

# *Empowering a Community for Outbreak Investigation*

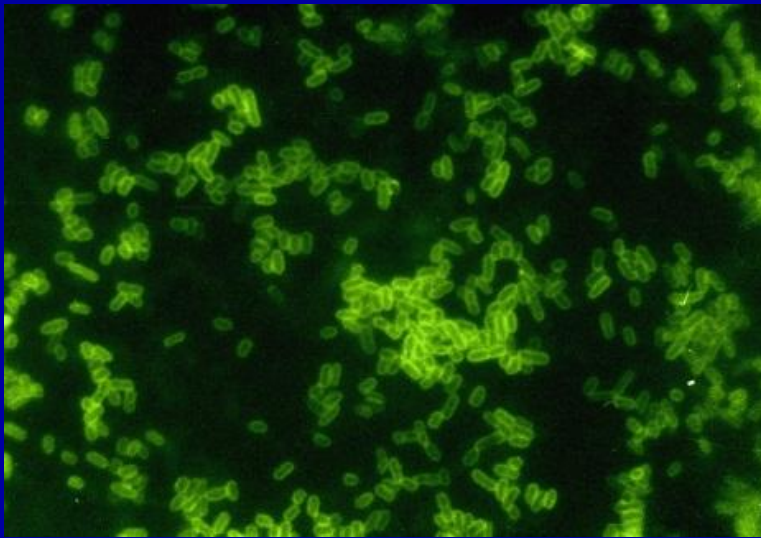


Image courtesy of Centers for Disease Control and Prevention

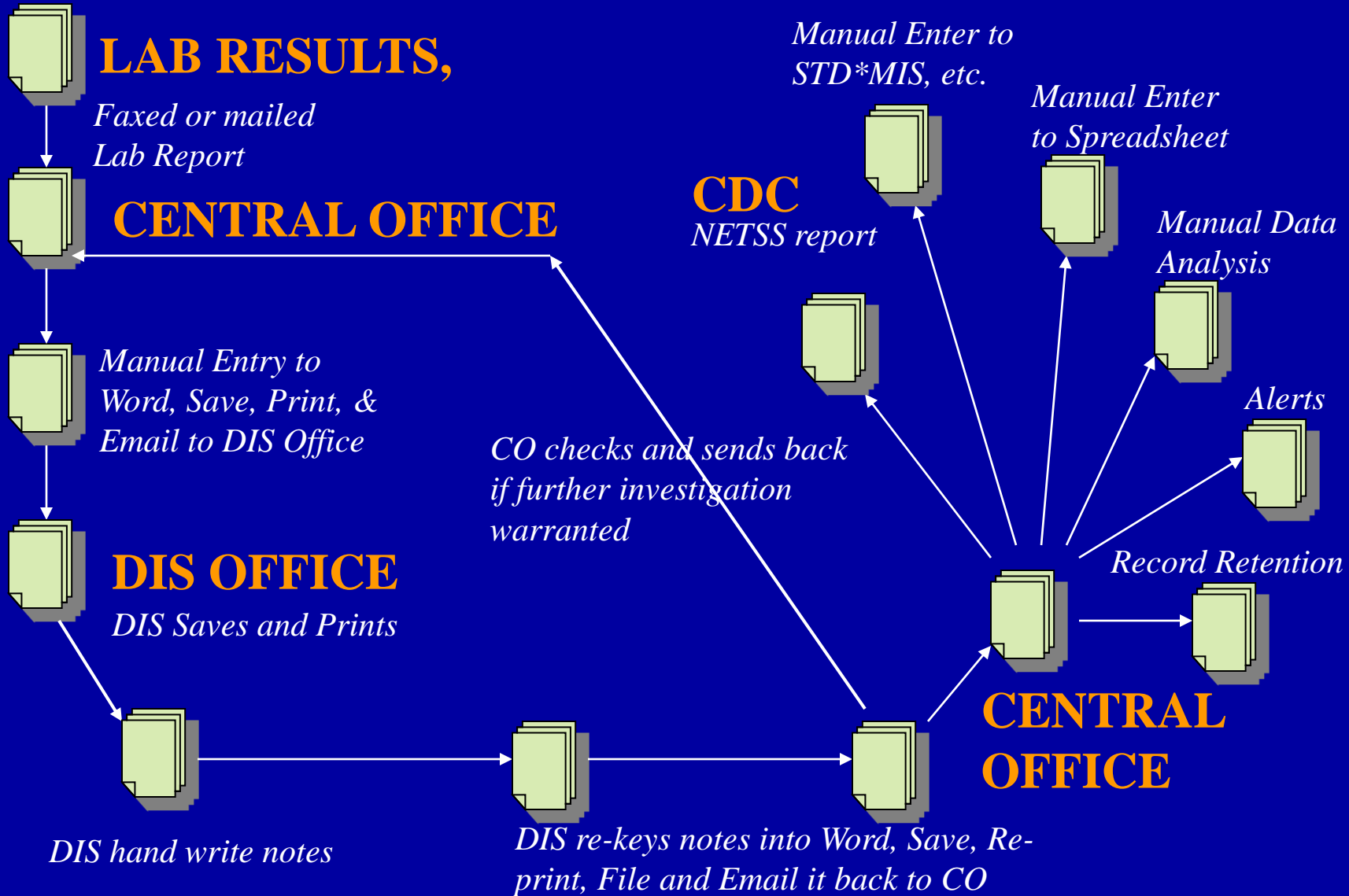


Image courtesy of the Office of United States Trade Representative

OutbreakNet 2012  
August 29, 2012

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Disease Surveillance Manager Epidemiologist, SD-DOH

# Historical data flow; nodes still stubbornly persist



# Status of Public Health

- **Lack of funding**
- **Lack of staffing resources**
- **Jurisdictional turf wars**
- **Lack of system capabilities**
- **Lack of technical expertise**
- **Not engaging the right partners**
- **Growth of government under intense scrutiny**
- **Benefits of new methods not clearly understood**

# Meaningful Use

- **Has potential to have dramatic impact, put our targets in focus, bridge the gap between clinical medicine and public health.**
