

ESSENCE, NEW AND IMPROVED

**Force Health Protection Conference
9 August 2006**

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Director, Force Health Readiness

Deployment Health Support Directorate

Office of the Assistant Secretary of Defense

(Health Affairs) Force Health Protection and Readiness



What is ESSENCE?

Electronic
Surveillance
System for the
Early
Notification of
Community-based
Epidemics

Web-based medical surveillance system developed to alert public health authorities of a possible biological warfare attack or other infectious disease outbreaks



Existing ESSENCE CONOPS

- Automated ingestion, analysis, and reporting of health events
- Temporal/spatial analyses of outpatient health events
 - All MTFs, by DMIS (Defense Medical Information System)
 - Maps ICD-9-CM & CPT codes into broad categories (syndrome)
 - Doesn't wait for final laboratory results or other confirmation
- Automatic alerts generated daily, system-wide data updated every 8 hours and available for ad hoc queries
- Use dedicated or pre-existing data sources (multi-purpose roles)
- Show actionable data for further investigation/validation



Current Data Sources for ESSENCE-IV

- Ambulatory data
 - Outpatient visits to military treatment facilities
 - Both garrison and in-theater (selected sites)
 - ICD9 and CPT codes
- Pharmacy data
 - Prescriptions ordered for military beneficiaries
 - Respiratory and Gastrointestinal syndromes only
- Local civilian hospitals (9 sites only)
 - Emergency room chief complaints



Broad Syndrome Groups

- Neurologic
- Botulism-like
- Shock / Coma
- Rash
- Gastrointestinal
- Respiratory
- Influenza-like illness
- Fever
- Febrile disease
- Hemorrhagic illness



DoD, 21st Century The New ESSENCE



GLOBAL INFORMATION
for **QUALITY CARE**



Computable Data = Power

- Bioterror surveillance
- Disease management
- Population health improvement
- Symptom surveillance



Desired Benefits/Outcomes

- Reduce illness rates as well as prevalence and severity of preventable conditions
- Detect and map global disease outbreaks
- Assess public health risks
- Assess deployment health and environmental and occupational health hazards
- Evaluate and plan systems based on population health rather than historical workload data



New Capabilities

- Improved outbreak detection
 - Refined analytical engine
 - Adapts to data flow interruptions, maintains sensitivity with fewer false positive alerts after data flow resumes
 - Adjusts for low-level “spikes” of uncommon events
- Role-based access to patient identifying info for local authorized public health staff
- Automated alerts via e-mail, pagers, phone



[[TriCare Regions](#) | [USACHPPM Regions](#) | [NEPMU Regions](#) | [AF-MAJCOM](#)]



System Defined Site Selection:	<input type="text" value="Select site"/>	User Defined Site Selection:	<input type="text" value="Select site"/>
User Defined Site Selection Editor - Used to Add/Edit/Delete User Defined Sites			

[[SADR Temporal Alerts](#) | [SADR Spatial Alerts](#) | [Pharmacy Temporal Alerts](#)]

Alert Date ASC DES

ASC DES

ASC DES

DATASOURCE: SADR REGION: TRICARE-WEST AGE: All

Alert Date	Syndrome	Detection	Visit Count	Expected	MTF	TimeSeries
31/May/2006	Shk_coma	0.021	1	0.143	FT. SHAFTER-TRIPLER AMC	TimeSeries
31/May/2006	Resp	0.022	17	7.181	VANDENBERG AFB-30th MEDICAL GROUP	TimeSeries
31/May/2006	Neuro	0.046	1	0.000	TRAVIS AFB-60th MEDICAL GROUP	TimeSeries
31/May/2006	ILI	0.003	16	6.101	VANDENBERG AFB-30th MEDICAL GROUP	TimeSeries
31/May/2006	Hemr_ill	0.021	1	0.143	OFFUTT AFB-55th MEDICAL GROUP	TimeSeries
31/May/2006	GI	0.015	4	1.179	BUCKLEY AFB-460th MDS-BUCKLEY AFB	TimeSeries
31/May/2006	Fever	0.003	3	0.607	SAN DIEGO-BMC MCRD SAN DIEGO	TimeSeries
31/May/2006	Fever	0.001	3	0.286	MALMSTROM AFB-341st MEDICAL GROUP	TimeSeries
31/May/2006	Feb_dis	0.007	3	0.679	SAN DIEGO-BMC MCRD SAN DIEGO	TimeSeries
31/May/2006	Feb_dis	0.001	3	0.286	MALMSTROM AFB-341st MEDICAL GROUP	TimeSeries
31/May/2006	Bot_like	0.043	1	0.214	FT. CARSON-EVANS ACH	TimeSeries
31/May/2006	Bot_like	0.025	1	0.179	ELMENDORF AFB-3rd MEDICAL GROUP	TimeSeries



