

**Child Health Evaluation
and Research Unit**



University of Michigan



**University of Michigan
C.S. Mott Children's Hospital**

Impact of HL7 Messaging on Retail Pharmacy Data Quality During Influenza Season

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Learning Objective

- Recognize the public health implications of HL7 interoperability
- Illustrate how HL7 interoperability by retail pharmacies can impact influenza vaccination surveillance and outreach

Background

- High volumes of influenza doses are administered during flu season
- Retail pharmacies administer substantial numbers of influenza doses
- Ongoing monitoring of flu vaccination coverage requires timely, accurate, and complete reporting to IIS

Background

- It is generally believed that HL7 messaging between EHRs and IIS will improve data quality
- HL7 messaging potential benefits:
 - real time reporting – faster?
 - automatic reporting – more complete?
 - linked to EHR – more accurate?

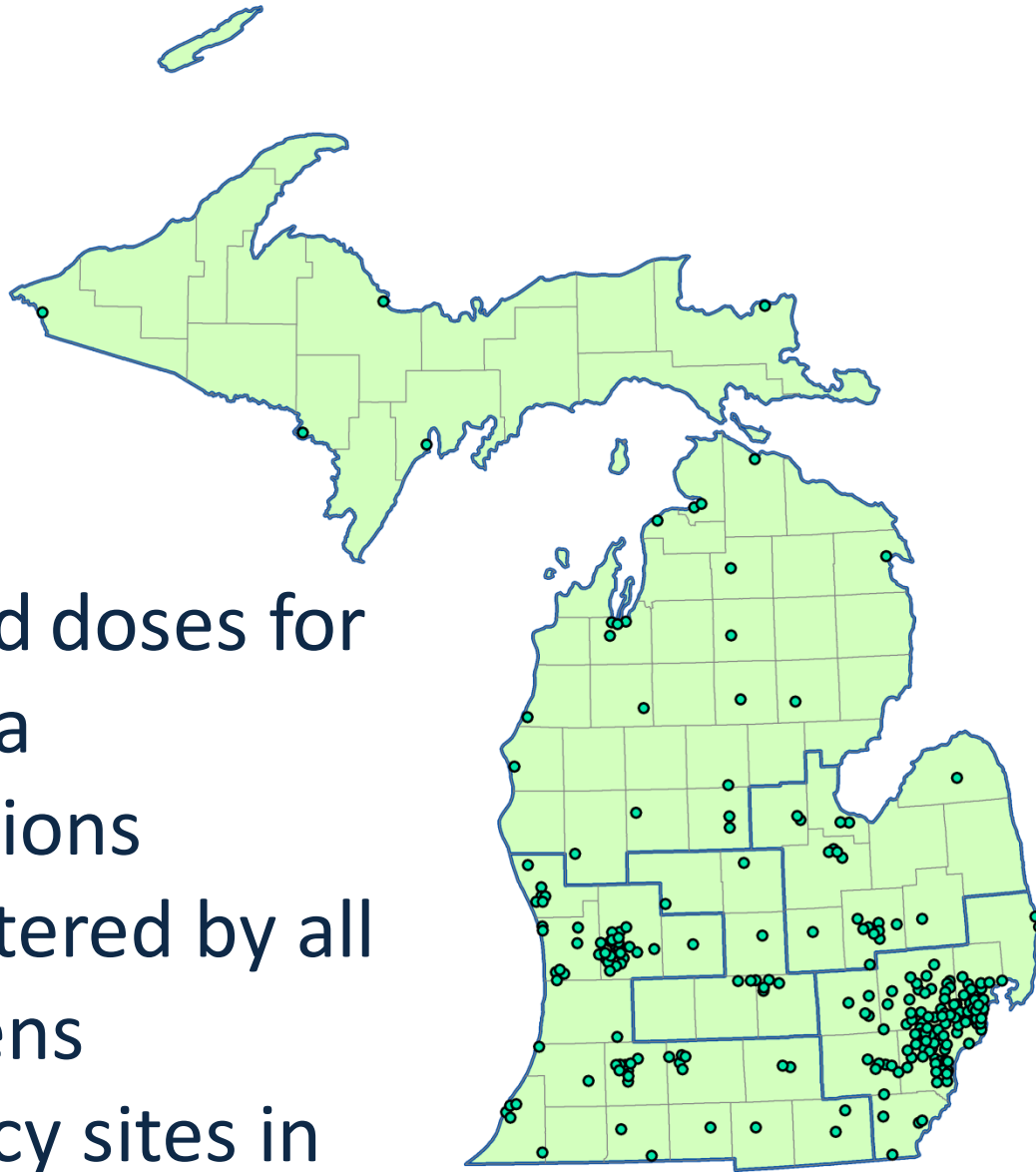
Objective

- Assess the data quality of influenza vaccination records following HL7 implementation by retail pharmacies

Walgreens



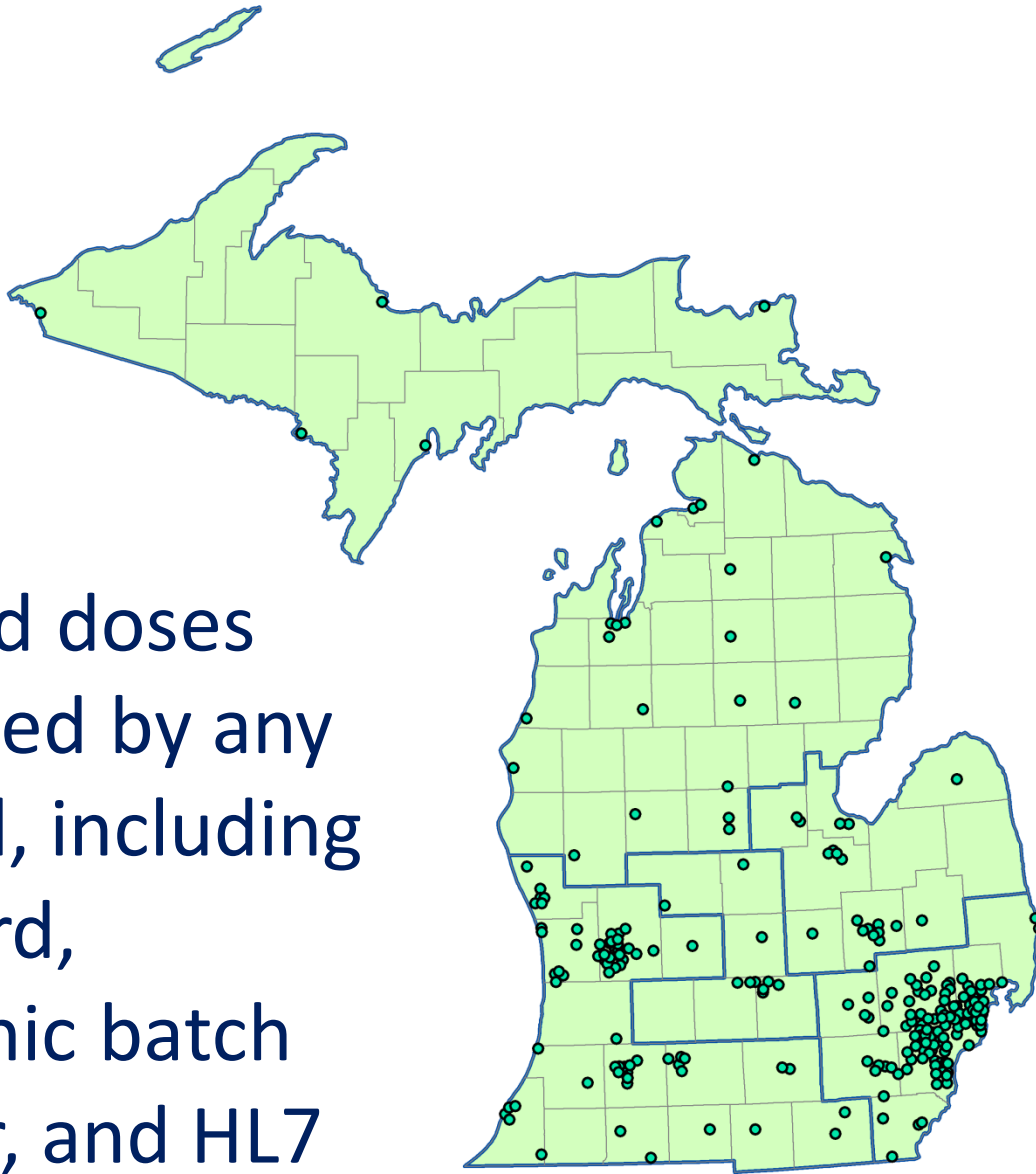
Assessed doses for
influenza
vaccinations
administered by all
Walgreens
Pharmacy sites in
Michigan (n = 229)



