The Texas Birth Defects Registry: Improving Program Efficiency using Business Process Analysis

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Today’s presentation

- overview of the Business Process Analysis experience,
- details on what the Texas Birth Defects Registry learned
- samples of current process maps
- samples of future opportunity maps and
- how the analysis is helping with requirements gathering for a new registry
Texas Birth Defects Registry is an active surveillance program

- Work in 220+ hospitals to find potential cases, read medical records, and abstract case data

- The hospitals are located in over 262,000 square miles - where possible, remote access to the electronic medical record is used (currently 30 hospitals)

- In 2010, over 92,000 medical records were reviewed yielding over 22,000 cases with 81,000+ diagnoses
Texas Birth Defects also does:

- Data Analysis (routine & ad hoc)
- Outreach to Family
- Communication
- Research
- Education & Training
Why did Texas go through a Business Process Analysis?

Our boss’s boss said we would
initial response=but...but...

- Quarterly we review progress on our strategic plan activities to improve our processes & do a new strategic plan every 2-3 years
- Regularly we discuss what is not in the plan but are new ideas/suggestions/realities impacting efficiency
- Have a written procedure manual

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- What will this really add?
Business Process Analysis is

- An approach to increasing program efficiency and effectiveness where Business Analysts conduct meetings with program staff to:
  - map, document and evaluate the current environment and discover opportunities for future business processes.
  - perform a gap analysis of the difference between the current state of the program and the desired future environment.
  - create an implementation plan for selected future opportunities.
The Texas Birth Defects Registry staff found:

- mapping the business process increased each person’s understanding of each process
- opportunities for improvement became clear when reviewing the process maps
- mapping the future opportunities included identifying benefits, costs, risks, risk management, dependencies, relationship to other process, etc

Helps with succession planning to handle employee departures
How did it actually work?

- Lots of meetings
- Introduction meeting
- Big group meeting to develop the overall picture
- Smaller meeting with individuals or groups to work on the individual processes
  - Initial meeting to talk through the process
  - Follow-up meeting to review the “draft” and make any edits
More Logistics

- Side meetings of project manager with analysts to keep project on task and deal with logistics

- Analysts did mapping directly into Viseo instead of working on blackboard/white board which removed the need for additional meetings

- Project manager had extensive knowledge about the BD program and was able to answer many questions in great detail – made the process quicker
Let’s see some maps!
8.0 HIGH-LEVEL FLOWCHART OF BDES PROCESSES

BDES – High-Level Flowchart of BDES Processes Page 1

I. Regional Office Activities

Start

1.0 Casefinding Process

Note: Field QA occurs in these processes:
1.0 Casefinding
2.0 Medical Record Review
3.0 Abstraction

2.0 Medical Record Review Process

3.0 Abstraction Process

4.0 Field Review Process

5.0 Clinical Review Process

6.0 Record Completion Process

7.0 Diagnosis Code Review Process

II. Central Office Activities
There is a high degree of relationship between some of these processes. The individual process shows specific relationships.

- 8.0 Vital Statistics Linkage and Processing Process
- 9.0 Case Analytic Database Process
- 10.0 Family Outreach (Referral, NTDRP)
- 11.0 Recurring Data Requests Process
- 12.0 Ad Hoc Data Requests and Reporting Process
- 13.0 Communication Activities Process
- 14.0 Production Database Activities Process
- 15.0 Research Center Activities Process
- 16.0 Other New
Clinical Reviewers (CR)

Start

Trigger: IAS Record ready for Clinical Review

YES

Reviews record page by page and takes notes outside the system for:
- Birth Defects page
- General QA Check

Compares notes against the IAS

Is this the first time through this decision?

NO

Do notes match Birth Defects page and is QA Check OK?

YES

Is it a case?

NO

Enters comments and assigns "Not A Case" per Clinical Reviewer in IAS

YES

Need more information?

NO

Everything correct?

