernardston, <sup>8</sup>	992	4	22	8
Hatfield, - - -	933	16	21	11	Buckland, <sup>9</sup>	1084	8	-	-
Middlefield, - -	1717	6	15	10	Charlemont, <sup>10</sup>	1127	6	24	20
Northampton, -	3750	16	87	94	Colrairie, <sup>11</sup>	1971	6	78	20
Norwich, - - -	750	8	18	10	Conway, <sup>12</sup>	1409	9	8	17
Pelham, - - -	956	13	8	7	Deerfield, <sup>13</sup>	1912	8	-	44
Plainfield, - - -	910	14	23	14	Erving, <sup>14</sup>	309	-	1	8
Prescott, - - -	780	8	10	7	Gill, - - -	798	6	17	20
South Hadley, -	1458	15	40	31	Greenfield, -	1756	-	-	-
Southampton, <sup>1</sup>	1157	11	23	18	Hawley, - - -	977	3	10	10
Ware, <sup>2</sup> - - -	1890	19	1	42	Heath, <sup>15</sup>	895	4	20	10
Westhampton, -	759	3	11	14	Leverett, - - -	875	10	10	17
Williamsburg, -	1309	19	23	22	Leyden, - - -	632	12	20	5
Worthington, <sup>3</sup>	1197	10	34	30	Monroe, - - -	282	-	10	6
HAMPDEN.	30,897	256	535	518	Montague, <sup>16</sup>	1255	2	-	18
Blandford, - -	1427	17	49	26	New Salem, -	1305	11	9	12
					Northfield, <sup>17</sup>	1673	1	21	3

## BIRTHS, MARRIAGES

TABLE II.—C

Cities and Towns.	Popul'n.	Marr.	Bths.	Dths.	C
Lanesborough,	1140	8	-	11	SI
Lee, - - -	2428	15	57	38	SI
Lenox, - - -	1313	4	6	13	W
Mt. Washing'tn,	438	1	12	5	W
New Ashford,	227	2	2	3	W
N. Marlboro', -	1682	-	4	15	
Otis, - - -	1177	7	-	23	
Peru, - - -	576	2	12	12	I
Pittsfield, - -	3747	4	51	51	A
Richmond, - -	1097	4	12	10	B
Sandisfield, -	1464	5	1	-	D
Savoy, - - -	915	4	1	1	D
Sheffield, - -	2322	10	-	48	E
Stockbridge, -	1992	-	-	-	F
Tyringham, -	1477	4	8	6	F
Washington, -	991	3	24	11	F
W. Stockb'dge.	1448	9	2	10	M

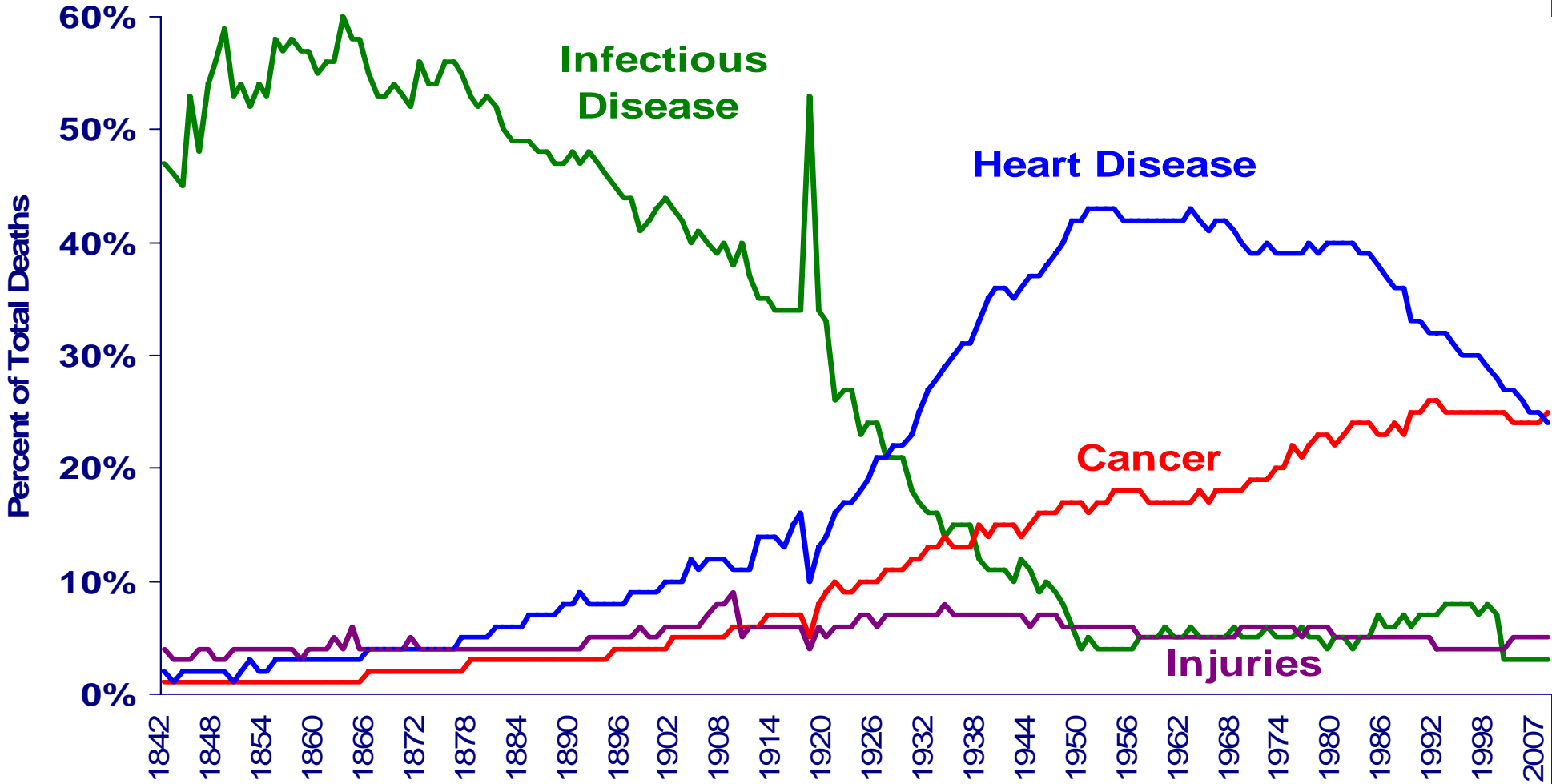
SOUTHBOROUGH, June 5, 1843.

