SDI
INNOVATIONS IN HEALTHCARE ANALYTICS

Timely Estimation of US Influenza Vaccine Administrations using Medical Claims Data

AND

Measuring % coverage using FluSTAR, a primary surveillance system

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Note: This data is collected from electronic medical claims processed by physicians on CMS-1500 forms. It does not represent immunizations given through other channels such as employers, pharmacies, senior centers, etc.

SDI, June 26, 2009

SDI QUICK FACTS

- Private sector data warehouse business in Plymouth Meeting, PA
- 25+ years of experience in disease surveillance programs
- Electronic claims data used to track vaccine administrations
- Also, a primary influenza surveillance network FluSTAR
- Specializes in providing innovative healthcare information solutions
- Recent growth from 200 to 700+ employees by acquiring Verispan
- Longitudinal data LINKED across the ENTIRE experience of the patient

Prescriptions | **Physician Visits** | **Inpatient/ Outpatient Hospital Visits** | **Laboratory Tests** | **Lifestyle Characteristics**

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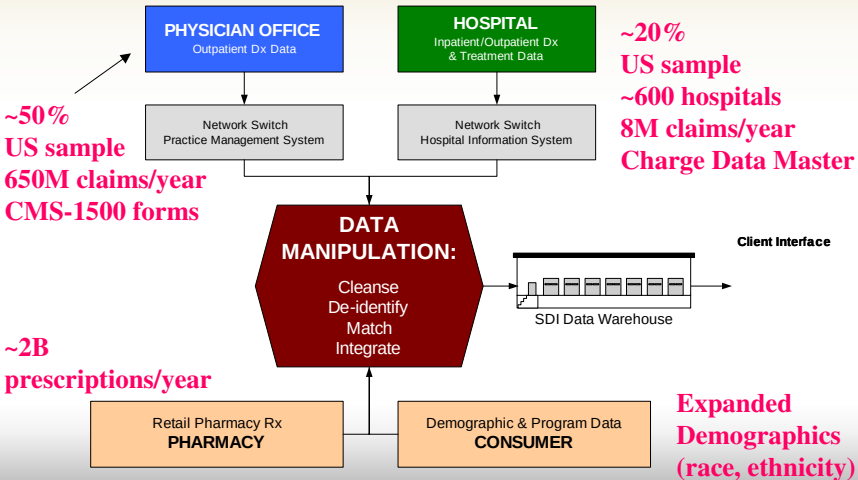
Overview of SDI's medical claims data capabilities



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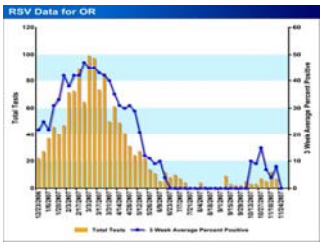
SDI's growing experience working with HHS agencies

- **FDA**
  - CDER – SDI provider of longitudinal patient level data
  - CBER - SDI won Adverse Event (AE) award (2008; 1 of 3 groups)
- **CDC**
  - Enhancement surveillance for RSV, Rotavirus
    - SDI laboratory network data capability
  - Study of Rotateq vaccine program impact on pediatric diarrhea
    - SDI medical claims data to study trends in disease burden and vaccine coverage
- **NIH**
  - NIAID- Influenza genomics project and BHB
  - Influenza virus RNA for whole virus sequencing + matching clinical/demographic data for BioHealthBase, from SDI's primary influenza surveillance system (2005-

Example of ongoing SDI-CDC collaborations:
Augmenting NREVSS virus surveillance data with SDI lab data network