YES

Enters comments and assigns "Clinical Review Complete" per Clinical Reviewer in IAS

NO

Enters comments and assigns "Needs More Information" per Clinical Reviewer in IAS

Enters comments and assigns "Needs Correction" per Clinical Reviewer in IAS

O: IAS Record ready for completion

Go to B in Process 4.0 Field Review

Note: Need for more information and for corrections needed are not mutually exclusive.
Process 8.1 - Vital Statistics Linkage and Processing

Regional, Other Data Sources

Start

Trigger: Calendar

12: VSU for
  * Birth
  * Death

13: CHS for
  * Fetal Deaths

14: CHS for Geocodes
  * Birth
  * Death
  * Fetal Death

11: Mirror Database (daily snapshot)

Central Office Staff

1. Requests from VSU and normalize:
   1. Quarterly Data (provisional)
   * Birth
   * Death
   2. Annually (stat locked)
   * Birth
   * Death

2. Requests from CHS (annually) and normalize:
   * Fetal death

3. Requests Geocodes from CHS (annually) and normalize:
   * Birth data
   * Death data
   * Fetal Death data

4. Creates and updates temporary vital record data sets

5. Pulls completed case records from 11: Mirror Database

Was case in 02 previously linked to Vital Statistics in 04?

YES

O3: Database of cases that need to be linked to vital statistics

04: Database of case numbers and their matched vital statistics numbers to date

05: Abstracted fetal death data for linked cases

End of Task

NO

06: Completed Case Records

07: Completed Birth Data

08: Completed Death Data

End of Task

End of Process

Go to Process 3.0 Case Analysis Database

#1 Sends subset of O1 to TAMU and regions to assist with Casefinding (See Process 3.0 Abstraction)

O1 subset: Temporary Birth Certificate Data

O1 subset: Temporary Vital Records Data For Cases

O11: RIS SAS Data

INVENTORY OF INPUTS/OUTPUTS USED FOR IN MULTIPLE CO PROCESSES

Inputs:
11: Mirror Database (daily snapshot)
12: VSU (Birth, Death)
13: CHS for Fetal Death Certificate
14: CHS for Geocodes
15: NBS Data-General
16: NBS Data-Specific

Outputs:
01: Temporary Vital Record Data Sets
02: Completed Case Records
03: Database of cases that need to be linked to vital statistics
04: Database of case numbers and their matched vital statistics numbers to date
05: Abstracted fetal death data for linked cases
06: Completed Birth Data
07: Completed Death Data
08: Completed Death Data

Process 11.0 – Recurring Data Requests

Central Office Staff

Start
- Trigger: Receives data requests

Note: These data requests recur and lend themselves to the development of standardized processes, which may require modification as the requests change. Depending on the individual request, data may be provisional or finalized.

EXAMPLES of Recurring Data Requests
- Annual Report - depends on Processes 6.0, 8.0
- Texas Health Data - depends on Processes 8.0, 9.0, Annual Report
- ICBDSSR - depends on Processes 6.0, 8.0, 9.0, provisional data
- NBDPRN - depends on Processes 6.0, 8.0, 9.0, provisional data
- NBDPS - depends on Processes 8.0 (denominator data)
- NTD Rapid Ascertainment - depends on Processes 6.0, 8.0

PROCESS
- 6.0 Record Completion
- 8.0 Vital Statistics Linkage and Processing
- 9.0 Case Analytic Database

#1 Receives and clarifies data requests (See Examples in legend.)

#2 Gets data from appropriate source, per data request

#3 Manages data - can include any or all of the following:
- Link
- Restructure
- Clean
- Recode

Type of data requested?
- Tabulated Data
- Individual Record Data

#5 Disseminates data or results - includes documentation and reports
- O: Requested data or results

#6 Completes entry in Data Request Database
- O: Entry completed in Data Request Database