Description

Site	TRICARE-WEST
Data Source	SADR
MTF	SAN DIEGO-BMC MCRD SAN DIEGO
Syndrome	Fever
Age Range	All
Clinic Type	all
Start Date	03/Mar/2006
End Date	31/May/2006

Configuration Options

Data Configuration			
Site	TRICARE-WEST	Data Source	SADR
MTF	All MTFs BEALE AFB-9th MEDICAL GROUP BREMERTON-NH BREMERTON	Clinic Type	All Clinic Types ER Other
Syndrome	GI	Age Range	18-25 26-64 65+
Start Date	03/Dec/2005	End Date	2/June/2006
<input type="button" value="Change Configuration"/>			

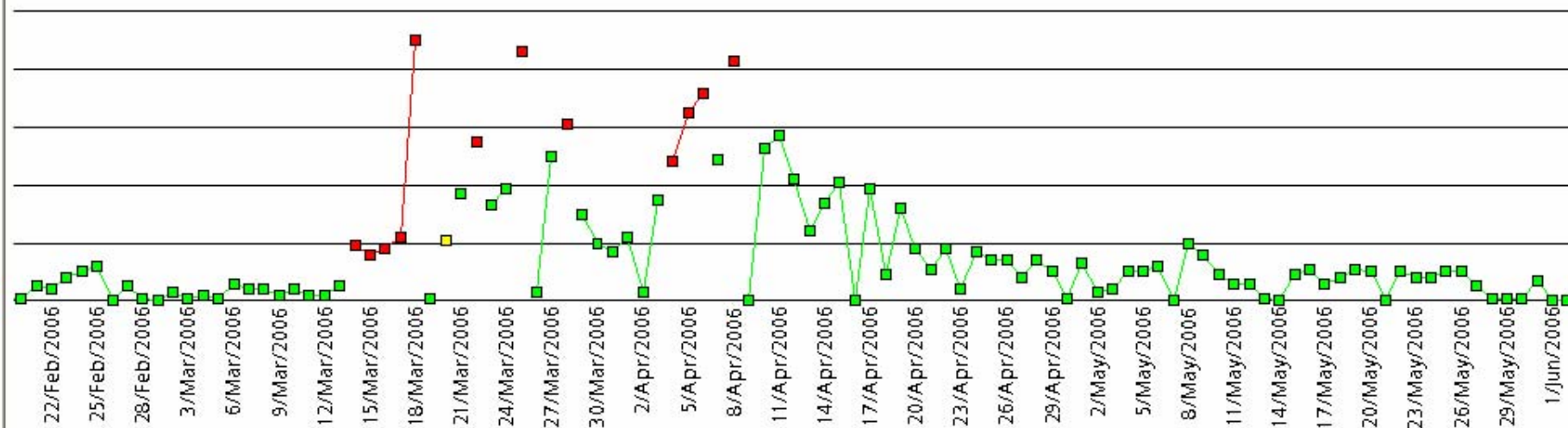


SADR Time Series



Site	TRICARE-WEST	Data Source	SADR
MTF	All MTFs BEALE AFB-9th MEDICAL GROUP BREMERTON-NH BREMERTON	Clinic Type	All Clinic Types ER Other
Syndrome	GI	Age Range	5-17 18-25 26-64
Start Date	03/Dec/2005	End Date	02/Jun/2006
Change Configuration			