To the Secretary of the Commonwealth: DEAR SIR,—This return would have been made and forwarded in due time if sickness had not prevented me.

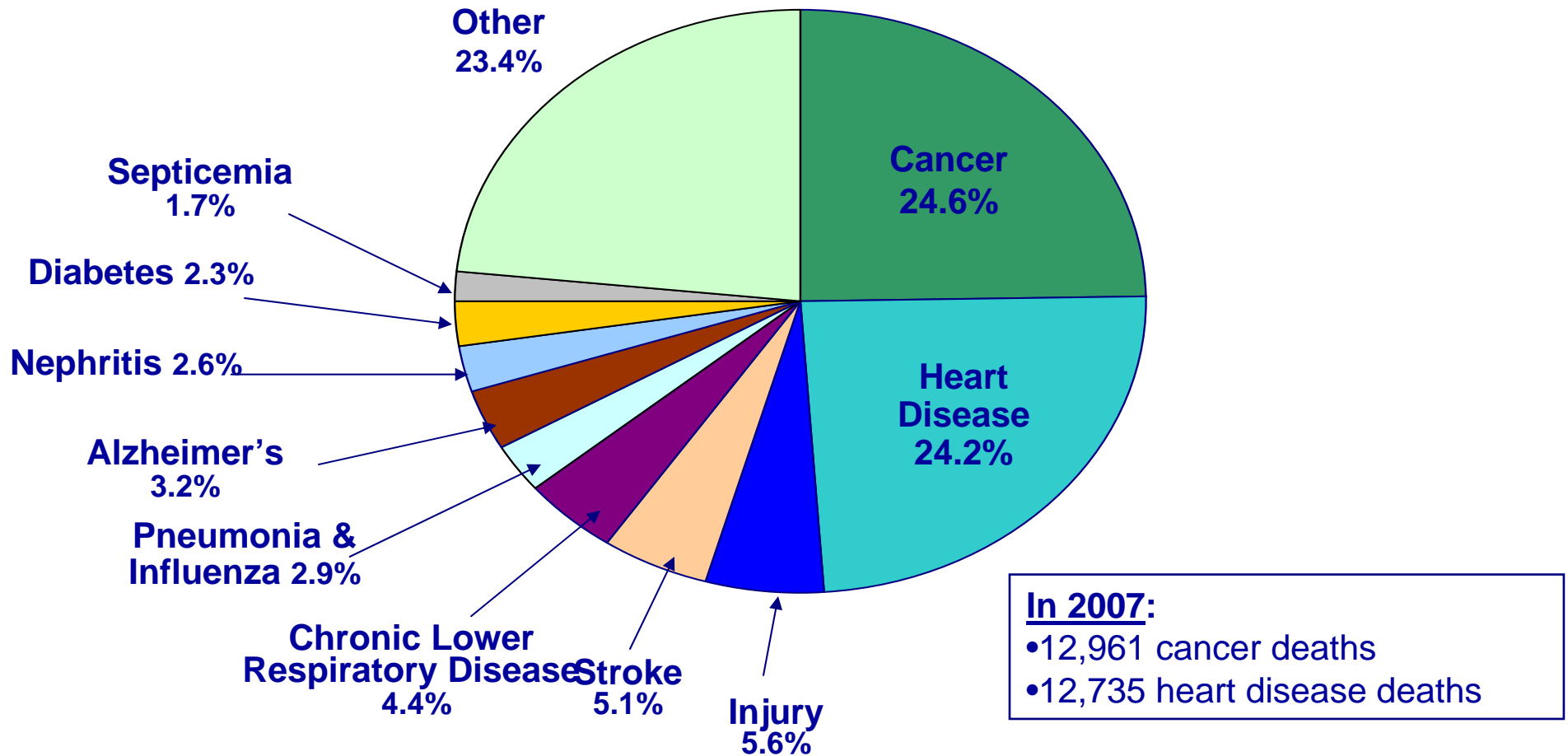
I know there has been 23 births in Southborough from May 1, 1842 up to May 1, 1843, though not more than 6 of those births have been recorded. Such has been the delinquency of our citizens. But we design that for the coming year, in this town, the law shall be strictly complied with, in order to enable the town clerk to make out his return full and complete.

