



# Leveraging the Cloud for Innovative Solutions

James Killeen, MD

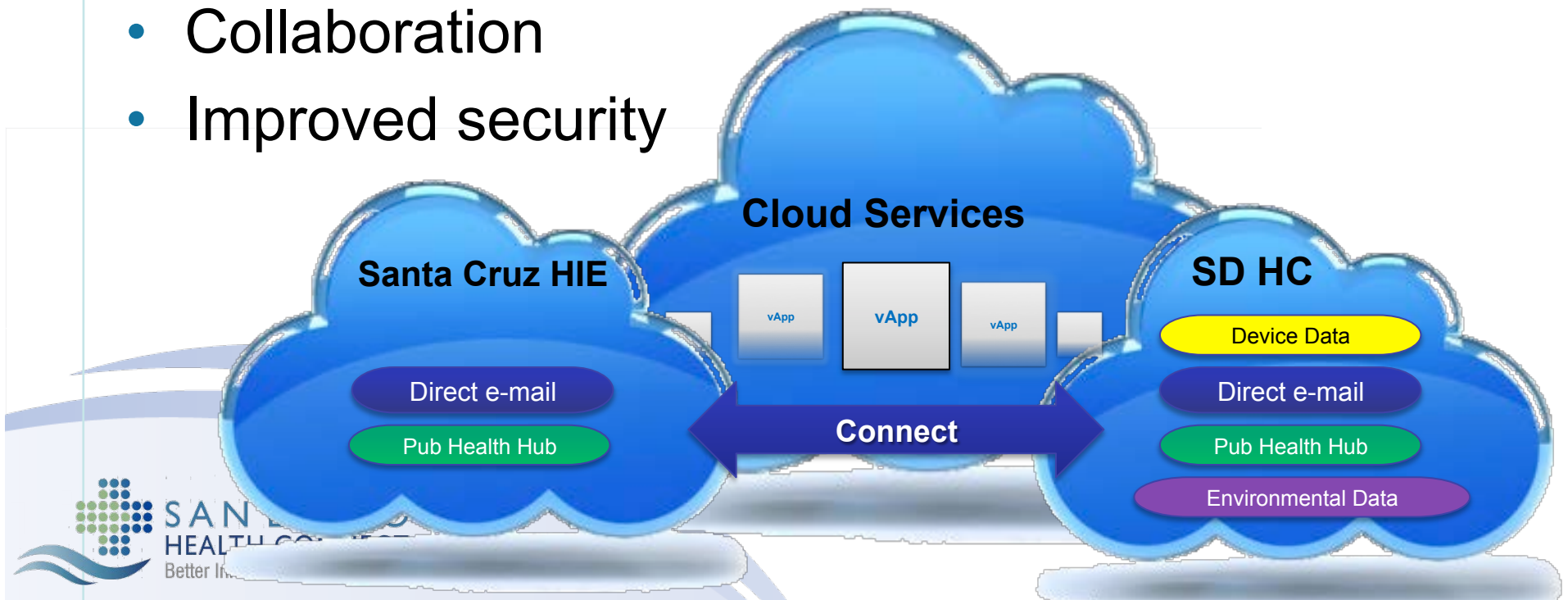
Daniel Chavez Executive Director

Redwood MedNet 2014



# HIE Shared Services

- Unique services or competency
- Focus and execution
- Collaboration
- Improved security
- Cost Savings
  - Economies of scale
- Product Management



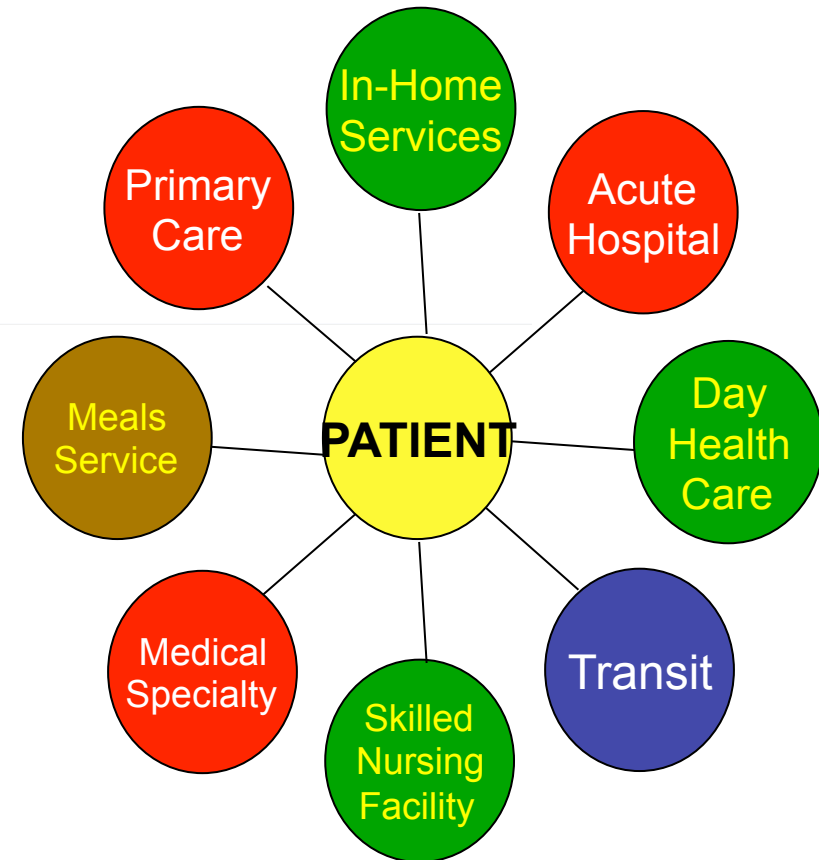
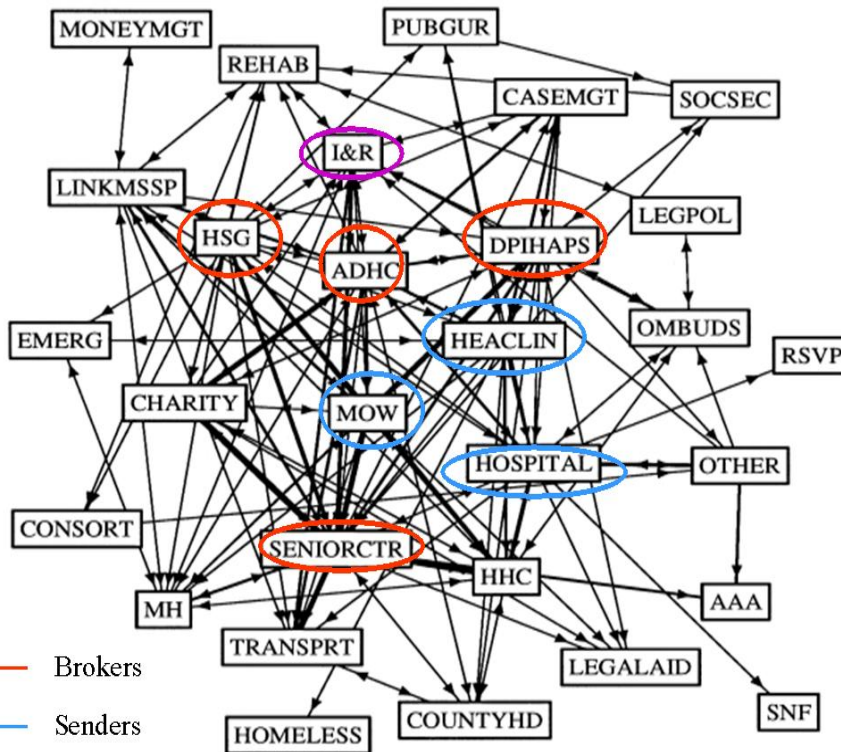


