Using Medicaid Claims to Assess Registry Data Completeness

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Background

The Michigan Childhood Immunization Registry (MCIR):

- tracks vaccinations for children ≤ 21 yrs. and reporting to MCIR is mandatory
- >2.8 million children
- >32 million immunization doses
- used widely by public and private providers
- data completeness remains an important concern

Background

- MCIR is especially important for assessing coverage among Medicaid enrollees:
  - MCIR is approved by NCQA for health plan HEDIS reporting
  - health plans have found MCIR-based HEDIS reports to be easier and less costly

Objective

To assess the completeness of MCIR vaccination records using Medicaid administrative claims data

Methods Overview

Study Design:

- Retrospective analysis of Michigan Medicaid administrative claims and MCIR vaccination records

Study population:

- 0-6 years of age having ≥1 primary vaccination visit
- continuously enrolled in Medicaid during 2002

Data source:

- Michigan Department of Community Health data warehouse

Methods Overview

Medicaid claims data:

- All 2002 claims selected for well-child exams, sick visits, and vaccinations

- Claims selection qualified using CPT procedure codes and ICD-9 CM dx codes

MCIR vaccination records:

- All vaccination records for 2002

- Linked MCIR Child ID to Medicaid ID

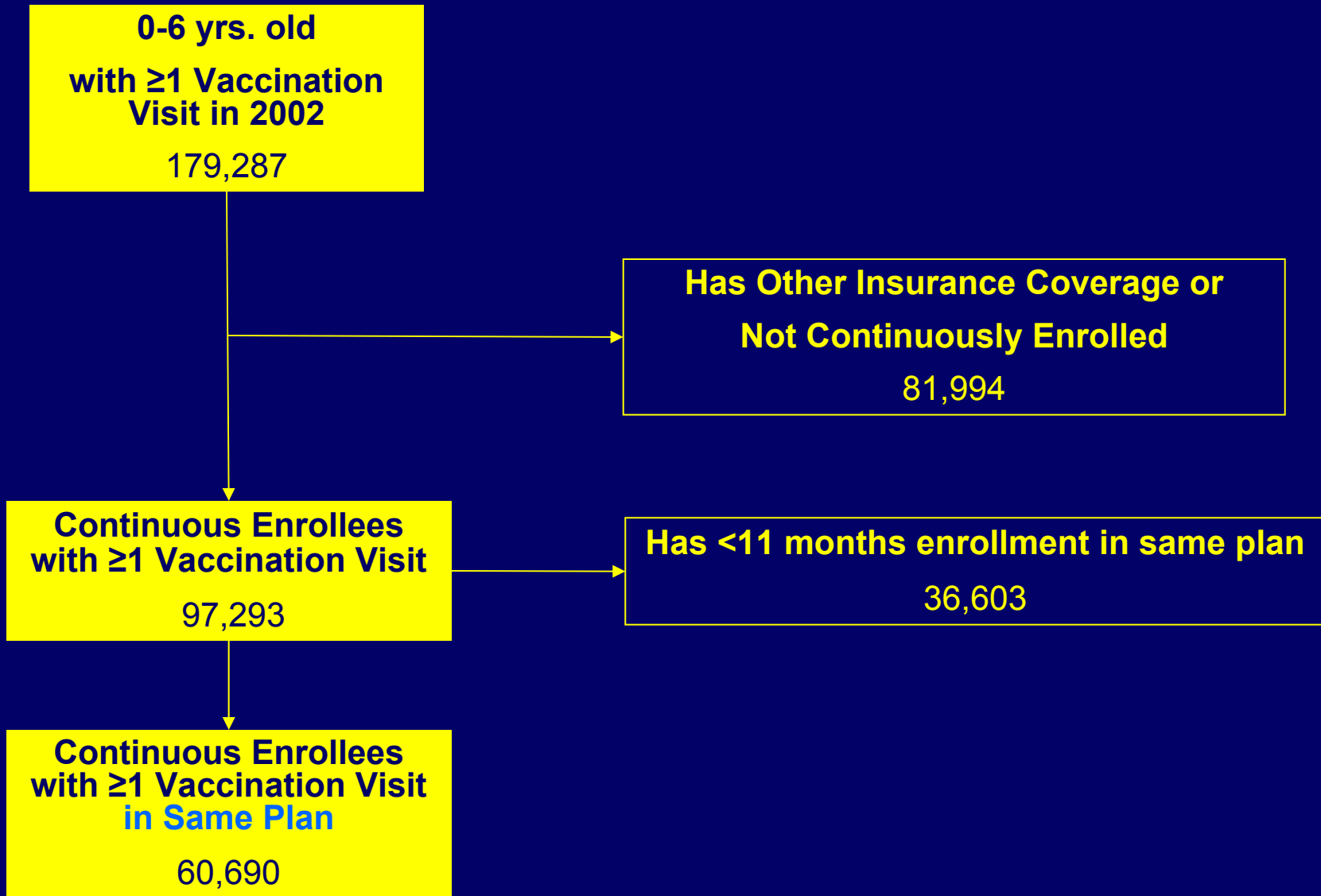- Subset vaccinations to 0-6 year olds

Methods Overview

Outcomes measured:

- vaccination events - one or more vaccination for a child on a given date

- percent agreement between Medicaid and MCIR vaccination events

- percent completeness of field that indicates whether a record is for dose administered / history entered

Statistical analysis:

- Univariate descriptive statistics

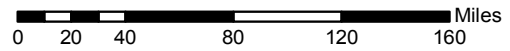- Bivariate analyses conducted using chi-square tests of association

Study Population

0-6 yrs. old

with ≥1 Vaccination Visit in 2002

179,287

Has Other Insurance Coverage or

Not Continuously Enrolled

81,994

Continuous Enrollees with ≥1 Vaccination Visit

97,293

Has <11 months enrollment in same plan

36,603

Continuous Enrollees with ≥1 Vaccination Visit in Same Plan

60,690

Results

Characteristic	Enrollees n = 97,293 (%)
0-2 Yrs.	60
3-6 Yrs.	40
Male	51
White	52
Black	38
All Others	10
Urban Location	83
Same Health Plan ≥ 11 Months	62