Your obedient servant, JOEL BURNETT.

# Causes of Death Massachusetts: 1842-2007



# Leading Causes of Death Massachusetts: 2007



# Ranking of Leading Causes of Death by Race and Ethnicity Massachusetts: 2007

	<u>White<sup>1</sup></u> (N=48,518)	<u>Black<sup>1</sup></u> (N=2,211)	<u>Asian<sup>1</sup></u> (N=610)	<u>Hispanic</u> (N=1,264)
<b>Cancer</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>Heart Disease</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>Stroke</b>	<b>3</b>	<b>6</b>	<b>3</b>	<b>5</b>
<b>CLRD<sup>2</sup></b>	<b>4</b>	<b>9</b>	<b>6</b>	<b>16</b>
<b>Unintentional Injuries</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>3</b>
<b>Alzheimer's Disease</b>	<b>6</b>	<b>14</b>	<b>14</b>	<b>15</b>
<b>Influenza &amp; Pneumonia</b>	<b>7</b>	<b>15</b>	<b>4</b>	<b>17</b>
<b>Nephritis</b>	<b>8</b>	<b>3</b>	<b>8</b>	<b>9</b>
<b>Diabetes</b>	<b>9</b>	<b>4</b>	<b>7</b>	<b>4</b>
<b>HIV/AIDS</b>	<b>29</b>	<b>8</b>	<b>--</b>	<b>8</b>
<b>Homicide</b>	<b>30</b>	<b>7</b>	<b>21</b>	<b>7</b>

OH9900

Note: The lower the number the higher the rank

<sup>1</sup> Non-Hispanic, <sup>2</sup> Chronic Lower Respiratory Disease

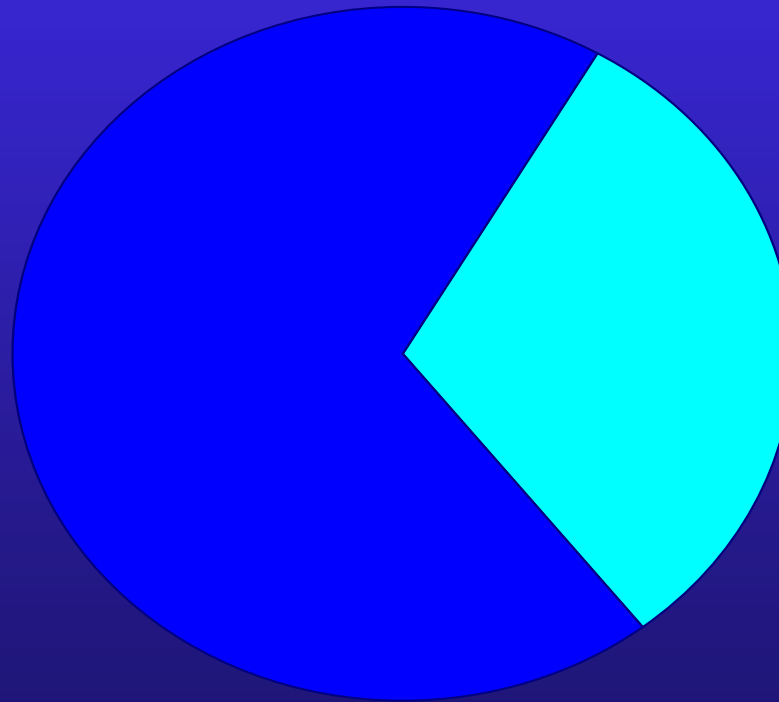
# Leading Causes of Death by Age Massachusetts: 2007

<u>Age</u>	<u>Leading Cause</u>	<u>% of Total in Age Group</u>	<u>Total Deaths</u>
1-14	Injuries	32%	128
15-24	Injuries	72%	505
25-44	Injuries	44%	2,023
45-64	Cancer	37%	8,560
65-74	Cancer	40%	7,494
75-84	Cancer	27%	14,781
85+	Heart Disease	30%	18,816