SADR Time Series



Encounter Date

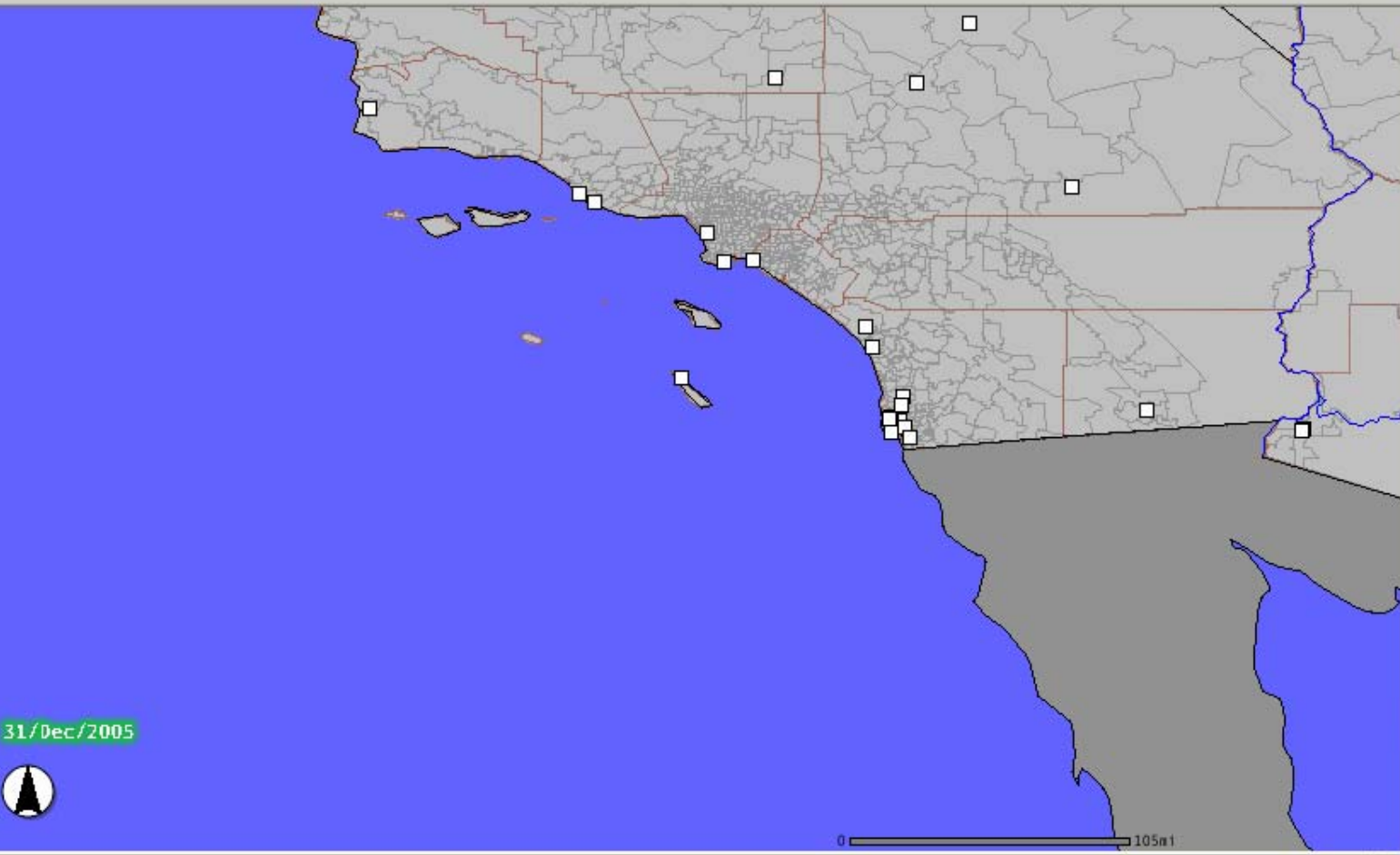
- [Group Chart](#)
- [MTF Chart](#)
- [Incidence Count](#)
- [Data Details](#)

Site	TRICARE-WEST
Data Source	SADR
MTF	SAN DIEGO-BMC MCRD SAN DIEGO
Syndrome	GI
Age Range	18-25
Clinic Type	all
Start Date	03/Dec/2005
End Date	02/Jun/2006

Data Table

[Data Details](#) [MapLink](#)

