

The Future of Vital Statistics

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Robert Wood Johnson Foundation

POPULATION AND NUMBER OF DEATHS—ILLINOIS

U. S. CENSUS REPORT 1850.

Total Population	851,470
White	846,034
Free Colored	5,436
Number died during year.....	11,619

NUMBER OF DEATHS FROM CERTAIN DISEASES—ILLINOIS

U. S. CENSUS REPORT 1860.

Population 1,711,951.

Deaths	19,300	Fever typhoid	1,183
Bowels, disease of.....	26	Infantile	378
Bronchitis	75	Influenza	14
Cephalitis	701	Measles	109
Cholera	70	Pleurisy	46
Cholera infantum	315	Pneumonia	1,357
Consumption	1,948	Scarlet fever	1,698
Croup	1,158	Smallpox	8
Diarrhoea	607	Teething	198
Diphtheria	41	Deaths under 1 year.....	4,407
Dysentery	845	Deaths under 5 years.....	9,928
Enteritis	329	Whooping cough	382
Fever intermittent	464	Yellow fever	1
Fever remittent	682		

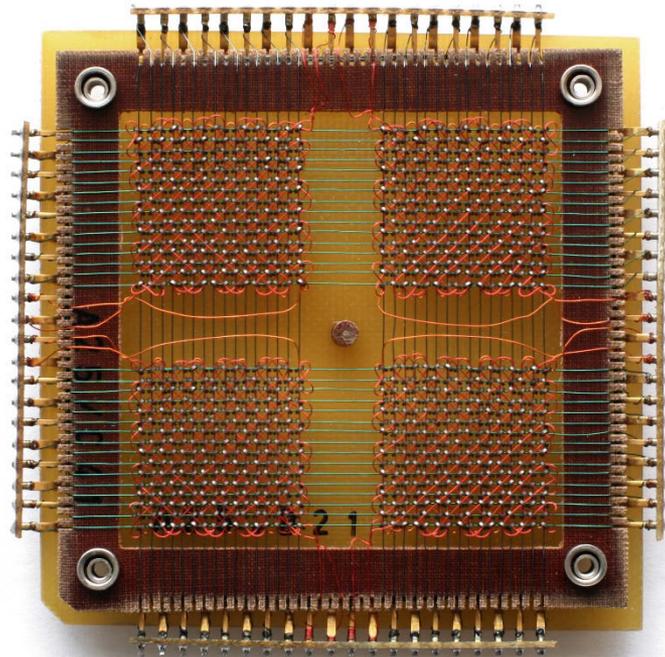
Table 2.

RATIO OF DEATHS AMONG CHILDREN LESS THAN FIVE TO ALL DEATHS.
CHICAGO 1843-1877 AND 1925.

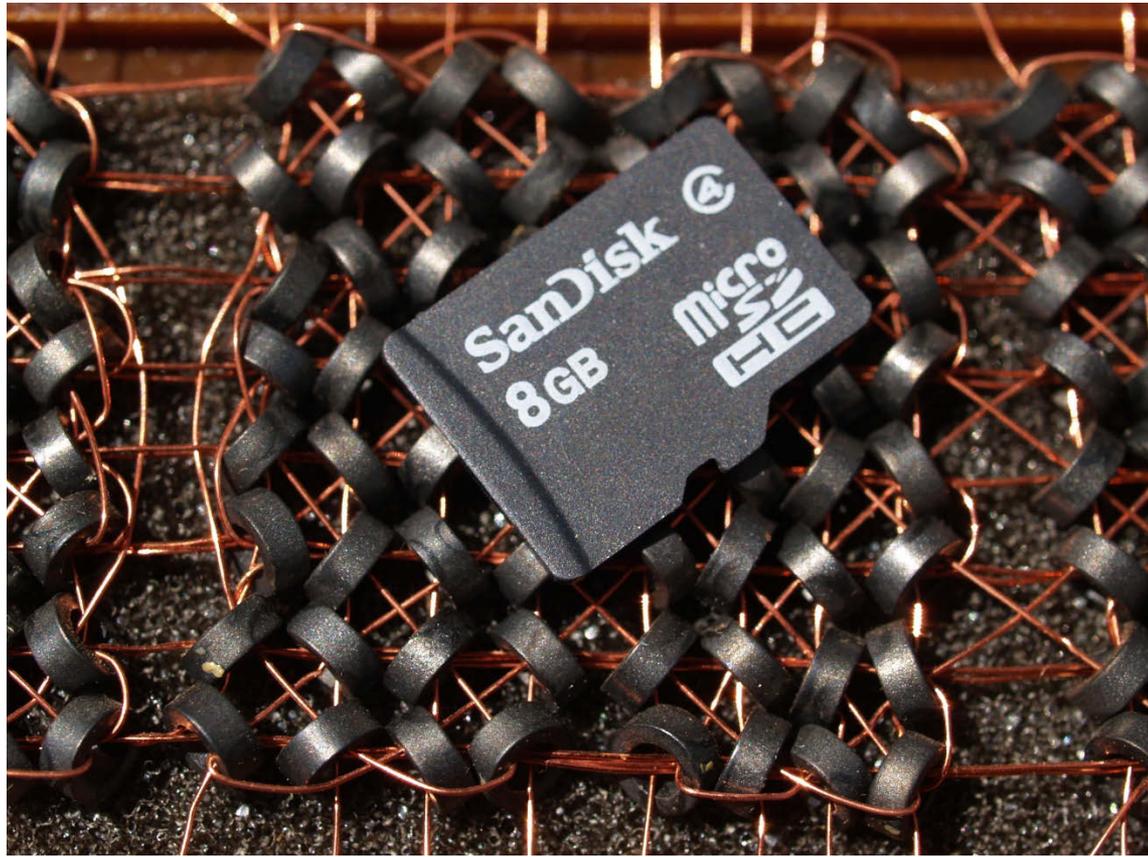
1843	28.5	1862	55.
1844	41.6	1863	50.7
1845	40.	1864	51.4
1846	33.3	1865	52.7
1847	37.	1866	48.8
1848	41.6	1867	57.5
1849	26.3	1868	42.2
1850	36.7	1869	54.4
1851	42.7	1870	62.8
1852	33.9	1871	70.7
1853	48.5	1872	45.2
1854	32.9	1873	59.3
1855	44.5	1874	61.
1856	52.7	1875	61.2
1857	58.5	1876	57.
1858	57.3	1877	56.2
1859	56.6		
1860	55.7		
1861	54.8	1925	17.8