# Diabetes-Related Deaths Massachusetts: 2007

**All Diabetes-related  
N=3,899**

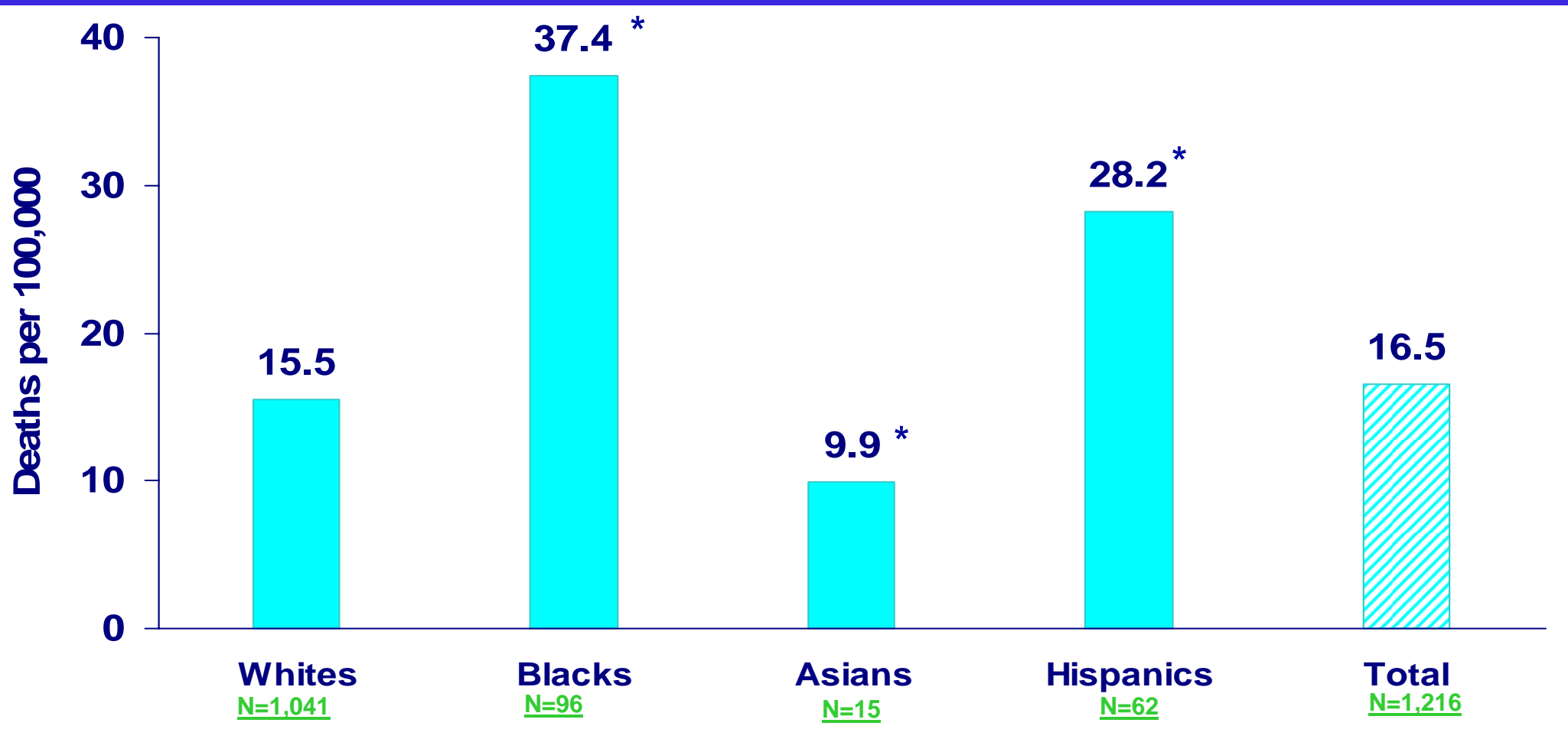
**Contributing Cause**  
(Looking at all other 15  
conditions mentioned on death  
certificates)  
**N=2,683**



**Underlying Cause**  
(Disease or injury which  
initiated the train of events  
leading directly to death, or the  
circumstances of the accident  
or violence which produced  
the fatal injury)<sup>1</sup>  
**N=1,216**

<sup>1</sup> World Health Organization. International Statistical Classification of Diseases and Related Health Problems, Tenth Revision. 2d ed. Geneva: World Health Organization. 2004.