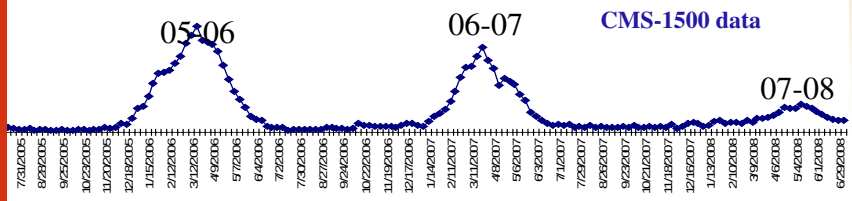


SDI lab data combined with CDC's NREVSS surveillance data

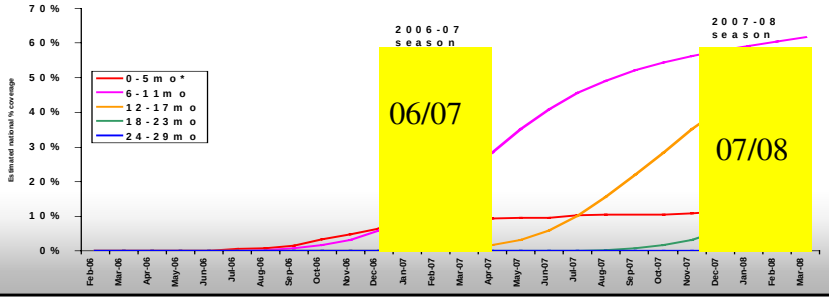
www.cdc.gov/surveillance/nrevss/rsv/

Example of ongoing SDI-CDC study:
Demonstrated profound reduction in Rotavirus burden in 2007-08 after introduction of Rotateq in the US

Physician's office visits for Rotavirus diarrhea (ICD=008.61)



1+ Rotateq vaccine dose coverage (CMS-1500 data)



Claims data used to capture vaccine administrations: CMS-1500 claims: 50% of US physician office visits

Dx Medical/Office/Clinic

1999 - 2009

Sample captures >50% of all US physician's office visits

Based on 300,000 physicians/month

State level data

~650M CMS-1500 claims per year

- Age, gender
- ZIP3/State/Region
- ICD-9 diagnosis
- CPT procedure
- Date of service
- Location of care
- Reported cost of service
- Payers/payer types
- Actual paid cost of service by payer
- Payer, plan, payment

Near-real-time: ~90% claims after 2 weeks currently a 50% US sample

Influenza vaccine CPT codes: 90655-90660

Projections of vaccine utilization to US pop

Includes any vaccine administration for pay (private insurance, medicare/medicaid)

Stratification by age, gender, State, 3-digit zip, type of influenza vaccine and provider type

Can be extended to race/ethnicity

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Version 120308

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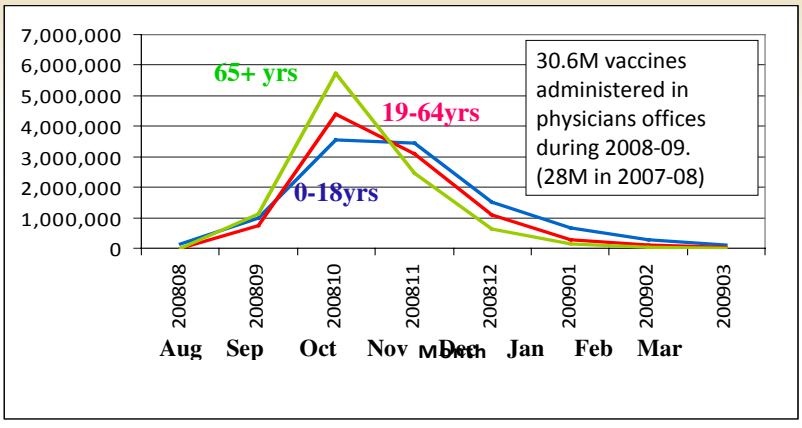
SDI projected US Influenza Vaccine Admin In Physician Offices, 2008/09, by calendar month and age



Total US availability in 2008-09: 115M doses

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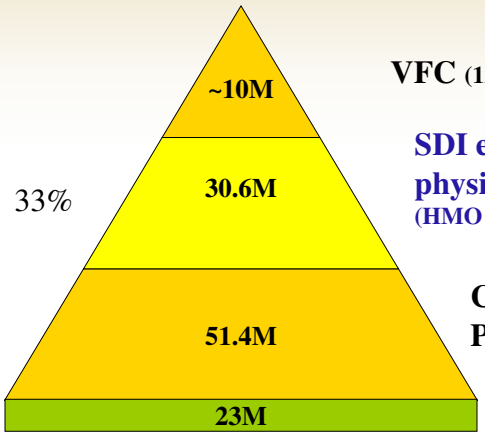
Note: New policies allow VFC dose administration fees to be included in claims data under Medicaid. In order to remove any possible VFC doses, Medicaid volume for children age 18 years and under is not included.

