Using OASIS to Prioritize Community Health Outcomes

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Georgia Data Innovation Hub
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https://oasis.state.ga.us

Developing Data Analytics Capabilities Conference 4.26.23

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Agenda

- Introduction
- Quick examples of 4 tools of OASIS
- Quicker Example of Prioritizing Health Outcomes with OASIS
- How was OASIS created? Experiences and steps taken to create OASIS.

OASIS – **O**nline **A**nalytical **S**tatistical **I**nformation **S**ystem

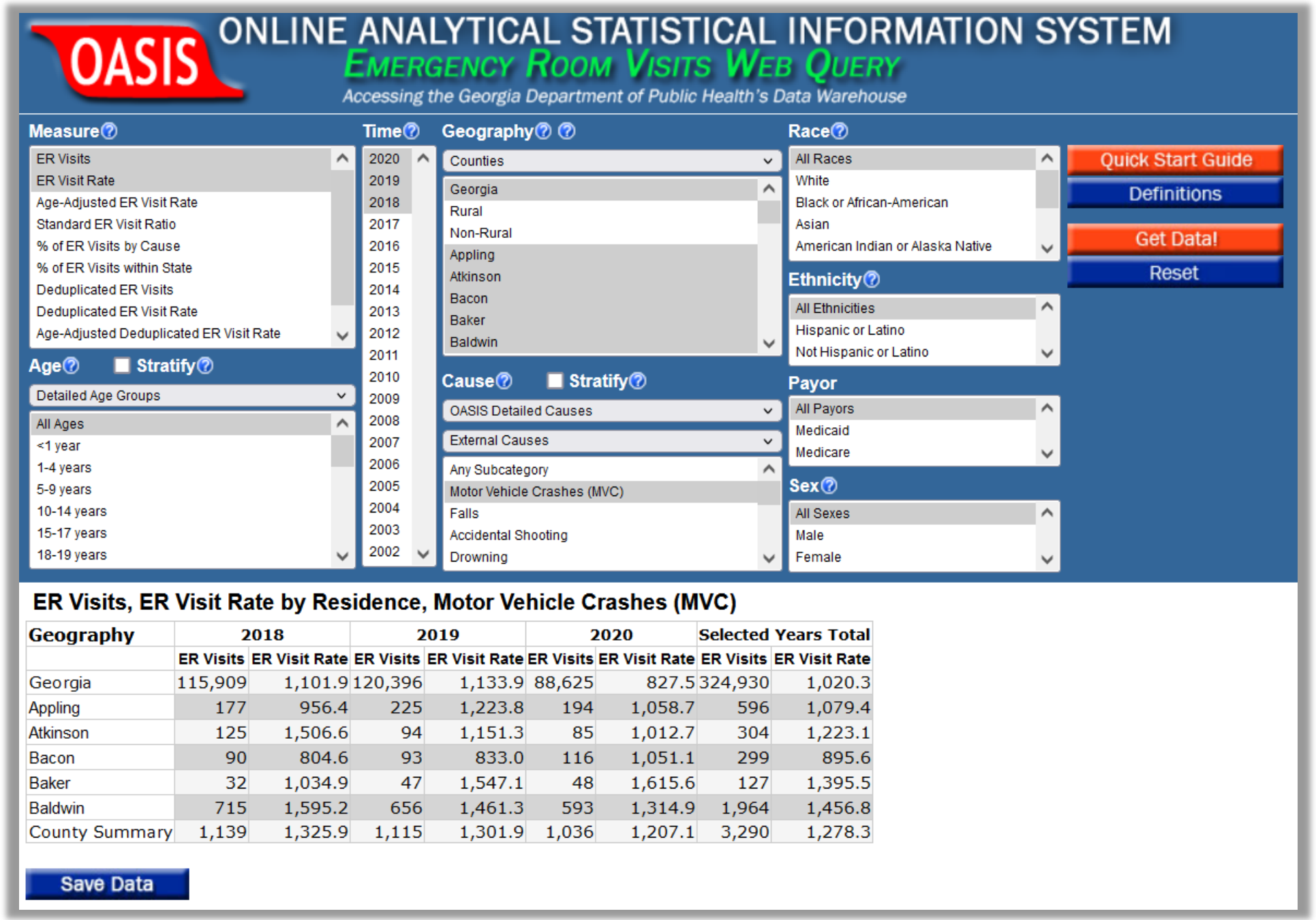
OHIP purpose:

- Translate data into information for local and state health planning and assessment.
- Make that information available to anyone via OASIS
- Technical assistance for community health needs assessments
- Custom data requests (vital records, hospital discharge/ER visit data)

My background:

- Medical geography / public health epidemiology & behavioral science.
- Department of Public Health 24 years.
- Private sector healthcare setting 5 years (local community health needs assessments)
- Federal (CDC) 2 yrs – APEX (Assessment Protocol for Excellence in Public Health)