1 K bytes magnetic core memory – 1950s



400 GB in the space of 8 bytes



Vital Statistics System of the Future

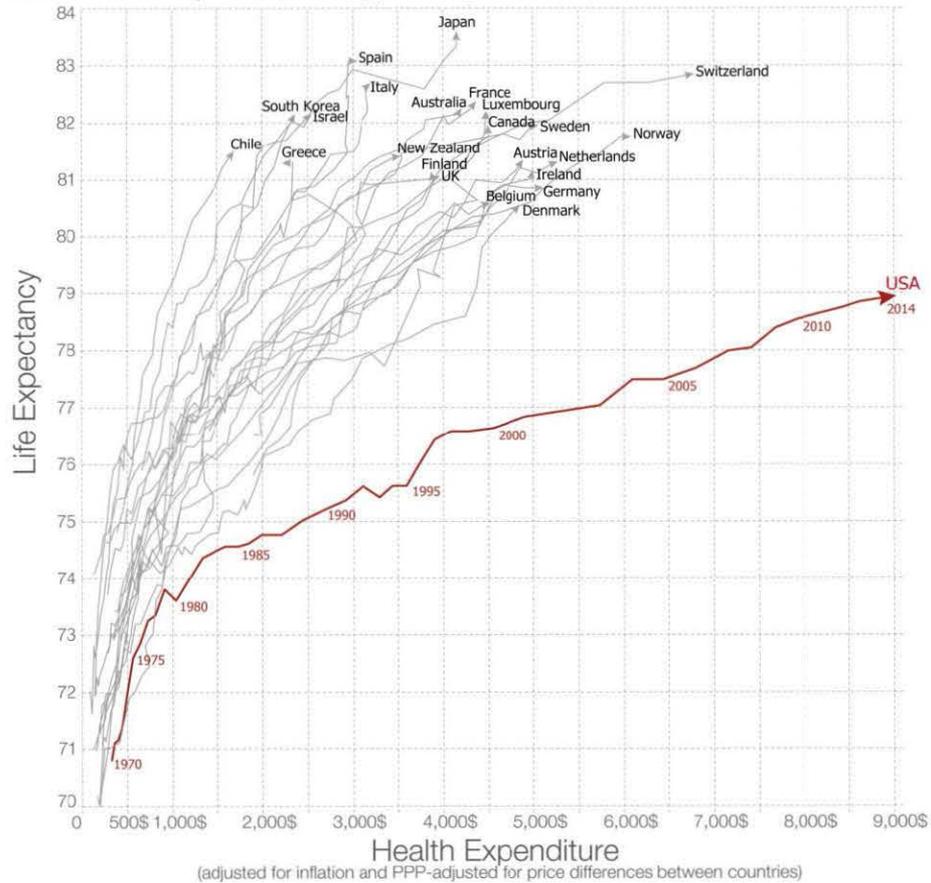
- Forward facing
- Imbedded in the workflow
- Meaningful to the data generator
- Timely
- Integrated
- Granular

The vital statistics system must transform from answering yesterday's questions to using tomorrow's tools to answer tomorrow's questions

Life expectancy vs. health expenditure over time (1970-2014)

