Saving Vaccine Costs by Using IIS Data for Vaccine Ordering Recommendations in NYC, 2013-2014

Melissa Mickle-Hope, MPH
Arianne Ramautar, MPH, Vikki Papadouka, PhD, MPH, Amy Metroka, MSW, MPH, Jane Zucker, MD, MSc

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Citywide Immunization Registry (CIR) Background

- Started citywide in 1997
- Vital records loaded twice a week
  - ~122,000 births annually
- Mandatory reporting of immunizations for children 0-18 yrs.; reporting for adults ≥ 19 yrs. requires verbal consent
  - City Health Code, State Law
- Contains over 5.6 million people with over 76 million immunizations

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New York City (NYC) Vaccines for Children Program (VFC)

- ~74% of NYC children 0-18 yrs. are eligible for vaccines distributed through VFC
  - ~67% are VFC eligible
  - <1% are eligible for 317 funds (underinsured at non FQHCs)
  - ~6% are SCHIP eligible
- Over 1,400 enrolled providers
- Distributes ~3.0 million doses of vaccine annually costing >$130 million

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Linking VFC Distribution to CIR Reporting

- In 2006, we linked VFC vaccine distribution to CIR reporting

  Created CIR-generated DAR for each provider, based on a rolling year

$$\textbf{DAR} = \frac{\textbf{Doses reported to the CIR}}{\textbf{Doses distributed by VFC}}$$

- VFC vaccine orders were adjusted based on DARs: if a provider's DAR was less than 80%, their vaccine order was reduced
- This incentivized VFC providers to report to the CIR

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VFC Ordering

- Providers order all VFC vaccines through the CIR Online Registry
  - Online Ordering Tool created in 2010
- A fully-featured Vaccine Inventory Management (VIM) system is being developed
  - Currently being created using Prevention and Public Health Fund (PPHF) grant
  - VIM will be an enhanced version of Ordering Tool

Online Ordering Tool (2010)

1. Review vaccine order history
2. Confirm, enter and/or update:
   - -Shipping and storage details
   - - Refrigerator and freezer temperatures
   - - Storage used for VFC vaccines
3. Enter current VFC vaccine inventory
4. Enter VFC order quantities
   - - Ordering recommendations provided
5. Receive confirmation number and confirmation E-mail

Ordering Tool

Vaccine Type / Brand	Doses Per Package	Unit Presentation	VFC Inventory on Hand by Dose	VFC Order Quantity by Dose	VFC Order Subtotal by Dose	VFC Recommended Quantity by Dose	Quantity Evaluation
DTaP							
DAPTACEL	10	SDV; 10-Pack	0	150			
Infanrix	10	0.5ml SYR; 10-Pack	0	0	150	150	Order total okay
Infanrix	10	SDV; 10-Pack	0	0			
DTaP-HepB-IPV							
Pediarix (Primary Series Only)	10	0.5ml SYR; 10-Pack	0	100	100	350	Order is less than recommended
DTaP-IPV							
Kinrix (Booster Dose Only)	10	0.5ml SYR; 10-Pack	0	500	500	110	Order exceeds recommended
Kinrix (Booster Dose Only)	10	SDV; 10-Pack	0	0			
DTaP-IPV/Hib							
Pentacel	5	SDV; 5-Pack	0	20	20	20	Order total okay
e-IPV							
IPOL (Inactivated Polio)	10	MDV; 10-Pack	0	0	0	40	Order is less than recommended

Legend
MDV = Multi-dose Vial
PF = Preservative Free Vaccine
SDV = Single Dose Vial
SYR = Syringe

Change Continue

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Ordering Recommendations Algorithm (2010 – July 2013)

1. On-hand Inventory
2. Safety stock
   - 5 weeks
3. Seasonality
   - Proportion of that specific vaccine type needed during the next 30, 60 or 90 days for all NYC providers for children <19 years of age
4. Number of vaccines doses expected to be administered before the next order – based on history of doses shipped