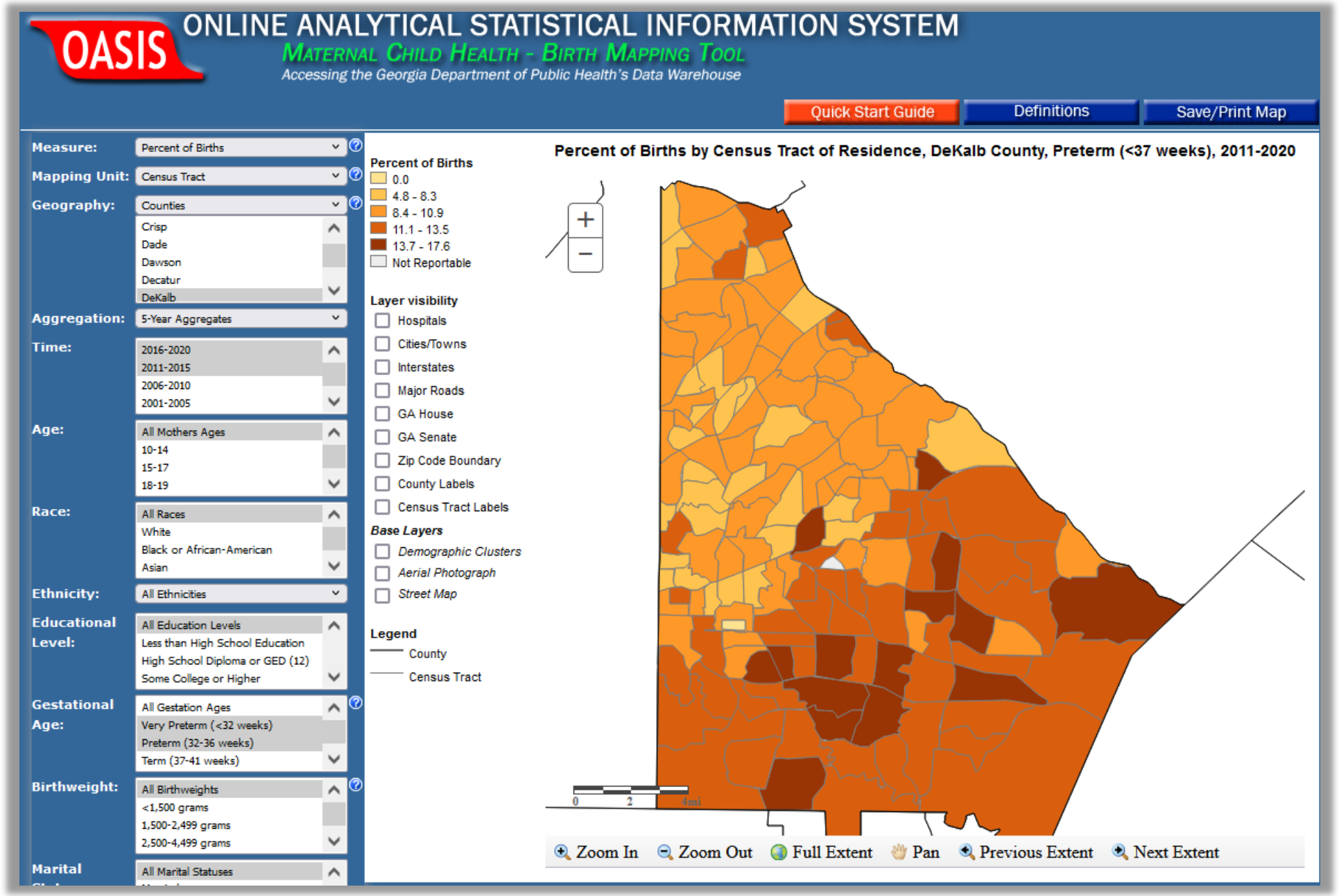
Examples of OASIS (live demo time!)



ER Visits, ER Visit Rate by Residence, Motor Vehicle Crashes (MVC)

Geography	2018		2019		2020		Selected Years Total	
	ER Visits	ER Visit Rate	ER Visits	ER Visit Rate	ER Visits	ER Visit Rate	ER Visits	ER Visit Rate
Georgia	115,909	1,101.9	120,396	1,133.9	88,625	827.5	324,930	1,020.3
Appling	177	956.4	225	1,223.8	194	1,058.7	596	1,079.4
Atkinson	125	1,506.6	94	1,151.3	85	1,012.7	304	1,223.1
Bacon	90	804.6	93	833.0	116	1,051.1	299	895.6
Baker	32	1,034.9	47	1,547.1	48	1,615.6	127	1,395.5
Baldwin	715	1,595.2	656	1,461.3	593	1,314.9	1,964	1,456.8
County Summary	1,139	1,325.9	1,115	1,301.9	1,036	1,207.1	3,290	1,278.3

