Initiative Overview

January 16, 2018
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Q&A
“Expand and enhance predictive models and profiling models to determine those at-risk for infant mortality in Ohio and design targeted interventions”

- State of Ohio Infant Mortality RFP
Program Overview
Ohio Resident Live Births

Number of Live Births

<table>
<thead>
<tr>
<th>Year</th>
<th>White</th>
<th>Black</th>
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<tbody>
<tr>
<td>2007</td>
<td>150,784</td>
<td>25,959</td>
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<tr>
<td>2008</td>
<td>139,034</td>
<td>23,469</td>
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<td>2009</td>
<td>139,312</td>
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<tr>
<td>2010</td>
<td>138,198</td>
<td>24,288</td>
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<td>2011</td>
<td>107,189</td>
<td>24,316</td>
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<td>2012</td>
<td>106,028</td>
<td>24,316</td>
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<td>2013</td>
<td>104,957</td>
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<tr>
<td>2014</td>
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<tr>
<td>2015</td>
<td>104,957</td>
<td>24,316</td>
</tr>
<tr>
<td>2016</td>
<td>104,957</td>
<td>24,316</td>
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</table>
Infant Mortality, Ohio & US, 2007 - 2016

Data Sources: Office of Vital Statistics, Ohio Department of Health and the National Center for Health Statistics
Ohio Infant Mortality Rate by Race 2007-2016
Overall infant mortality has significantly decreased from 2007 to 2016 in the US, Ohio as a whole, all OEI counties combined, or all OEI cities combined, but not all non-OEI counties combined.

Data Sources: Office of Vital Statistics, Ohio Department of Health and the National Center for Health Statistics
Note: Categories are not mutually exclusive (e.g., United States includes Ohio)
Ohio Infant Mortality Numbers by Race 2016

Table 1: Ohio Infant Mortality, by Race and Ethnicity (2016)

<table>
<thead>
<tr>
<th>Group</th>
<th>Infant Deaths (Number)</th>
<th>Infant Mortality Rate (Per 1,000 Live Births)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race</td>
<td></td>
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</tr>
<tr>
<td>All Races</td>
<td>1,024</td>
<td>7.4</td>
</tr>
<tr>
<td>White</td>
<td>610</td>
<td>5.8</td>
</tr>
<tr>
<td>Black</td>
<td>369</td>
<td>15.2</td>
</tr>
<tr>
<td>American Indian</td>
<td>2</td>
<td>*</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>18</td>
<td>3.8***</td>
</tr>
<tr>
<td>Unknown</td>
<td>25</td>
<td>6.3</td>
</tr>
<tr>
<td>Ethnicity</td>
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<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>54</td>
<td>7.3</td>
</tr>
<tr>
<td>Non-Hispanic***</td>
<td>970</td>
<td>7.4</td>
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</table>

* Rates based on fewer than 10 deaths are considered unreliable and are suppressed.
** Rates based on fewer than 20 infant deaths should be interpreted with caution.
*** Non-Hispanic births and deaths include those of unknown ethnicity.
Ohio Infant Deaths 2016, n=1024

by OEI County

<table>
<thead>
<tr>
<th>County</th>
<th>Number of Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butler</td>
<td>128</td>
</tr>
<tr>
<td>Cuyahoga</td>
<td>165</td>
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<tr>
<td>Franklin</td>
<td>98</td>
</tr>
<tr>
<td>Hamilton</td>
<td>8</td>
</tr>
<tr>
<td>Lucas</td>
<td>15</td>
</tr>
<tr>
<td>Mahoning</td>
<td>38</td>
</tr>
<tr>
<td>Montgomery</td>
<td>45</td>
</tr>
<tr>
<td>Stark</td>
<td>41</td>
</tr>
<tr>
<td>Summit</td>
<td>31</td>
</tr>
<tr>
<td>Other Ohio</td>
<td>418</td>
</tr>
</tbody>
</table>

Death Rate per 1,000

- Butler: 6.9
- Cuyahoga: 8.7
- Franklin: 9.1
- Hamilton: 7.3
- Lucas: 6.8
- Mahoning: 9.0
- Montgomery: 7.5
- Stark: 6.5
- Summit: 6.5
- Other Ohio: 9.0
Causes of Infant Death in Ohio (2016)