# Diabetes Mortality Rates by Race and Ethnicity Massachusetts: 2007

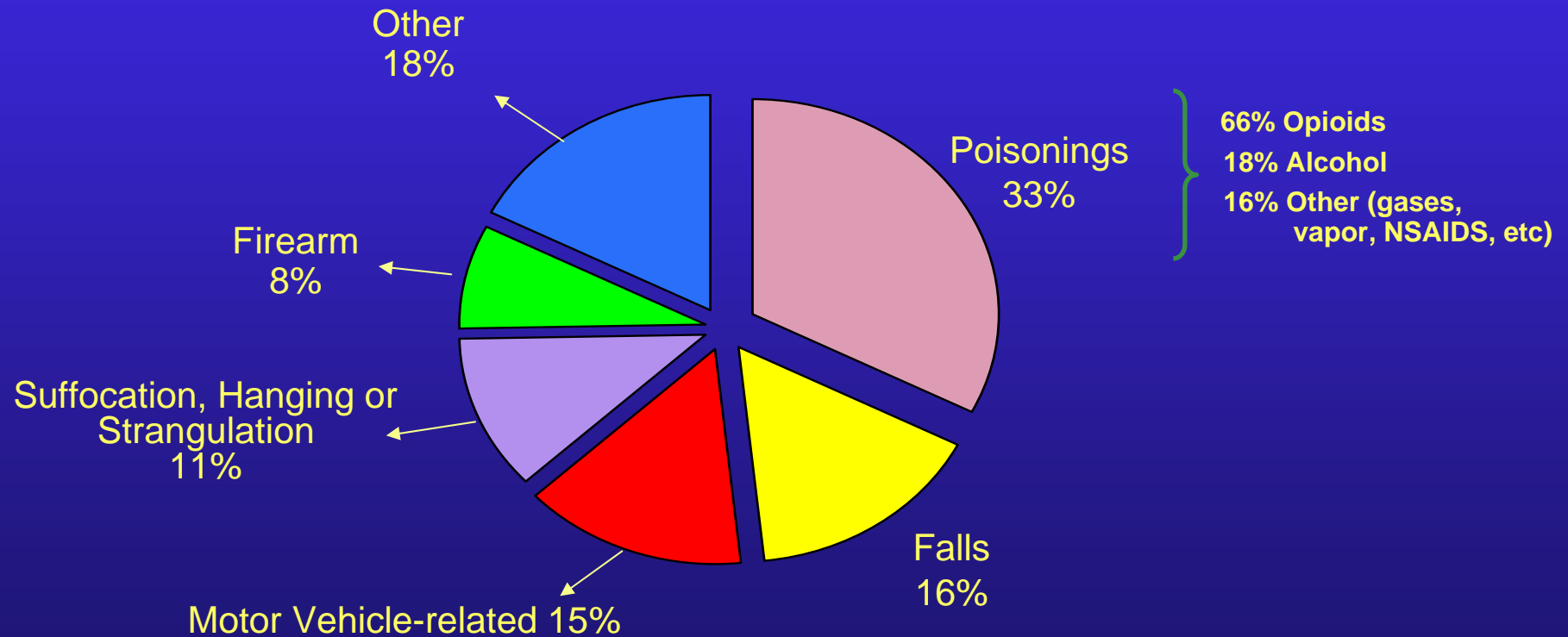


Rates are per 100,000 population. Age-adjusted to the 2000 US standard population

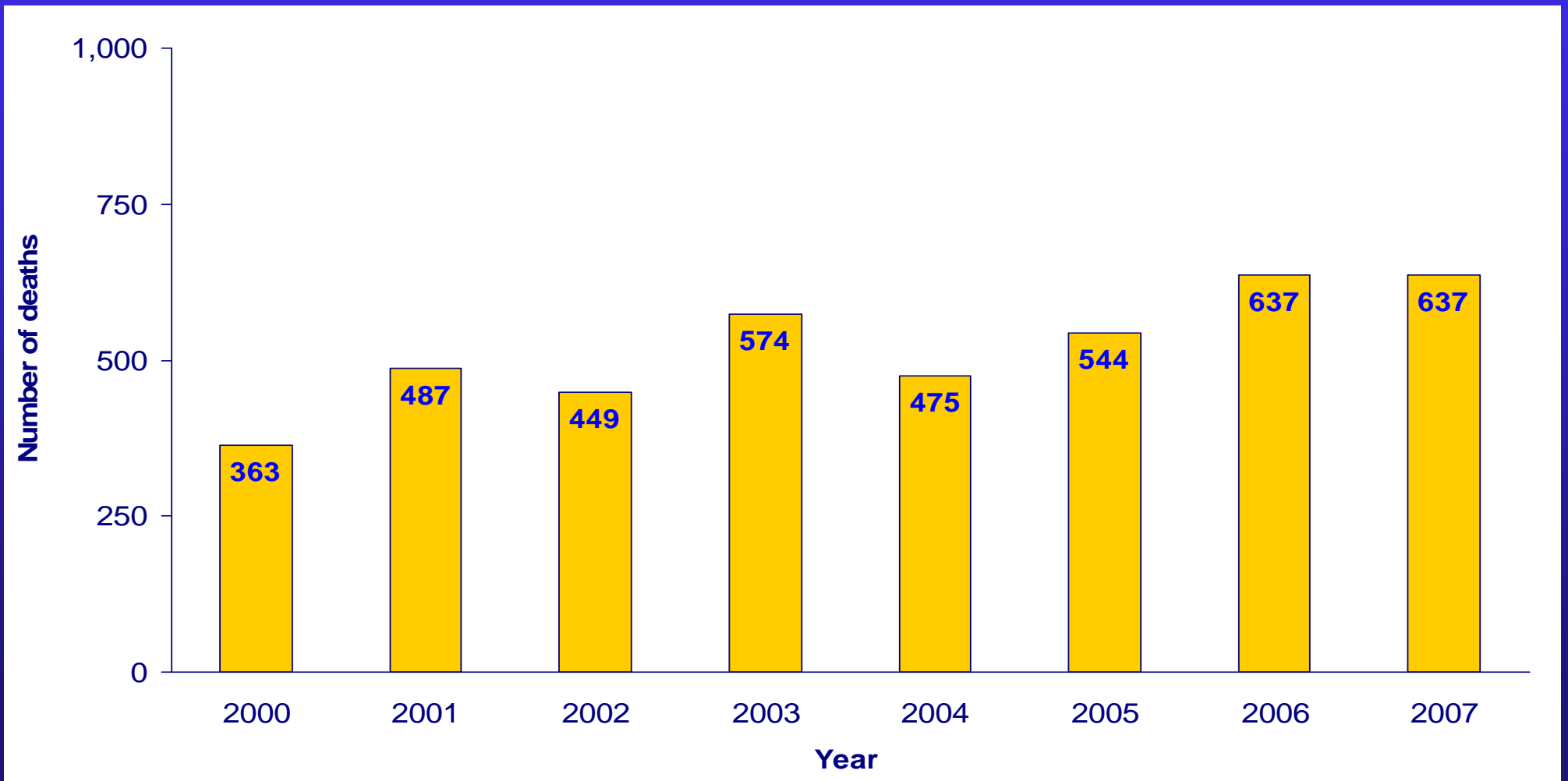
\* Statistically different than state rate (p<0.05)