Our World
in Data

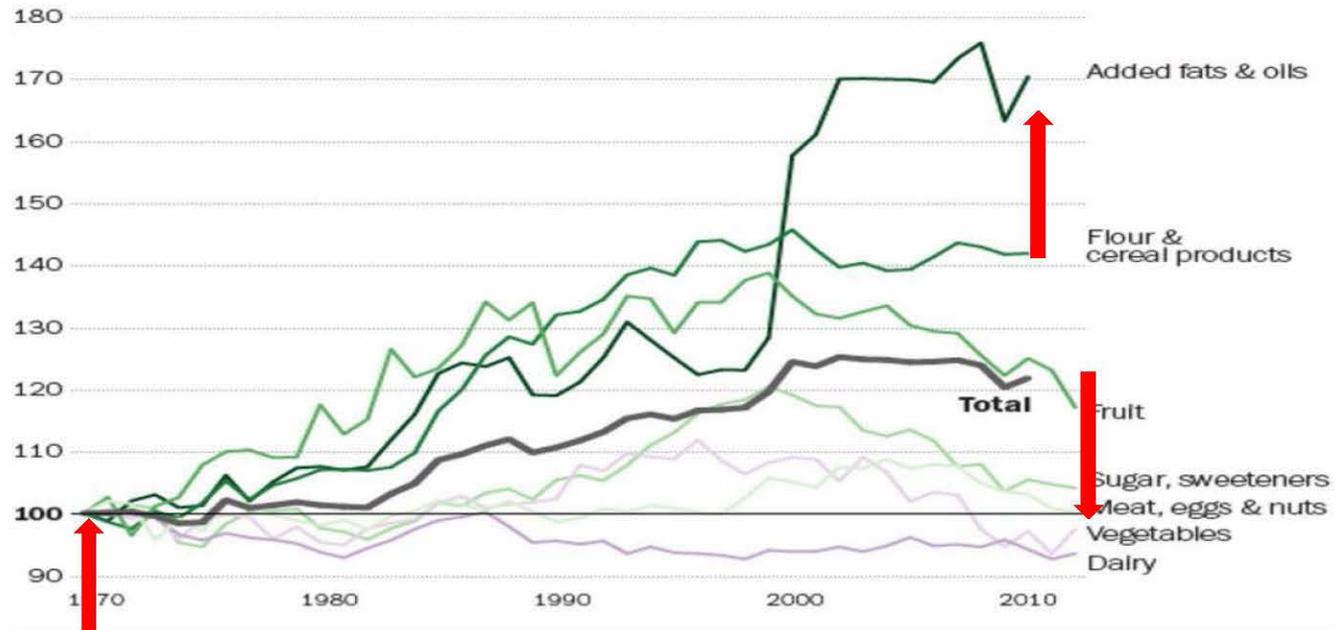
Health spending measures the consumption of health care goods and services, including personal health care (curative care, rehabilitative care, long-term care, ancillary services and medical goods) and collective services (prevention and public health services as well as health administration), but excluding spending on investments. Shown is total health expenditure (financed by public and private sources).



Data source: Health expenditure from the OECD; Life expectancy from the World Bank. Licensed under CC-BY-SA by the author Max Roser. The data visualization is available at OurWorldInData.org and there you find more research and visualizations on this topic.

The rise of oils, fats and grains

percent change in average daily per-capita calories (1970 value = 100)



WASHINGTONPOST.COM/WONKBLOG

Source: USDA



We, as a nation, will strive together to build a culture of health enabling all in our diverse society to lead healthy lives, now and for generations to come



**what is a
culture
of health?**

Being healthy
and staying
healthy is an
**esteemed
social value**



health of the
population
guides public
and private
decision-making

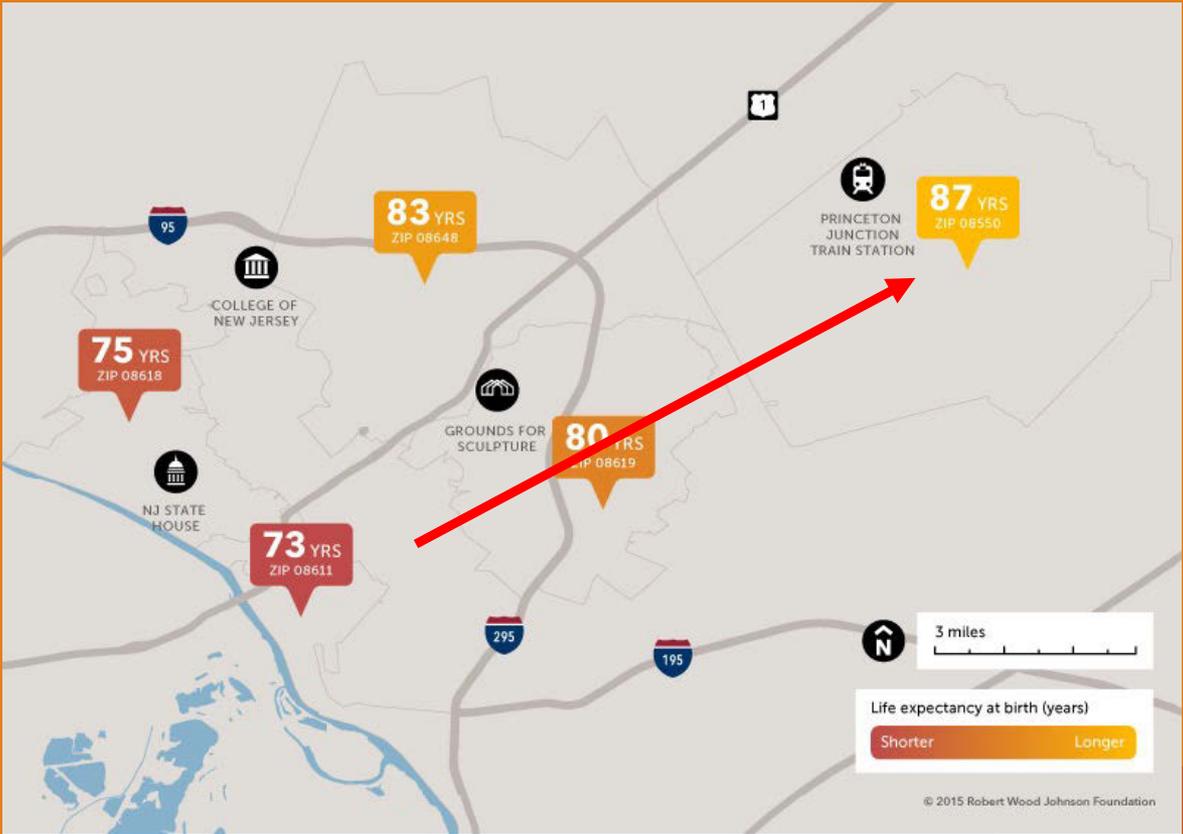




individuals,
businesses and
governments
work collectively
to foster healthy
communities and
lifestyles.