Medicaid Enrollees
0-6 Years Old

	2,736 - 2,906
	2,907 - 7,247
	7,248 - 13,789
	13,790 - 42,535

Region 8

Region 7

Region 2

Region 7

Region 4

Region 1

Region 3

Region 5

Region 6

Region 7
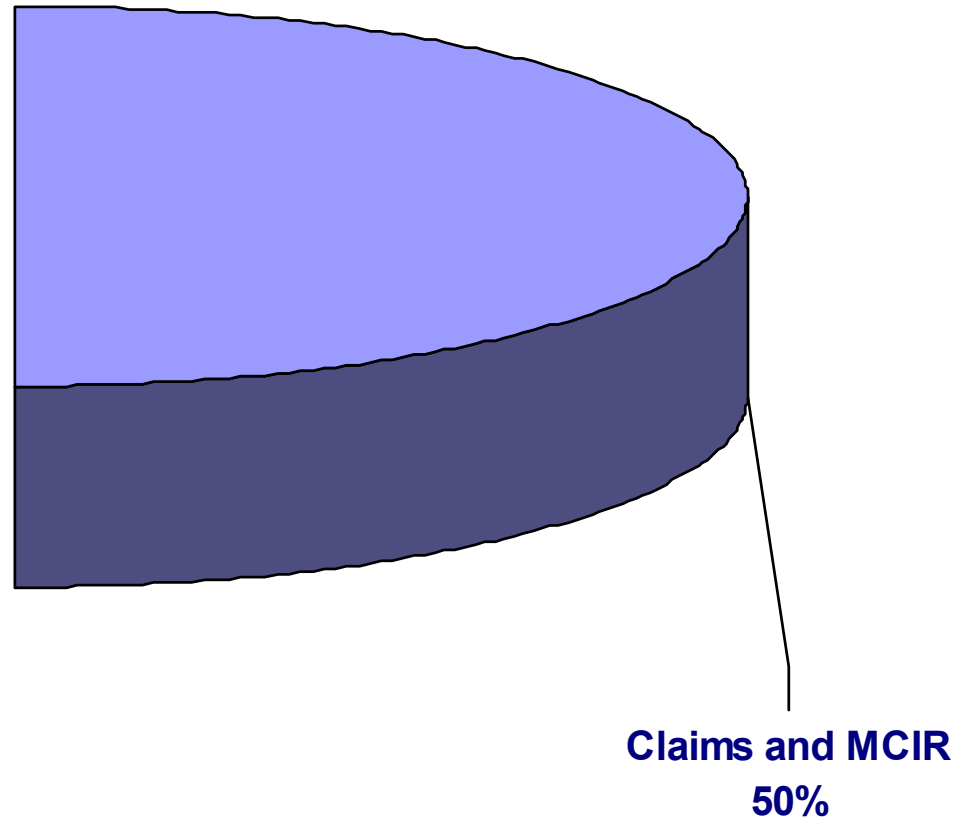
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