Save Data


OASIS
ONLINE ANALYTICAL STATISTICAL INFORMATION SYSTEM
MATERNAL CHILD HEALTH - BIRTH MAPPING TOOL
Accessing the Georgia Department of Public Health's Data Warehouse
Quick Start Guide
Definitions
Save/Print Map
Measure: Percent of Births
Mapping Unit: Census Tract
Geography: Counties
Crisp
Dade
Dawson
Decatur
DeKalb
Aggregation: 5-Year Aggregates
Time:
2016-2020
2011-2015
2006-2010
2001-2005
Age:
All Mothers Ages
10-14
15-17
18-19
Race:
All Races
White
Black or African-American
Asian
Ethnicity: All Ethnicities
Educational Level:
All Education Levels
Less than High School Education
High School Diploma or GED (12)
Some College or Higher
Gestational Age:
All Gestation Ages
Very Preterm (<32 weeks)
Preterm (32-36 weeks)
Term (37-41 weeks)
Birthweight:
All Birthweights
<1,500 grams
1,500-2,499 grams
2,500-4,499 grams
Marital
All Marital Statuses
Percent of Births
0.0
4.8 - 8.3
8.4 - 10.9
11.1 - 13.5
13.7 - 17.6
Not Reportable
Layer visibility
Hospitals
Cities/Towns
Interstates
Major Roads
GA House
GA Senate
Zip Code Boundary
County Labels
Census Tract Labels
Base Layers
Demographic Clusters
Aerial Photograph
Street Map
Legend
County
Census Tract
Percent of Births by Census Tract of Residence, DeKalb County, Preterm (<37 weeks), 2011-2020
0
2
4mi
Zoom In
Zoom Out
Full Extent
Pan
Previous Extent
Next Extent

OASIS

ONLINE ANALYTICAL STATISTICAL INFORMATION SYSTEM

ANIMATED CHARTING TOOL (ACT)

Accessing the Georgia Department of Public Health's Data Warehouse

Measure

Number of Population by Age

Race

Total-White-Black
All Races (Total)
White
Black or African-American
Asian

Ethnicity

All Ethnicities
Hispanic or Latino
Not Hispanic or Latino

Geography

County

Catoosa
Charlton
Chatham
Chattahoochee
Chattooga
Cherokee
Clarke

Aggregation

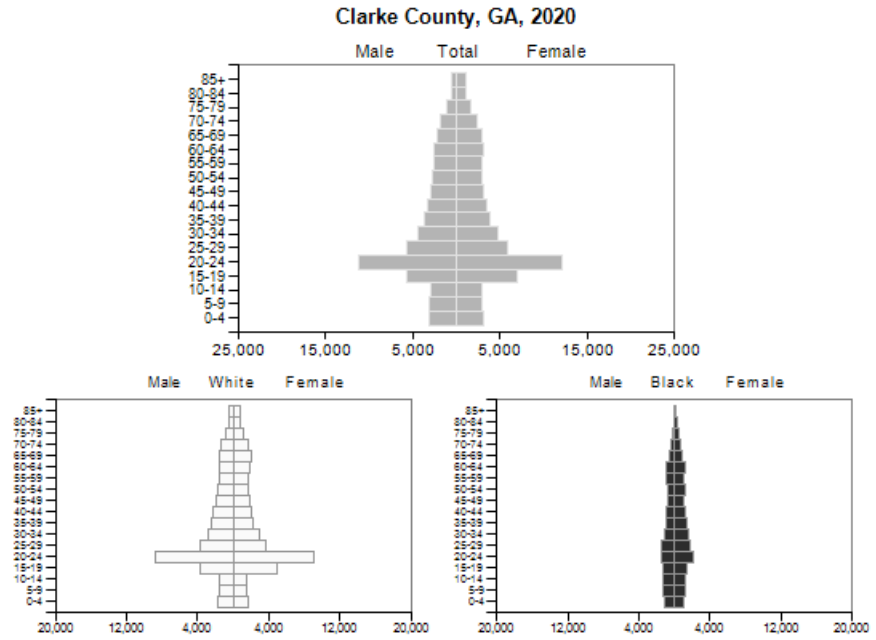
1-Year Aggregates
3-Year Aggregates
5-Year Aggregates

OASIS Home
Quick Start Guide
Definitions

Get Pyramids!
Reset
Show Data

Animate | Back | Forward | Save Image | Save Animation

Number of Population by Age, Total, White and Black or African-American



OASIS

ONLINE ANALYTICAL STATISTICAL INFORMATION SYSTEM

TRENDING TOOL

Accessing the Georgia Department of Public Health's Data Warehouse

Measure
- Number of Deaths
- Death Rate
- Age-Adjusted Death Rate

Time
- All Years
- 2020
- 2019
- 2018
- 2017
- 2016
- 2015

Geography
- Counties
- Georgia
  - Rural
  - Non-Rural
  - Appling
  - Atkinson

Race
- All Races
- White
- Black or African-American
- Asian
- American Indian or Alaska Nat
- Native Hawaiian or Other Paci
- Multiracial