# ACCOUNTABLE CARE COMMUNITY

Here

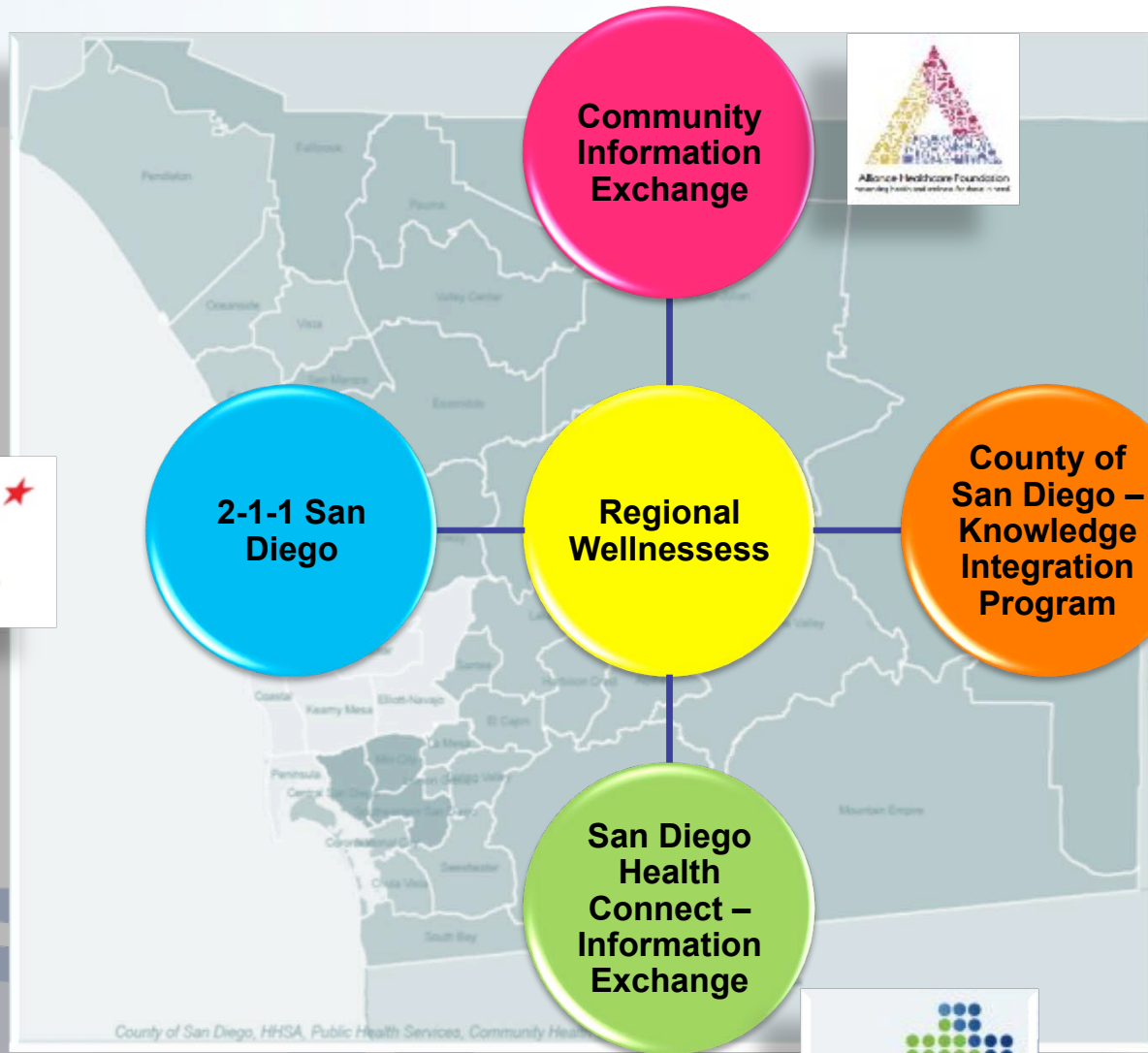
Client Referral Patterns

There



- Brokers
- Senders
- Receivers

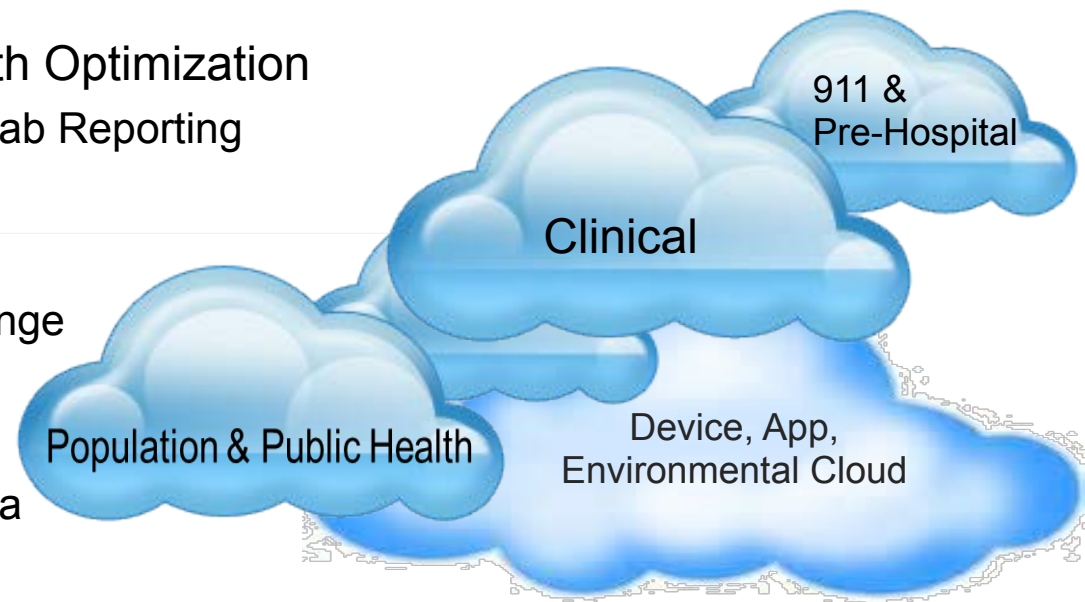
# San Diego Knowledge Exchange



# Services in Operation



- Pre-hospital Cloud
  - Pre-hospital record, ECG, & Images
  - Search capability into the HIE
  - Case Management
  - 911 Analytics
- Population and Public Health Optimization
  - Immunization, Electronic Lab Reporting
  - Syndromic Surveillance
- Clinical Cloud
  - Community Clinical Exchange
  - Health-e-way Exchange
  - Direct Exchange
  - Import Medical Device Data
  - Alert Notifications
- Device-App-Environmental Cloud







# Integrated Clinical Experience

Sccaudit, Six W  
**Sccaudit, Six W** 63 year old, 02/14/1950 HC: 10-CCU Allergies: No Known All... Iso: None Attend Prov: AUGER, W  
 MRN: 1913228-1 Female CCU12 Code: Not on file Infection: None Pref Language: English MYUCSDChart..

- Request Updates
- Patient Summary
- Chart Review
- Synopsis
- Results Review
- Allergies
- History
- Problem List
- Immunizations
- Medications
- Doc Flowsheets
- Intake/Output
- MAR
- Notes
- Order Review
- Order Entry
- Orders (Inf Ctr)
- Admit-Txf-Disch
- Rounding + Con...

Care Everywhere Outside Records

Home Summary Documents Lab Results Other Results

From: UC SAN DIEGO HEALTH SYSTEM - BLD

Information displayed in this activity will not trigger automated decision support such as interaction warnings or alerts.

Patient Demographics | Active Allergies | Medications | Active Problems | Most Recent Encounters | Plan of Care | Surgical Hx | Medical Hx | Social Hx | Results from 05/10/2013 to 08/10/2013 | Document Information

**Epic Clinical Summary - Sccaudit, Six W (63 y.o. female)** As of Aug. 10, 2013

Medications					
Active Prescription	Sig.	Disp.	Refills	Start Date	End Date
acetaminophen (TYLENOL) 325 MG tablet	Take 2 tablets by mouth every 6 hours as needed for Mild Pain (Pain Score 1-3).	30 tablet	2	12/16/2012	12/11/2013
aspirin 81 MG chewable tablet	Take 81 mg by mouth daily.				Suspended
furosemide (LASIX) 40 MG tablet	Take 40 mg by mouth daily.				Suspended
metoprolol succinate (TOPROL XL) 200 MG XL tablet	Take 2 tablets by mouth daily.	30 tablet	2	12/16/2012	
QUetiapine (SEROQUEL) 100 MG tablet	Take 1 tablet by mouth 2 times daily.	60 tablet	0	12/16/2012	
rosuvastatin (CRESTOR) 40 MG tablet	Take 20 mg by mouth nightly.				Suspended
zolpidem (AMBIEN) 10 MG tablet	Take 0.5 tablets by mouth nightly as needed for Insomnia.	30 tablet	2	12/16/2012	
Active Facility Administered Medication					
Active Facility Administered Medication	Ordered Dose	Route	Frequency	Start Date	End Date
acetaminophen (TYLENOL) tablet 650 mg	650MG	PO	Q6H PRN	08/21/2012	
DOPamine (INTROPIN) 400 mg/250 mL infusion (1600 mcg/mL)	0-1500mcg/min	IV	Continuous	06/06/2012	
fentaNYL (SUBLIMAZE) IV bolus from bag 25 mcg	25MCG	IV	Q5 Min PRN	06/27/2013	
fentaNYL 2,500 mcg in sodium chloride 0.9 % 250 mL infusion (10 mcg/mL)	0-200mcg/hr	IV	Continuous	06/27/2013	
heparin (HEP-LOCK) flush injection 250 Units	250Units	IK	Daily	08/07/2013	
heparin (HEP-LOCK) flush injection 250 Units	250Units	IK	As Directed	08/07/2013	
midazolam (VERSED) 50 mg in sodium chloride 0.9 % 50 mL infusion	0-10mg/hr	IV	Continuous	06/27/2013	
midazolam (VERSED) 50 mg in sodium chloride 0.9 % 50 mL infusion	0-10mg/hr	IV	Continuous	05/23/2013	
midazolam (VERSED) IV bolus from bag 4 mg	4MG	IV	Q5 Min PRN	05/23/2013	
midazolam (VERSED) IV bolus from bag 6 mg	6MG	IV	Q5 Min PRN	06/27/2013	
sertraline (ZOLOFT) tablet 50 mg	50MG	PO	Daily	12/16/2012	

**Active Problems**  
 Not on file

**Most Recent Encounters**

Date	Type	Specialty	Providers	Description
04/26/2013	Orders Only	INTERNAL MEDICINE	Martin, Leslie Marie, MD	
04/22/2013	Orders Only	PULMONARY VASCULAR	Auger, William Roger, MD	
11/02/2012	Telephone		Martin, Leslie Marie, MD	

**Plan of Care**  
 Not on file

**Surgical History**

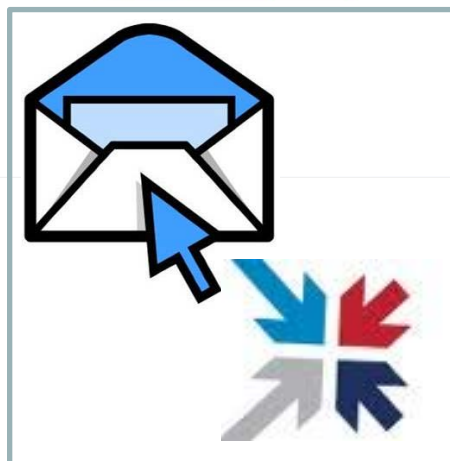
Surgery	Date	Comments
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More Activities

# Direct Secure Mail Services



- Provider to Provider PHI Messaging
- Transitions of Care Messaging
- Referral Messaging
- Event Notification
- Payor Out of Network Notification
- Case Management Notification
- PHR to Provider Messaging
- Environmental Data Reporting