Accounting for Vaccine Doses Administered, 2008-2009
33% of administrations in doctor's offices



33%

VFC (12.5M doses less 20% waste)

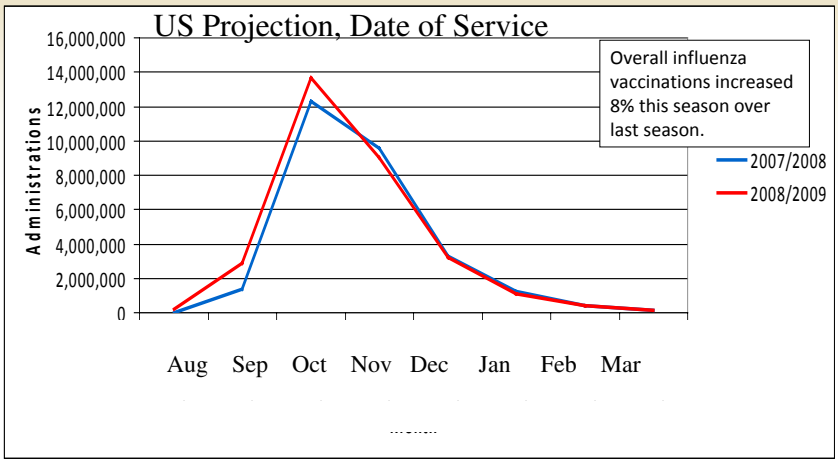
SDI estimated physician office admin
(HMO included in US projection)

Community, Employer, Public Health, and Cash

Wasted (~20%)

Total Doses Distributed = 115M doses

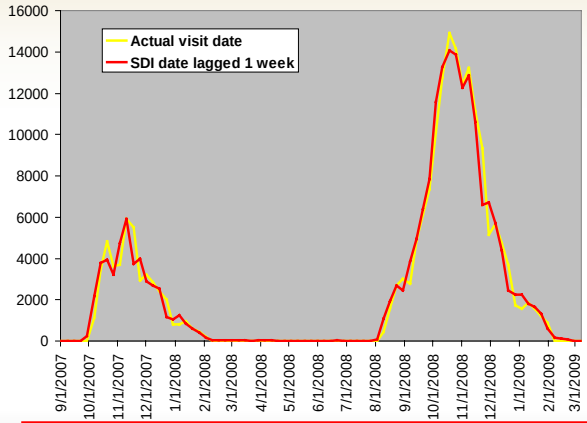
Influenza Vaccine Administered In Physician Offices for '08/09 compared with '07/08
8% Increase, mostly due to gains in Sept-Oct



Note: Medicaid volume for children age 18 years and under is not included.

Near-real-time weekly SDI projections contrasted with final Date of Service count: LAG=1 week

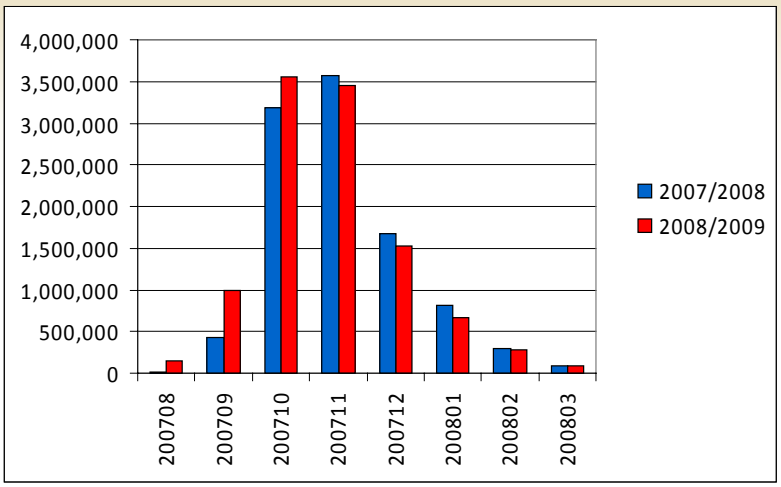
Showing LAIV vaccine admin in pediatrician offices, 2007-09



Message: SDIs near-real time reports produce a nice pattern of the final seasonal vaccine administration – lagged by 1 week