Geography and demographics do not serve as barriers to good health.





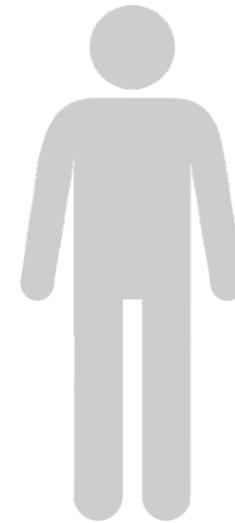
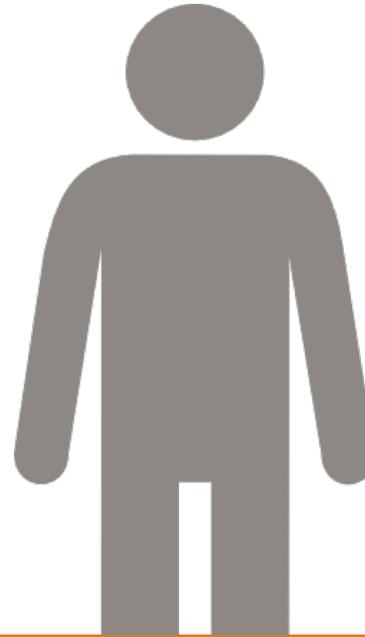
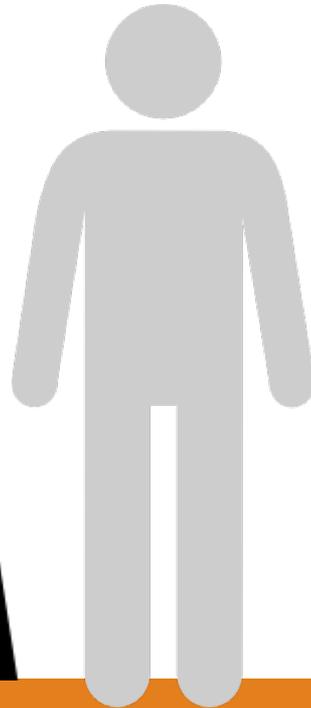
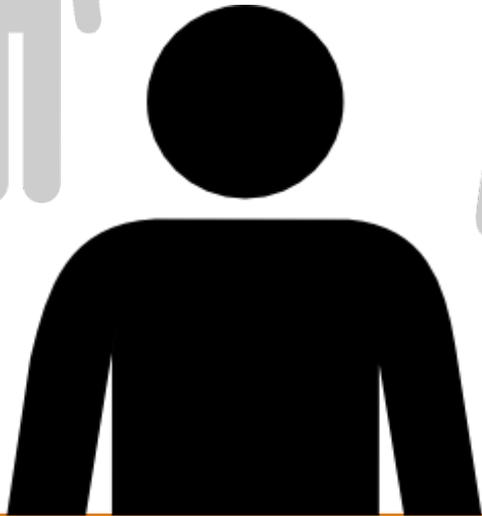
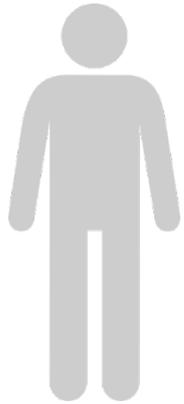
the economy is less burdened by
excessive and unwarranted
health care spending

we are all
supported to make
proactive
choices that will
improve our
health.





we will only be able to succeed if we take
chances and consider completely
new approaches and ways of thinking



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PRACTICE OF EPIDEMIOLOGY

Completeness of Notifiable Infectious Disease Reporting in the United States: An Analytical Literature Review