Walgreens



Included doses
submitted by any
method, including
keyboard,
electronic batch
transfer, and HL7



Methods

- Compared flu vaccine doses reported during flu seasons:
 - pre-HL7
 - post-HL7
- Evaluated doses in terms of:
 - timeliness of record submission
 - total volume of doses reported
 - total number of duplicate doses

Duplicate Doses

- Doses were classified as duplicates if these fields were the same:
 - person
 - date of administration
 - vaccine (CVX) code
 - manufacturer code
 - VFC code
 - lot number
 - dose volume

2013-2014 Flu Season

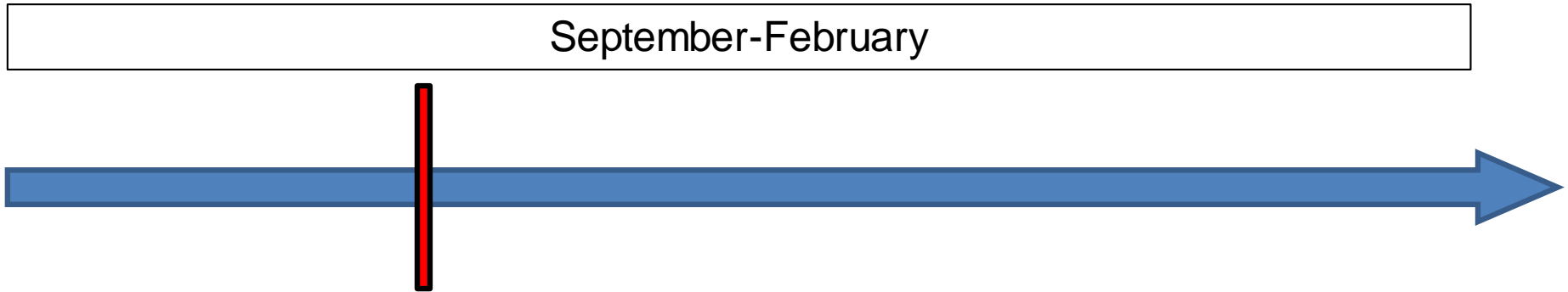
September-February



2013-2014 Flu Season

September-February

Walgreens Pharmacy
Go Live
November 1st



2013-2014 Flu Season

September-October

November-February

**Walgreens Pharmacy
Go Live
November 1st**



2012-2013 Flu Season

September-October

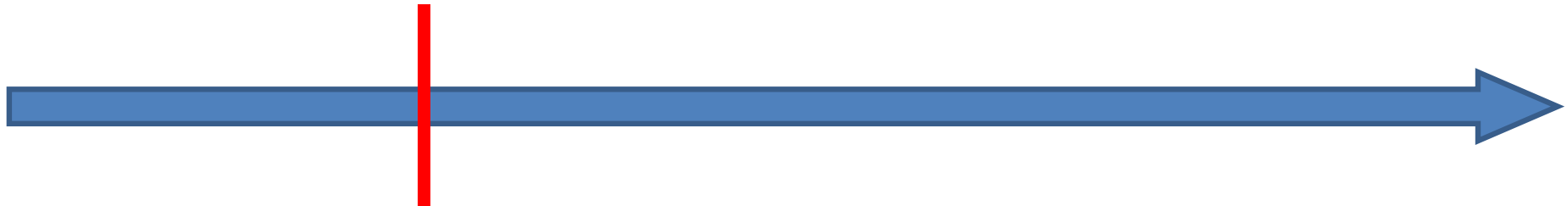
November-February



2013-2014 Flu Season

September-October

November-February



**Walgreens Pharmacy
Go Live
November 1st**

2012-2013 Flu Season

September-October

November-February

Pre-HL7

September-October

November-February

Post-HL7

**Walgreens Pharmacy
Go Live
November 1st**

Results

Overall Reporting Volume

Nov. 2012 – Feb. 2013

- 85,357 flu doses administered
- 95,792 flu doses transferred to MCIR
- All records transferred from electronic files
- Median reporting time: 4 days

Nov. 2013 – Feb. 2014

- 71,379 flu doses administered
- 73,510 flu doses transferred to MCIR
- All records transferred using HL7
- Median reporting time: 1 day

Duplicate Doses

Nov. 2012 – Feb. 2013

- 9,540 duplicates reported (10%)
- 2,826 duplicates with doses in MCIR (3%)