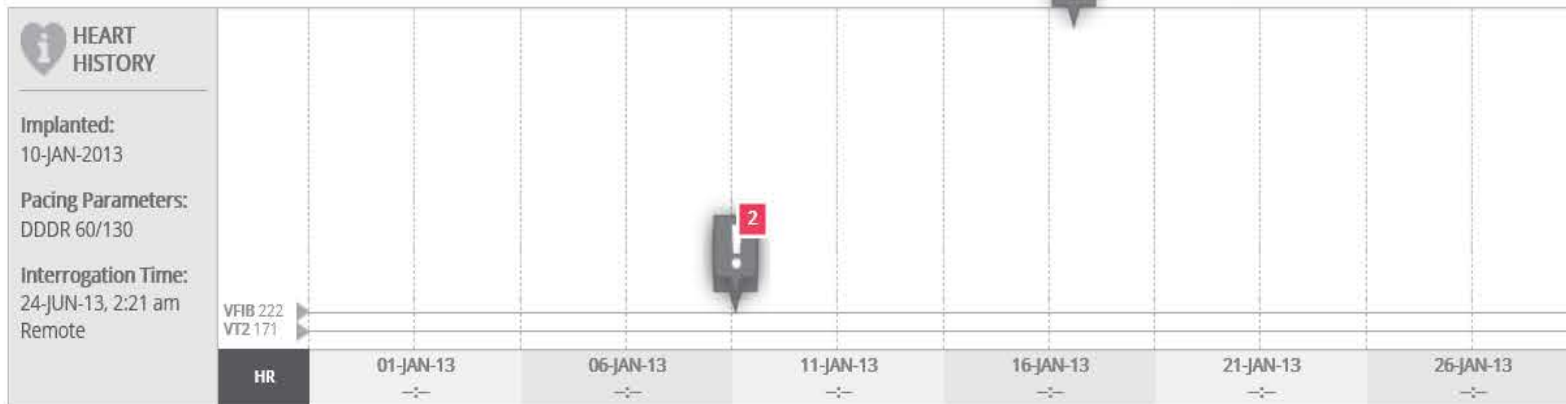
# BIOTRONIK ZZTEST



D.O.B.: 08/11/1962      Interrogated: 24-JUN-13, 02:21 PT  
 MRN:                      Uploaded :  
 Visit #:                  Reason for Interrogation:  
 Location: UCSD

Status:

<b>DEVICE DETAILS</b> ICD 01/10/2013 GilAnthony ... +1619370022...	<b>BATTERY STATUS</b> BOS (Beginni...	<b>LEAD STATUS</b> REVIEW DATA	<b>EPISODE COUNT</b>	<b>VT THERAPIES</b> Turned ON	<b>MAGNET MODE</b> ON Pacing: No effect Tachy: Disabled	<b>MRI SAFETY</b> Not Safe for MRI	<b>CHF WATCH</b> Not Applicable
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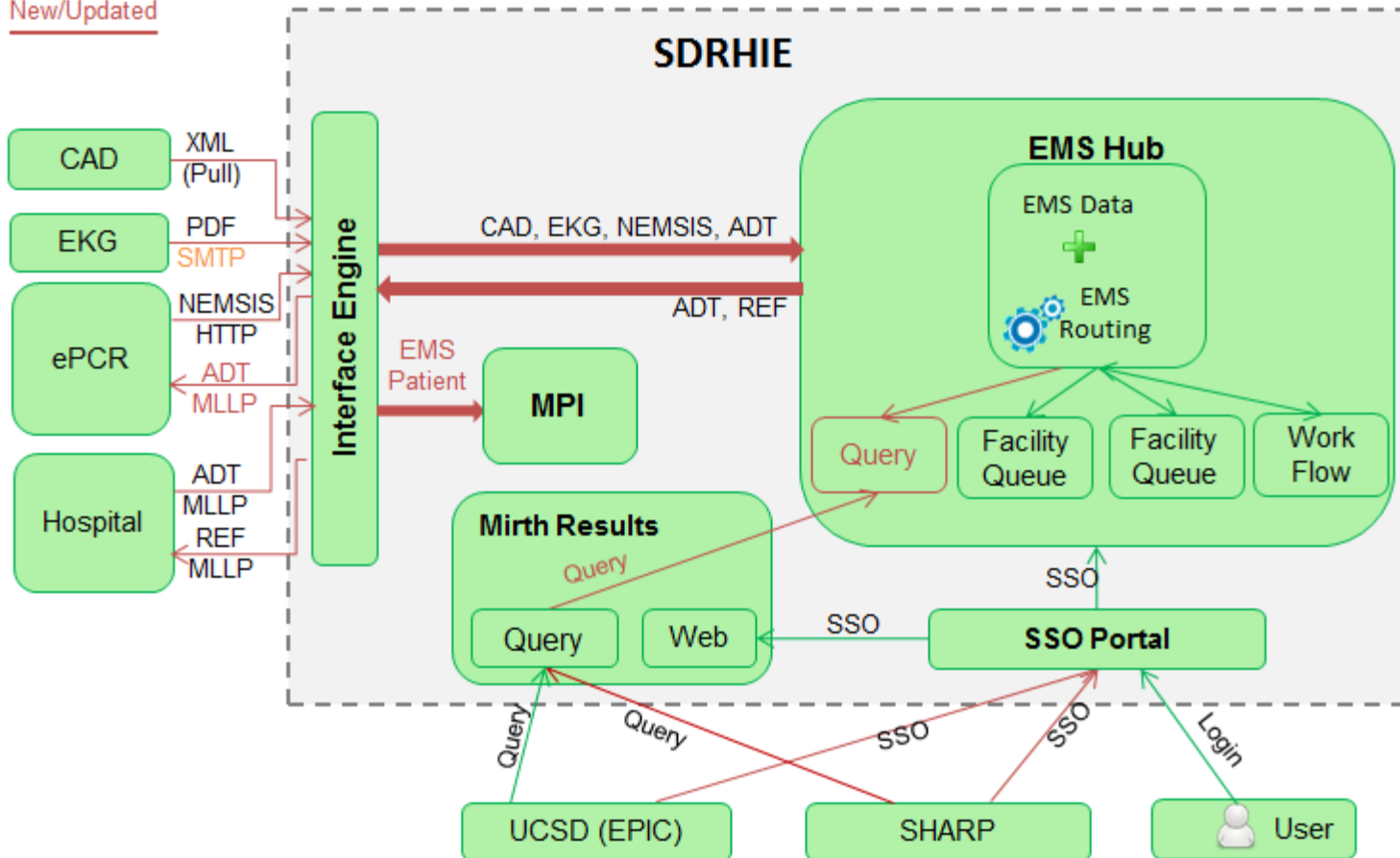
*\*Graph displays the last 4 episodes. Episodes within the last 7 days will be red. Heart History data points may not correlate with the number of events reported in the Episode Counts tab due to limitations with transmissions and/or device settings. If there is a clinical need for specific event details, please refer to the PDF from a point-of-care interrogation.*



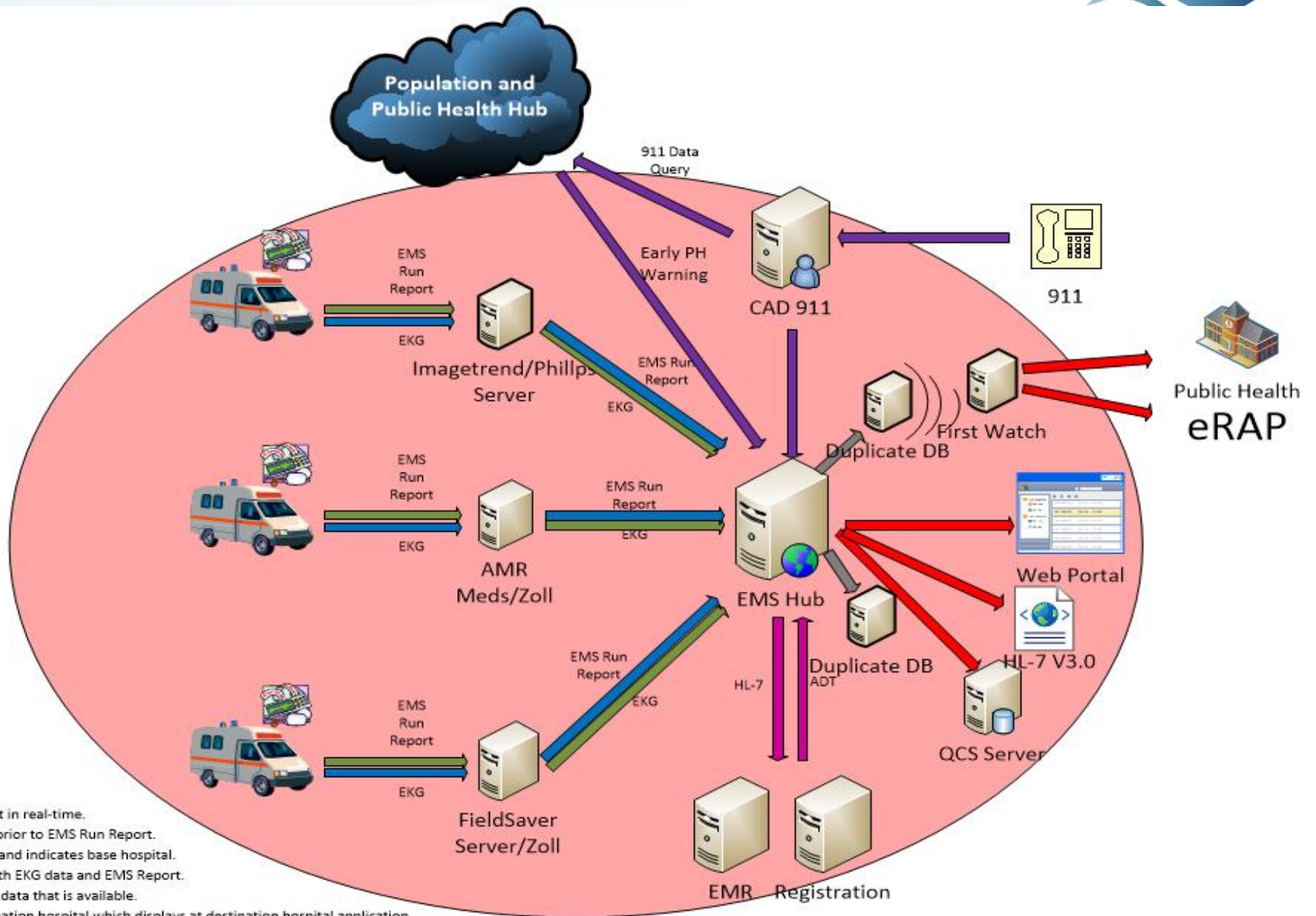
# EMS Hub



New/Updated



# EMS Hub



1. CAD 911 data is sent in real-time.
2. EMS may send EKG prior to EMS Run Report.
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BASE STATION