End of Process
Analysis also includes a narrative

- Owner
- Contributer Roles
- Responsibility Chart (RACI)
- Tools & Materials
- Entry Criteria
- Primary Inputs
- Primary Outputs
- Exit Criteria
- Measurements
<table>
<thead>
<tr>
<th>PROCESS ACTIVITIES</th>
<th>RACI ROLES</th>
<th>SS</th>
<th>QAS</th>
<th>CO</th>
<th>Reg Super</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assigns IAS record for Field Review.</td>
<td></td>
<td>A</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2. Send Abstraction Form (paper) to QAS.</td>
<td></td>
<td>A</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3. Reviews IAS record and compares with SS Abstraction Form (paper.)</td>
<td></td>
<td>A</td>
<td></td>
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<tr>
<td>4. Determines if it is a case.</td>
<td></td>
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</tr>
<tr>
<td>a. If yes, goes to step 5.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>b. If no, assigns “Not a case” per QAS in IAS and enters results into Field</td>
<td></td>
<td>A</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Review Database and ends process.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5. Detects errors and/or missing information and edits IAS record as needed.</td>
<td></td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Enters results into Field Review Database and comments in IAS.</td>
<td></td>
<td>A</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>7. Provides results to Central Office, Regional Supervisor, and Surveillance</td>
<td></td>
<td>I</td>
<td>A</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>Specialist.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>8. Determines if needs to go back to Surveillance Specialist.</td>
<td></td>
<td>I</td>
<td>A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. If yes, assigns to appropriate case stage and sends to Surveillance Specialist</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>and goes to A in Process 3.0 Abstraction.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>b. If no, goes to step 9.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>9. Determines if needs a clinical review.</td>
<td></td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. If yes, assigns “Needs Clinical Review” per QAS. Go to Process 5.0 Clinical</td>
<td></td>
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</tr>
<tr>
<td>Review.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>b. If no, assigns “Record Ready for Completion” per QAS. Go to Process 6.0</td>
<td></td>
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</tr>
<tr>
<td>Record Completion.</td>
<td></td>
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</tr>
</tbody>
</table>

Role Legend:  A=Accountable,  C=Consult,  I=Inform,  R=Responsible
What about Futures?
Future Process 8.5 Statewide Hospital Discharge Database as a Casefinding Source

Note:
* May possibly impact Process 1.0 Casefinding as a source of data.
* Not a current process now.

**Entry/Exit Point**

**External Sources**

- All hospitals send hospital discharge data to DSHS

**DSHS Program**

- Exports and transfers data to BDES
- Cleans and processes data

**Central Office Staff**

- Links to I1: Mirror Database
  - O13: Statewide Hospital Discharge Data and linkage results
    - Sends subset of O13 to appropriate region for Casefinding (See Process 1.0 Casefinding)
    - O13: Subset of Statewide Hospital Discharge Data specific for region

**Trigger:** Calendar Quarterly?

**Start**

**End of Process**
Future Process 8.4 Laboratory Reporting of Chromosome Test Results to Supplement Existing Cases

Note:
* Not for Process 1.0 Casefinding but used as supplementary data to rule out or confirm chromosomal diagnoses.
* Not a current process now.

Start
Trigger: Calendar Quarterly?

Sends data through NEDSS
I7: Laboratory Chromosomal Data

Exports and transfers data to BDES

Reviews I7 data and determines estimated date of delivery (EDD) for each record

For EDD, is delivery year complete in registry I1?

YES

O12: Laboratory Chromosomal Data (with EDD)

Links O12 to O1

Did O12 record link to I1?

NO

Process TBD (may include linkage to Vital Statistics)

YES

Updates Registry with O12 data (Process TBD – will impact CO and RO staff)

End of Process
Future Process 1.0 - Casefinding Process  
(Modified by Prenatal Diagnosis Facilities as a Casefinding Source)

Start

Trigger: Regional Supervisor initiates surveillance activities

ICD9

Requests ICD9 List from hospital

Hospital provides ICD9 List

ICD9 List from hospital

Conducts cleaning process: formats, cleans, merges, and eliminates duplicates in information from ICD9 List and Unit Logs

Produces List of Potential Cases

Selects sample for re-casefinding from ICD9 List and/or Unit Logs

Reviews sample

Produces QAS List of Potential Cases

Compares SS List of Potential Cases to the QAS List of Potential Cases

Identifies missed potential cases

Provides results to CO, Regional Supervisor, and Surveillance Specialist

Missed potential cases?