- **Advantages:** systematic and standardized way to collect and share patient information, formatted digitally, facilitated data exchange, tracking care, reminder/warnings, validating outcomes, statistical evaluations, security, audit tracking.

# We're still *missing* the most important part of the picture



**PATIENTS** conducting *their own investigations* as soon as diagnosed or lab results are reported.



Image courtesy of Centers for Disease Control and Prevention

[http://www.cdc.gov/2008\\_12th\\_Annual\\_PulseNet\\_Meeting](http://www.cdc.gov/2008_12th_Annual_PulseNet_Meeting)

# Empowering the Patient

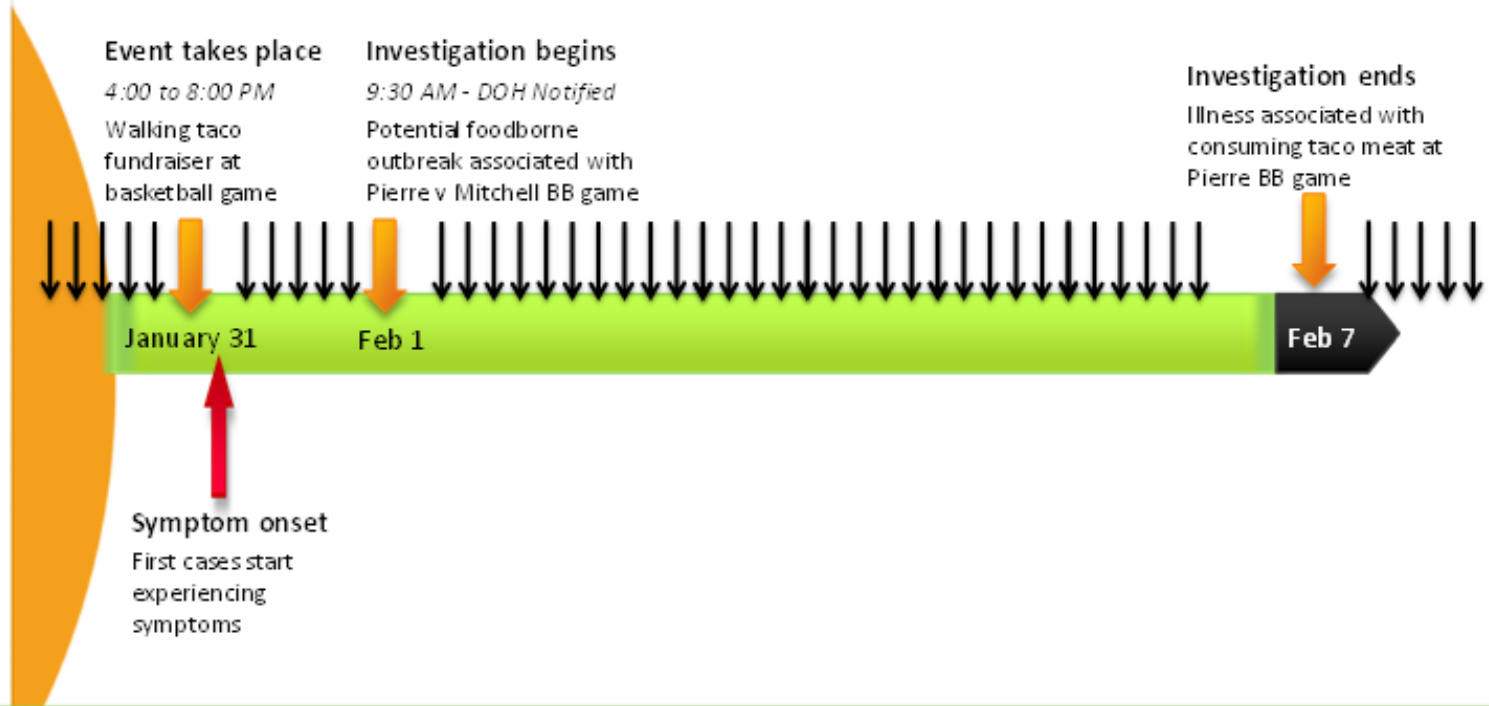
- Equip them and give them their advocacy role.
- Public health can “see” the patient more quickly
- Investigations more effective while patient still infectious
- Intervention efforts are closer to the fire
- Prompt and quality feedback to clinical medicine
- Tracking population trends and statistics
- Clearly identify problems and gaps in need
- Evaluate and increase effectiveness of population-based prevention & control