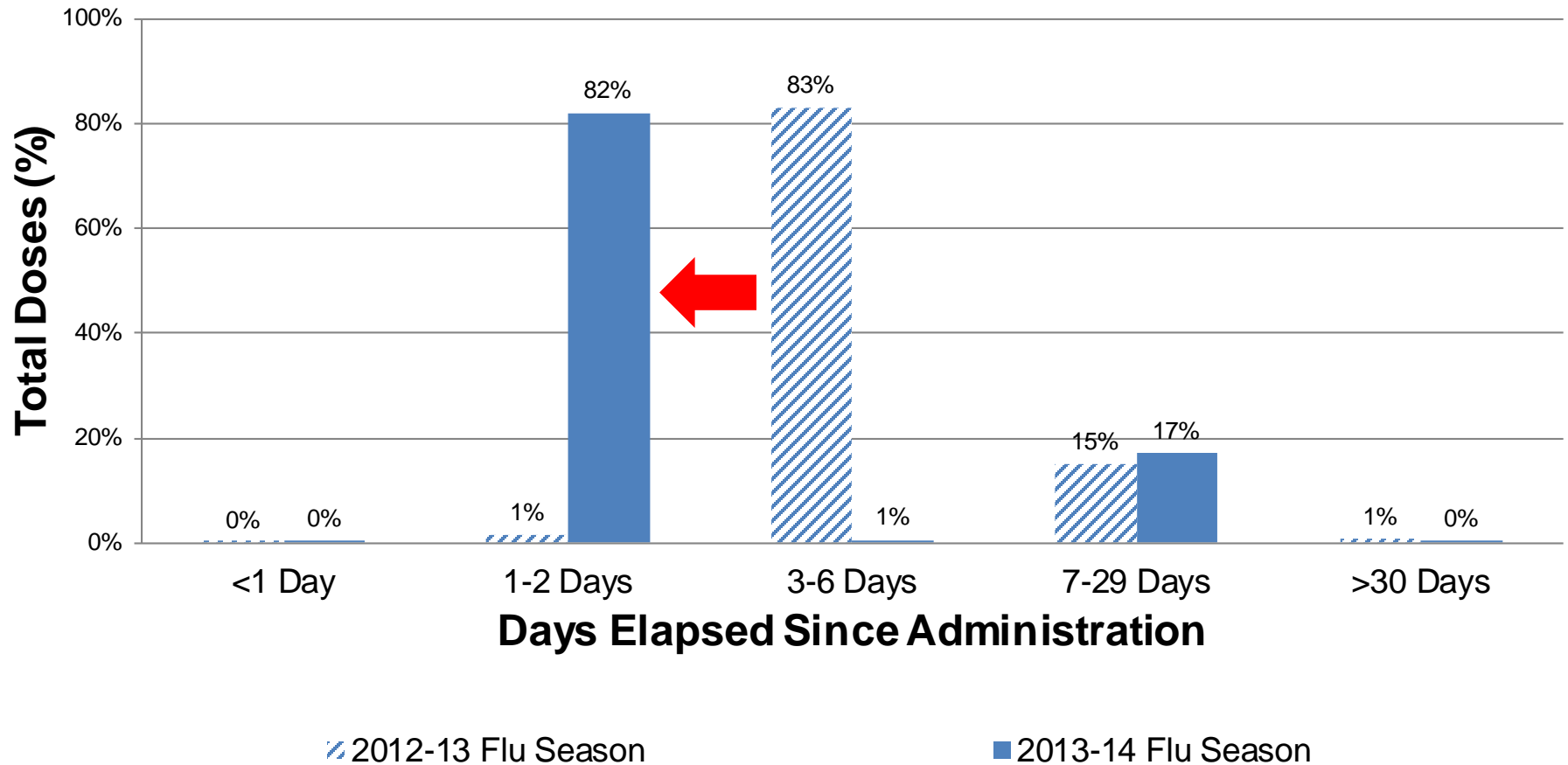
Nov. 2013 – Feb. 2014

- 119 duplicates reported (0.2%)
- 130 duplicates with doses in MCIR (0.2%)