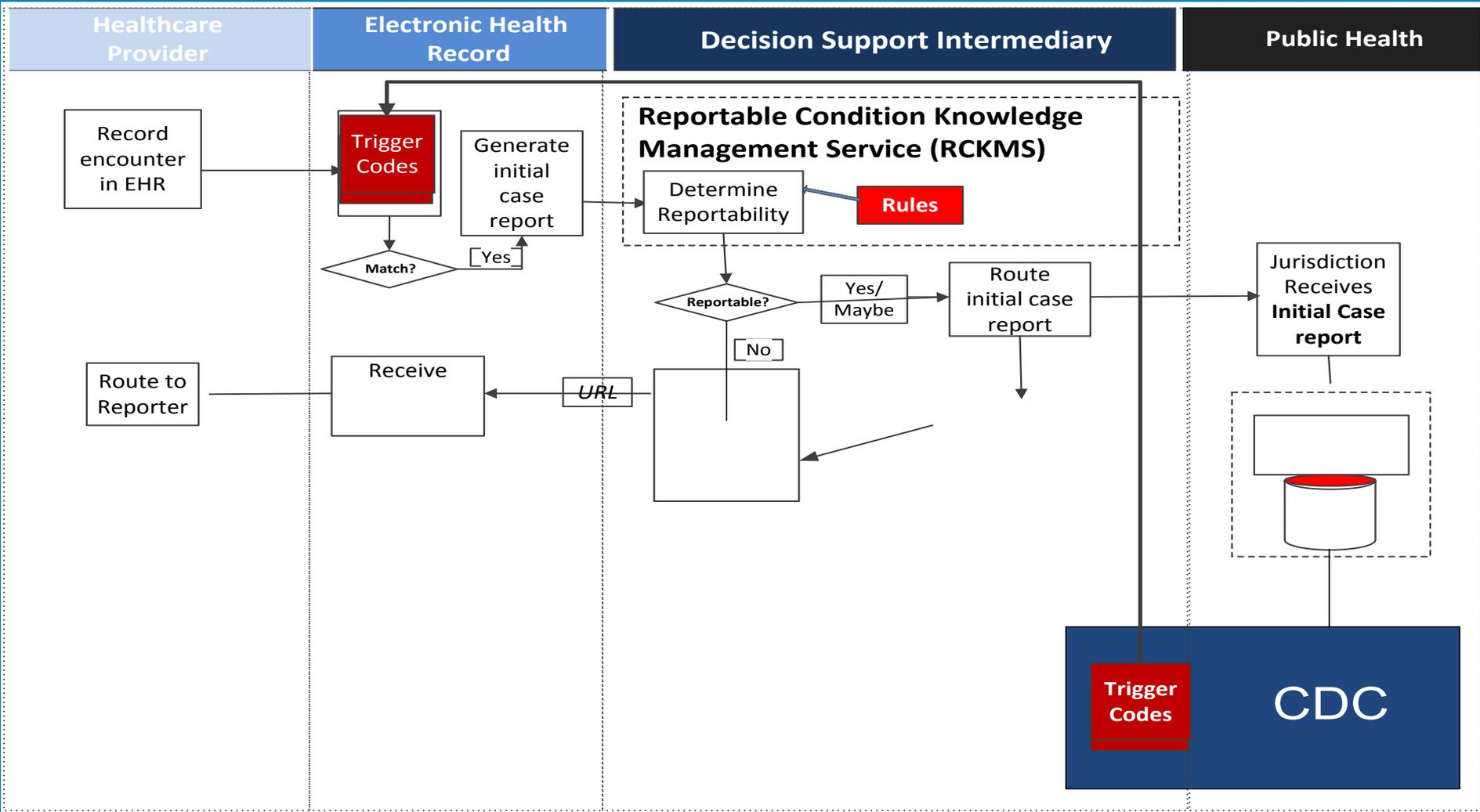
Timothy J. Doyle, M. Kathleen Glynn, and Samuel L. Groseclose

Despite state and local laws requiring medical providers to report notifiable infectious diseases to public health authorities, reporting is believed to be incomplete. Through means of an analytical literature review, the

Reporting completeness 9 to 99%

Participating Organizations





Vital Statistics System of the Future

- Forward facing
- Imbedded
- Meaningful and generative
- Personalized

ular

FLOW OF VITAL RECORDS AND STATISTICS IN THE UNITED STATES

Responsible person or agency	Birth certificate	Death certificate	Fetal death certificate (stillbirth)	Notifiable disease report	Reporting officials	Marriage record	Divorce or annulment record
Physician or other professional attendant	Completes entire certificate in consultation with parent(s). Files certificate with local registrar of district in which birth occurs.	<ol style="list-style-type: none"> 1. Completes medical certification and signs certificate. 2. Returns certificate to funeral director. 	Certifies to the cause of fetal death and signs certificate. Returns it to funeral director.	Reports each case by telephone or by mail on special form to local or State health department.	Clerk of local government	<ol style="list-style-type: none"> 1. Receives application for marriage license. 2. Verifies information from serological tests. 3. Issues marriage license. 4. Sends completed record of marriage to State registrar. 	↓
Funeral director	↓	<ol style="list-style-type: none"> 1. Obtains personal facts about the deceased. 2. Takes certificate to physician for medical certification. 3. Delivers completed certificate to local registrar and obtains burial permit. 	<ol style="list-style-type: none"> 1. Obtains personal facts about the fetal death. 2. Takes certificate to physician for entry of cause of fetal death. 3. Delivers completed certificate to local registrar and obtains burial permit. 	↓	Marriage officiant	<ol style="list-style-type: none"> 1. Performs the marriage ceremony. 2. Certifies to facts of marriage and sends the record to license clerk. 	↓
Local registrar of vital statistics	Verifies completeness and accuracy. Makes copy, ledger entry, or index for local use. Sends certificates to local health department or to State registrar.	<ol style="list-style-type: none"> 1. Verifies completeness and accuracy. Makes copy, ledger entry, or index for local use. Sends certificates to local health department or to State registrar. 2. Issues burial permit to funeral director. 3. Verifies returns of burial permits. 	<ol style="list-style-type: none"> 1. Verifies completeness and accuracy. Makes copy, ledger entry, or index for local use. Sends certificates to local health department or to State registrar. 2. Issues burial permit to funeral director. 3. Verifies returns of burial permits. 	↓	Clerk of court	↓	<ol style="list-style-type: none"> 1. Provides form for report to petitioner or attorney, or uses petition for decree to make entries on such form. 2. Verifies entries on returned form. 3. Enters final decree facts. 4. Sends completed report to State registrar.
City or county health department	<ol style="list-style-type: none"> 1. Uses certificates in allocating medical and nursing services, follow-up of infectious diseases, planning programs, and measuring effectiveness of activities. 2. Forwards certificates and case reports to State registrar. 	↓	↓	↓	Attorney for petitioner	↓	<ol style="list-style-type: none"> 1. Enters personal facts relative to spouses. 2. Returns form to clerk of court.
State health department Bureau of Vital Statistics	↓	<ol style="list-style-type: none"> 1. Queries incomplete or inconsistent information. 2. Maintains files for permanent reference and source of certified copies. 3. Compiles statistics for State and civil divisions of State for use of the health department and other interested agencies or groups. 4. Prepares transcripts or microfilm copies of birth, death, and fetal death certificates, and summary reports of marriage, divorce, and notifiable disease records for transmission to National Office of Vital Statistics. 	↓	↓	↓	↓	↓
Public Health Service National Office of Vital Statistics	↓	<ol style="list-style-type: none"> 1. Prepares and publishes national statistics of births, deaths, fetal deaths, marriages, divorces, and notifiable diseases for official and voluntary consumers. 2. Publishes analyses of data as they relate to public health and social problems. 3. Provides services needed to foster more complete and uniform registration. 	↓	↓	↓	↓	↓