# Empowering Communities



SOUTH DAKOTA DEPARTMENT OF HEALTH

## Outbreak Response Timeline





# SDEDSS Dynamic Outbreak and Survey Builder

South Dakota Electronic Disease Surveillance System

Enter Case ID or Search Term...

Unbind Event Logged in as nhill (Unfiltered)

### Outbreak Summary

Basic Information		Notes (Click Edit   Show My Notes)
Event ID:	100115294	
Disease:	Q fever	
Name:	QFever	
Date:	Create Date: 05/14/2012	
Case Status:	Open	
Linked Events/Contacts:	23 linked event(s)/contact(s) ( <a href="#">View</a> )	
Linked Exposure Sites:	0 linked exposure site(s)	
Attachments:	0 attachment(s) ( <a href="#">Add</a> )	
Notifications:	<b>There must be a lead investigator for every outbreak.</b>	

### Outbreak Information

Event Data	Lab Results	Concerns	Tasks	Outbreak Questions	Surveys	Event History
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QUESTION PACKAGE	LAST UPDATE	UPDATED BY	STATUS
Outbreak / Exposure Information	05/14/2012	Michael Zielenski (mzielenski)	Complete

# SDEDSS Dynamic Questionnaire Builder

**Define Cluster Question Package**

Name:

Report ID:

Show Questions For:  *Note: Once set this can not be changed!*

Start Date:

End Date:

Disabled:

Question	Answer Type	Answer Options	Question Trigger	Filter	Report ID	Report Label	Required	Disabled	Action
<input type="text"/>	String			<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Delete</a> <a href="#">Add</a>

[Add Question](#)

**Define Cluster Question Package**

Name:

Report ID:

Show Questions For:  *Note: Once set this can not be changed!*

Start Date:


End Date:

Disabled:

Question	Answer Type	Answer Options	Question Trigger	Filter	Report ID	Report Label	Required	Disabled	Action
<input type="text" value="Did you eat the tacos?"/>	Yes/No/Unknown			<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Delete</a> <a href="#">Add</a>
<input type="text" value="With lettuce?"/>	Yes/No/Unknown		Yes No	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Delete</a> <a href="#">Add</a>
<input type="text" value="With tomatoes?"/>	Yes/No/Unknown		Yes No	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Delete</a> <a href="#">Add</a>
<input type="text" value="With cheese?"/>	Yes/No/Unknown		Yes No	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Delete</a> <a href="#">Add</a>
<input type="text" value="With ground beef?"/>	String		Yes No	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Delete</a> <a href="#">Add</a>
<input type="text" value="Did you eat pizza?"/>	Yes/No/Unknown			<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Delete</a> <a href="#">Add</a>
<input type="text" value="Cheese pizza?"/>	String		Yes No	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Delete</a> <a href="#">Add</a>
<input type="text" value="Sausage pizza?"/>	String		Yes No	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Delete</a> <a href="#">Add</a>
<input type="text" value="Pepperoni pizza?"/>	String		Yes No	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Delete</a> <a href="#">Add</a>