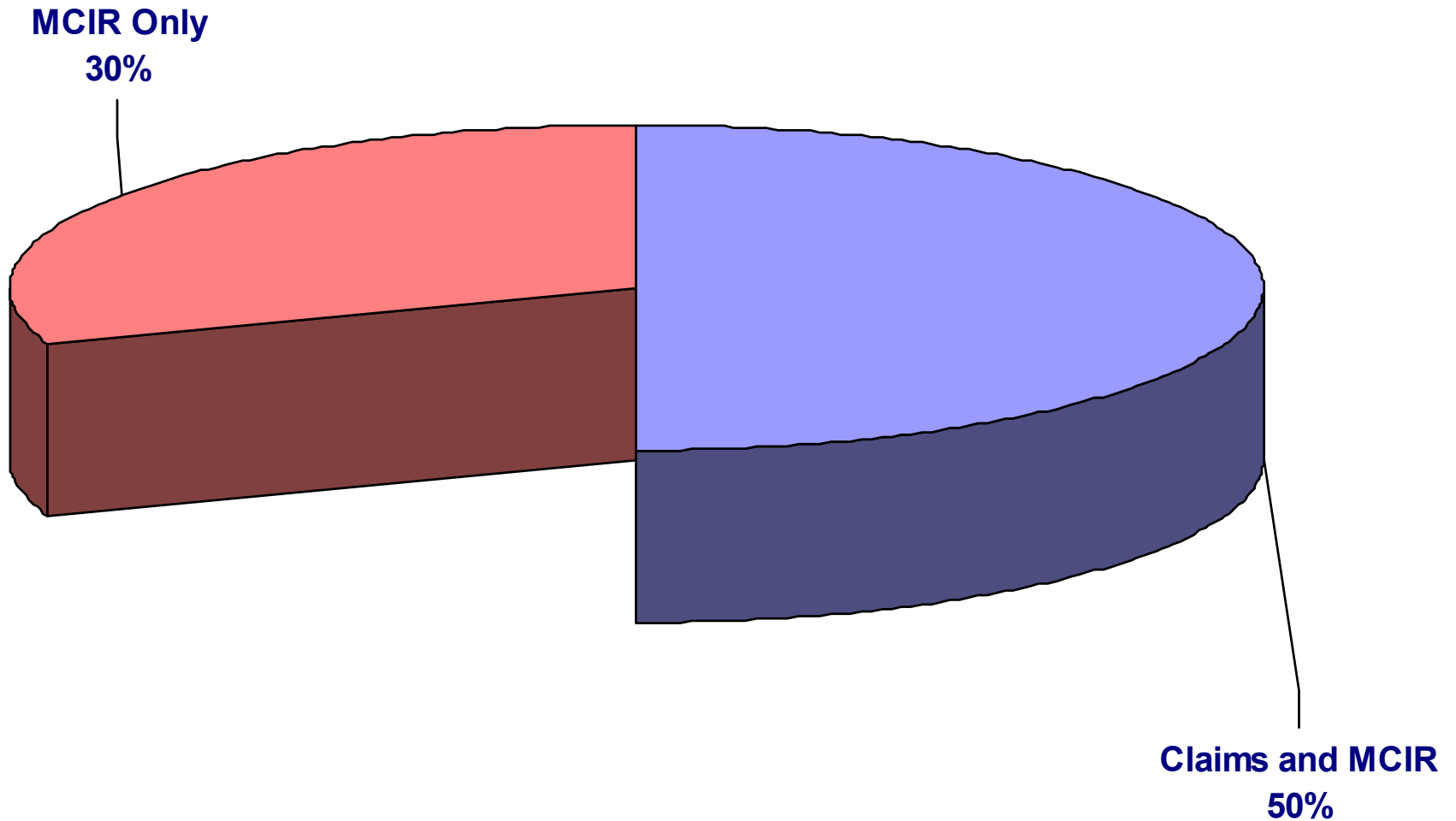0   20   40   80   120   160
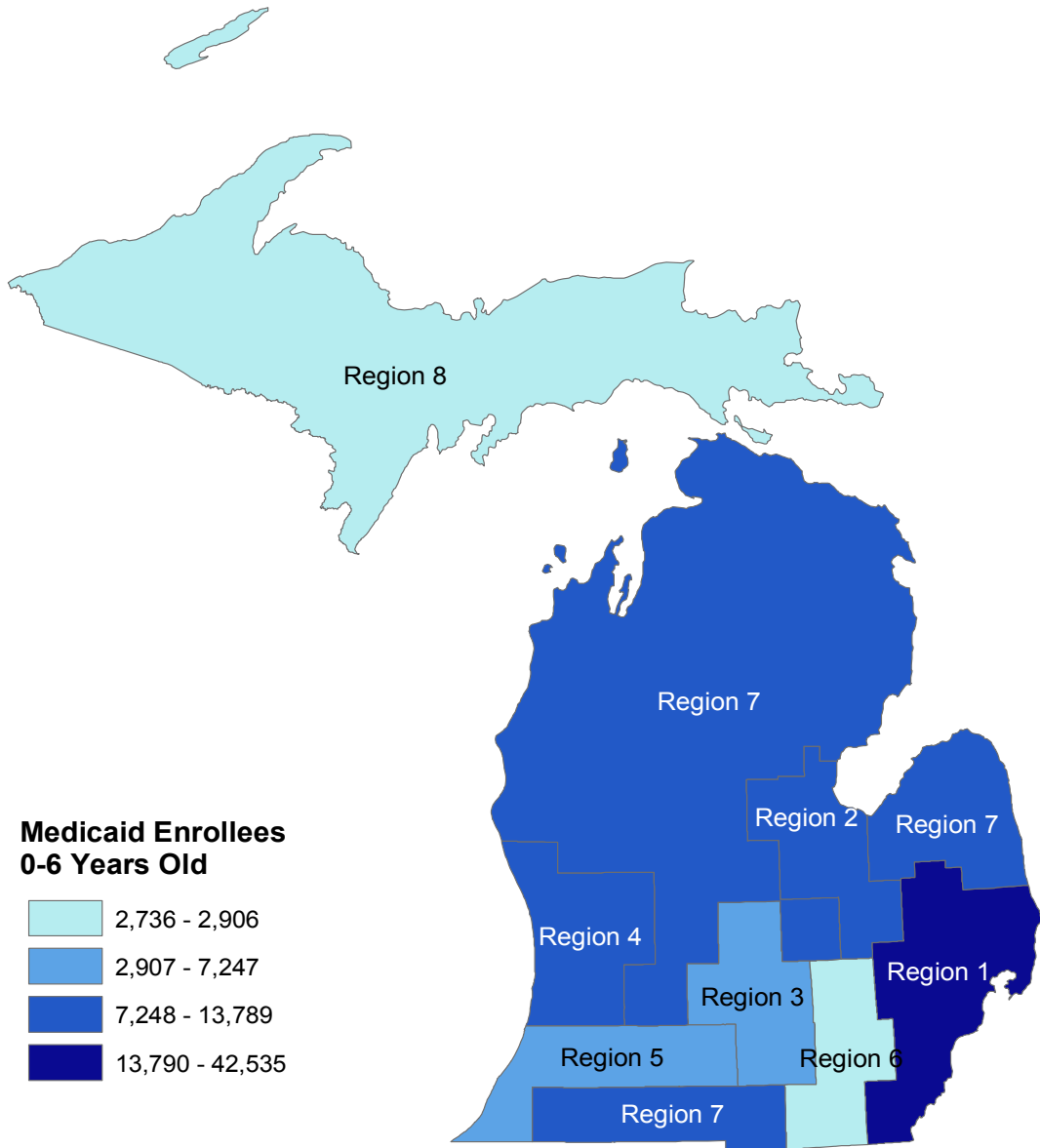
Results