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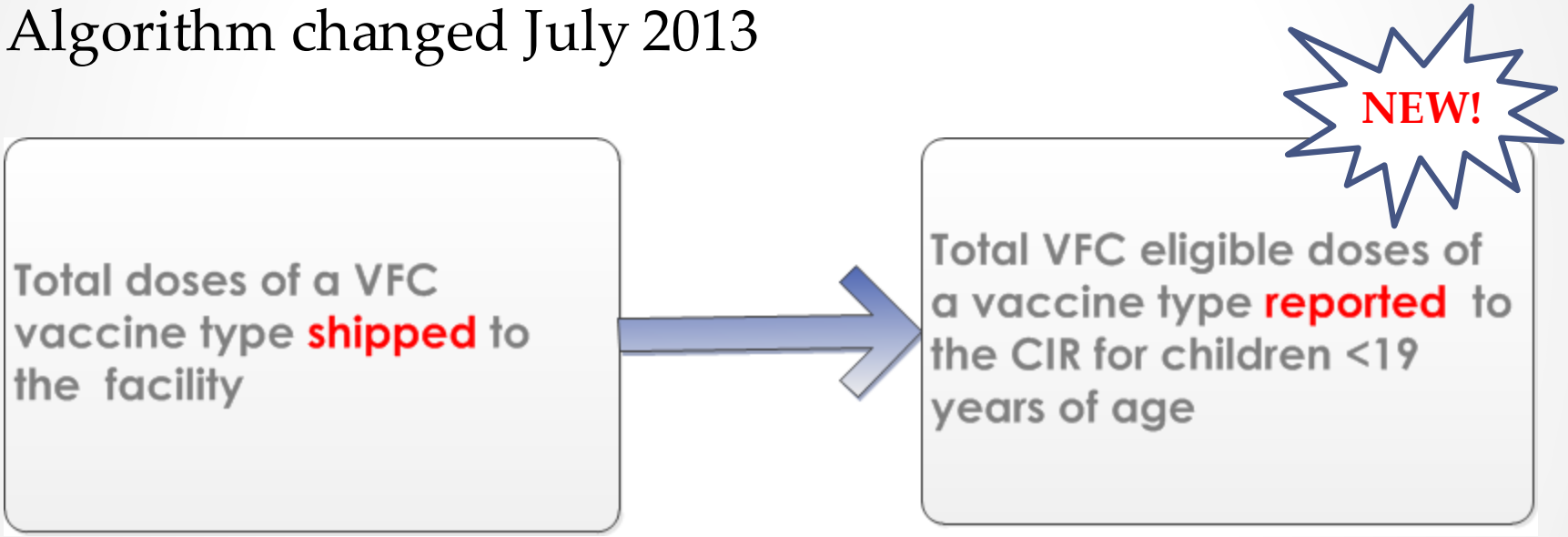
Change in Ordering Recommendations Algorithm

Algorithm changed July 2013



Measuring the Impact of Algorithm Change

- Compared before and after the algorithm change:
  - Number of vaccine doses recommended by Ordering Tool (Source: CIR)
  - Number of vaccine doses distributed (Source: VTrckS)
  - Costs of vaccines shipped (Source: CDC Price List)
- Examined other factors that may affect VFC vaccine distribution
  - Number of VFC providers
  - Vaccination coverage
  - Size of VFC eligible population

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Results

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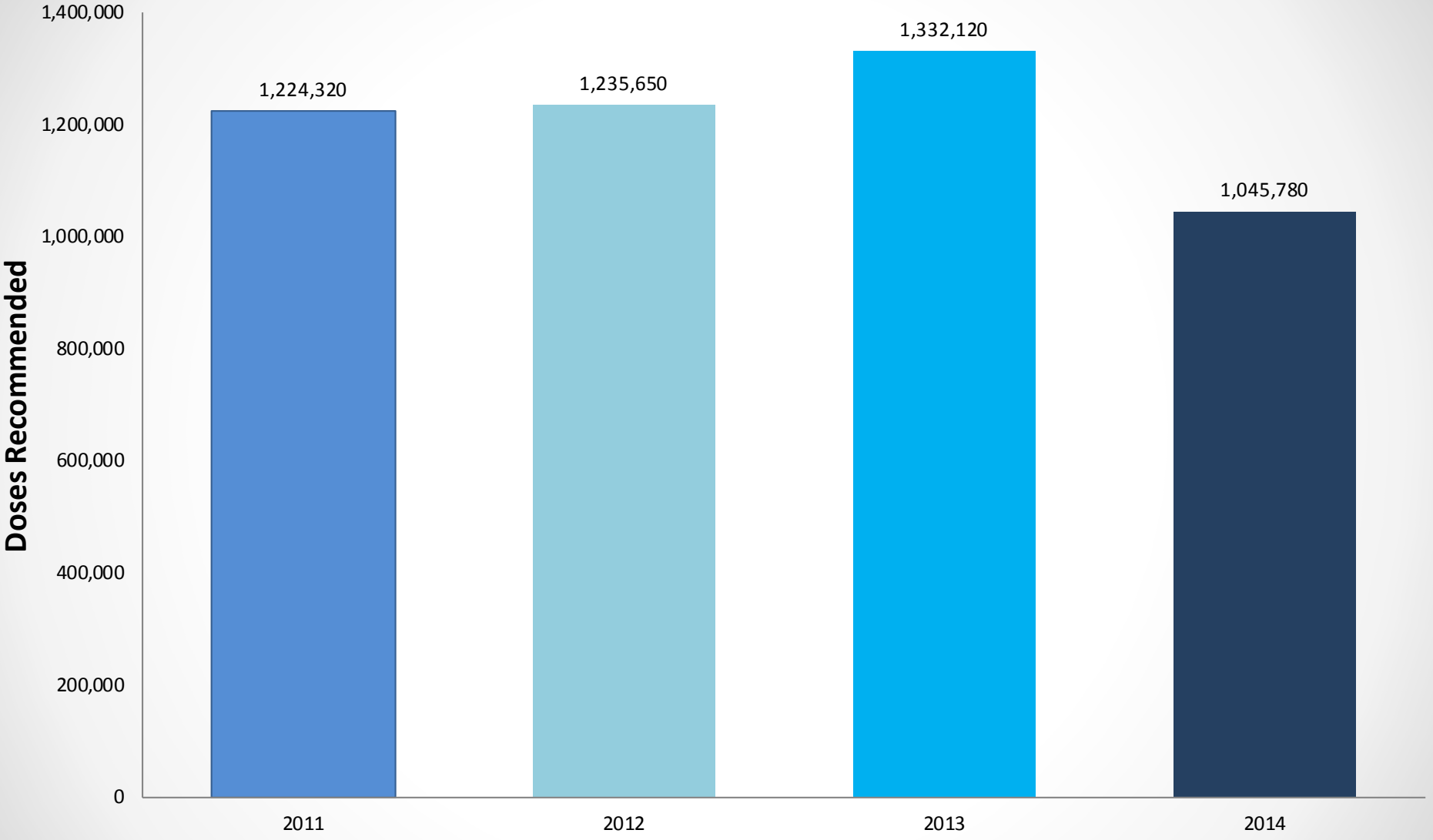
Vaccine Doses Recommended*
July-December, 2011-2014