[Add Question](#)

# SDEDSS Dynamic Questionnaire

* First Name:	<input type="text"/>	Please describe any other symptoms? <input type="text"/>
* Last Name:	<input type="text"/>	
City:	<input type="text"/>	
Zip Code:	<input type="text"/>	
Home Phone:	<input type="text"/>	
Cell Phone:	<input type="text"/>	
Age (in years):	<input type="text"/>	
Gender:	<input type="text"/>	
Did you attend the Pierre/Mitchell basketball game on Tuesday, Jan. 31st?	<input type="text"/>	
Did you have any illness on the day BEFORE you attended the basketball game?	<input type="text"/>	
Did you become ill AFTER the basketball game?	<input type="text"/>	
Have you sought medical care?	<input type="text"/>	
Clinic Name	<input type="text"/>	
Was stool sample collected?	<input type="text"/>	
What day did your symptoms start?	<input type="text"/> 	
Approx. what time did symptoms begin?	<input type="text"/>	
About how long did your illness last (in hours)?	<input type="text"/>	
Did you have diarrhea?	<input type="text"/>	
Did you have watery diarrhea?	<input type="text"/>	
Did you have bloody diarrhea?	<input type="text"/>	
Did you have abdominal cramps?	<input type="text"/>	
Did you have a fever?	<input type="text"/>	
Did you have nausea?	<input type="text"/>	
Did you have vomiting?	<input type="text"/>	
Did you have weakness?	<input type="text"/>	
Did you have chills?	<input type="text"/>	
Did you have headache?	<input type="text"/>	
Did you have constipation?	<input type="text"/>	
Did you have Walking Tacos?	Yes <input type="text"/>	<input type="text"/>
Did you have meat?	<input type="text"/>	
Did you have chips?	<input type="text"/>	
Did you have cheese?	<input type="text"/>	
Did you have lettuce?	<input type="text"/>	
Did you have salsa?	<input type="text"/>	
Did you have sour cream?	<input type="text"/>	
Did you have pizza?	<input type="text"/>	
Did you have hot dogs?	<input type="text"/>	
Did you have popcorn?	<input type="text"/>	
Did you have fountain pop?	<input type="text"/>	
Did you have anything else to eat or drink at the basketball game?	<input type="text"/>	<input type="text"/>
Comments:	<input type="text"/>	<input type="text"/>

\* Indicates required field

# SDEDSS Report Builder

**Maven Reporting**

Category:

Select Report:

- Cluster/Outbreak Related Dynamic Question Extract
- Contact Network Graph
- Dynamic Outbreak Questionnaire Extract (Excel, CSV)
- Outbreak Statistics Report

**Maven Reporting**

Category:

Select Report:

EventID:

Question Packages:

- 3. Clinical (DiseaseSurveillanceModel\_EPI\_IMM)
- 2. Demographic (DiseaseSurveillanceModel\_EPI\_IMM)
- 6. Epi-linked and Outbreak Information (DiseaseSurveillanceModel\_EPI\_IMM)
- 5. Risk/Exposure/Control & Prevention (DiseaseSurveillanceModel\_EPI\_IMM)
- 7. Food History (DiseaseSurveillanceModel\_EPI\_IMM)

Report Format:

# SDEDSS Outbreak Reports

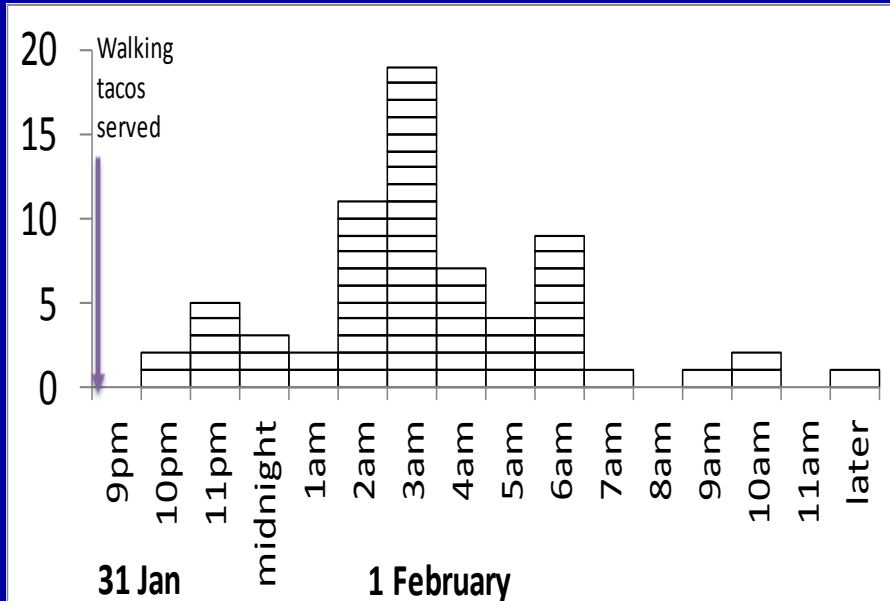


Table 1. Symptoms of Ill cases, Pierre/Mitchell Boys High School Basketball Outbreak, Jan, 2012.

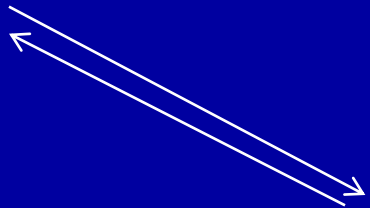
Symptom	Responses	Number with Symptom	% with symptom
Diarrhea	74	74	100%
Watery diarrhea	73	58	79%
Bloody diarrhea	68	4	6%
Abdominal cramps	74	56	76%
Nausea	73	24	33%
Vomiting	73	3	4%
Fever	73	9	12%
Headache	73	14	19%
Chills	73	22	30%
Weakness	73	26	36%
Constipation	73	3	4%

Table 2. Analytical epidemiology: statistical breakdown of foods served at the Pierre/Mitchell Boys High School Basketball Outbreak, Jan, 2012.

Food	Ill Persons		Well Persons		RR	95% CI	P
	Did consume	Did not consume	Did consume	Did not consume			
Walking Taco	72	1	19	48	38.8	5.6 – 270.5	<<0.0001
-Taco Meat	70	2	20	47	19.1	4.9 – 74.4	<<0.0001
-Taco Cheese	70	1	19	47	37.8	5.4 – 263.4	<<0.0001
-Taco Lettuce	62	10	18	49	4.6	2.6 – 8.1	<<0.0001
-Taco Sour Cream	52	20	16	50	2.7	1.8 – 4.0	<<0.0001
-Taco Salsa	53	18	16	50	2.9	1.9 – 4.4	<<0.0001
-Taco Chips	68	4	19	48	10.2	3.9 – 26.2	<<0.0001
Hot Dogs	8	64	13	54	0.7	0.4 – 1.2	0.1299
Pizza	5	67	11	56	0.6	0.3 – 1.2	0.0686
Popcorn	41	31	27	40	1.4	0.996 – 1.9	0.0364
Fountain pop	5	67	13	54	0.5	0.2 – 1.1	0.0258

# Future SDEDSS Vision

**CLINICIAN  
REPORT**



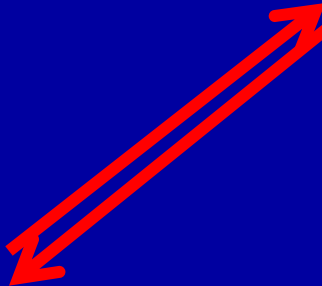
**ELR-EMR  
EXCHANGE**



**SDEDSS**



**Local, State,  
Federal,  
International  
Exchange  
Partners**



**PATIENT DRIVEN  
DATA FLOW**

# Moving out of the trench...

Public Health must realize we have a smarter, more mobile, more informed **PUBLIC**. Need to develop tools to engage and leverage these resources to advance public health. Public must be brought into the process.

# FDOMS predecessor system

The PATIENT “conducts” their own interview as soon as symptoms develop, diagnosed, or lab result is available.