Figure 3: Proportion of Causes of Infant Death in Ohio (2016)

- Prematurity-Related: 30%
- Congenital: 19%
- Sudden Infant Death Syndrome (SIDS): 7%
- Obstetric Conditions: 5%
- Birth Asphyxia: 4%
- Perinatal Infections: 8%
- Other Infections: 7%
- External Injury: 1%
- Other Causes: 1%

Contact Information

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Initiative Core Components

Taking Ohio to where it needs to be in the 21st Century by embracing technology (H.B. #49 Sec. 125.32)

Cloud Compute & Storage
The State provides access to cloud compute and storage for analytical projects as part of a hybrid cloud/on-prem strategy

Pre-Qualified Analytics Firms
The State provides access to pre-qualified firms with expertise in data analytics & machine learning across 14 functional domains

Data Sharing & Analytics Platform
The State has a highly secured hosted analytics platform inside the State data center featuring industry leading tools for secure data sharing and analytical workloads

Visual Analytics
Visual analytics and interactive dashboards are provided out of an enterprise service based on Tableau software

Data Analytics Support Services
The State supports the tools and hybrid data platform, supports data staging and curation, and provides scope and procurement services
Analytics Model

- **Descriptive Analytics**
  - Explains what happened
  - Dashboards, reports, data
  - Identify clusters based on some variables

- **Diagnostic Analytics**
  - Explains why something happened
  - Data discovery and correlations
  - Understand causes

- **Predictive Analytics**
  - Explains what will happen
  - Forward-looking KPI’s and insights
  - Predict behavior of this set at a future point in time

- **Prescriptive Analytics**
  - What should the business do?
  - Suggest best actions to meet a desirable outcome
  - Typical of streaming, machine-learning, & AI
Project Overview
Team Organization

**EXECUTIVE STEERING COMMITTEE**

- State Domain SME(s)
- State Domain SME(s)
- Clinical SMA(s)
- Analytics Lead
- Analytics SMA(s)
- Accenture Advisory Team

**DELIVERY TEAM**

- State Policy Staff
- State Data Experts
- Accenture Data Scientists
- Analytics Pod A
- Analytics Pod B
- Analytics Pod C
- Heavy onboarding w/ SQL, existing reporting, data, context

**Critical Success Factors**

- Help us access data and expertise
- Guide our analysis, share past learnings
- Help us focus on the right data and context
- Review outputs and contribute insights

Engaged throughout.

Heavy lifter as findings emerge. Public Health, Social Services, regional, data sets

<table>
<thead>
<tr>
<th>State of Ohio</th>
<th>Accenture Data Science</th>
<th>Accenture Advisory</th>
</tr>
</thead>
</table>
Scope of Work

**KEY QUESTIONS**

- Which mothers and infants are most at risk of infant death?
- Which families are most likely to benefit from targeted interventions?
- Which families are most likely to participate in targeted interventions?
- Which intervention programs yield the best return on investment?

**KEY MODELS**

- Evaluating Efficacy of State Intervention Programs
- Identifying Mothers at High Risk of Infant Mortality and Constructing Their Profiles
- Predicting the Characteristics of Mothers Most Likely To Benefit From An Intervention Program
- Predicting Which Intervention Program(s) At-Risk Mothers Should be Enrolled In
- Identifying Mothers Most At-Risk of Having a Baby that will Require a NICU Admission
Fusing Data Sets to Build Novel Views

- Data sets and understanding are validated in 2-way conversation with State SMEs.
- Data are joined into an analytics record with normalized data, for modeling purposes.
- Segmentation and Profiling to compare apples to apples.
- Models are built per segment, in priority order.
## MILESTONES AND CHECK-INS

<table>
<thead>
<tr>
<th>Collaboration with State Experts to build data understanding</th>
<th>Data documentation obtained, weekly touchpoints with SMEs</th>
<th>All data accessed, validated, bi-weekly touchpoints with Policy Staff and Data Experts</th>
<th>Milestone Checkpoint with Executive Steering Committee</th>
<th>Milestone Checkpoint with Executive Steering Committee</th>
<th>Final readout to executive leadership</th>
</tr>
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<tbody>
<tr>
<td>Dec 2017</td>
<td>Jan 2018</td>
<td>Feb</td>
<td>Mar</td>
<td>Apr</td>
<td>May</td>
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## ACTIVITIES