SDI Time Pattern in Vaccine Admin in 0-18 Year Olds

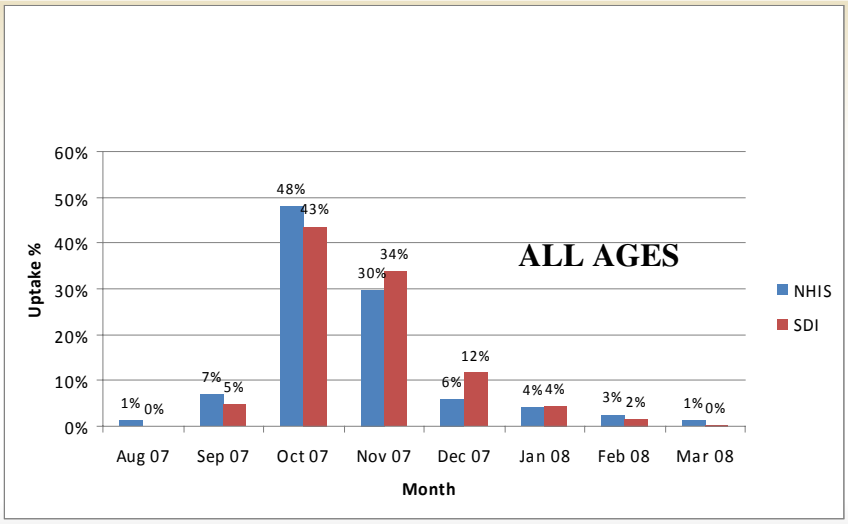
7% increase (same increase in other age grps, not shown)



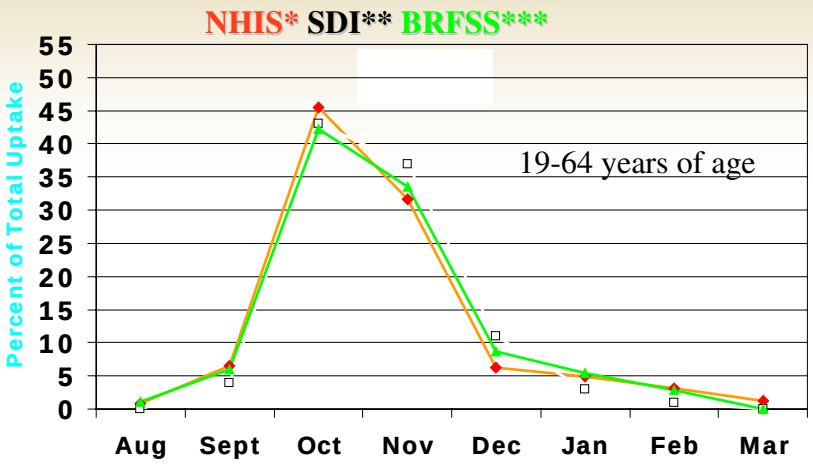
Vaccine administrations in this age group increased 7% this season over last.

Note: Medicaid volume for children age 18 years and under is not included.

NHIS and SDI Monthly Uptake Patterns for 2007/2008 very similar



BRFSS, NHIS and SDI Monthly Uptake Patterns for 2007/2008 very similar



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FluSTAR

– a primary surveillance system that provides influenza vaccine coverage est

FluSTAR – a primary influenza surveillance system

- SDI Network of ~400 physician's offices (44 States)
- ~20,000 patients with ILI studied each season
  - Rapid-testing with Quickvue
  - ~2,000 positive
  - Questionnaire
    - Demo, medical history, symptoms, fever, travel history
    - Vaccination status and type of vaccine (injectable, nasal)
- Estimating vaccine coverage
  - Among ILI lab-neg patients (population proxy)
  - Estimated coverage by Dec 31, April 3

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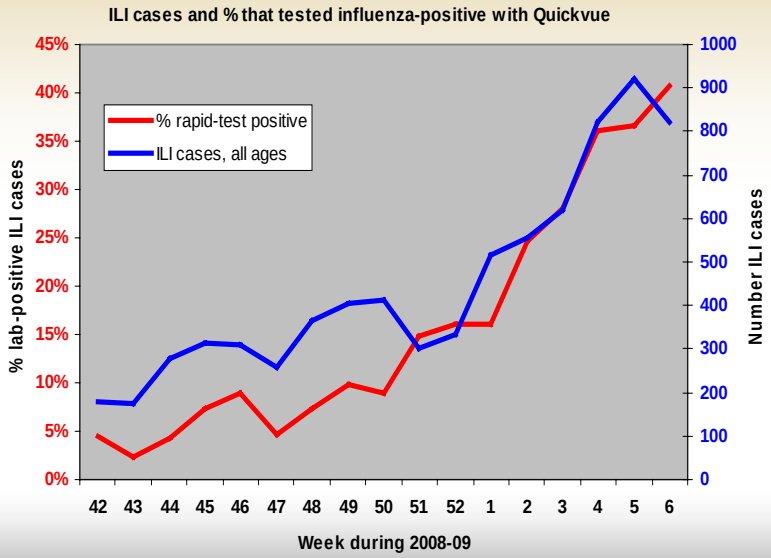
Rapid test for influenza A,B viruses using Quickvue test