- **Demonstration of FD-OMS (front side)**

<https://apps.sd.gov/applications/ph93Morbidity/secure/FoodHistory.asp>

- **Demonstration of FD-OMS (back side)**

<https://www.state.sd.us/applications/DP42Launchpad/Logon.aspx>



# Question Package **FDOMS**

South Dakota  
Department  
of Health

## Confidential Food History Questionnaire

*front end*

### Contact Information

Section 1 of 5 [Next >>](#)

We need **your help** to determine if any food items you ate may have caused your illness. The information you provide is compared with others who have similar illnesses - to identify possible sources. The way this works best is if you can obtain grocery and restaurant receipts, as well as any checkbook entries or credit card statements (if available) - for the past 10 days before you became ill. Use these and your best recall to tell us about your activities and what you ate in that period. (Note, If you don't know the answer, please just select "unk" for unknown and go to the next item.) **Please be sure to push the "Submit Questionnaire" button on Section 5 when you are finished.** [Click Here](#) to download a PDF version(Adobe Acrobat required).

### PERSON ILL

*First Name:	<input type="text"/>	MI:	<input type="text"/>	*Last Name:	<input type="text"/>
Home Address:	<input type="text"/>				
*City:	<input type="text"/>	State:	SD <input type="text"/>	Zip:	<input type="text"/>
*Phone:	<input type="text"/>	County:	-- Select -- <input type="text"/>	Gender:	-- Select -- <input type="text"/>
Date of Birth:	<input type="text"/>	<small>(mm/dd/yyyy)</small>			
Onset date of your first symptoms:	<input type="text"/>	<small>(mm/dd/yyyy)</small>			
Onset date of vomiting or diarrhea:	<input type="text"/>	<small>(mm/dd/yyyy)</small>			
Was this lab confirmed?	<input type="text"/>				
Physician Diagnosis:	<input type="text"/>				
Are you:	the person ill <input type="text"/>				
If you are not the person ill please enter your name:	<input type="text"/>	Phone:	<input type="text"/>		

Section 1 of 5 [Next >>](#)

# Question Package **FDOMS**

**General Risks for Illness** (in the last 10 days before you got sick) << Previous Section 2 of 5 Next >>

Yes No Unk

- Was anyone else in your household (or living arrangement) sick with diarrhea or vomiting?
- Did you spend any nights away from home?
- Are you on any kind of special or limited diet?
- Did you have any contact with dogs, cats, or other pets?
- Did you have any contact with commercial animals (hogs, cattle, horses, sheep, goats, etc.)?
- Did you handle any pets treats like pig ears, rawhide chews - at home or anywhere else?
- Did you have contact with any reptiles, such as snakes, iguanas, or other lizards, and turtles?
- Did you have any contact with baby chicks or other live poultry?
- Do you have any underlying medical conditions such as pregnancy, cancer, or diabetes that you have been told might affect your immune system?

If you answered "Yes" to any of these questions, please describe in this comments section. (5000 character limit)

**Eating and Shopping** (in the last 10 days before you got sick did you eat any food from..)

Yes No Unk

- any fast-food restaurants
- sit-down restaurants
- grocery-store deli or other kind of deli
- bakery
- coffee shop
- street vendor (wheeled cart or walking tray at events, etc.)
- event concession stand
- gas station or similar mini-mart
- tavern or bar
- free samples anywhere (e.g. grocery store, farmer's market, food event, etc.)

Yes No Unk

- cafeteria/dining room (e.g. worksite, hospital, school)
- nursing home or care facility dining
- hotel room service
- child care facility
- potluck-type private event
- catered private gathering (e.g. wedding, parties)
- any food at a social event or gathering (church, coffee-hour, etc.)
- food brought in to school, offices or workplace

If you answered "Yes" to any of these questions, please describe in this comments section. (5000 character limit)

**Restaurant Types** (if you answered "Yes" to the sit-down restaurants question above)

Yes No Unk

Yes No Unk

*See test URL for complete system form and fields (front end, only)*

# Workflow FDOMS

South Dakota Confidential Morbidity Report Form - Microsoft Internet Explorer provided by State of South Dakota

## PH93Morbidity

## Food History Questionnaire

### Test

#### Actions

- [Morbidity Form List](#)
- [Outbreak List](#)
- [Influenza List](#)
- [Disease Admin](#)
- [Facility Admin](#)
- [Disease Report Export](#)
- [Food History List](#)**
- [Food History Export](#)
- [Case Status Admin](#)
- [Food History Events](#)

#### Administration

- [About](#)
- [Close](#)