<table>
<thead>
<tr>
<th>MOBILIZATION</th>
<th>DATA DISCOVERY</th>
<th>ANALYTICS RECORD</th>
<th>SEGMENTATION AND PROFILING</th>
<th>MODELING</th>
<th>TARGETED INTERVENTION ROADMAP</th>
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<table>
<thead>
<tr>
<th>DEC 2017</th>
<th>JAN 2018</th>
<th>FEB</th>
<th>MAR</th>
<th>APR</th>
<th>MAY</th>
<th>JUN</th>
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Keys To Success

MOVING BEYOND THE EXPLORATORY AND THE ACADEMIC

INDUCTIVE REASONING AND EVIDENCE-BASED INTERVENTIONS

STATE PLANNING DRIVING LOCAL IMPACT
Interagency Coordination
Executive Steering Committee

• Monthly Meetings
  • Receive updates on project
  • Remove roadblocks
  • Assess policy implications

• Each participating agency will have a representative
Ohio Department of Health

Lead agency

• Coordinate with Accenture and participating agencies
  • Provide overall direction for project in conjunction with the Executive Steering Committee
  • Ensure project scope is complete
  • Ensure project goals are met
  • Deliverables are completely timely
  • Procurement and vendor payment
  • Communicate project status to stakeholders
    • Participating agencies
    • Governor’s Office
Supporting agency

- Stand up and maintain data lake platform
- Work with agencies to receive and ingest data into the data lake
- Ensure platform security
- Provide data lake access when authorized
- Technical support for participating agencies and Accenture
- Guidance to all involved parties
ODJFS, ODM & OhioMHAS

Participating agencies

• Legal review of relevant data to determine what can be contributed
• Submit data to OIT for inclusion in data lake
• Provide subject matter experts for included datasets to share knowledge on:
  • Provide a point person to Accenture, ODH, and DAS to guide requests to the right individuals
• Be engaged and part of the team throughout the project
  • Feedback on project direction
  • Timely responses
Legal Aspects: Memorandums Of Understanding

• Types of Agreements: Business Associate Agreement, Data Use Agreement, or similar agreement

• Structure:
  • Business Associate Agreement between DAS and the respective agency
    • DAS’ role: Hosting and managing all of the agencies’ information
  • Multi-party Business Associate Agreement or Data Use Agreement between ODH, Accenture (vendor) and respective agency
    • ODH’s role: Managing agency of the vendor, Accenture
    • Accenture’s role: Vendor accessing the information to perform the work under this project

• Purpose: Establish each party’s role and obligations with respect to this project
  • Agency’s information shall be used and disclosed only for the purposes of this project
  • Include applicable federal, state and local requirements to safeguard the confidentiality and security of the agency’s protected information
• All research
  • involving human subjects
  • conducted, supported, or otherwise subject to the Federal government regulation
  • must be reviewed and approved by an IRB
  • unless the research falls into an exemption.

• “Human Subject” definition includes the data of or about the human subject.

• The ODH Institutional Review Board (IRB) is composed of members from several state agencies.
  • IRB meetings are the 4th Tuesday of every month January through October and the first Tuesday of December. (Jan. 23, 2018)
  • IRB Applications and all documents must be received at least 14 calendar days prior to the meeting date for it to be considered.
Project Expectations for Agencies
ODH Approach for Onboarding Data

• Meet with each program/data owner to discuss project
  • Discuss importance and overall goals of project
  • Include attorney familiar with program and privacy
  • Determine what level of data can be provided (i.e., the entire dataset, deidentified line-level, or aggregate)

• Obtain agency consensus/approval for the level of data to be provided

• Complete onboarding paperwork and submit to DAS

• Work with DAS to move transfer data to the data lake
  • Secure FTP
  • SQL table access
Subject Matter Experts (SME)

- Familiar with the collection and use of the data
- Understand data limitations
- Know the details
- Can suggest potential avenues for exploration
- Available for:
  - Scheduled interviews
  - Sessions to share findings and collect feedback
  - Answering questions from the Accenture team
Q&A