% influenza positive increased from ~3% in Oct to ~40% by mid-Feb



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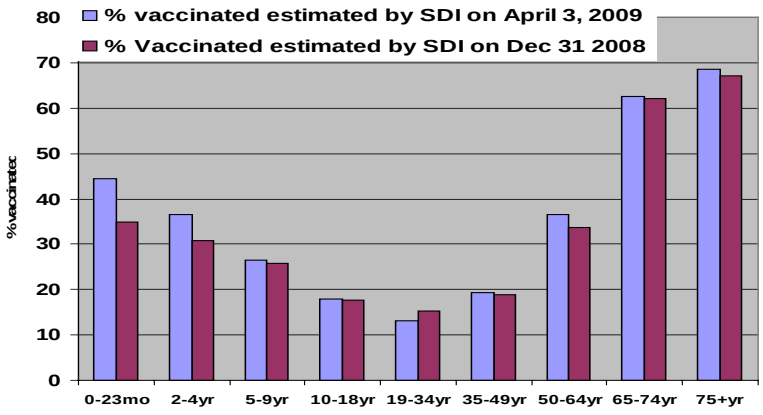
FluSTAR: Age specific influenza vaccine coverage, 2008-09



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SUMMARY

- SDI CMS-1500 medical claims data
  - Excellent for relative patterns in vaccine administrations
    - 31M doses admin to private sector payers in 2008-09
    - 8% increase in uptake in 2008-09 season (compared with 07-08)
  - Validation:
    - When CDC 08-09 data become available, this can be tested
- SDI FluSTAR primary surveillance system
  - By Dec 2008, stable vaccine coverage est for 2008-09
  - ~65% coverage in seniors
    - validates the ILI case-negative estimation strategy

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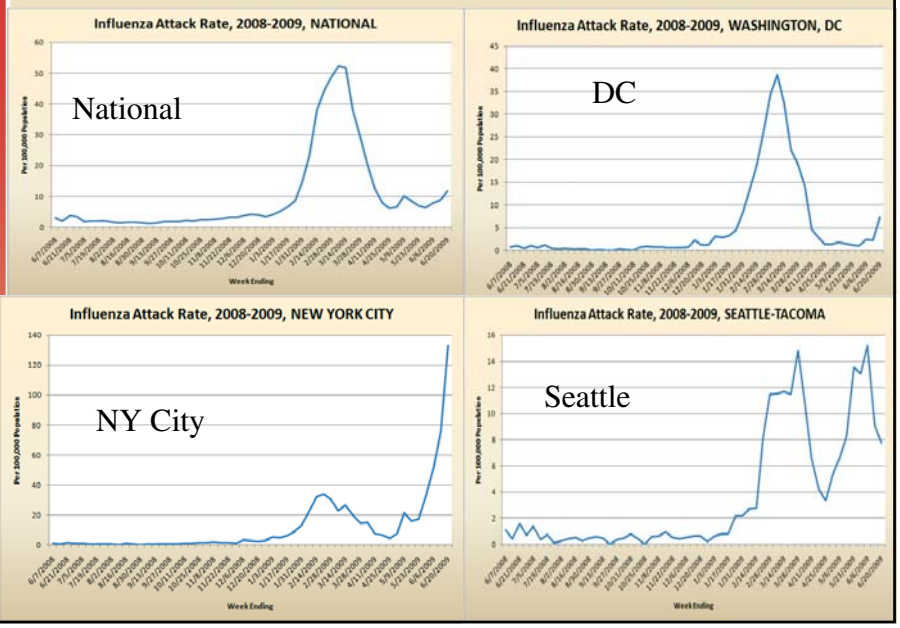
Weekly physician's office visits for influenza (ICD 487)
Up to week ending June 20 2009 (weekly claims received)