Date	CaseStatus	Event Name	First Name	Last Name	City
1/24/2008	Confirmed	RapidCitySalmonellaOutbreak	Harley	Davidson	Rapid City
1/14/2008	Confirmed	RapidCitySalmonellaOutbreak	MyHero	Nero	Rapid City
1/9/2008	Confirmed	RapidCitySalmonellaOutbreak	Sara	Mason	Rapid City
1/2/2008	Confirmed	RapidCitySalmonellaOutbreak	Frederick	Currey	Rapid City
12/27/2007	Confirmed	RapidCitySalmonellaOutbreak	Steve	Stevens	Rapid City
12/26/2007	Confirmed	RapidCitySalmonellaOutbreak	Amy	Henderson	Rapid City
12/21/2007	Confirmed	RapidCitySalmonellaOutbreak	Nick	Jones	Hot Springs
12/21/2007	Confirmed	RapidCitySalmonellaOutbreak	Fred	Flintstone	Rapid City
12/20/2007	Confirmed	RapidCitySalmonellaOutbreak	Rita	Gerlach	Rapid City
12/20/2007	Confirmed	RapidCitySalmonellaOutbreak	Wilma	Flintstone	Rapid City
12/19/2007	Confirmed	IsolatedCase	Marsha	Smith	Rapid City
12/19/2007	Confirmed	IsolatedCase	Barney	Rubble	Rapid City
12/19/2007	Confirmed	RapidCitySalmonellaOutbreak	Betty	Rubble	Summerset

View

Delete

Print

Cancel

*Back end*

# Print Template **FDOMS**

South Dakota Confidential Morbidity Report Form - Microsoft Internet Explorer provided by State of South Dakota

PH93Morbidity

South Dakota Department of Health

Confidential  
Rapid City Salmonella Investigation

Test

Actions

- Morbidity Form List
- Outbreak List
- Influenza List
- Disease Admin
- Facility Admin
- Disease Report Export
- Food History List**
- Food History Export
- Case Status Admin
- Food History Events

Administration

About

Close

Case Status:

Outbreak Name:

Disease Name:

Event Name:

**Contact Information** Section 1 of 5

We need **your help** to determine if any food items you ate may have caused your illness. The information you provide is compared with others who have similar illnesses - to identify possible sources. The way this works best is if you can obtain grocery and restaurant receipts, as well as any checkbook entries or credit card statements (if available) - for the past 10 days before you became ill. Use these and your best recall to tell us about your activities and what you ate in that period. (Note, if you don't know the answer, please just select "unk" for unknown and go to the next item.) **Please be sure to push the "Submit Questionnaire" button on Section 5 when you are finished.**

Event Name: **RapidCitySalmonellaOutbreak**

Outbreak Name: **Salmonellosis\_Pennington\_12-07**

Disease Name: **Salmonellosis (Salmonella spp.)**

Case Status: **Confirmed**

**PERSON ILL**

First Name: **Harley** MI: Last Name: **Davidson**

Home Address: **100 Packer dr.**

City: **Rapid City** State: **SD** Zip: **57701**

Phone: **605-555-0333** County: **Pennington** Gender: **Male**

Date of Birth:

Onset date of your first symptoms: **12/10/2007**

Onset date of vomiting or diarrhea:

Was this lab confirmed? **Yes**

Physician Diagnosis:

Are you: **the person ill**

If you are not the person ill please enter your name: Phone:

**General Risks for Illness** Section 2 of 5  
**(in the last 10 before you got sick)**

Was anyone else in your household (or living arrangement) sick with diarrhea or vomiting?

Did you spend any nights away from home?

Are you on any kind of special or limited diet?

Did you have any contact with dogs, cats, or other pets?

Did you have any contact with commercial animals (hogs, cattle, horses, sheep, goats, etc.)

Did you handle any pets treats like pig ears, rawhide chews - at home or anywhere else?

Did you have contact with any reptiles, such as snakes, iguanas, or other lizards, and turtles?

Did you have any contact with baby chicks or other live poultry?

Do you have any underlying medical conditions such as pregnancy, cancer, or diabetes that you have been told might affect your immune system?

If you answered "Yes" to any of these questions, please describe in this comments section.