YES

NO

End of Process

Re-sends List of Missed Potential Cases to Surveillance Specialist

QA: Re-Casefinding Process

QA Specialists (QAS)

End of Process

Go to Process 2.0 Medical Record Review

Surveillance Specialists (SS)

Note: The Prenatal process may also impact Process 2.0 Medical Record Review
<table>
<thead>
<tr>
<th>#</th>
<th>Opportunity - Implementing Direct Data Entry into Registry System (for Process 3.0 Abstraction) <em>(To include direct data entry, the Registry System will...)</em></th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Have the ability to use voice-activated input, which can be edited later</td>
<td>* Speeds up data entry</td>
</tr>
</tbody>
</table>
| 2  | Have capability for direct entry into the primary web-based system when physically at the facility (Ex: through WiFi, cellular network) | * Wouldn't have to capture on paper or on laptop first  
    * Will need more laptops (ex: Netbook) |
| 3  | Have ability to distinguish between records directly data entered versus records entered from paper form | * For QA |
| 4  | Have ability in the Produce Forms function to generate printed case records with ample space to write down additional information | * More efficient |
| 5  | Have data input screens designed with direct data entry in mind                                 | * Reduce wasted space |
| 6  | Be able to generate new case forms using information from the casefinding database              | * Casefinding database must be incorporated or be able to interact with the web-based Registry system |
| 7  | Integrate VSU data every night with registry record so next morning the user can identify duplicates, pull data from VSU, and update case record | * Decrease duplicate work  
    * Downside: may lose ability to determine if data are from VSU or from medical records  
    * Requirement: need field that is vital record certificate number |
| 8  | Have a more robust initial duplicate check or additional duplicate checks throughout the process  | * Will catch errors earlier |
| 9  | For duplicate registry records, have ability for system to combine the two records into one record | * System would ask user to make decision which items to keep or delete  
    * Case may be worked in two regions at the same time |
| 10 | Permit user to enter data into any records, even those not from their region                     | * Decreases data entry time for region of ownership  
    * Increases data entry time for regions that collect the most transferred records |
Now what?