1950

NOTE: In some States certificates of birth, death, and fetal death, and reports of notifiable diseases are not routed through local health departments; in others, there is no central file for marriage and divorce records at the State level.



Digital Bridge

- “Public health is like a thousand gnats. They consistently pester you, but they never help you do anything.” --- Prominent EHR vendor

Digital Bridge Vision

We will work together to improve the health of our nation by creating a bi-directional exchange of health information between public health and health care

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Birth related systems

- Birth record
- SS# enumeration at birth
- Medicaid enrollment
- Immunization registry
- Adverse pregnancy outcome registry
- Metabolic screening
- Well water testing
- MCH family case management

STANDARD CERTIFICATE OF LIVE BIRTH

Murray of The Census

STATE OF MISSISSIPPI

Registrar's Number

1. PLACE OF BIRTH—

County Lee City or Town Tupelo Inside or Outside Corporate Limits? Inside
Hospital at home or Street and No. Old Saltilla or Rural Precinct
Mother's Stay Before Delivery—(a) in Hospital at home (b) in the Community yes

2. RESIDENCE OF MOTHER—

State Miss County Lee City or Town Tupelo or Rural Precinct

3. FULL NAME OF CHILD

Elvis Aaron Presley

4. DATE OF BIRTH

1-8-35

5. SEX OF CHILD

Boy

6. Twin or Triplet?

Single

7. If born 1st, 2d., or 3d.

1st

8. Number Months of Pregnancy

9

9. Is Mother Married?

Yes

FATHER OF CHILD

1. Full Name Vernon Elvis Presley
10. Color or Race White 11. Age at Time of this Birth 20 yrs.
12. Where Born? Mississippi
13. Usual Occupation Laborer
14. Industry or Business

MOTHER OF CHILD

15. Full Maiden Name Gladys Love
16. Color or Race White 17. Age at Time of this Birth 21 yrs.
18. Where Born? Mississippi
19. Usual Occupation Factory Worker
20. Industry or Business

21. CHILDREN BORN TO THIS MOTHER:

(a) How many other children of this mother are now living? none

(b) How many other children were born alive but are now dead? 0 (c) How many children were born dead? 1

22. Mother's Mailing Address for Registration Notice

Old Saltilla Rd.

23. I hereby certify that I attended the birth of this child who was born alive at the hour of ... M., on the date above stated, and that the information given was furnished by Vernon Presley related to this child as father

24. Date Rec'd. by Registrar

1-23-35

(S-1042)

25. Signature of Registrar

[Signature]