View Queue UCSD Base Station

NOT ROUTED

RECENT

EKGs

ADMIH

	Left Scene Time	Agency	Unit	Patient Name	Age	Sex	Chief Compl	Problems	Bed/Location
0	CAD Incident ID: FS13126131			Dispatch Time:				Problem:	Disposition:
	11/06/13 04:14	SDMSE	M20	[Redacted]	75		Traumatic Injury	Moderate	Scripps Mercy Hospital San Diego ED
0	CAD Incident ID: FS13126124			Dispatch Time:			CAD Agency:	Problem:	Disposition:
	11/06/13 03:08	SDMSE	M20	[Redacted]	23	F	Abdominal Pain/Problem	Mild	Sharp Memorial Hospital ED
0	CAD Incident ID: FS13126095			Dispatch Time:			CAD Agency:	Problem:	Disposition:
	11/05/13 23:47	SDMSE	M20	[Redacted]		F	Traumatic Injury	Moderate	Scripps Memorial Hospital La Jolla ED
0	CAD Incident ID: FS13126088			Dispatch Time:			CAD Agency:	Problem:	Disposition:
	11/05/13 22:43	SDMSE		[Redacted]	63	M	Traumatic Injury	Mild	Scripps Mercy Hospital San Diego ED
0	CAD Incident ID: FS13126052			Dispatch Time:			CAD Agency:	Problem:	Disposition:
	11/05/13 20:21	SDMSE	M20	[Redacted]	34	M	Traumatic Injury	Mild	UCSD Hillcrest ED
	11/05/13 20:21	SDMSE	M20	[Redacted]	23	F	Traumatic Injury	Mild	UCSD Hillcrest ED
0	CAD Incident ID: FS13126021			Dispatch Time:			CAD Agency:	Problem:	Disposition:
	11/05/13 19:00	SDMSE	M229	[Redacted]	52	F	Allergic Reaction	Mild	Scripps Mercy Hospital Chula Vista ED
0	CAD Incident ID: FS13125989			Dispatch Time:			CAD Agency:	Problem:	Disposition:
	11/05/13 17:44	SDMSE	M20	[Redacted]	72	F	Behavioral/PS Disorder	Mild	UCSD Hillcrest ED
0	CAD Incident ID: FS13125974			Dispatch Time:			CAD Agency:	Problem:	Disposition:
	11/05/13 16:58	SDMSE	M229	[Redacted]	46	M			Scripps Mercy Hospital San Diego ED
0	CAD Incident ID: FS13125943			Dispatch Time:			CAD Agency:	Problem:	Disposition:
	11/05/13 15:23	SDMSE	M20	[Redacted]	51	M	Traumatic Injury	Mild	UCSD Hillcrest ED
0	CAD Incident ID: FS13125932			Dispatch Time:			CAD Agency:	Problem:	Disposition:
	11/05/13 14:55	SDMSE	M229	[Redacted]	53	F	Other	Mild	Scripps Mercy Hospital Chula Vista ED
0	CAD Incident ID: FS13125898			Dispatch Time:			CAD Agency:	Problem:	Disposition:
	11/05/13 13:53	SDMSE	M20	[Redacted]	42	F	Other GU Problems	Mild	Sharp Memorial Hospital ED
0	CAD Incident ID: FS13125839			Dispatch Time:			CAD Agency:	Problem:	Disposition:
	11/05/13 11:43	SDMSE	M20	[Redacted]	60	M	Hypertension	Mild	UCSD Hillcrest ED
0	CAD Incident ID: FS13125892			Dispatch Time:			CAD Agency:	Problem:	Disposition:
	11/05/13 13:21	SDMSE	M229	[Redacted]	38	F	Poisoning/Dr Ingestion	Mild	Sharp Chula Vista Medical Center ED
0	CAD Incident ID: FS13125837			Dispatch Time:			CAD Agency:	Problem:	Disposition:
	11/05/13 11:47	SDMSE	M229	[Redacted]	44	M	Other Illness/Injury	Mild	UCSD Base Station
		SDMSE	M229	[Redacted]	44	M	Other Illness/Injury	Mild	UCSD Base Station
0	CAD Incident ID: FS13125793			Dispatch Time:			CAD Agency:	Problem:	Disposition:
	11/05/13 09:34	SDMSE	M20	[Redacted]	44	M	Other	Mild	UCSD Hillcrest ED

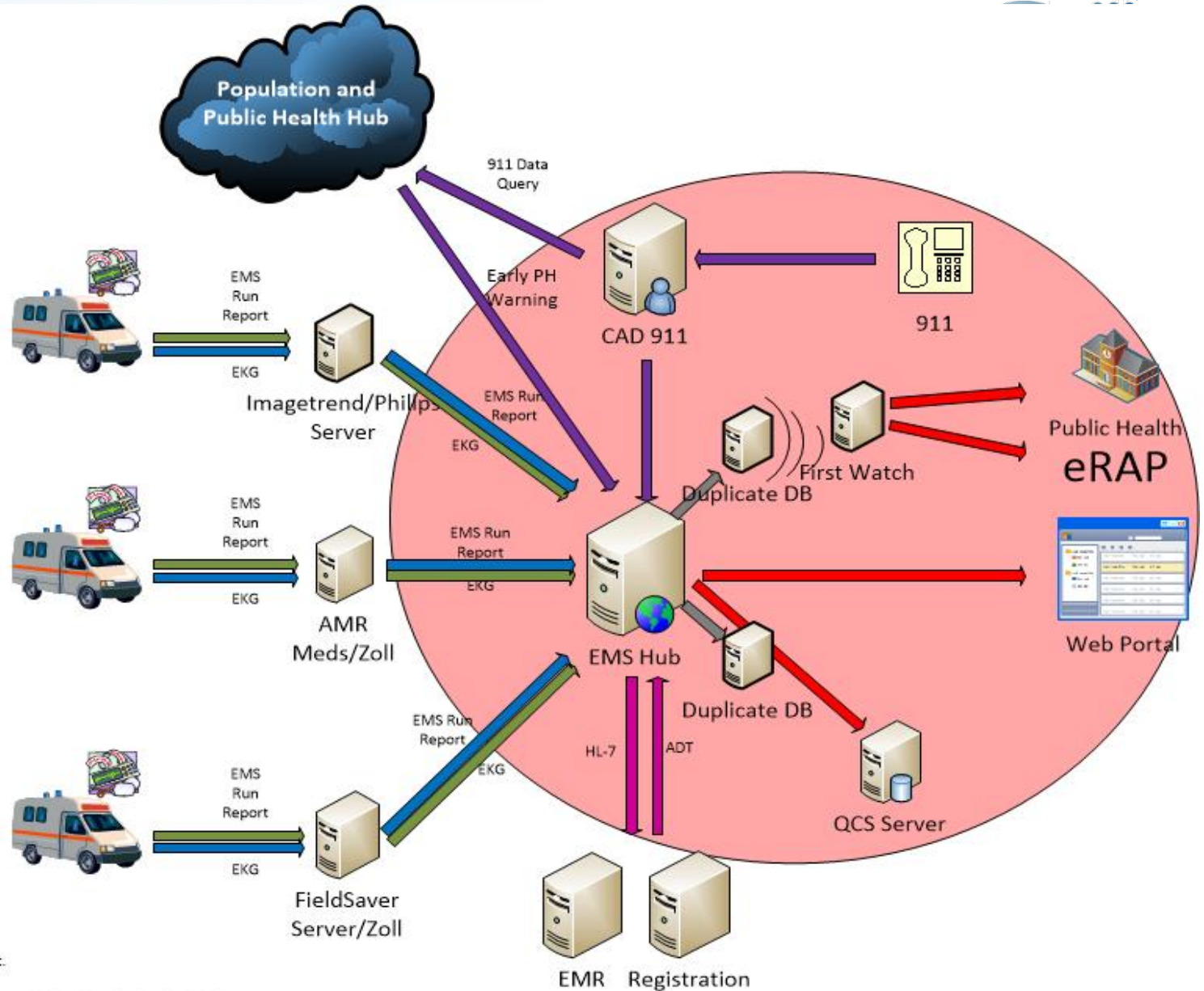
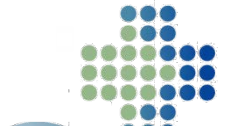
Patient Care Records