- A total of 185,425 vaccination events

- The majority of vaccinations were administered to:
  - children under 3 yrs.   76%
  - children in urban areas   83%
  - continuous plan enrollees   56%

- Most vaccinations were by private providers:
  - Local Health Dept.   16%
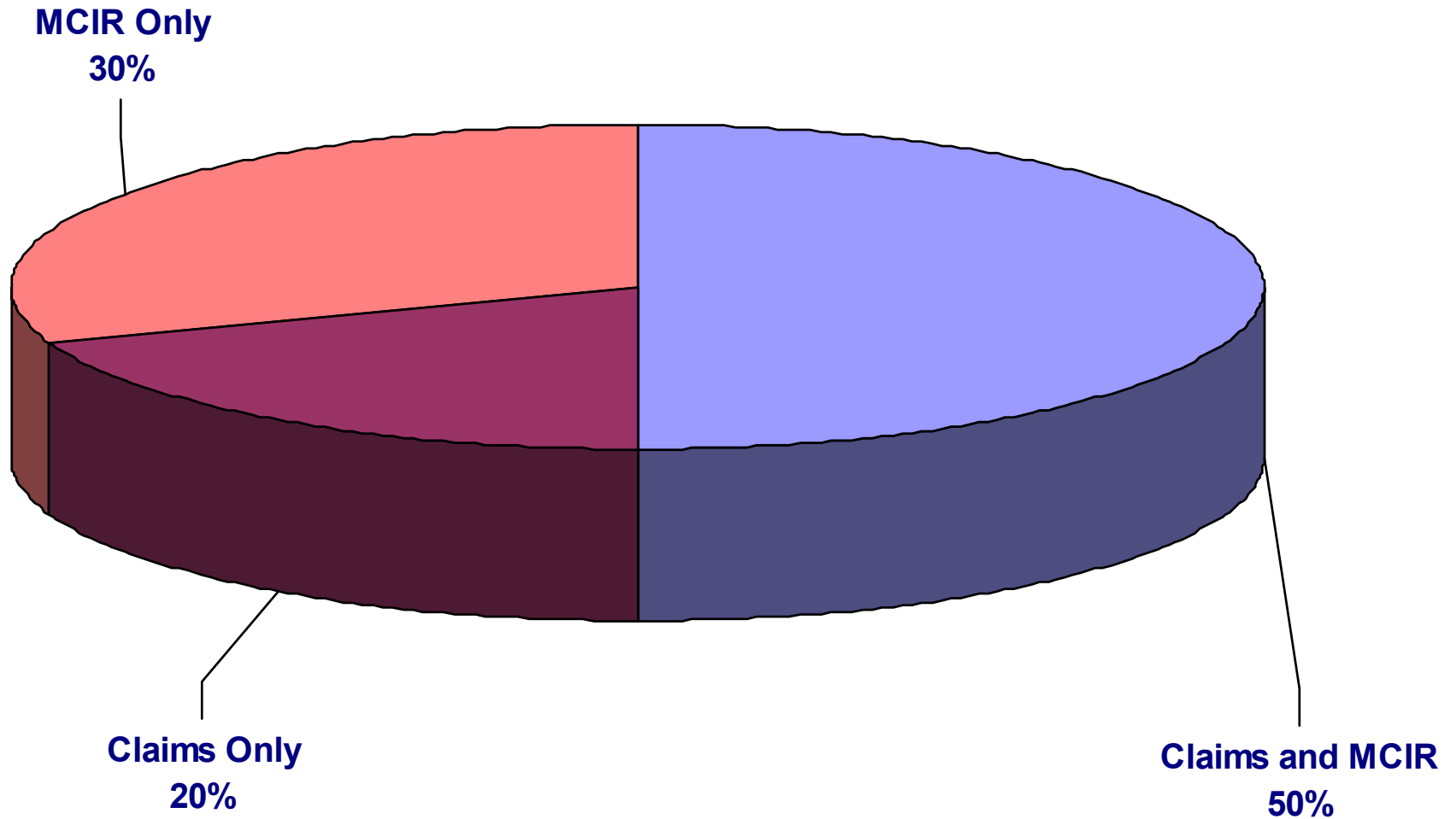 - Private   75%
  - Unknown provider type   8%