*No Influenza Vaccine

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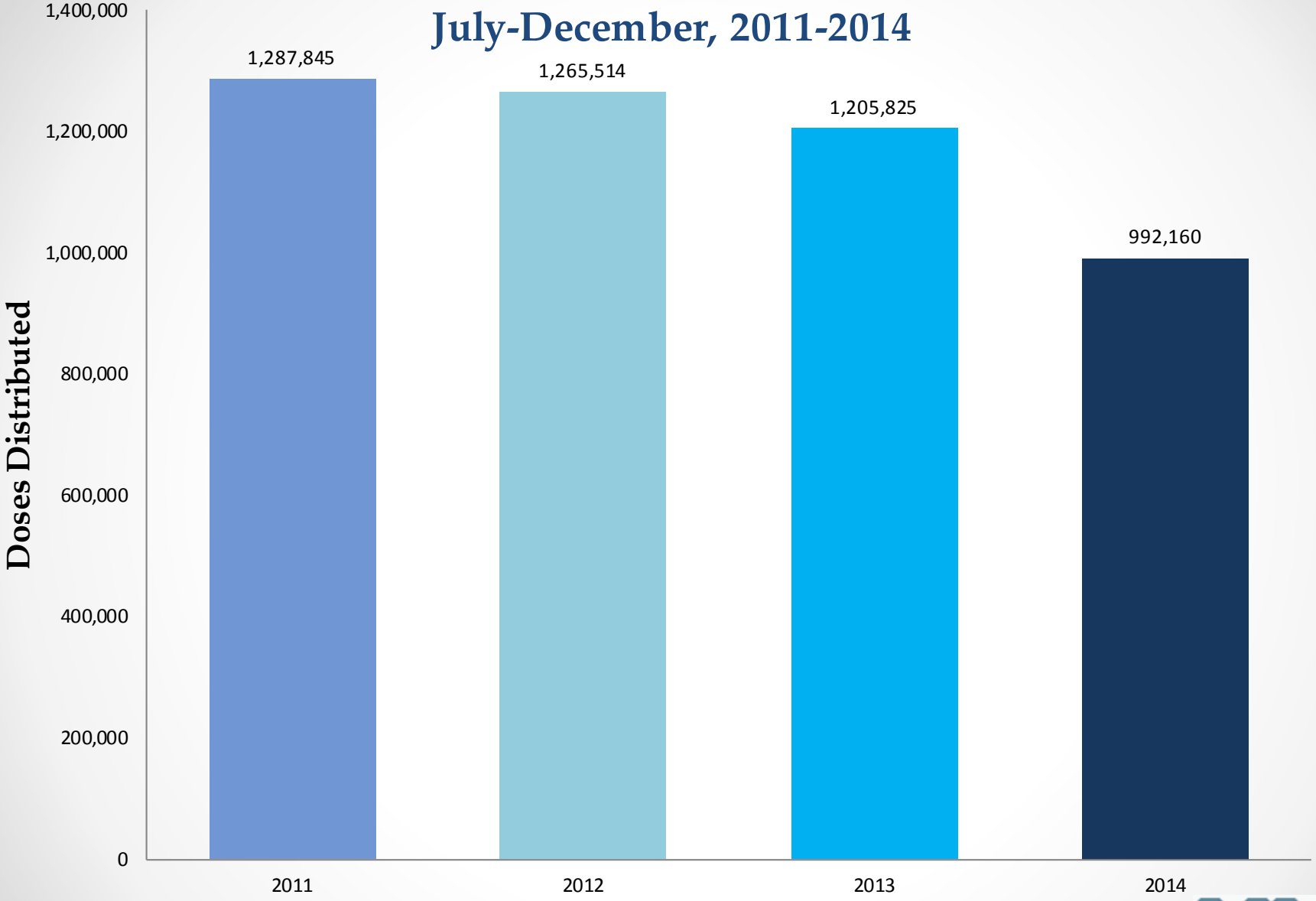
Vaccine Doses Distributed*
July-December, 2011-2014