CAD Incidents

Destinations



# Street Sense

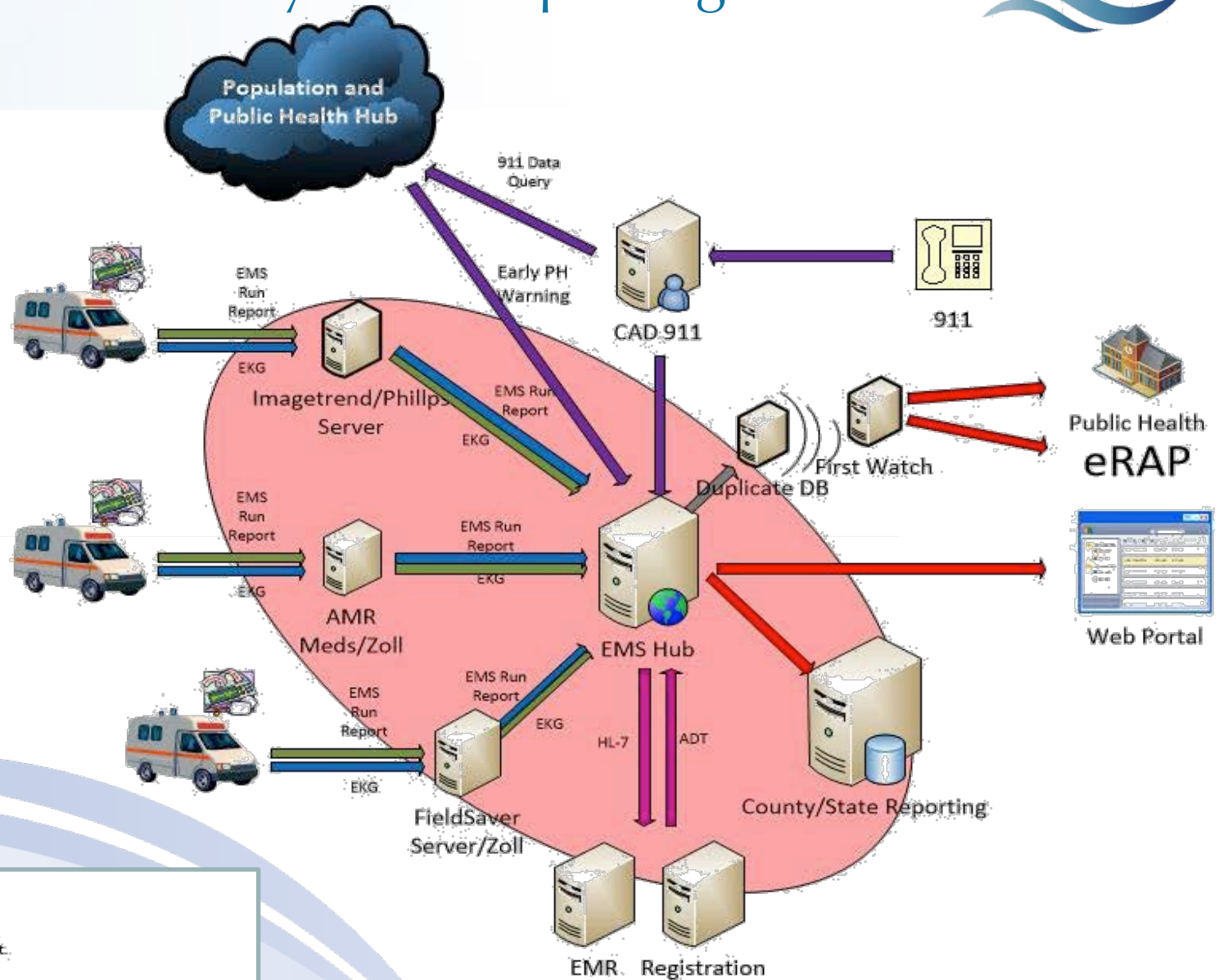


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# EMS Hub as a County/State Reporting Tool



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https://secure.infotechsm.com/HubTestQCS/error\_list.aspx?run=1544387 - Google Chrome

https://secure.infotechsm.com/HubTestQCS/epcr\_report.aspx

# INFUTECH PORTAL

Home  
Messaging  
Analytics  
My Profile  
Admin  
Change Password

## Report Search

**FILTER RESULTS**

Start Date:  End Date:  QCS #:  Agency:

Unit:  Role:  Medic ID:  CAD Incident #:

Base Contacted:  Bypass Issue:  Chief Complaint Status:  Destination Reason:

Primary Provider Impression:  Receiving Hospital:  Run Disposition:  Trauma Type:

Transport Code:  Transmitted:  Error:

**Filter** **Reset**

Run Time	QCS #	Linkage #	Agency	Unit	Role	Medic ID	CAD Incident #	Transmitted	# of Errors	Record Age (hrs:min)	
11/6/2013 12:15:18 PM		506IID0000000320	506 - City of San Diego-ALS	0001	First Responder		FS13880700	No	25	21:06	<a href="#">Email</a>
11/6/2013 1:03:21 AM	4004734	506IID0000000319	506 - City of San Diego-ALS	0001	Calling, First Responder		FS13124870	Yes	0	32:18	<a href="#">Email</a>
11/6/2013 12:39:10 AM		506IID0000000318	506 - City of San Diego-ALS	0001	Calling, First Responder		FS13125231	No	22	32:42	<a href="#">Email</a>
11/6/2013 12:06:54 AM		506IID0000000317	506 - City of San Diego-ALS	0001	Calling, First Responder		2013-113883	Rejected	1	33:15	<a href="#">Email</a>
11/5/2013 11:32:01 PM		506IID0000000316	506 - City of San Diego-ALS		Calling, First Responder		FS13125991	No	4	33:49	<a href="#">Email</a>
11/4/2013 5:05:54 PM		506IID0000000315	506 - City of San Diego-ALS	2031	First Responder		FS13456677	No	23	64:16	<a href="#">Email</a>
11/4/2013 11:18:22 AM	4004733	506IID0000000314	506 - City of San Diego-ALS	0001	Calling, First Responder		FS13125512	No	14	70:03	<a href="#">Email</a>
11/4/2013 11:04:00 AM		506IID0000000313	506 - City of San Diego-ALS	2031	First Responder		FS13125415	No	21	70:17	<a href="#">Email</a>

https://secure.infotechsm.com/HubTestQCS/error\_list.aspx?run=1544387

# INFUTECH PORTAL

**INFORMATION**

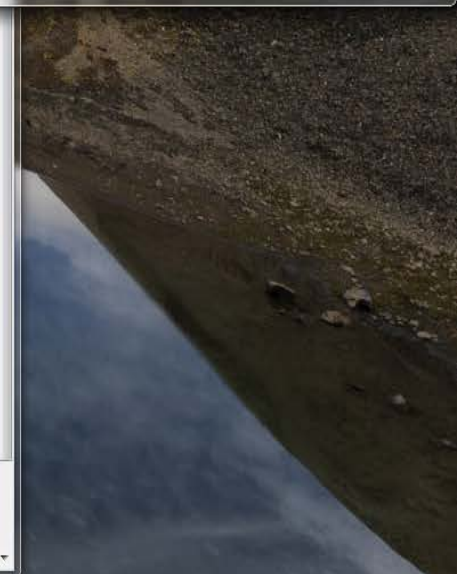
Incident Number: **FS13125991** Unique Incident Number: **506IID0000000316**

QCS Number: Agency: **506 - City of San Diego-ALS**

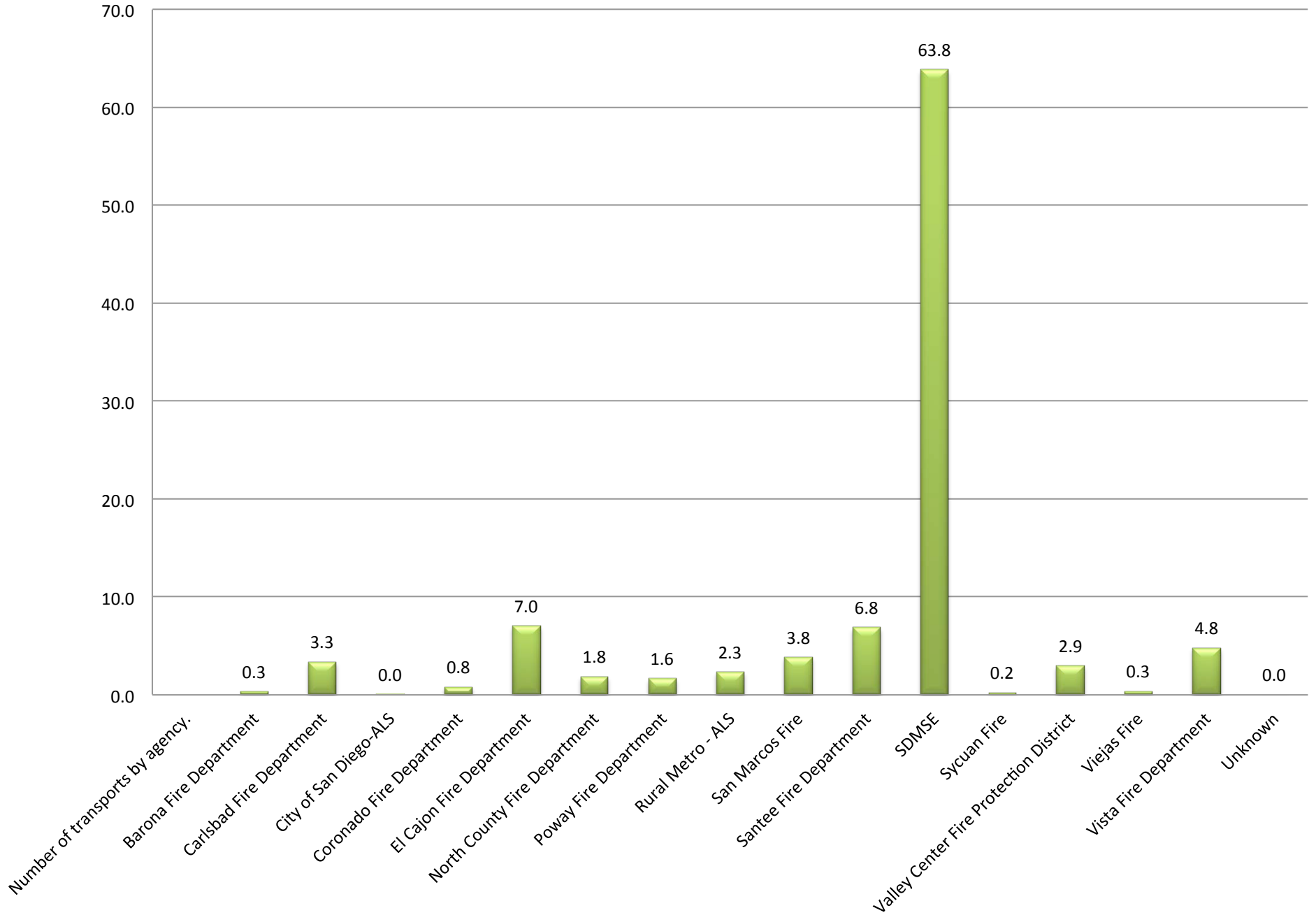
Unit: **0001** Run Time: **11/5/2013 11:32:01 PM**