# Causes of Injury Deaths Massachusetts: 2007

Total Injuries = 2,967



# Number of Poisoning Deaths Where *Opioids Are Mentioned* Massachusetts: 2000-2007



# Report of Fetal Death



The Commonwealth of Massachusetts  
DEPARTMENT OF PUBLIC HEALTH  
REGISTRY OF VITAL RECORDS AND STATISTICS  
**REPORT OF FETAL DEATH**

FORM R-304 1/00

DATE OF RECORD

STATE USE ONLY

FACILITY NUMBER	FACILITY NAME (IF NOT HOSPITAL, GIVE STREET AND NUMBER)		DATE OF DELIVERY (Month Day Year)	
	CITY/TOWN OF DELIVERY	COUNTY OF DELIVERY	TIME OF DELIVERY	PLACE OF DEATH
<b>FETUS</b>			PLURALITY	BIRTH ORDER
	SEX	WEIGHT	WEEKS GESTATION AT DELIVERY DATE	DIED BEFORE LABOR / DURING LABOR OR DELIVERY
<b>MOTHER</b>	CURRENT NAME FIRST MIDDLE LAST			
	MAIDEN SURNAME	DATE OF BIRTH	CITY AND STATE/COUNTRY OF BIRTH	
	RESIDENCE ADDRESS	NUMBER AND STREET	CITY/TOWN	COUNTY STATE ZIP
<b>FATHER</b>	CURRENT NAME FIRST MIDDLE LAST			
	DATE OF BIRTH	CITY AND STATE/COUNTRY OF BIRTH		
<b>CAUSE OF FETAL DEATH PART I</b>	ENTER ONLY ONE CAUSE PER LINE FOR (a), (b), and (c) SPECIFY FETAL OR MATERNAL			
	IMMEDIATE CAUSE	(a)		
	DUE TO OR AS A CONSEQUENCE OF	(b)		
	DUE TO OR AS A CONSEQUENCE OF	(c)		
<b>PART II</b>	OTHER SIGNIFICANT CONDITIONS OF THE FETUS OR THE MOTHER			
	WAS THE CASE REFERRED TO A MEDICAL EXAMINER?	WAS AN AUTOPSY PERFORMED?	WERE AUTOPSY FINDINGS AVAILABLE PRIOR TO THE COMPLETION OF CAUSE OF DEATH?	
	DATE OF INJURY (MATERNAL)	TIME OF INJURY	INJURY AT WORK	PLACE OF INJURY
	DESCRIBE HOW INJURY OCCURRED		LOCATION OF INJURY	
<b>CERTIFIER</b>	I HEREBY CERTIFY that this delivery occurred on the date stated and the product of conception was not a live birth.			
	Signature of Certifying Physician or Medical Examiner		TITLE	LICENSE #
	Type or Print - Name of Certifying Physician or Medical Examiner			

•Hospital or ME Transmits Directly to RVRS

•Board of Health may receive a copy for disposition permit

# Report of Fetal Death

Mother's Name		State File Number	
Mother Transferred Into Facility?	Transferred from:	Mother's Occupation	Mother's Industry
Mother's Race (Specify):		Mother's Ancestry (Specify):	
Mother's Elem/Sec Education	Grade:	Diploma:	Mother's College/University Education
Years:	Degree:		
Tobacco Prior:	Tobacco During:		Alcohol During:
Marital Status	Father's Occupation	Father's Industry	
Father's Race (Specify):		Father's Ancestry (Specify):	
Father's Elem/Sec Education	Grade:	Diploma:	Father's College/University Education
Years:	Degree:		
Pregnancy History:	Prior Births Living:	Prior Births Now Dead:	Date of Last Live Birth:
Weight Gain:	Prior Terminations:		Date of Last Termination:
Date Last Menses Began	Date of First Prenatal Visit	Number of Prenatal Visits	
Site of Prenatal Care:	Type of Prenatal Practitioner		
Prenatal Tests and Procedures	Risk Factors for this Pregnancy		
Prenatal Payment Type:	Government Source:	Delivery Payment Type:	Government Source:
Name of Insurer		Name of Insurer	
Methods of Delivery	Complications of Labor and Delivery		
Clinical Estimate of Gestation in Weeks:			
Labor and Delivery Procedures	Congenital Anomalies of Fetus		
Name of Person Completing Report	Title		

Do not send this portion to the Board of Health. The original R-304, front and back, should be sent by mail (or in approved electronic format) directly to the Department of Public Health address listed on the front of this form.

**DO NOT PHOTOCOPY BELOW THIS LINE**

HID

- Pregnancy and Delivery information are captured on the back of the Report of Fetal Death
- Information is similar to what is collected on the statistical portion of the birth certificate and is used to assess birth outcomes.