Most vaccination events located in MCIR:

**Claims and MCIR
50%**

Most vaccination events located in MCIR:

MCIR Only
30%

Claims and MCIR
50%

Most vaccination events located in MCIR:

MCIR Only
30%

Claims Only
20%

Claims and MCIR
50%

Results

- MCIR completeness varies substantially by:
  - age of child
  - type provider
  - geographic region
  - health plan

Completeness by Age

Characteristic		Vaccinations (n=185,425)	MCIR and Claims (%)	MCIR Only (%)	Claims Only (%)
Age (years)	0	27,091			
	1	91,105			
	2	22,482			
	3	7,780			
	4	18,507			
	5	14,898			
	6	3,562			

Completeness by Age

Characteristic		Vaccinations	MCIR and Claims	MCIR Only	Claims Only
		(n=185,425)	(%)	(%)	(%)
Age (years)	0	27,091	44		
	1	91,105	53		
	2	22,482	55		
	3	7,780			
	4	18,507			
	5	14,898			
	6	3,562			

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		(n=185,425)	(%)	(%)	(%)
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	1	91,105	53	29	
	2	22,482	55	26	
	3	7,780			
	4	18,507			
	5	14,898			
	6	3,562			

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Age (years)	0	27,091	44	36	20
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	2	22,482	55	26	19
	3	7,780	46	31	23
	4	18,507	46	31	23
	5	14,898	45	33	23
	6	3,562	39	37	24

Completeness by Provider Type

Characteristic		Vaccinations	MCIR and Claims	MCIR Only	Claims Only
		(n=185,425)	(%)	(%)	(%)
Provider	Local Health Dept.	30,142	50	41	9

Completeness by Provider Type

	Characteristic	Vaccinations	MCIR and Claims	MCIR Only	Claims Only
		(n=185,425)	(%)	(%)	(%)
Provider	Local Health Dept.	30,142	50	41	9
	Private	139,769	52	28	20

Completeness by Provider Type

	Characteristic	Vaccinations	MCIR and Claims	MCIR Only	Claims Only
		(n=185,425)	(%)	(%)	(%)
Provider	Local Health Dept.	30,142	50	41	9
	Private	139,769	52	28	20
	Unknown	15,514	28	32	40