*Back end*

# Data Export FDOMS

Back end

South Dakota Confidential Morbidity Report Form - Microsoft Internet Explorer provided by State of South Dakota

**PH93Morbidity** Food History Questionnaire Export

Export All Data

Export Person III & Comments Data

Export Person III & Questions Data

Microsoft Excel - FoodHistory\_All[1].csv

EventName	OutbreakName	DiseaseName	CaseStatus	FirstName	MI	LastName	Address	City	State	Zip	Phone	County	Gender
RapidCitySalmonellaOutbreak	Salmonellosis_Pennington_12-07	Salmonellosis (Salmonella spp.)	Confirmed	Wilma	A	Flintstone	1000 Sioux Ave	Rapid City	SD	57701	605-555-1111	Pennington	Female
RapidCitySalmonellaOutbreak	Salmonellosis_Pennington_12-07	Salmonellosis (Salmonella spp.)	Confirmed	Fred		Flintstone	1001 Sioux Ave	Rapid City	SD	57703	605-555-2222	Pennington	Female
RapidCitySalmonellaOutbreak	Salmonellosis_Pennington_12-07	Salmonellosis (Salmonella spp.)	Confirmed	Betty	B	Rubble	777 Lucky Dr.	Summerset	SD	57718	605-555-3333	Meade	Female
IsolatedCase		Salmonellosis (Salmonella spp.)	Confirmed	Barney	C	Rubble	2250 Omaha	Rapid City	SD	57703	605-555-4444	Pennington	Male
IsolatedCase		Salmonellosis (Salmonella spp.)	Confirmed	Marsha	D	Smith	1500 E. North st.	Rapid City	SD	57703	605-555-5555	Pennington	Female
RapidCitySalmonellaOutbreak	Salmonellosis_Pennington_12-07	Salmonellosis (Salmonella spp.)	Confirmed	Nick		Jones	148 S. Hills dr.	Hot Springs	SD	57747	605-555-6666		
RapidCitySalmonellaOutbreak	Salmonellosis_Pennington_12-07	Salmonellosis (Salmonella spp.)	Confirmed	Frederick	E	Curey	575 Sheridan Lake Rd.	Rapid City	SD	57702	605-555-7777	Pennington	Male
RapidCitySalmonellaOutbreak	Salmonellosis_Pennington_12-07	Salmonellosis (Salmonella spp.)	Confirmed	Amy	F	Henderson	222 E. Monroe	Rapid City	SD	57701	605-555-8888	Pennington	Female
RapidCitySalmonellaOutbreak	Salmonellosis_Pennington_12-07	Salmonellosis (Salmonella spp.)	Confirmed	Steve	G	Stevens	5645 Albertson way	Rapid City	SD	57702	605-555-9999	Pennington	Male
RapidCitySalmonellaOutbreak	Salmonellosis_Pennington_12-07	Salmonellosis (Salmonella spp.)	Confirmed	Sara	H	Mason	15755 Jackson Blvd	Rapid City	SD	57701	605-555-0111	Pennington	Female
RapidCitySalmonellaOutbreak	Salmonellosis_Pennington_12-07	Salmonellosis (Salmonella spp.)	Confirmed	MyHero	I	Nero	300 W. Main st.	Rapid City	SD	57702	605-555-0222	Pennington	Female
RapidCitySalmonellaOutbreak	Salmonellosis_Pennington_12-07	Salmonellosis (Salmonella spp.)	Confirmed	Harley		Davidson	100 Packer dr.	Rapid City	SD	57701	605-555-0333	Pennington	Male
RapidCitySalmonellaOutbreak	Salmonellosis_Pennington_12-07	Salmonellosis (Salmonella spp.)	Confirmed	Rita		Gerlach	552 Alpine st.	Rapid City	SD	57701	605-555-0444	Pennington	Female

Ready NUM

Start | Inbox - Microsoft Outlook | LaunchPad Application M... | South Dakota Confidenti... | https://appstest.sd.gov/... | untitled - Paint | E:\ | Microsoft PowerPoint - [... | Microsoft Excel - Food... | Trusted sites | 11:13 AM

# Sample report

*“I live and sleep with stray pups and dogs. I live with street people who are alcoholics. My trailer has no utilities no plumbing no inside bathroom and no running water. Trailer is run down and unlivable. I cook outside in the open fire.”*

**Salmonellosis case: self-reported history submitted  
online 6-29-2012**

# SDEDSS

- **Create model in SDEDSS for all disease conditions, with FDOMS data import.**
- **Build and expand for routine surveillance and outbreak detection.**
- **Standardize all models to FoodCORE model and share real time data w/CDC**

Picture used by permission



# Summary

- **Patient is given the tools and control (FDOMS and SDEDSS patient portal)**
- **Patient is the primary advocate for Public Health**
- **Public Health takes the back seat. We become data and information managers, not hunter gatherers. Data shared near real-time...EpiNet??**