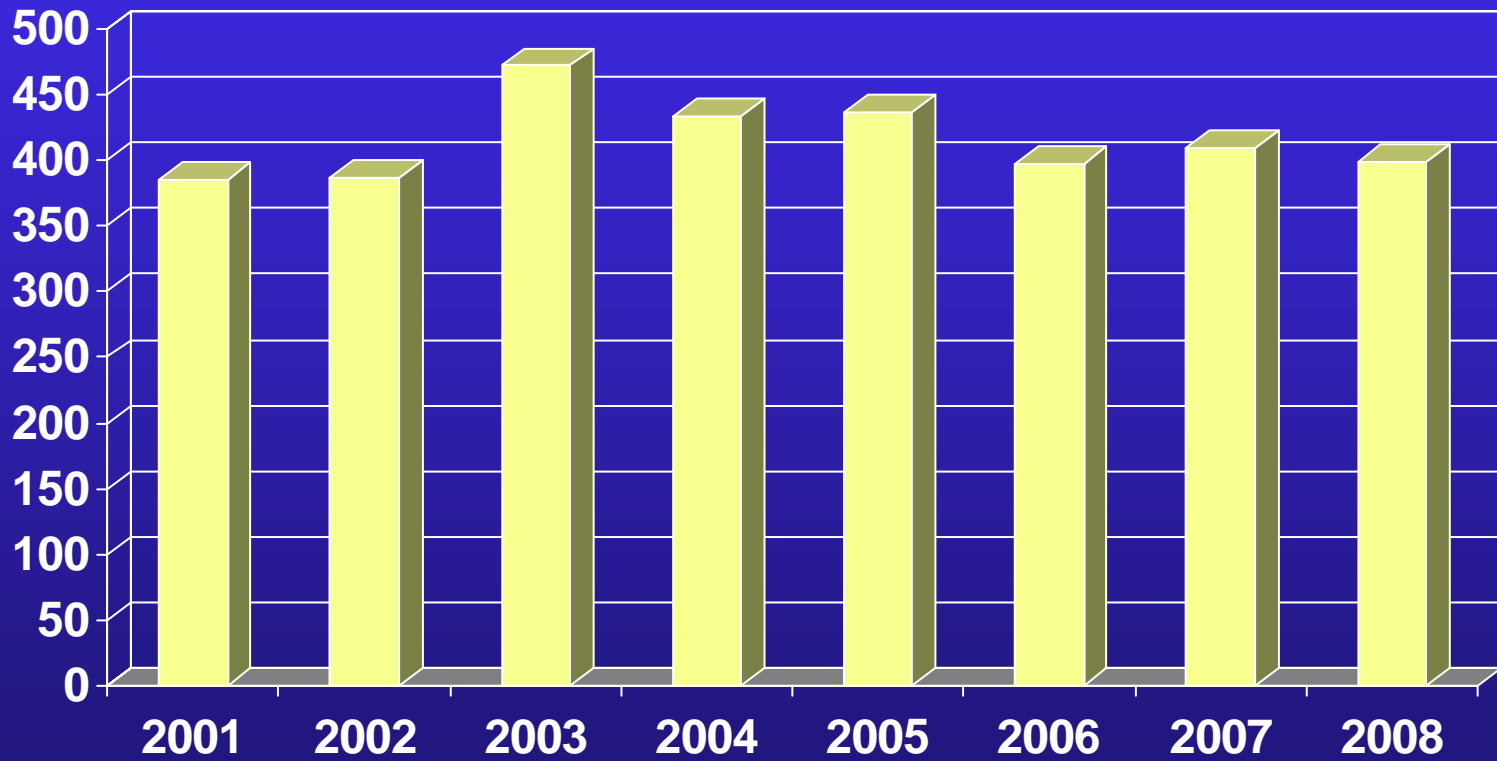
# Report of Fetal Death

- Massachusetts General Law Chapter 111 section 202 governs the reporting of fetal death information.
- “... death prior to the complete expulsion or extraction from its mother...”
- If a fetus weighs 350 grams or more OR is twenty weeks gestation or more, it is reportable to DPH within 10 days of the event.

# Report of Fetal Death

- Reports are confidential and shall be released only upon written request of the parent, executor or any other person designated by the parent in writing.
- Beginning in 2002, parents may now request a Certificate of Birth Resulting in Stillbirth provided there is a Report of Fetal Death

# Reports of Fetal Death by Year



# 2007 Reports of Fetal Death

## Cause of Death

- 1) Fetal death of unspecified cause
- 2) Unknown
- 3) Compression of umbilical cord
- 4) Placental separation and hemorrhage
- 5) Extreme immaturity

# A wealth of public health information

Vital Records computer files date back to 1969.

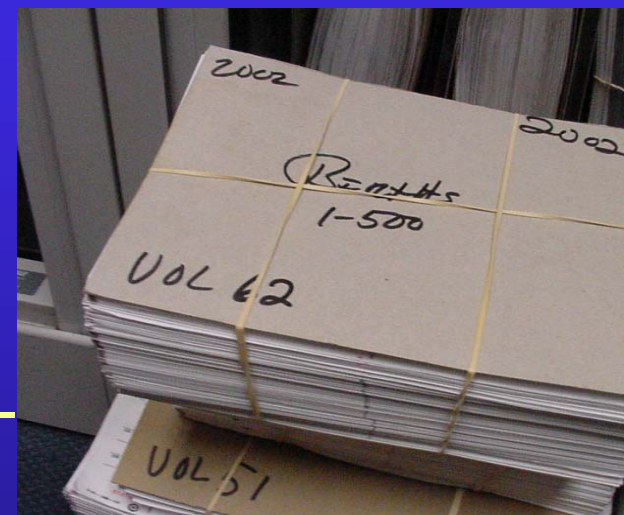
In total, RVRS maintains files of:



# Current State: Existing Challenges

Since 1969, vital records registration and statistics processing has changed very little

- 200,000 legal birth, death and marriage documents travel every year by mail between registration partners:
  - City/town clerks, physicians, medical examiners, hospitals, funeral directors, courts, marriage officiants, boards of health, and out-of-state state vital records offices...& more
  - Most legal birth, death and marriage paper certificates arrive 2-4 months after occurrence
  - Non-uniform issuance: over 500 variations of certified copies



# Current State: Existing Challenges, cont.

- **Statistical data capabilities are limited**
  - Birth data is transmitted via 2400 bps modem from DOS-based system at hospital
    - 14 year-old system is no longer supported by vendor
    - No ability to modify for changing needs of DPH programs and researchers
  - Death and marriage records are not available on a statistical file for 7-8 months
    - No ability to respond with timely mortality data
    - Little mainframe or COBOL support available for fixes or modifications

# VITALS INFORMATION PROCESSING SYSTEM

Create a secure, fully web based system to support the processing of vital records information and associated statistical data.