Completeness by Urban Residence

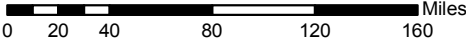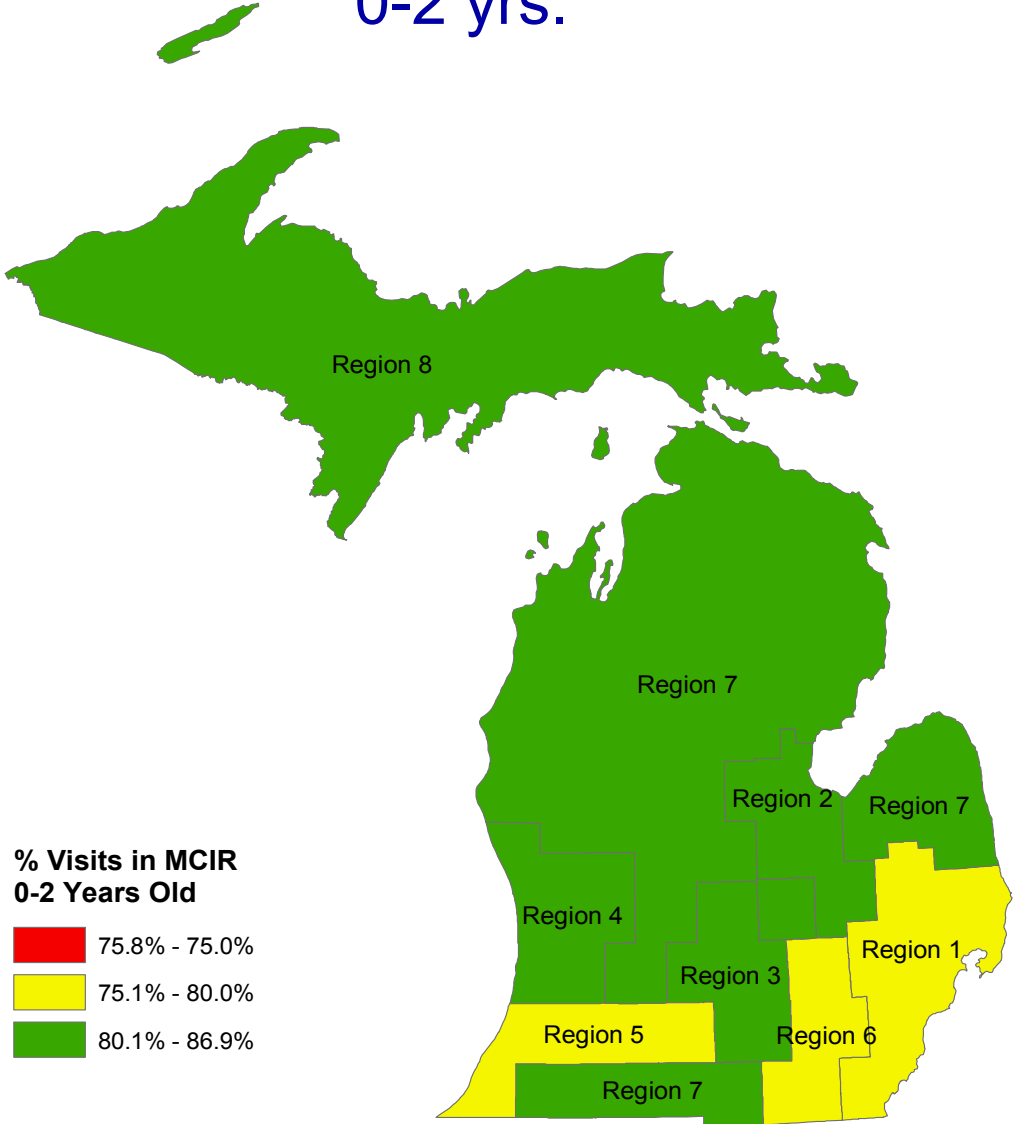|	Characteristic	Vaccinations (n=185,425)	MCIR and Claims (%)	MCIR Only (%)	Claims Only (%)
Residence	Urban	153,136	49	30	21
	Not Urban	32,289	55	31	14

Completeness by Region

- MCIR completeness varies by geographic region:
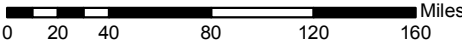   - Lowest –   78%
    - Highest – 86%

Completeness by Region
0-2 yrs.