Quick Start Guide

Definitions

Aggregation
- 1-Year Aggregates
- 3-Year Aggregates
- 5-Year Aggregates

Cause
- Drug Overdoses
- All Drug Overdoses
- All Opioids only
  - Natural, Semi-synthetic, Synthetic Opic
  - Synthetic Opioids other than Methador
  - Heroin
  - Methadone

Ethnicity
- All Ethnicities
- Hispanic or Latino
- Not Hispanic or Latino

Sex
- All Sexes
- Male
- Female

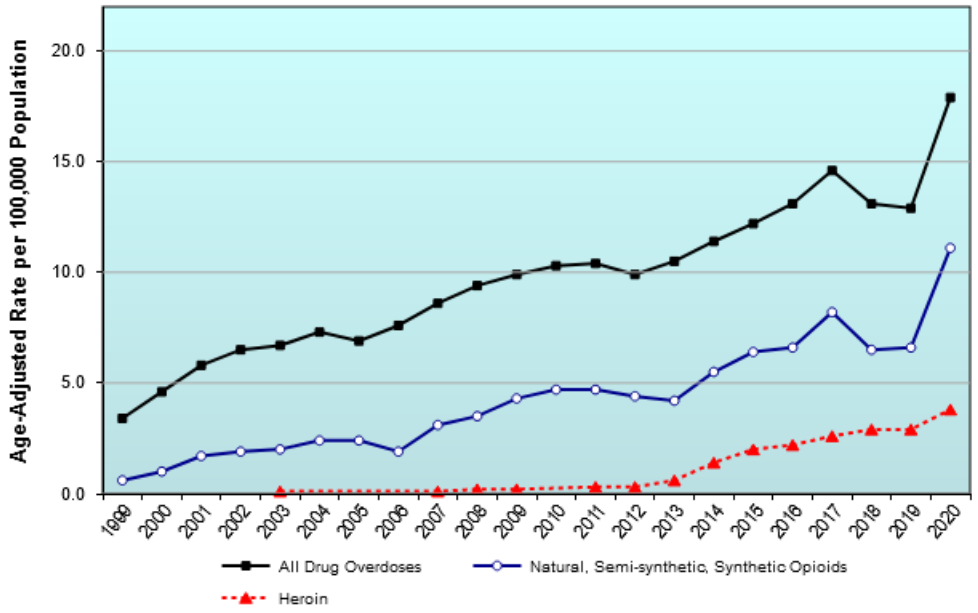
Get Trends!

Reset

Show Data

Save Image

Age-Adjusted Death Rate, Selected Causes, Georgia, 1999-2020



OASIS & Prioritizing Health Outcomes

Using OASIS to Prioritize Community Health Outcomes

…what criteria should be used to determine if a cause of mortality warrants particular attention? Would a local rate 10% higher than the state indicate something of concern?

- Standard Mortality Ratios (SMR's)
- Years of Potential Life Lost (YPLL)

These principles/techniques can apply to any subject area

OASIS

ONLINE ANALYTICAL STATISTICAL INFORMATION SYSTEM
Community Health Needs Assessment Dashboard
Tools for Public Health and Public Policy Data Analysis
Accessing the Georgia Department of Public Health's Data Warehouse

Geography: Public Health District
- Georgia
- Northwest Health District
- North Georgia Health Dis
- North Health District (Gai
- Cobb/Douglas Health Dis
- Fulton Health District

Age:
- All Ages
- <1 year
- 1-4 years
- 5-9 years
- 10-14 years
- 15-17 years
- 18-19 years

Rank By: Age-Adjusted Death Rate

Race: All Races

Sex: All Sexes

Time: 6 years: 2016-2021

☐ Prioritize! (significantly high causes)
☑ Using green, yellow and red for dials
☑ Using Georgia Rankable Groups

Get Data!

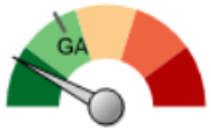
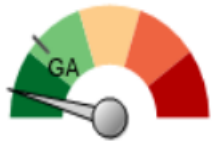
Reset

Quick Start Guide
Definitions
GA Rankable Definitions
NCHS Definitions
Known Data Issues

External Resources

Change Action Guide
MAPP
County Health Rankings
The Community Guide
Health Improvement Navigator

Ranked Causes and State/County Comparison, Age-Adjusted Death Rate, Cobb/Douglas Health District, 2016 - 2021

# 1	# 2	# 3	# 4	# 5
Ischemic Heart and Vascular Disease n=3,061	**Cerebrovascular Disease n=2,336**	**Alzheimers Disease n=1,725**	**Malignant Neoplasms of the Trachea, Bronchus and Lung n=1,457**	**Covid-19 n=1,332**
				