1. Streamline processing through use of shared central system
2. Replace current obsolete systems
3. Compliance with Federal and Commonwealth statutes
4. Improve timeliness and accuracy of data
5. Reduce administrative burden for all stakeholders in capturing and reporting information

# Additional Benefits of the VIP System

Ability to respond quickly and inexpensively to changing needs – e.g., emerging legal and statistical data such as Assisted Reproductive Technology and new mandates such as the adoption registry

1. Keep personal information secure and private
2. Prevent ID theft and vital records fraud
3. Match births and deaths beyond age 1
4. Match marriages and divorces
5. Support nationwide verifications and inter-jurisdictional exchange
6. Rapidly assist law enforcement activities
7. Provide improved and timely customer service

# Features of the VIP System

## Births

Process Birth  
Records

Statistical  
Information

## Deaths, Fetal Deaths

Process Death  
and Fetal Death  
Records

Statistical  
Information

## Marriages, Divorces, ITOP

Process Marriage  
Records

Process Divorce  
Reports

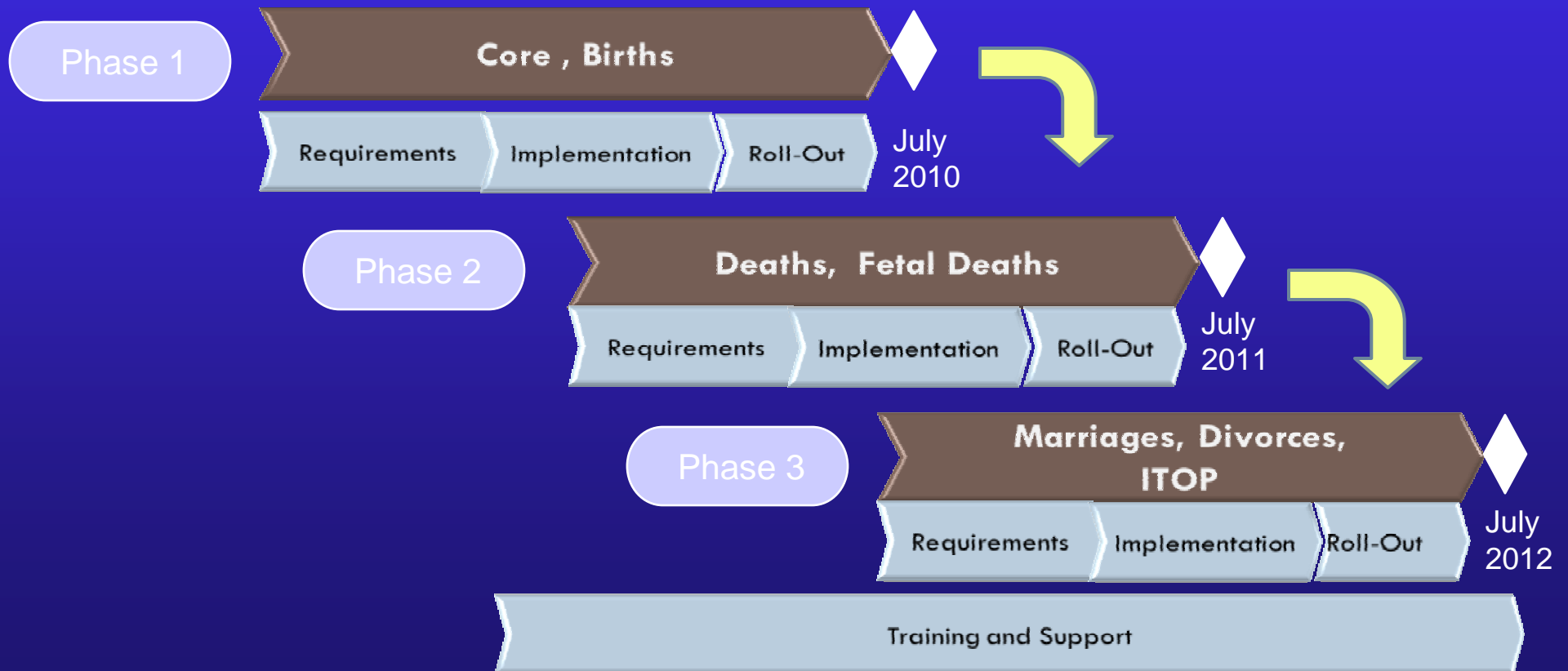
Statistical  
Information

## Core Functions

Security  
Reporting  
Data Exchange

# Project Timeline

Project completed in independent steps or phases which build on each other. Each step will provide value to the RVRS and stakeholders.



# Contacts

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