Date	Actual Visits	14-Day Incidence	Detection	Temporal Data Link	Temporal Map Link
2/Jun/2006	0	0	0.000	Details	MapLink
1/Jun/2006	0	0	0.000	Details	MapLink
31/May/2006	7	5	0.899	Details	MapLink
30/May/2006	1	1	0.972	Details	MapLink
29/May/2006	1	1	0.951	Details	MapLink
28/May/2006	1	0	0.919	Details	MapLink
27/May/2006	5	1	0.705	Details	MapLink
26/May/2006	10	3	0.364	Details	MapLink
25/May/2006	10	2	0.468	Details	MapLink
24/May/2006	8	3	0.619	Details	MapLink
23/May/2006	8	3	0.661	Details	MapLink
22/May/2006	10	4	0.716	Details	MapLink
21/May/2006	0	0	0.000	Details	MapLink
20/May/2006	10	4	0.520	Details	MapLink
19/May/2006	11	6	0.652	Details	MapLink
18/May/2006	8	4	0.768	Details	MapLink
17/May/2006	6	5	0.810	Details	MapLink



LAYERS

- All Layers
- Base Layers
 - [Visible][Label]Active[Name] Cities
 - [Visible][Label]Active[Name] Counties
 - [Visible][Label]Active[Name] Countries
 - [Visible][Label]Active[Name] MTFs
 - [Visible][Label]Active[Name] Rivers
 - [Visible][Label]Active[Name] States
 - [Visible][Label]Active[Name] States:OutLi
 - [Visible][Label]Active[Name] Zips
- Results
 - [Visible][Label]Active[Name] Results

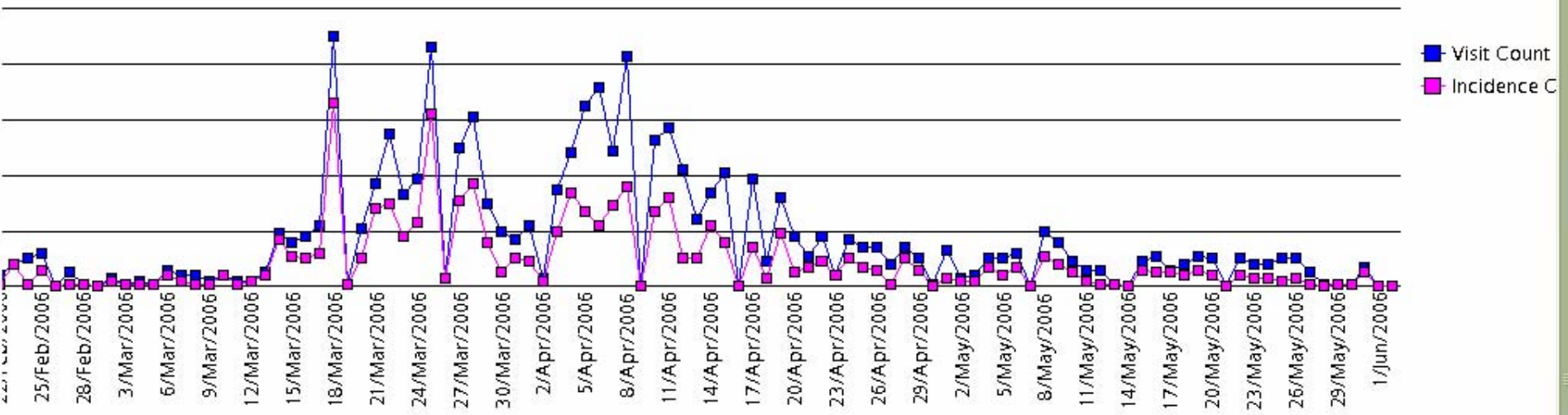
Reset Map

Layer Name	Results	Data Column Name	Value
Site	TRICARE-WEST	Data Source	SADR
Medical Grouping	GI	Age	18-25
ClinicType	All	StartDate	31/Dec/2005

Legend

- MTFs
- Rivers
- States:OutLine
- Counties
- Zips
- States
- Countries

Incidence & Visit Count Chart



Encounter Date

Site	TRICARE-WEST	Data Source	SADR
Start Date	03/Dec/2005	End Date	02/Jun/2006
MTF	All MTFs BEALE AFB-9th MEDICAL GROUP BREMERTON-NH BREMERTON	Clinic Type	All Clinic Types ER Other
Syndrome	GI	Age Range	5-17 18-25 26-64
Change Configuration			