All Other Diseases of the Nervous System n=1,287	**All COPD Except Asthma n=1,276**	**Essential (Primary) Hypertension and Hypertensive Renal, and Heart Disease n=1,168**	**Accidental Poisoning and Exposure to Noxious Substances n=961**	**Diabetes Mellitus n=920**

Top Causes of Overall Mortality

Of the top 15, the top 5 were:

- Heart Disease
- Stroke
- Alzheimer's
- Lung Cancer
- Covid

…Introducing the Standard Mortality Ratio…

OASIS

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- 15-17 years
- 18-19 years

Rank By: Age-Adjusted Death Rate

Race: All Races

Sex: All Sexes

Time: 6 years: 2016-2021

- [x] Prioritize! (significantly high causes)
- [x] Using green, yellow and red for dials
- [x] Using Georgia Rankable Groups

Get Data!

Reset

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Ranked Significantly High Causes and State/County Comparison, Age-Adjusted Death Rate, Cobb/Douglas Health District, 2016 - 2021

Cerebrovascular Disease n=2,336	Accidental Poisoning and Exposure to Noxious Substances n=961
	
# 1	# 2

Numbers shown are the sum of deaths. Click on a Dial for more information.

Only TWO occurring Significantly more than they should:

- Stroke
- Drug Overdoses

= Useful information, but to what degree do these contribute to “premature” mortality?

…introducing YPLL: Years of Potential Life Lost…

Leading Causes of **Premature** Death dashboard

'Premature Death' measured by **Years of Potential Life Lost (YPLL)** which sums years of life lost **before age 75**. A death at age 65 therefore would be 10 YPLL.

Compared with leading causes of death, YPLL directs focus on causes that occur at younger ages. In doing so, **YPLL highlights causes that are more likely to be attributable to preventable causes and therefore subject to prevention and intervention**.

OASIS ONLINE ANALYTICAL STATISTICAL INFORMATION SYSTEM

LEADING CAUSES OF PREMATURE DEATH

Accessing the Georgia Department of Public Health's Data Warehouse

Geography

Public Health District

North Health District (Gainesville)
Cobb/Douglas Health District
Fulton Health District
Clayton County Health District (Jonesboro)
Gwinnett, Newton and Rockdale
DeKalb Health District
District 4 Public Health
South Central Health District (Dublin)
North Central Health District (Macon)
East Central Health District (Augusta)

Time

2021
2020
2019
2018
2017
2016
2015
2014
2013

Save Images

Prioritize! (significantly high causes only)

Georgia Rankable Causes. Uncheck box to use NCHS Rankable Causes.

Top 10 Causes of YPLL and % Total YPLL:

1) Accidental Poisoning and Exposure to Noxious Substances 9.65% (30,306)
2) Intentional Self-Harm (Suicide) 6.47% (20,343)
3) Ischemic Heart and Vascular Disease 6.19% (19,458)
4) Motor Vehicle Crashes 6.05% (18,995)
5) Certain Conditions Originating in the Perinatal Period 4.88% (15,346)
6) Assault (Homicide) 3.68% (11,553)

Definitions
GA Rankable Definitions
NCHS Definitions

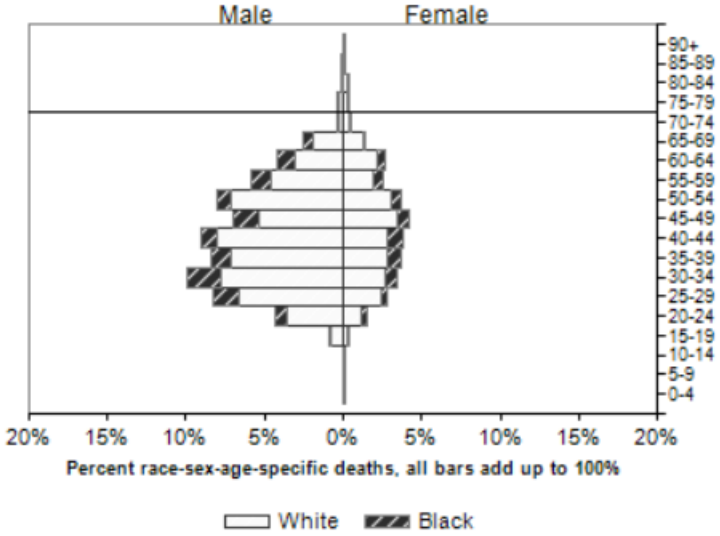
Get Causes!
Reset

Show Data

Mortality Pyramids of the Top 10 Causes of Years of Potential Life Lost (YPLL), Cobb/Douglas Health District, GA, 2016 - 2021

1) Accidental Poisoning and Exposure to Noxious Substances

ICD-10 Codes: (X40-X49)



Top 5 causes of **Premature** Mortality (before age 75)

- Drug Overdoses
- Suicide
- Heart Disease
- Motor Vehicle Crashes
- Infant Mortality

…are any of *these* occurring more than they should?