Last Validation Time: **11/6/2013 12:08:23 AM**

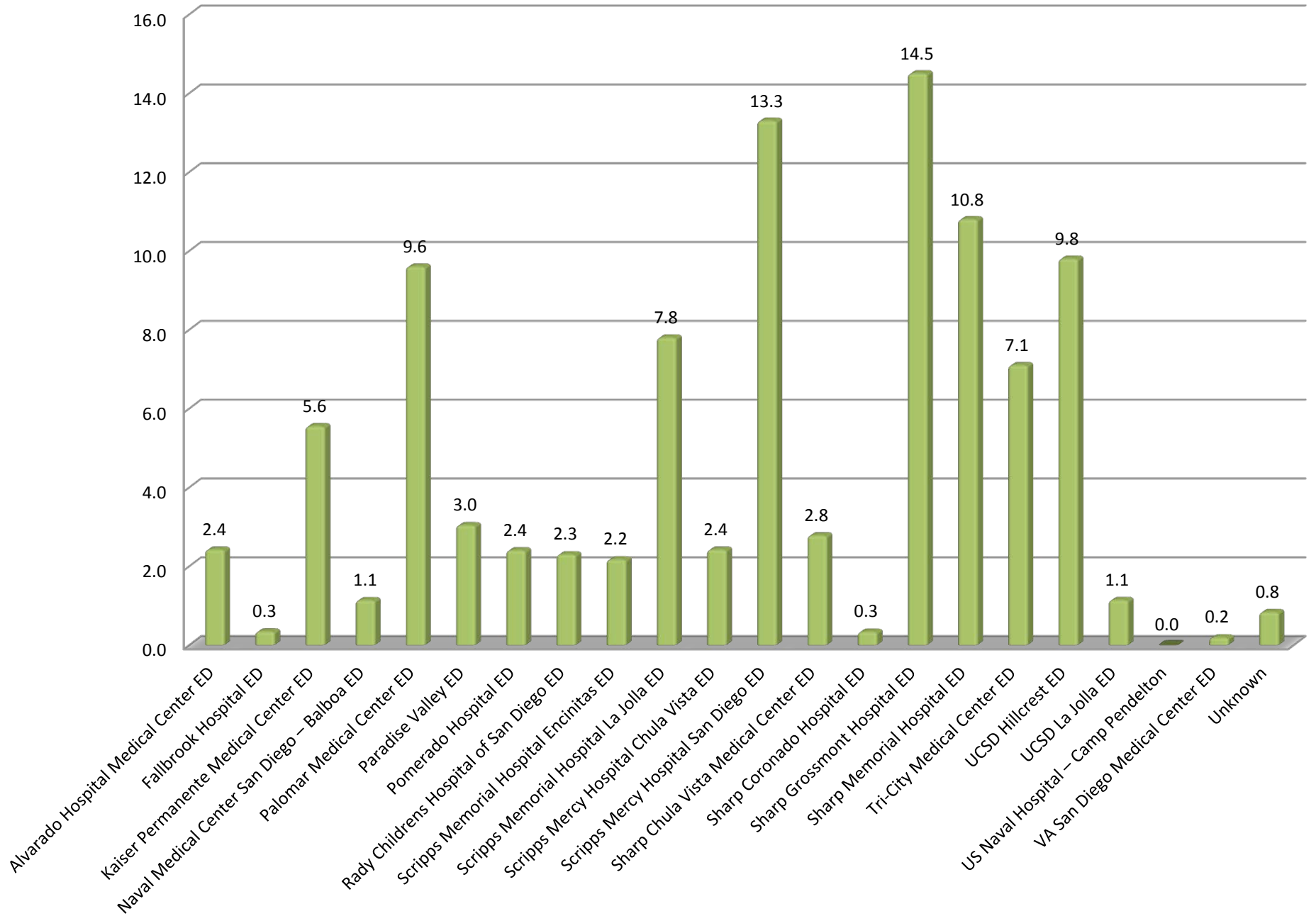
Code	Field	Error Description
	ARRIVEDDESTINATIONDATE	Date arrived at destination is required.
	ARRIVEDDESTINATIONTIME	Time arrived at destination is required.
	DEPARTEDSCENEDATE	Date departed scene is required.
	DEPARTEDSCENETIME	Departed scene time is required.



# Percentage of Transports by Agency

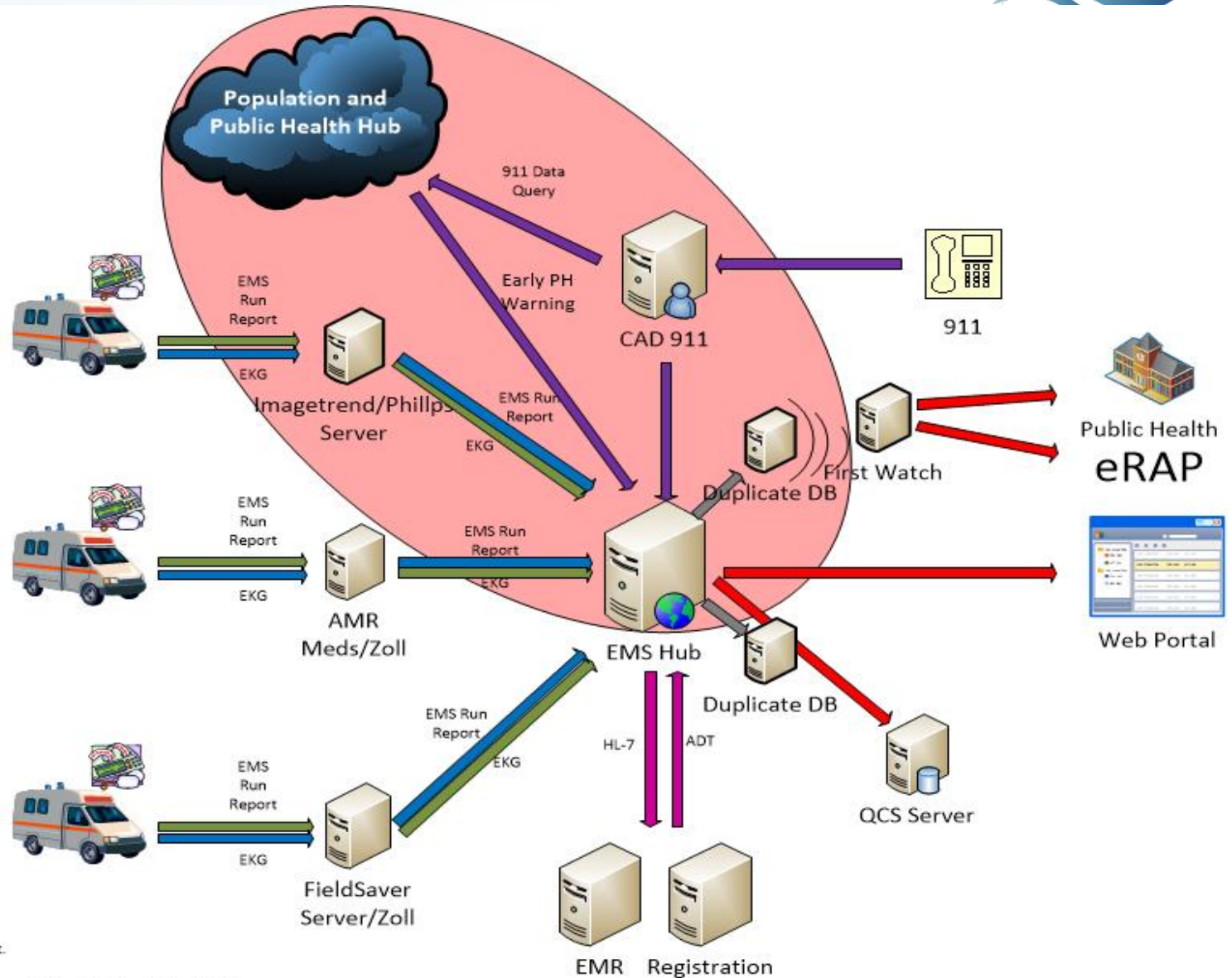


## Percentage of transports by Hospital Destination





# Public Health Alert



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# EMS Pickup Alert



Search Layers

Group Layers

- Group Layers
  - SHP AQI 20140210b
  - VEC Attensity
  - Demos
    - VEC Solano Flu Cases
    - VEC Solano Flu Labs
    - VEC Solano TB ELR
    - VEC Solano TB EMS
    - VEC Solano Vaccination Rates
  - CELL Intelecells
  - VEC Twitter Live

Active Layers

- WMS Bing Imagery
- VEC Solano TB ELR
- VEC Solano TB EMS



# MDRTB Lab Confirmation



Search Layers

Group Layers

- Group Layers
  - SHP AQI 20140210b
  - VEC Attensity
  - Demos
    - VEC Solano Flu Cases
    - VEC Solano Flu Labs
    - VEC Solano TB ELR
    - VEC Solano TB EMS
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  - CELL Intelecels
  - VEC Twitter Live

Active Layers

- WMS Bing Imagery
- VEC Solano TB ELR
- VEC Solano TB EMS

Solano TB ELR	
zipcode:	94533
test:	MDRTB
type:	PCR
agerange:	31-40
result:	Postive
description:	Solano TB ELR
tooltip:	Solano TB ELR
iconurl:	<a href="https://maps.gstatic.com/intl/en_au/mapfiles/ms/micons/red-dot.png">https://maps.gstatic.com/intl/en_au/mapfiles/ms/micons/red-dot.png</a>