24/Dec/2005	0407572B77	20	20	008.69	OTHER VIRAL INTES INFEC	GI	BHAR	ARANDAA	Primary Care	SAN DIEGO- BMC MCRD SAN DIEGO	2,500
24/Dec/2005	040756B027	20	20	008.69	OTHER VIRAL INTES INFEC	GI	BHAR	ARANDAA	Primary Care	SAN DIEGO- BMC MCRD SAN DIEGO	2,501
24/Mar/2006	0715104394	20	20	008.69	OTHER VIRAL INTES INFEC	GI	BHAR	ARANDAA	Primary Care	SAN DIEGO- BMC MCRD SAN DIEGO	2,502
24/Dec/2005	03B1810EC7	20	20	008.69	OTHER VIRAL INTES INFEC	GI	BHAR	ARANDAA	Primary Care	SAN DIEGO- BMC MCRD SAN DIEGO	2,503
27/Mar/2006	24BCE25EA0	20	20	008.69	OTHER VIRAL INTES INFEC	GI	BHAR	ARANDAA	Primary Care	SAN DIEGO- BMC MCRD SAN DIEGO	2,504
24/Dec/2005	1AAD4A1633	20	20	008.69	OTHER VIRAL INTES INFEC	GI	BHAR	ARANDAA	Primary Care	SAN DIEGO- BMC MCRD SAN DIEGO	2,505
5/Apr/2006	1255287B04	19	20	008.69	OTHER VIRAL INTES INFEC	GI	BHAR	ARANDAA	Primary Care	SAN DIEGO- BMC MCRD SAN DIEGO	2,506

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User Profile

Alert Subscription

Pharmacy Temporal Alerts

Alert Level:
 Yellow and Red
 Red Only

Subscribed Sites

<< Add
Remove >>

Select Site:

NEPMU-2

SADR Temporal Alerts

Alert Level:
 Yellow and Red
 Red Only

Subscribed Sites

<< Add
Remove >>

Select Site:

NEPMU-5

Select MTF:

1 AD DIVARTY CAS (TOE)

vv Add Remove ^^

Subscribed MTFs

SADR Spatial Alerts

Alert Level:
 Yellow and Red
 Red Only

Subscribed Sites

<< Add
Remove >>

Select Site:

USACHPPM-West

Subscribed Zip Codes

<< Add
Remove >>

Enter zip Code:

E-mail Addressable Accounts

Address 1 james.smith@pentagon.mil

E-mail Devices

Computer Cell Phone PDA

Address 2 Computer Cell Phone PDA

On the Horizon

- Revised ILI ICD-9 mapping scheme reduces background noise
- New data source evaluations
 - Laboratory and radiology test orders
 - Chief complaint text parsing
- Add field for local input regarding validity of alarms and findings/status of any investigation
- Explore potential power of MEDCIN structured note analysis
 - Create detailed case definitions using CC, VS, ROS, Physical Exam, test results, etc.



Roles/Responsibilities

- Installation level (most important)
 - Daily monitoring of beneficiary population and other nearby military communities
 - Monitoring of civilian community health, as possible
- Service-specific Public Health Center
 - CHPPM, NEHC, and AFIOH
- Higher HQ, regional and Service
- DoD level (Health Affairs)
- National level (CDC BioSense)



Discussion & Questions

Backup Material



Syndromic Systems Can . . .

- Provide early detection of outbreaks
 - Earlier than most existing electronic systems
- Provide epidemiologic tools to assist the outbreak investigation
- Provide information for leaders and risk communicators
- Decrease workload for labor intensive active systems
- Prompt more accurate diagnostic testing



Syndromic Systems Cannot . . .

- Detect every outbreak early, especially those with
 - Few cases, or
 - Short, explosive incubation period
- Decrease morbidity/mortality every time
 - Best for diseases with longer incubation periods where effective interventions exist
- Tell you the causative agent
 - Lots of nonspecific information will not give you specific information
- Investigate the outbreak for you
 - Public health professionals remain the important link