OASIS ONLINE ANALYTICAL STATISTICAL INFORMATION SYSTEM

LEADING CAUSES OF PREMATURE DEATH

Accessing the Georgia Department of Public Health's Data Warehouse

Geography

Public Health District

- North Health District (Gainesville)
- Cobb/Douglas Health District
- Fulton Health District
- Clayton County Health District (Jonesboro)
- Gwinnett, Newton and Rockdale
- DeKalb Health District
- District 4 Public Health
- South Central Health District (Dublin)
- North Central Health District (Macon)
- East Central Health District (Augusta)

Time

2021, 2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013

Save Images

Prioritize! (significantly high causes only)

Georgia Rankable Causes. Uncheck box to use NCHS Rankable Causes.

Top 4 Causes of YPLL and % Total YPLL:

1) Accidental Poisoning and Exposure to Noxious Substances 9.65% (30,306)
2) Malignant Neoplasm of the Breast 2.48% (7,801)
3) Acute Rheumatic Fever and Chronic Rheumatic Heart Diseases 0.12% (388)
4) Infections of Kidney 0.05% (164)

Definitions | GA Rankable Definitions | NCHS Definitions

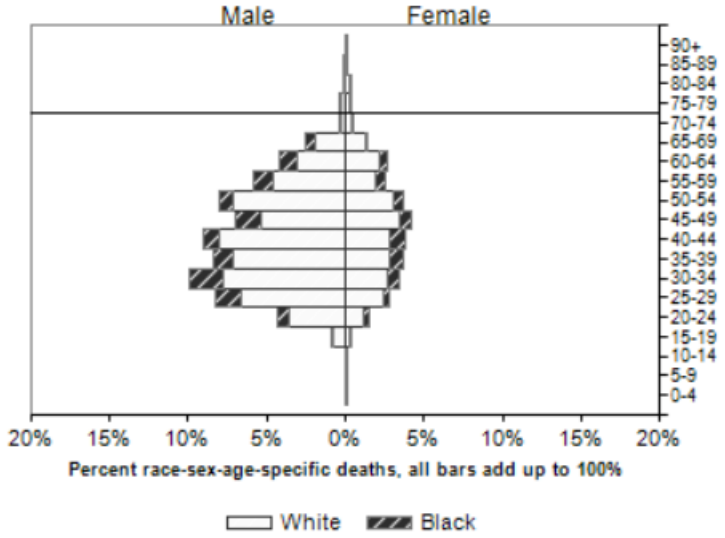
Get Causes! | Reset

Show Data

Mortality Pyramids of the Top 4 Causes[1] of Years of Potential Life Lost (YPLL), Cobb/Douglas Health District, GA 2016 - 2021

1) Accidental Poisoning and Exposure to Noxious Substances

ICD-10 Codes: (X40-X49)



Top 2 causes of significantly high Premature Mortality

- Drug Overdoses
- Breast Cancer

In Summary:

	1	2	3
<u>Top 5 Overall</u> • Heart Disease • Stroke • Alzheimer's • Lung Cancer • Covid	<u>Top 2 Overall Sig.</u> • Stroke • Drug Overdose	<u>Top 5 YPLL</u> • Drug Overdose • Suicide • Heart Disease • Motor Vehicle Crashes • Infant Mortality	<u>Top 2 YPLL & Sig.</u> • Drug Overdose • Breast Cancer

Bonus! Comparing rates using Percent Difference can be misleading

Age-Adjusted Death Rate, Percentage Difference, Standard Mortality Ratio

	2019					2020			
	Cause	Age-Adjusted Death Rate	Percentage Difference	Standard Mortality Ratio		Cause	Age-Adjusted Death Rate	Percentage Difference	Standard Mortality Ratio
Muscogee	Oral Cancer	**4.3**	**65% Higher**	Expected		Throat Cancer	**7.0**	**106% Higher**	Expected
Georgia	Oral Cancer	**2.6**	**-**	-		Throat Cancer	**3.4**	-	-

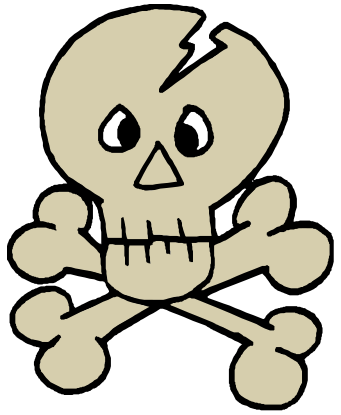
Oral cancer: **65% higher**, but 4.3 is *expected (no significant difference)*.

Throat cancer: **106% higher**, but 7.0 is *expected (no significant difference)*.

How was OASIS created?