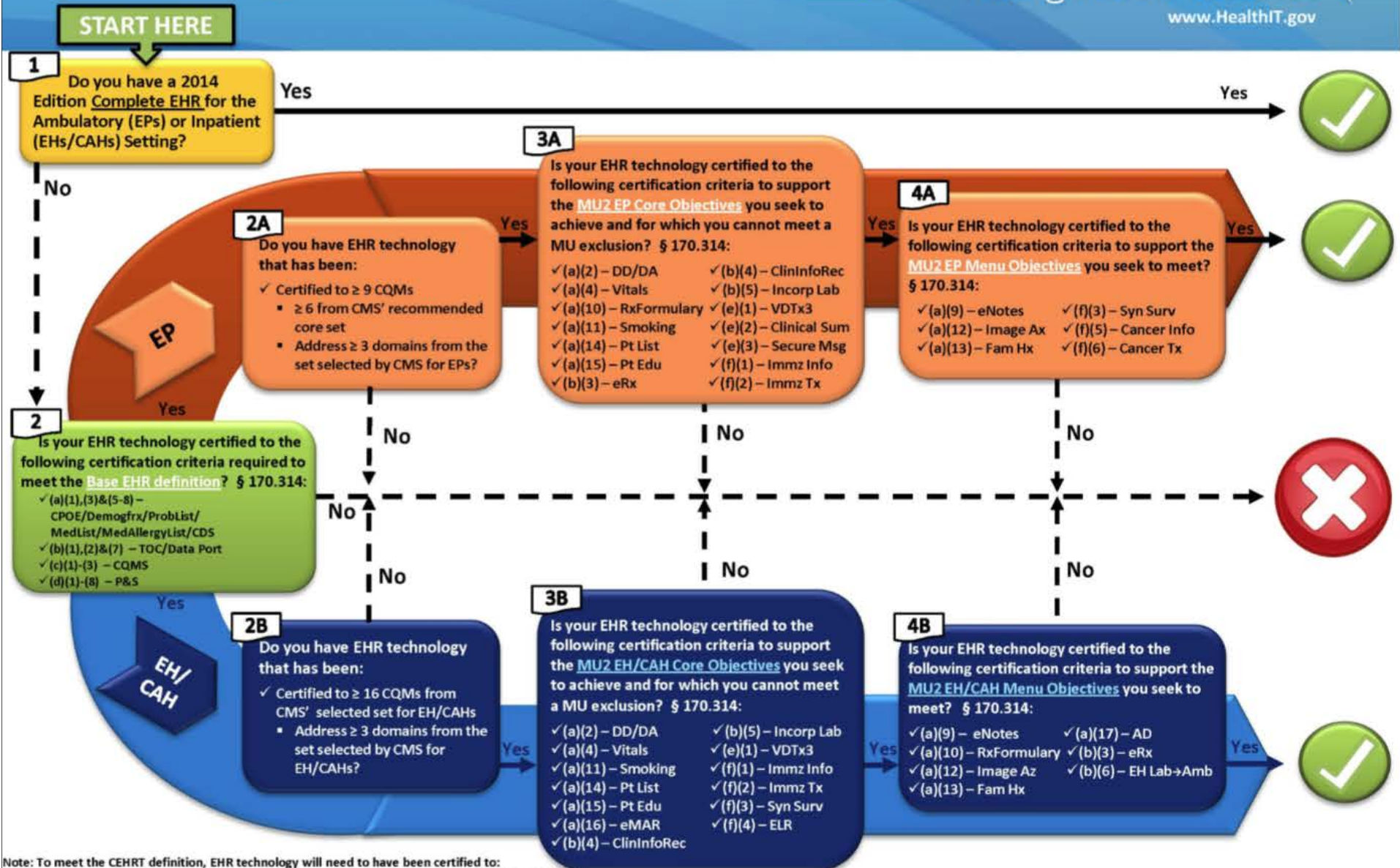
Leveraging Meaningful Use

# **PUBLIC HEALTH HUB & ANALYTICS**



# Do you have EHR Technology that meets the new Certified EHR Technology definition for Meaningful Use Stage 2?

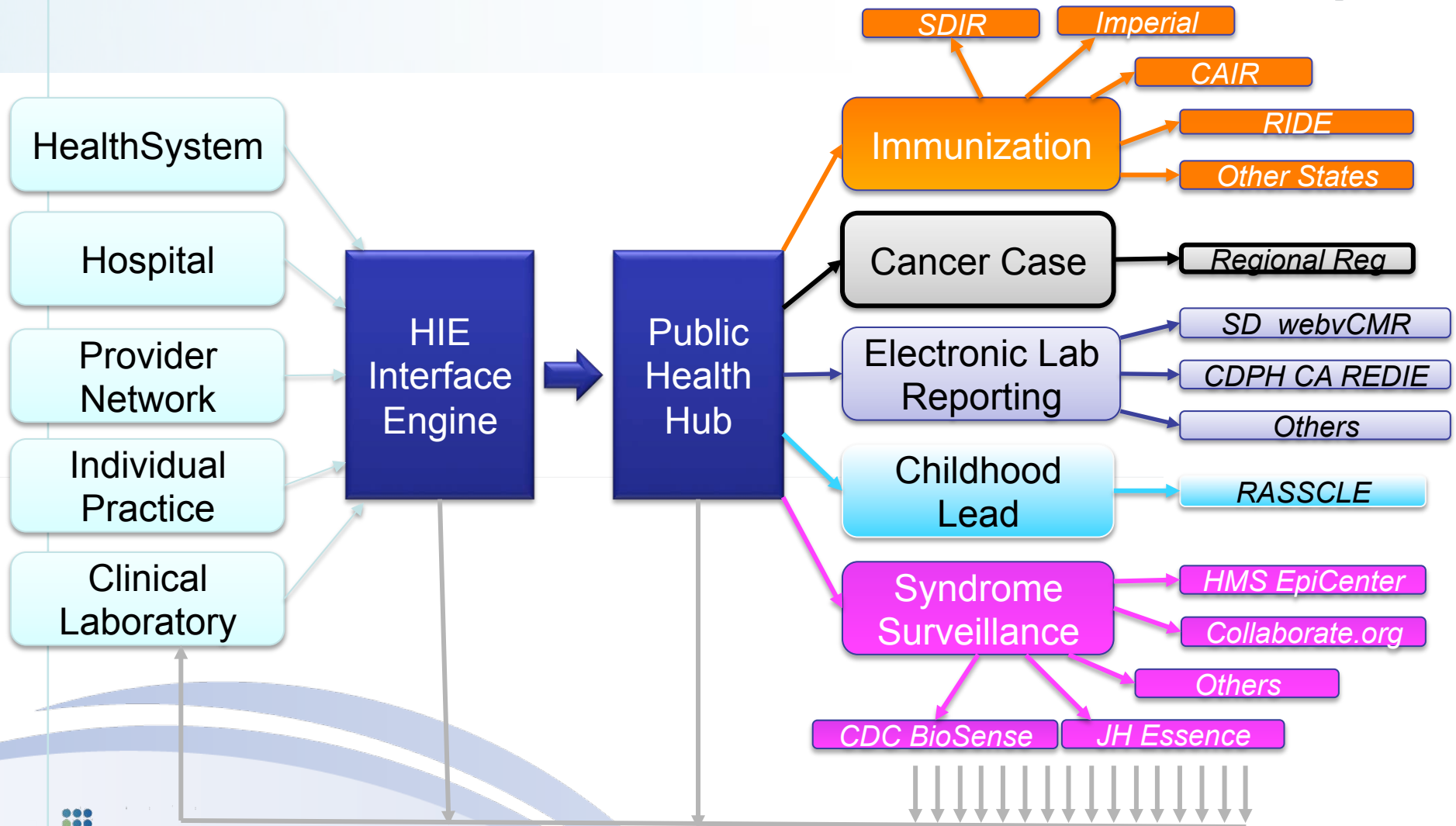
Putting the I in HealthIT   
www.HealthIT.gov



Note: To meet the CEHRT definition, EHR technology will need to have been certified to:

- Automated numerator recording (170.314(g)(1)) or Automated measure calculation (170.314(g)(2));
- Safety-enhanced design (170.314(g)(3)); and
- Quality management system (170.314(g)(4))