Timeliness of Flu Dose Reporting ≥ 18 Years

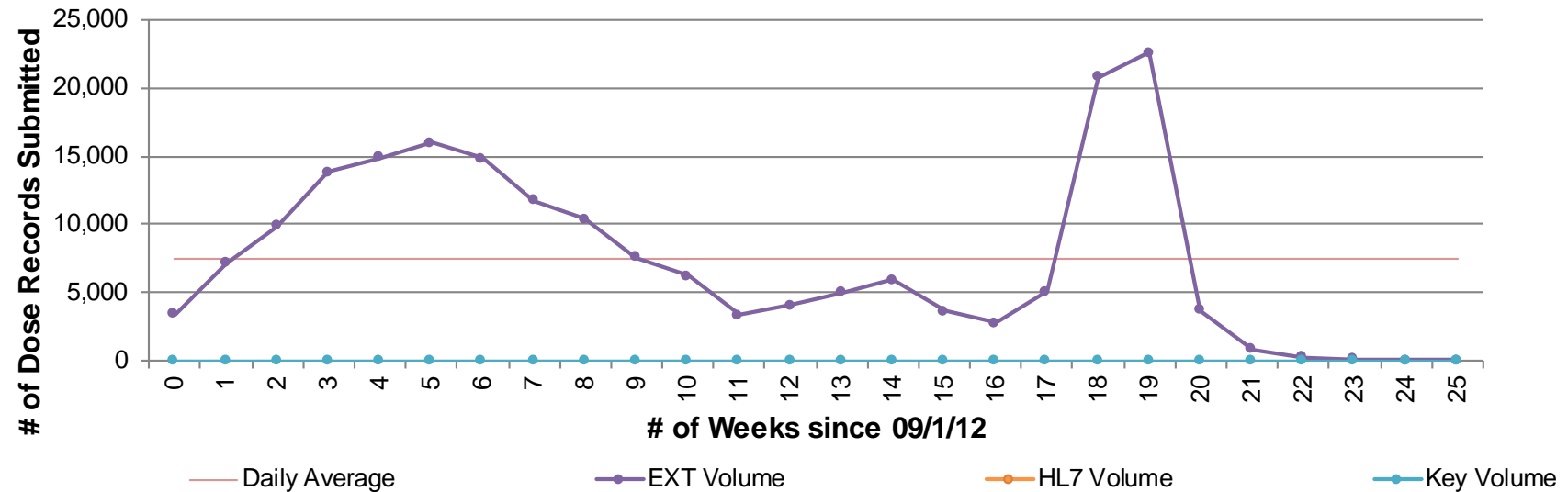
Walgreens Pharmacy

November-February



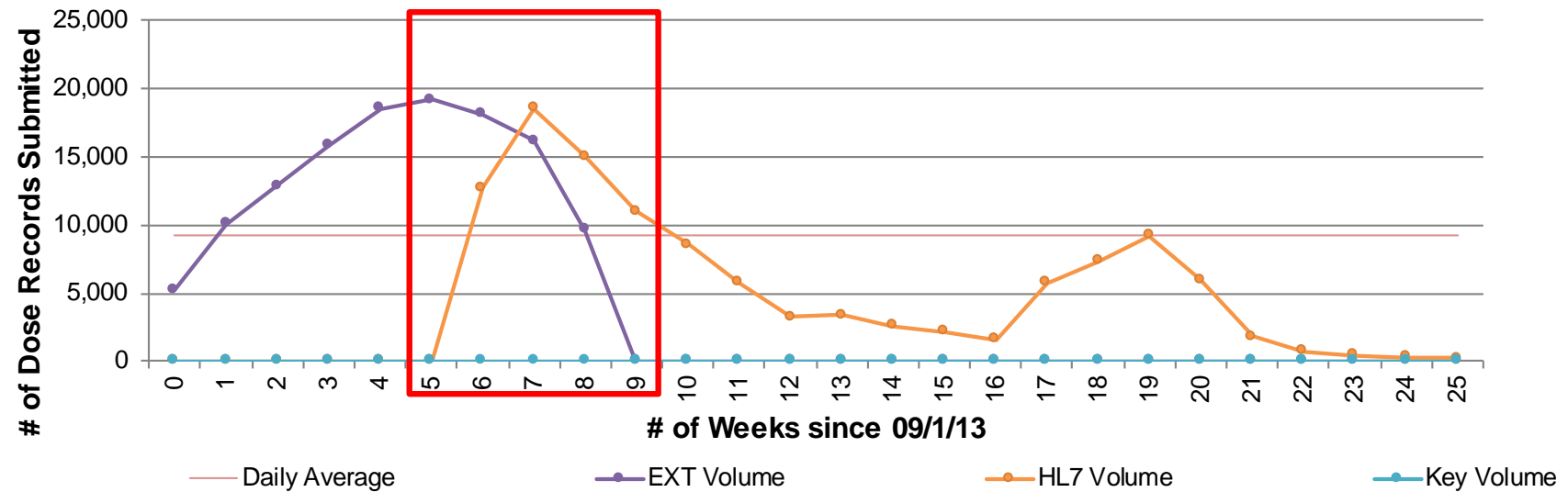
Before HL7

Total Volume of Flu Dose Records Submitted Walgreens Season 09/1/12-2/28/13



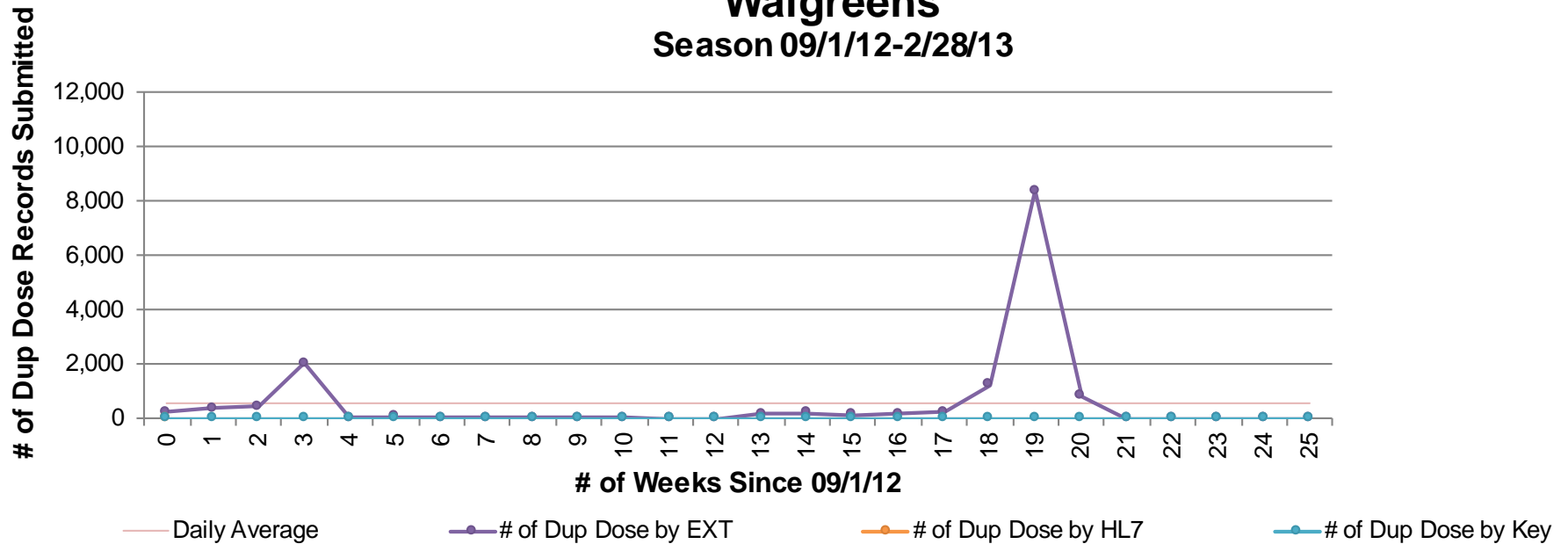
After HL7

Total Volume of Flu Dose Records Submitted Walgreens Season 09/1/13-2/28/14



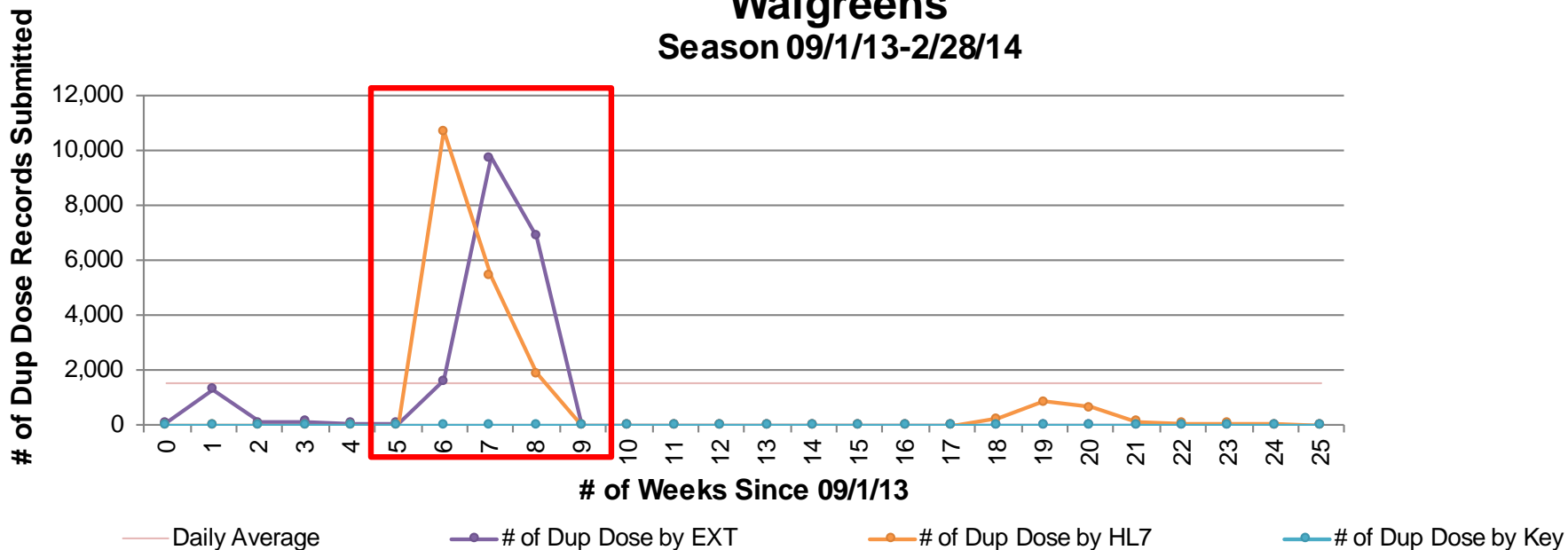
Before HL7

of Duplicated Flu Dose Records Submitted Walgreens Season 09/1/12-2/28/13



After HL7

of Duplicated Flu Dose Records Submitted Walgreens Season 09/1/13-2/28/14

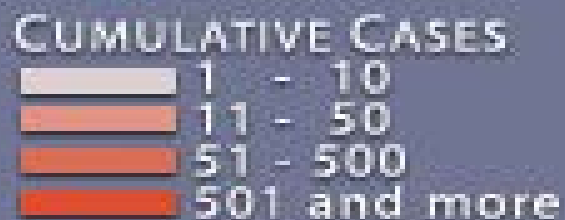


Conclusions

- Flu vaccination administered at a large retail pharmacy chain:
 - Records were reported to MCIR more promptly post-HL7
 - Proportion of duplicate records decreased
- HL7 messaging may enable improved flu vaccination surveillance using IIS