Causes of Death, Georgia, 1733-1734

- 11 killed by Spanish
- 3 drowned
- 1 hit by falling tree
- **1 lost in woods**
- 2 shot
- **1 buried alive**
- 1 by duel
- 3 homicide
- 1 consumption
- 3 hanged

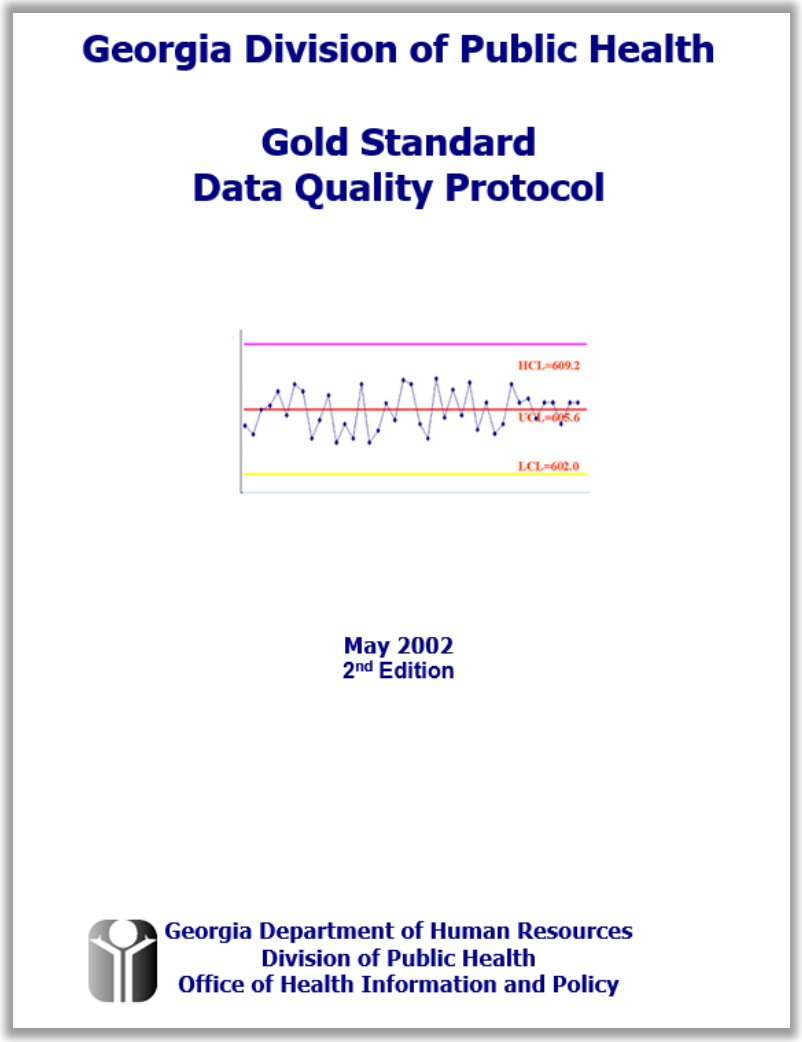


Abercrombie History of Public Health in Georgia, 1733-1950

1999 - Steps taken to create OASIS:

1. Create data standards *independent* of Vital Records/Dischage/etc data
2. Assess source data metadata: Create Translations
3. Assess source data quality: Create Imputations
4. Create Value-add fields, e.g. geocoding / birthweight groups / Cause categories / etc.
5. Promotion to Repository/Data Warehouse
6. Create OLAP Cubes
7. Design/Write OASIS applications

Step 1: Creating data standards



Data Quality Requirements

A variable shall:

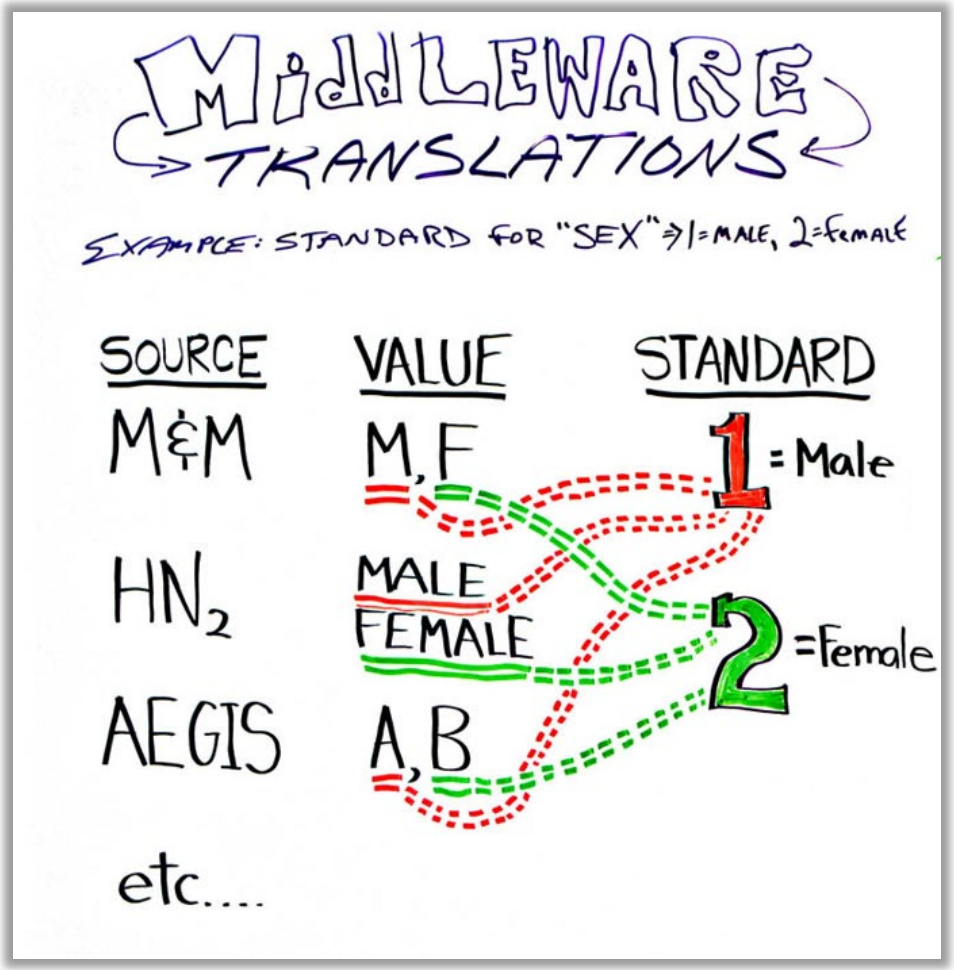
1. Have one and only one name.
2. Have one and only one definition.
3. Be stored in one and only one data type.
4. Have one and only one field length.
5. Be stored in one and only one unit of measurement.
6. Be stored in one and only one level of measurement.
7. Represent or store only those values specified in its definition.
8. Have one and only one source.
9. Etc……..

Step 1 cont'd: Define Standard Data Properties

Property	Value
Presentation Name(s)	**COUNTY**
Definition	Geographic county of event or residence.
Valid Values	Two digit state FIPS code 00-99 followed by three digit FIPS county code 000-999; range 13001-13321; 0=Non-Georgia county, -1 = unknown.
Data Type	String
Field Length	5
Unit of Measurement	Unitless
Level of Measurement	Nominal
Unit of Analysis	Unitless
Level of Analysis	Nominal
Derivation	Derived from geoc county in specific i
Time Stamp of Standard	3/16/2000. 0 for n

Property	Value
Presentation Name(s)	**ETHNICITY**
Definition	Ethnicity, currently limited to asking whether the person is "Hispanic or Latino" (A person of Mexican, Puerto Rican, Cuban, South or Central American, or other Spanish culture or origin, regardless of race) (OMB-15, 1997).
Valid Values	1=Hispanic or Latino, 0=No; -1=unknown.
Data Type	Integer
Field Length	2
Unit of Measurement	Unitless
Level of Measurement	Nominal
Unit of Analysis	Unitless
Level of Analysis	Nominal
Derivation	Practice in vital records for pre-03 version of certificates: Derived from Origin values 1-5 inclusive.
Time Stamp of Standard	3/16/2000 per U.S. OMB Directive 15, 1997.

Step 2: Assessing Data Source Translatability



Steps 3-7 (Data Quality / Value-add fields / etc…)

- 3-Assessment of data quality / Decide if imputations in order
  - 5% rule
  - National specs vs improved local specs: e.g. Race imputation
- 4-Value-adds: geocoding / create indicators as part of loading process
  - 300+ fields on a birth certificate; we add 66.
- 5-Promotion to DW (hybrid Inmon/Kimball model)
- 6-Create OLAP cubes
- 7-Design/Write OASIS applications

OASIS / ETL processes are 100% built in-house.

Lastly – Working Across Program Lines

- Initially: "All at Once" approach:
  - '…all we need to worry about is how our funder wants data'
  - See the value, but tied to their funder's system specs.
  - Difficult since there was no tangible product

- *Led to Change in strategy: (Get some wins!)*

- Once OASIS up and running: Others came on board
  - Others would like to, but articulating metadata / assessing level of data quality can be difficult

3 Examples of Organizational/Human Challenges

Organizational Inertia

The Right Leadership

Incomplete/Inaccurate metadata

3 Examples of Technical/Data Challenges

ICD9 to ICD10 and later ICD9CM to ICD10CM

Cause Categories (National standards vs locally-relevant/actionable)

Discharge/ER data: same categories, but no Underlying Cause for external causes

Thank You!

Developing Data Analytics Capabilities Conference

https://oasis.state.ga.us

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