- Use to explain business process to new employees and those outside the program
- Must update regularly to be sure it reflects reality and have discussions to improve efficiency
- Develop more detail written procedures to cover these processes
- Helps with new system requirements development
<table>
<thead>
<tr>
<th>Number</th>
<th>Category</th>
<th>Requirement Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC1</td>
<td>Data Collection</td>
<td>The system must uniquely identify individual records.</td>
</tr>
<tr>
<td>DC2</td>
<td>Data Collection</td>
<td>The system must have the capability to accommodate manual data entry. For batch or manual entry, system must maintain external identifiers.</td>
</tr>
<tr>
<td>DC3</td>
<td>Data Collection</td>
<td>The system must have the capability to import and filter data from a variety of sources (hospitals, prenatal diagnosis facilities, fetal death certificates, statewide hospital discharge databases, etc). Users shall be able to modify import format specifications as needed to keep up with format changes.</td>
</tr>
<tr>
<td>DC4</td>
<td>Data Collection</td>
<td>The system must have the capability to grey-out fields if not applicable and pre-fill as applicable, based on context or linked records. (ex: region of jurisdiction is based on county of residence, using case finding data to pre-fill new abstraction).</td>
</tr>
<tr>
<td>DC5</td>
<td>Data Collection</td>
<td>For manual entry, the system must perform data validation on the data entry screen for each field. (ex: real time correction)</td>
</tr>
<tr>
<td>DC6</td>
<td>Data Collection</td>
<td>The system must provide processes to validate and filter automatically imported data from all sources.</td>
</tr>
<tr>
<td>DC7</td>
<td>Data Collection</td>
<td>The system must provide the ability to take batches of off-line data entry of abstraction records and update, process, and synchronize them to online system.</td>
</tr>
<tr>
<td>NOT1</td>
<td>Notification (Audit and Tracking)</td>
<td>The system must provide tracking log of changes made to all individual patient records (case finding and abstracts) allowed through the normal user interface. Tracking includes who, when, and what the change was.</td>
</tr>
<tr>
<td>-------</td>
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<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>NOT2</td>
<td>Notification (Audit and Tracking)</td>
<td>The system must provide error and success reports to users for all batch data loaded into the system. The report must include error type (ex: rejection, empty or inaccurate data fields or duplicate) and specific definition.</td>
</tr>
<tr>
<td>NOT3</td>
<td>Notification (Audit and Tracking)</td>
<td>The system must allow user to set predetermined notifications (alerts) based on workflow conditions, including dates, timeliness, number of pending items, and similar workflow-related items. Note: The administrator would set the majority of alert criteria. Where possible, permit other users to set some criteria.</td>
</tr>
<tr>
<td>NOT4</td>
<td>Notification (Audit and Tracking)</td>
<td>The system will allow event driven (time/date or data modification) reports, emails and alerts.</td>
</tr>
<tr>
<td>DA2</td>
<td>Data Analysis</td>
<td>The system must have data extraction tools to support multi-dimensional (using criteria from multiple data tables and multiple fields) for external analysis of the data. The tool must accommodate both basic and advanced users.</td>
</tr>
<tr>
<td>------</td>
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<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>DA3</td>
<td>Data Analysis</td>
<td>The system must allow analysis to include use of linked data. Ability to cross reference and match with any other imported data. Must minimally link for individuals, facility, location.</td>
</tr>
<tr>
<td>DA4</td>
<td>Data Analysis</td>
<td>The system must provide standard reports for all standard BDES registry tasks.</td>
</tr>
<tr>
<td>DA5</td>
<td>Data Analysis</td>
<td>The system must allow reporting and analysis of workflow tasks and activities.</td>
</tr>
<tr>
<td>REP</td>
<td>Category</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
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<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>REP1</td>
<td>Reporting</td>
<td>The system must provide reports in multiple printable formats, including HTML and PDF.</td>
</tr>
<tr>
<td>REP2</td>
<td>Reporting</td>
<td>The system must allow for the export of any report as data in XML and CSV.</td>
</tr>
<tr>
<td>REP3</td>
<td>Reporting</td>
<td>The system must allow for users to save reports in any given allowable export format.</td>
</tr>
<tr>
<td>REP4</td>
<td>Reporting</td>
<td>The system must include development and processing of common reports. The users will have the ability to modify these reports and develop new common reports. Common reports that are developed will be available on the system to all authorized users.</td>
</tr>
<tr>
<td>REP5</td>
<td>Reporting</td>
<td>The system must support the sharing of other reports.</td>
</tr>
<tr>
<td>REP6</td>
<td>Reporting</td>
<td>The system must provide immediate notification of a failed report to the requesting user, providing reason or error code.</td>
</tr>
<tr>
<td>REP7</td>
<td>Reporting</td>
<td>The system shall provide real-time monitoring and viewing of record workflow status.</td>
</tr>
<tr>
<td>GEN2</td>
<td>General</td>
<td>The system shall give administrators the ability to lock out all or a group of non-administrator users.</td>
</tr>
<tr>
<td>------</td>
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<td>---------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>GEN3</td>
<td>General</td>
<td>The system must provide a completely dynamic query tool that allows searching by any single data point. Search results must be sortable and allow user to view and perform appropriate actions on records found. Note: this focuses on finding, viewing, and performing actions on the record inside the system.</td>
</tr>
<tr>
<td>GEN4</td>
<td>General</td>
<td>The system must provide context appropriate standard query tools that allow searching for case findings or abstracts. Search results must be sortable and allow user to view and perform appropriate actions on records found.</td>
</tr>
<tr>
<td>GEN5</td>
<td>General</td>
<td>The system must allow inclusion of all historical data migrated from the IAS. Historical data must be accessible in the new system even if some historical data fields are no longer actively updated.</td>
</tr>
<tr>
<td>GEN6</td>
<td>General</td>
<td>The solution must include a separate test system.</td>
</tr>
<tr>
<td>GEN7</td>
<td>General</td>
<td>The system shall give users capability to flag a record to indicate a question and the flag will follow the record until the question is answered and the flag is turned off.</td>
</tr>
</tbody>
</table>
Questions?
For More Information:

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512-458-7111 ext 2058