PA NDEMIC (H1N1) 2009

CONFIRMED CASES AS REPORTED TO W.H.O.



TOTAL: 94, 512 Cases; 429 Deaths
Chinese Taipei confirms 61 cases of
pandemic (H1N1), as of July 2009,
with 0 deaths which are included
in the cumulative totals.

Data source: World Health Organization

Implications

- Substantial time lags in dose recorded can occur during pandemic flu events:
 - large numbers of doses administered
 - intense periods of administration
 - administration in non-traditional settings
- Real time HL7 reporting by high volume influenza vaccine providers can improve accuracy of IIS data for surveillance

UNITED STATES POSTAL SERVICE

NOT VITAL RECORDS

Michigan Dept of Community Health
Capitol View Bldg
201 Townsend
PO Box 30195
Lansing, MI 48909

Immunization
Michigan Dept of
Capitol View Bldg

MICHIGAN DEPARTMENT OF COMMUNITY HEALTH
CAPITOL VIEW BUILDING
201 TOWNSEND
PO BOX 30195
LANSING MI 48909

Communicable Disease

WRONG RECIPIENT

Does not live
at this address

no forwarding

Return

Not I

Return

MICHIGAN DEPARTMENT OF COMMUNITY HEALTH
CAPITOL VIEW BUILDING
201 TOWNSEND
PO BOX 30195
LANSING MI 48909

3034466085
CASSANDRA VERWULLEN
808 1/2 PLYMOUTH ST
JACKSON MI 49201-2425

KYLE HOGAN
517 W BARACK AVE
MARQUETTE MI 49855-4647

JOHN WILLIAMS
1100 E 10TH AVE
WON HAK BCR MI 48022-2389

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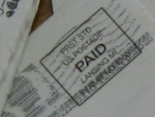
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CAPITOL VIEW BUILDING
201 TOWNSEND
PO BOX 30195
LANSING MI 48909

JOHN TAYLOR
303 CAPITOL
BATTLE CREEK MI 49810

PRESORTED
STANDARD MAIL
U.S. POSTAGE
PAID
Lansing, MI
Permit No. 1200



Reminder / Recall Implications

- A fundamental truth of reminder / recall:
- Undeliverable notices cannot help improve flu vaccination rates
- Expensive:
 - mailing / postage
 - follow-up for undeliverable notices
- HL7 reporting enables timely updates of address information

Reminder / Recall Implications

- Pharmacies provide an avenue for adults' addresses to be regularly updated
- Delays in data entry lead to unnecessary recall notifications
 - trains people to ignore notices
 - accurate IIS data focuses recall on those who need it

Next Steps

- Continued onboarding of large retail pharmacy chains:
 - Walgreens
 - CVS
 - Meijer
 - Target
 - Walmart
 - RiteAid
 - Kroger

Next Steps

- Broaden evaluation of data quality pre- / post-HL7:
 - timeliness of record submission
 - total volume of doses reported
 - total number of duplicate doses
- Evaluate address updates
- Assess impacts during 2015-16 flu season

Collaborators

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