Address

[Signature] Tupelo

FOR LIVE BIRTH ONLY USE SPECIAL BLANK FOR RECORDING STILL BIRTH

Vital Statistics System of the Future

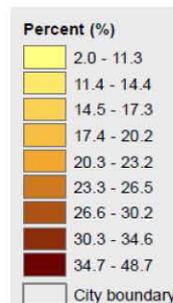
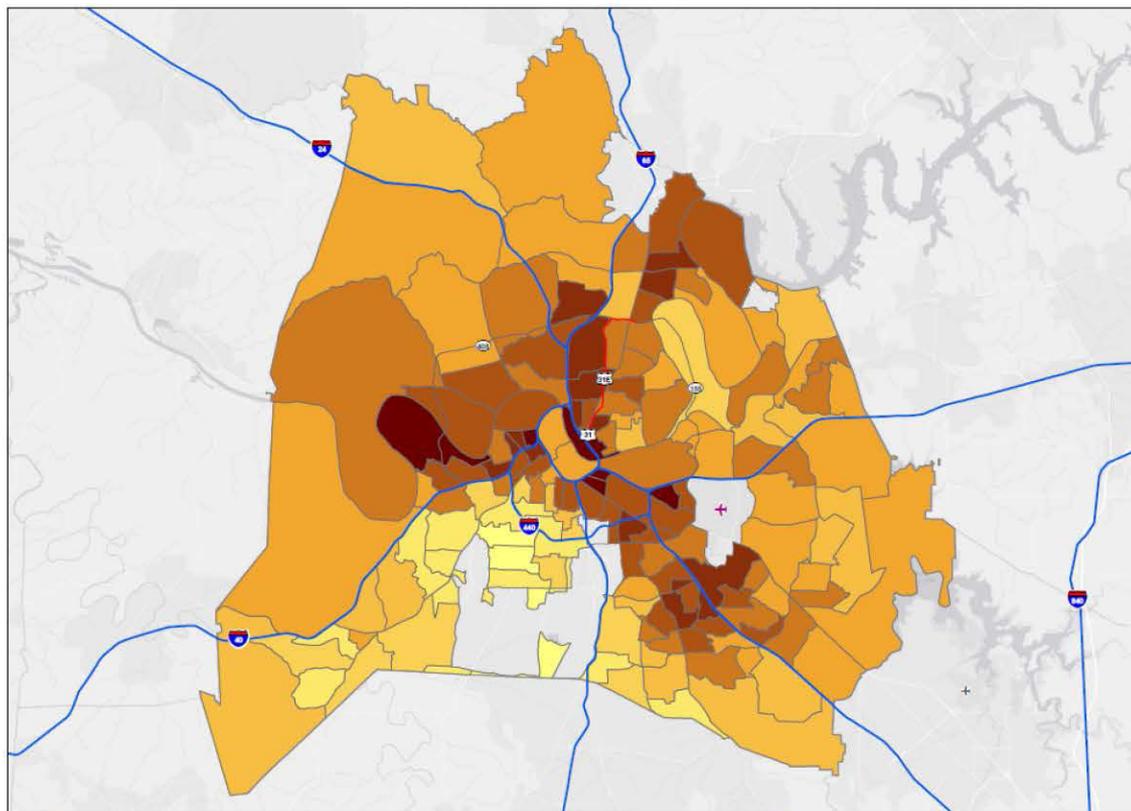
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Author: CDC/NCCDPHP/DPH/ESB-GIS
Date: 7/13/2016



Current smoking among adults aged ≥ 18 years by census tract, Nashville, TN, 2014



Classification:
Jenks natural breaks (9 classes) based
on data for all 500 cities' census tracts.
Legend depicts only those data classes
within this map extent.

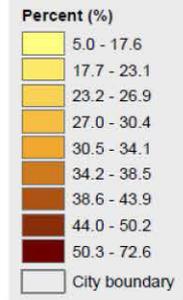
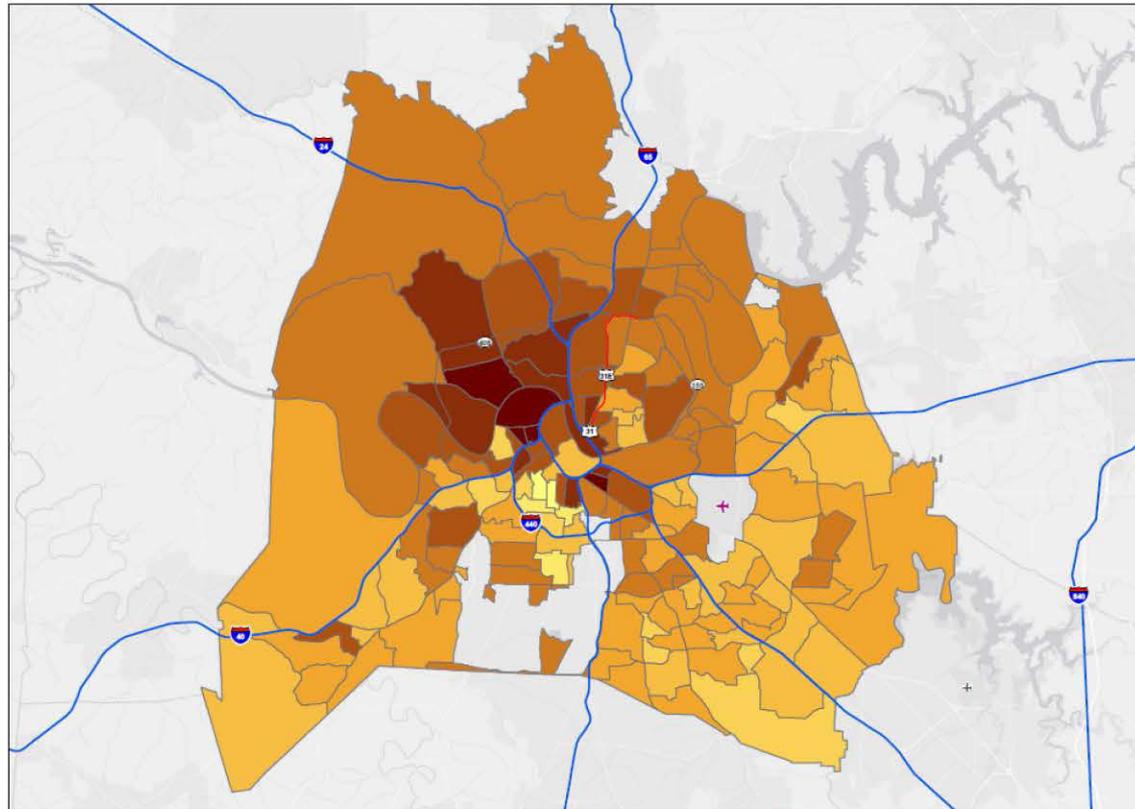
Census tracts with population less
than 50 were excluded from the map.