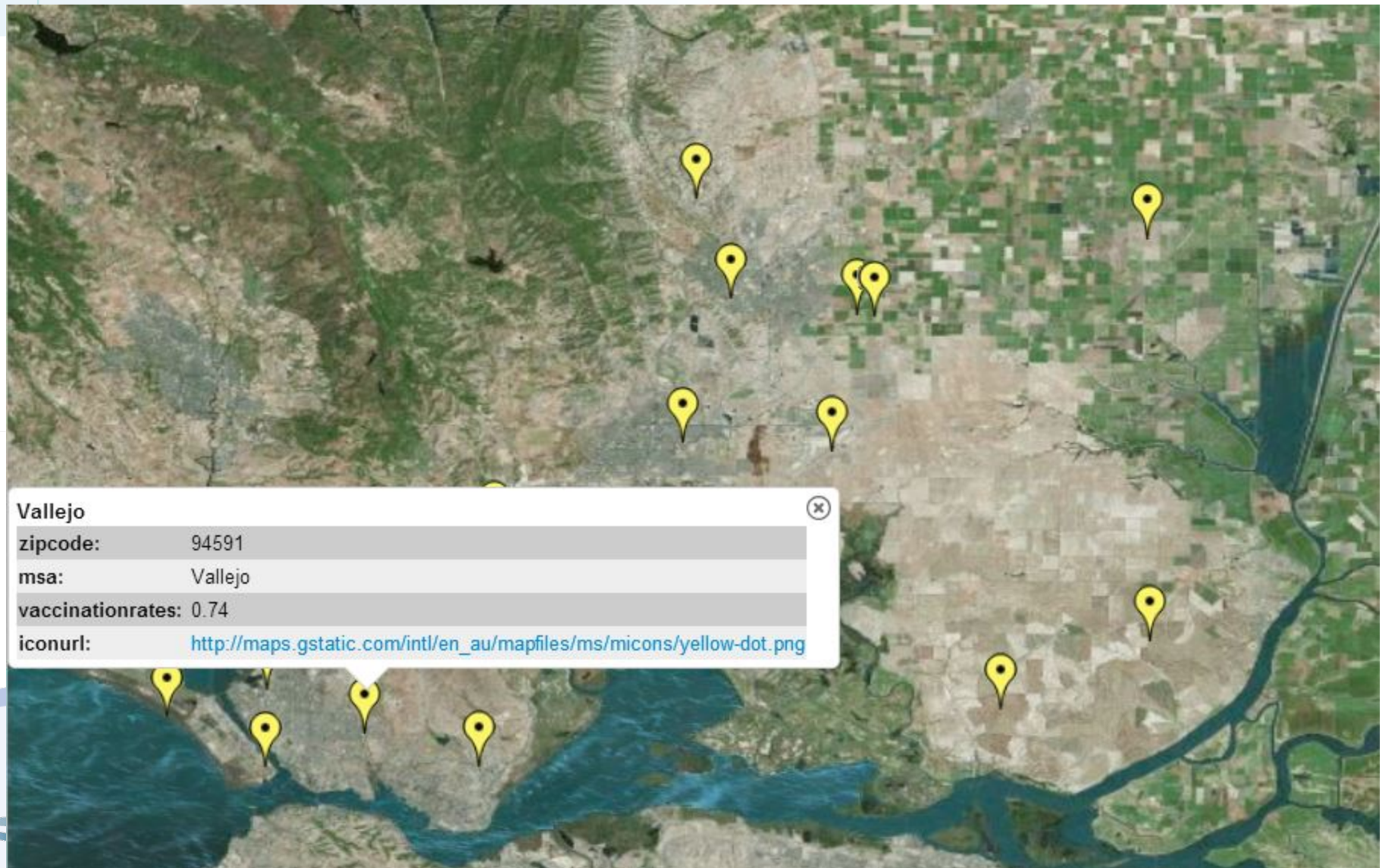
# Public Health Hub



ACKs, Feedback & Data Provenance

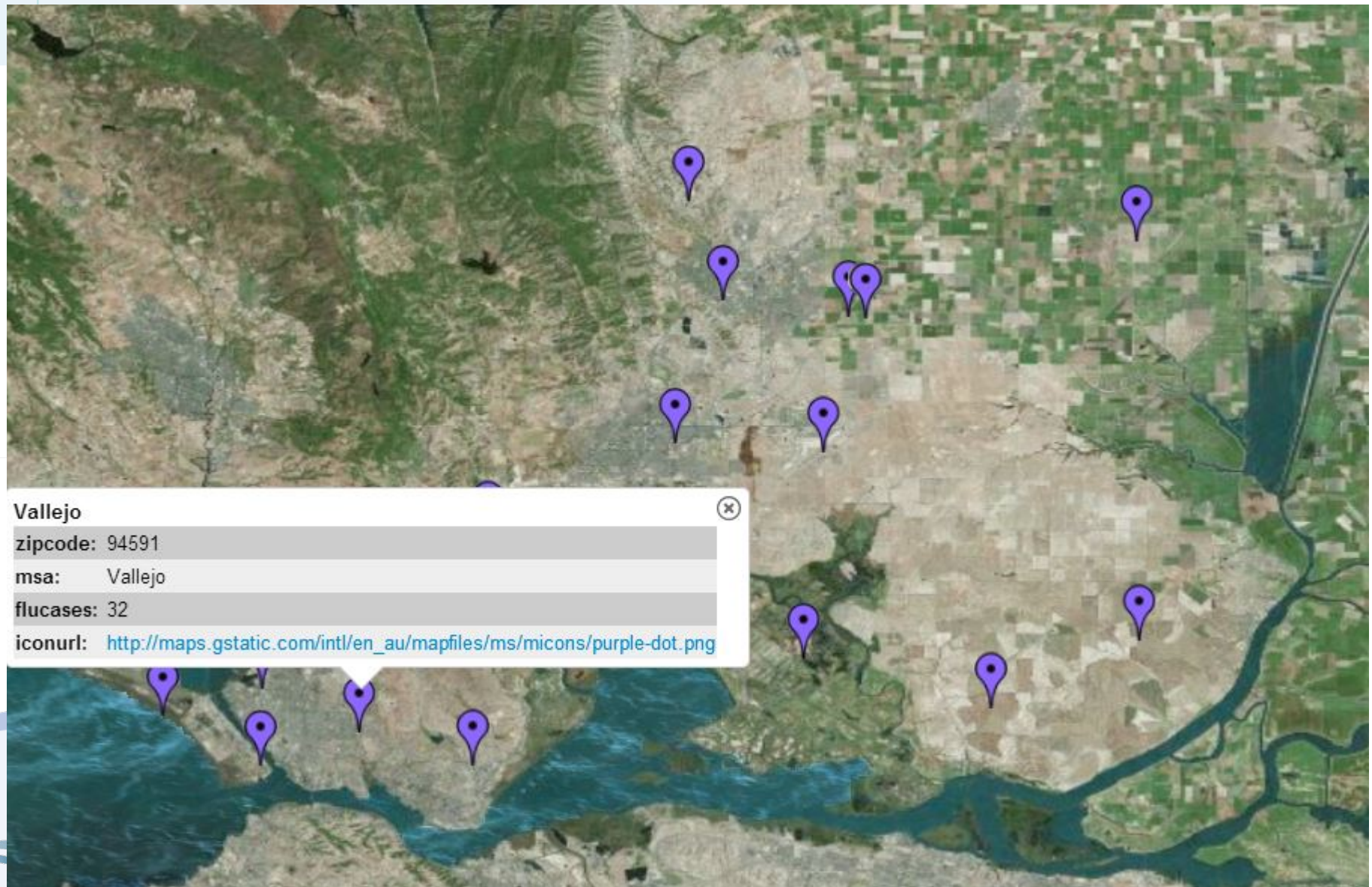


# Influenza Vaccination Rates





# Flu Cases by ZipCode

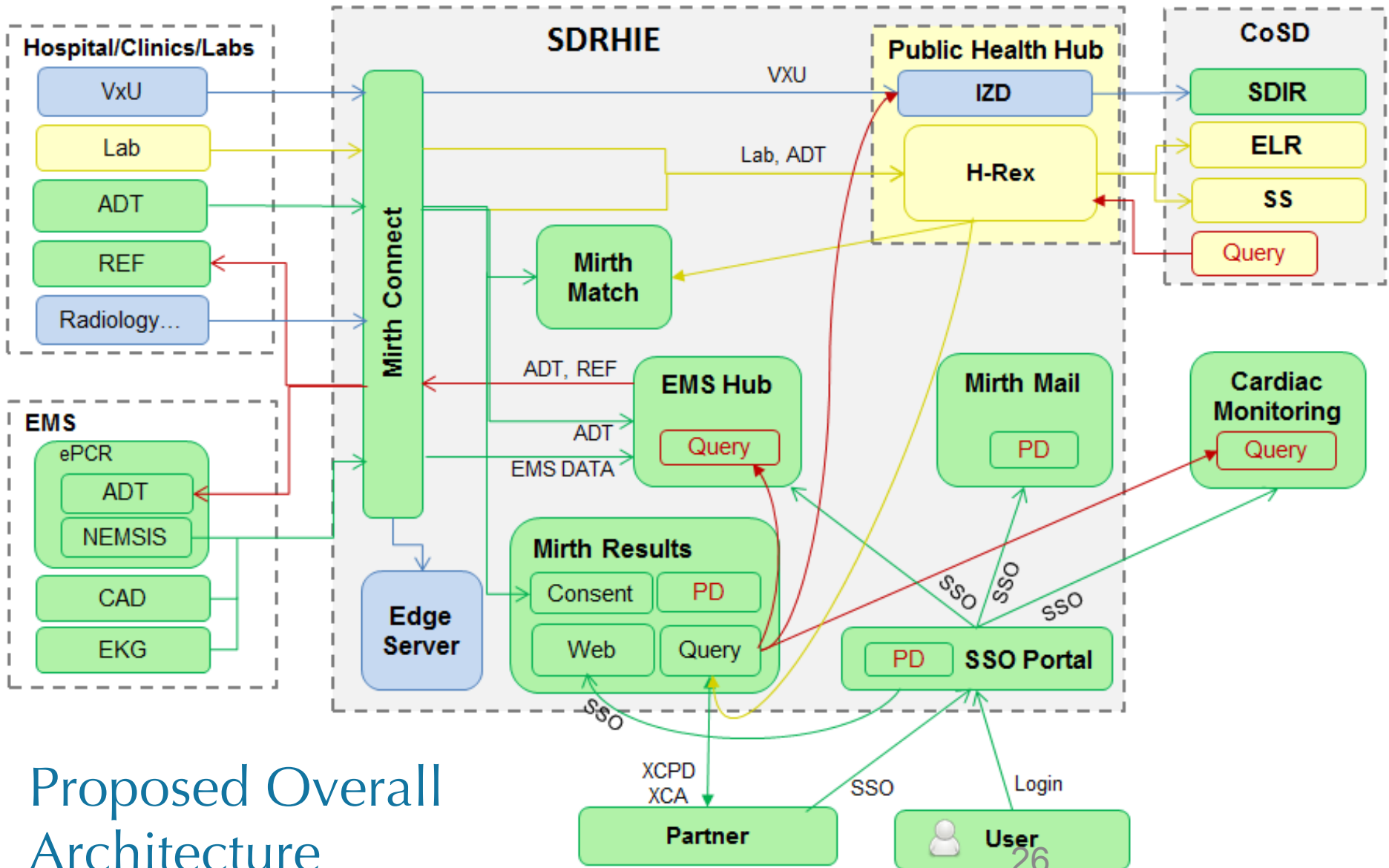




Production    In progress    Planning

PD: Provider Directory

Update  
Work Item



# Proposed Overall Architecture