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Reduction in Vaccine Distribution and Costs (Unadjusted)

Time Period	Vaccine Doses Distributed	Cost of Distributed Vaccine
July-December 2013	1,205,825	$63,890,368
July-December 2014	992,160	$57,533,462
Difference	-213,665	-$6,356,906

VFC Provider Participation

- Number of VFC Providers

Year	Enrolled and Active
2013	1436
2014	1402

**Source: Vaccine Management Survey data*

- The number of enrolled and active VFC providers changed by only 2.4% from 2013 to 2014
- Small impact on vaccine distribution

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Immunization Coverage Rates - CIR

Vaccine	2012	2013	2014
4:3:1:3:3:1:4*	66.4%	70.1%	71.2%
Females: HPV (≥3 doses)	36%	39%	43%
Males: HPV (≥3 doses)	10%	20%	29%
≥1 MCV4	76%	80%	84%
≥1 Tdap	89%	93%	96%

*4 DTap:3 Polio: 1 MMR: 3 HIB: 3 Hep B: 1 Varicella: 4PCV

- CIR coverage rates have improved between 2012 and 2014

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VFC Eligible Population Estimates

Fiscal Year	<1 yr.	1-2 yrs.	3-6 yrs.	7-18 yrs.	Total
CY 2013	100,715	174,351	312,862	752,003	1,339,931
CY 2014	96,850	166,390	297,832	717,580	1,278,652
Difference	-3,865	-7,961	-15,030	-34,423	-61,279
%Difference	-3.84%	-4.57%	-4.80%	-4.58%	-4.57%

**CDC Population Estimate Survey (PES) data*

- Estimated 61,279 fewer VFC eligible patients
- Adjustment to cost savings is necessary

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Adjustment to Cost Savings

- VFC spend plan – vaccine schedule
  - Grantee specific population data
  - Estimation of vaccine doses needed by funding source, antigen and age for 1 year
- Aggregated doses by age and vaccine component
- Determined vaccine cost using CDC vaccine price list for single antigen vaccine products
- Estimated the number of doses and vaccine value associated with the decrease of VFC eligible population for each age group
- Adjusted initial estimates of cost savings

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Adjusted Cost Savings Example

- < 1 year- olds
  - CDC spend plan data estimates
    - 783,650 doses of single antigen vaccine needed for NYC population for 6 months
    - Cost $28,431,909.78
- 3.84% population reduction

783,650 doses X 3.84%= 30,092 less doses

$28,431,909.78 X 3.84%= $1,091,785

- This calculation was performed for each age group.
  - <1yrs.,1-2 yrs., 3-6yrs., and 7-18 yrs.

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Total Adjusted Cost Savings

Category	Doses	Amount
Unadjusted Reduction	213,665	$6,356,905.64
Reduction due to decrease in VFC eligible population	-71,992.47	-$3,058,730.64
Adjusted Cost Savings	141,672.53	$3,298,175.00

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Summary

- VFC ordering recommendations based on CIR reporting
  - Reduced the number of VFC vaccine doses recommended
  - Reduced the amount of VFC vaccine distributed
  - Aligned distribution to active vaccine administration
  - Did not negatively impact vaccine coverage
  - Resulted in large cost savings even after adjusting for the decline in the VFC population

Next Steps

- Full Vaccine Inventory Management (VIM) implementation
  - Enhanced ordering system
    - Available summer 2015
    - Pre-populated VFC vaccine lot information for inventory reporting
    - VFC inventory will be decremented based on reporting to CIR
    - Specialized transaction reports
  - Future enhancements
    - Updated VFC returns and wastage module
    - Web-based VFC enrollment

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Thank You!

Melissa Mickle-Hope

42-09 28th Street-5th Floor

L.I.C, NY, 11101

Ph:347-396-2493

Fax:347-396-2559

mmickle@health.nyc.gov

Thank You!

Melissa Mickle-Hope

42-09 28th Street-5th Floor

L.I.C, NY, 11101

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Fax:347-396-2559

mmickle@health.nyc.gov