Data sources:
CDC BRFSS 2014, US Census Bureau
2010 Census, ACS 2010-2014.



High blood pressure among adults aged ≥ 18 years by census tract, Nashville, TN, 2013



Classification:
Jenks natural breaks (9 classes) based
on data for all 500 cities' census tracts.
Legend depicts only those data classes
within this map extent.

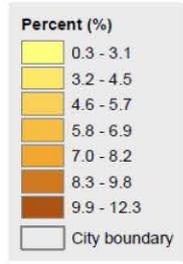
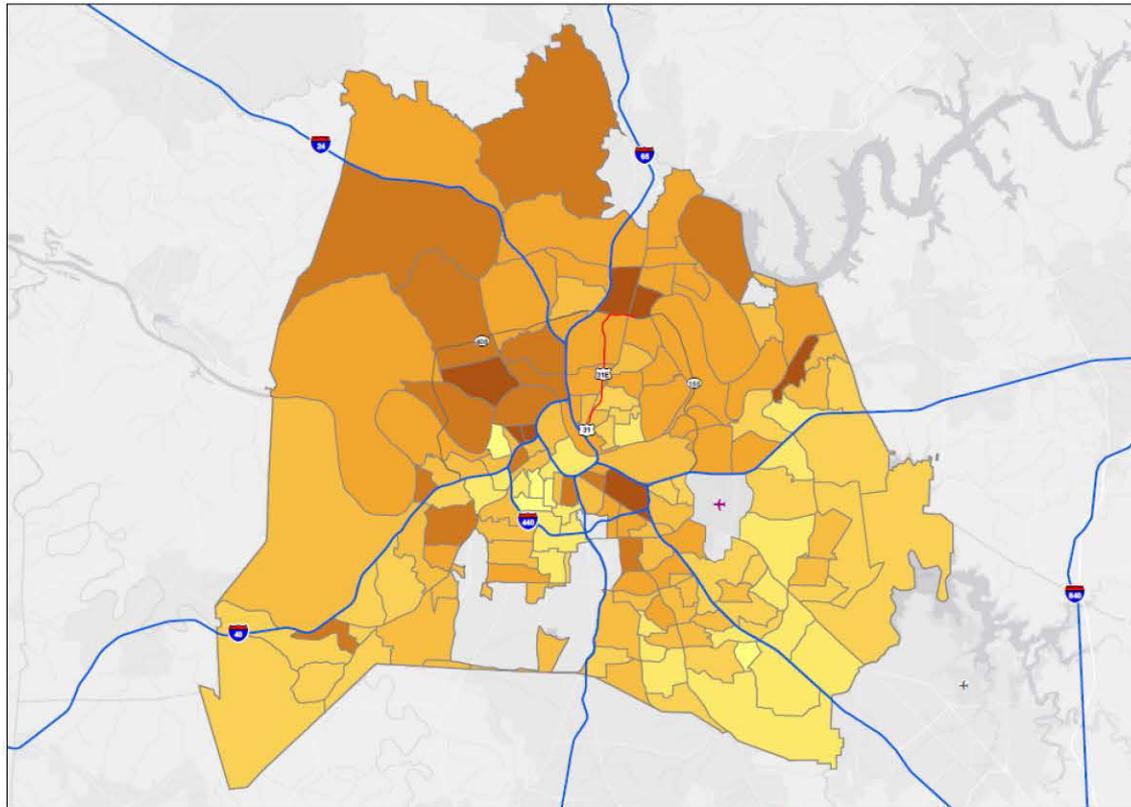
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2010 Census, ACS 2009-2013.

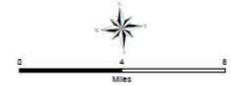


Coronary heart disease among adults aged ≥ 18 years by census tract, Nashville, TN, 2014



Classification:
Jenks natural breaks (9 classes) based
on data for all 500 cities' census tracts.
Legend depicts only those data classes
within this map extent.

Census tracts with population less
than 50 were excluded from the map.



Data sources:
CDC BRFSS 2014, US Census Bureau
2010 Census, ACS 2010-2014.



Organizational and Governance Challenge

- **Governance within government**
- **Governance with private sector**
- **Legal framework to facilitate the secure, privacy-respectful flow of data**
- **Commitment to get the right data to the right place at the right time to improve health**

Record Linkage*

HALBERT L. DUNN, M.D., F.A.P.H.A.

*Chief, National Office of Vital Statistics, U. S. Public Health Service,
Federal Security Agency, Washington, D. C.*

EACH person in the world creates a Book of Life. This Book starts with birth and ends with death. Its pages are made up of the records of the principal events in life. Record linkage is the name given to the process of assembling the pages of this Book into a volume.

The Book has many pages for some and is but a few pages in length for others. In the case of a stillbirth, the

the various important records of a person's life.

The two most important pages in the Book of Life are the first one and the last one. Consequently, in the process of record linkage the uniting of the fact-of-death with the fact-of-birth has been given a special name, "death clearance."

IMPORTANCE OF ASSEMBLING THE