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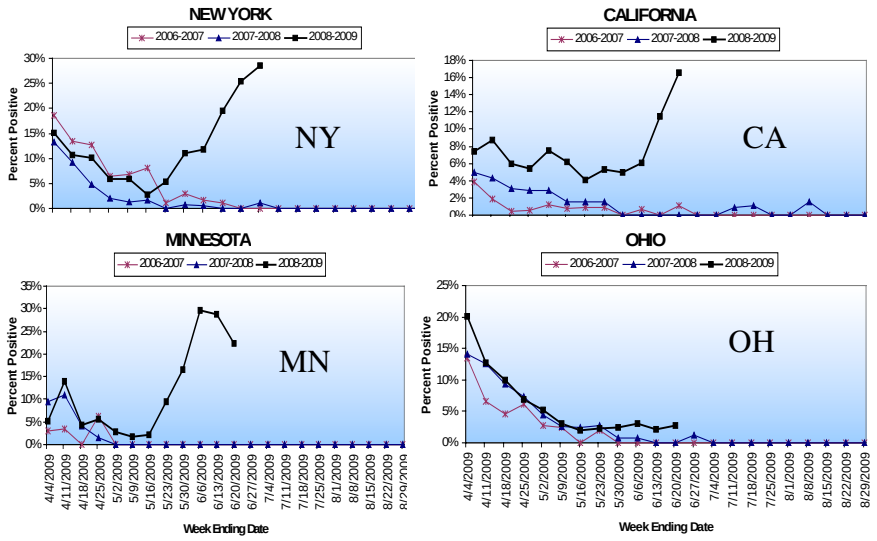
Weekly % lab positive, FluSTAR component up to week ending June 20, 2009



Perspective

- **SDI has much to offer in terms of tracking patterns in vaccine dose administrations and vaccine coverage estimates**
- **SDI has much to offer in context of novel H1N1:**
  - **Tamiflu, adamantane prescriptions**
  - **Daily/weekly ILI (spread)**
  - **Weekly/Monthly Hospitalizations (severity)**
  - **Weekly/Month in-patient case fatality (severity)**
  - **Lab testing/results**
  - **Co-morbidities, special studies of risk factors**
  - **Vaccine Adverse Events tracking**

Acknowledgments

- Gary Euler
- Joel Greenspan
- SDI colleagues

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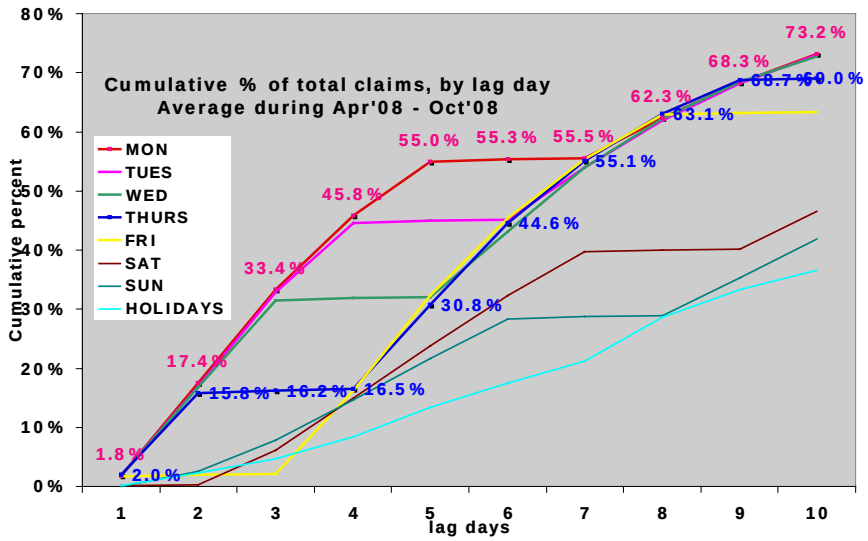
Innovations in Healthcare Analytics

Near-real time projections LAG strategy for generating 100% projections with 1 to 3 lag days only

Pattern of CMS-1500 claims accumulation at SDI follows a predictable pattern for each week day of service



Strategy for making Daily Projections of the final count of visits for any given week-day of service – using sample of claims Available to SDI on day 1, 2 and 3 after the day of service

DoS day in the week	Evaluation day: Days between DOS and Archive lead = lag days	Cumulative SDI count of DOS with lag days	SDI available Count on that lag day	Projection factor
M,Tu,W,Th, F	1	1 x1		1.8%
M,Tu,W,Th	2 1+2	x2		17%
M,Tu,W	3 1+2+3	x3		33%

Under construction at SDI…… Fantastic tool for daily tracking of
-swine flu cases, tamiflu and vaccine dose administrations