Region 8

Region 7

Region 2

Region 7

Region 4

Region 1

Region 3

**% Visits in MCIR
0-2 Years Old**

🟥	75.8% - 75.0%
🟨	75.1% - 80.0%
🟩	80.1% - 86.9%

Region 5

Region 6

Region 7
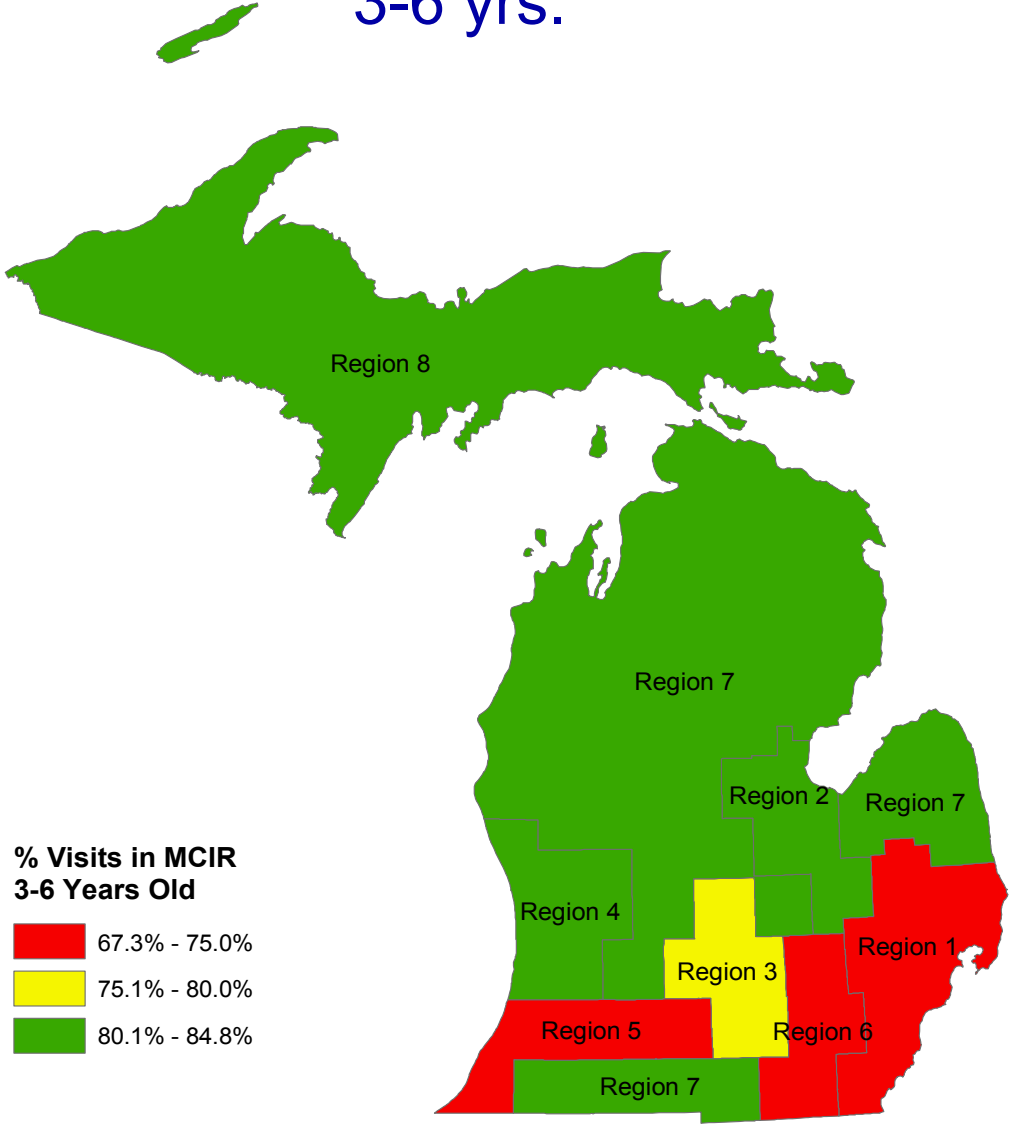
Miles

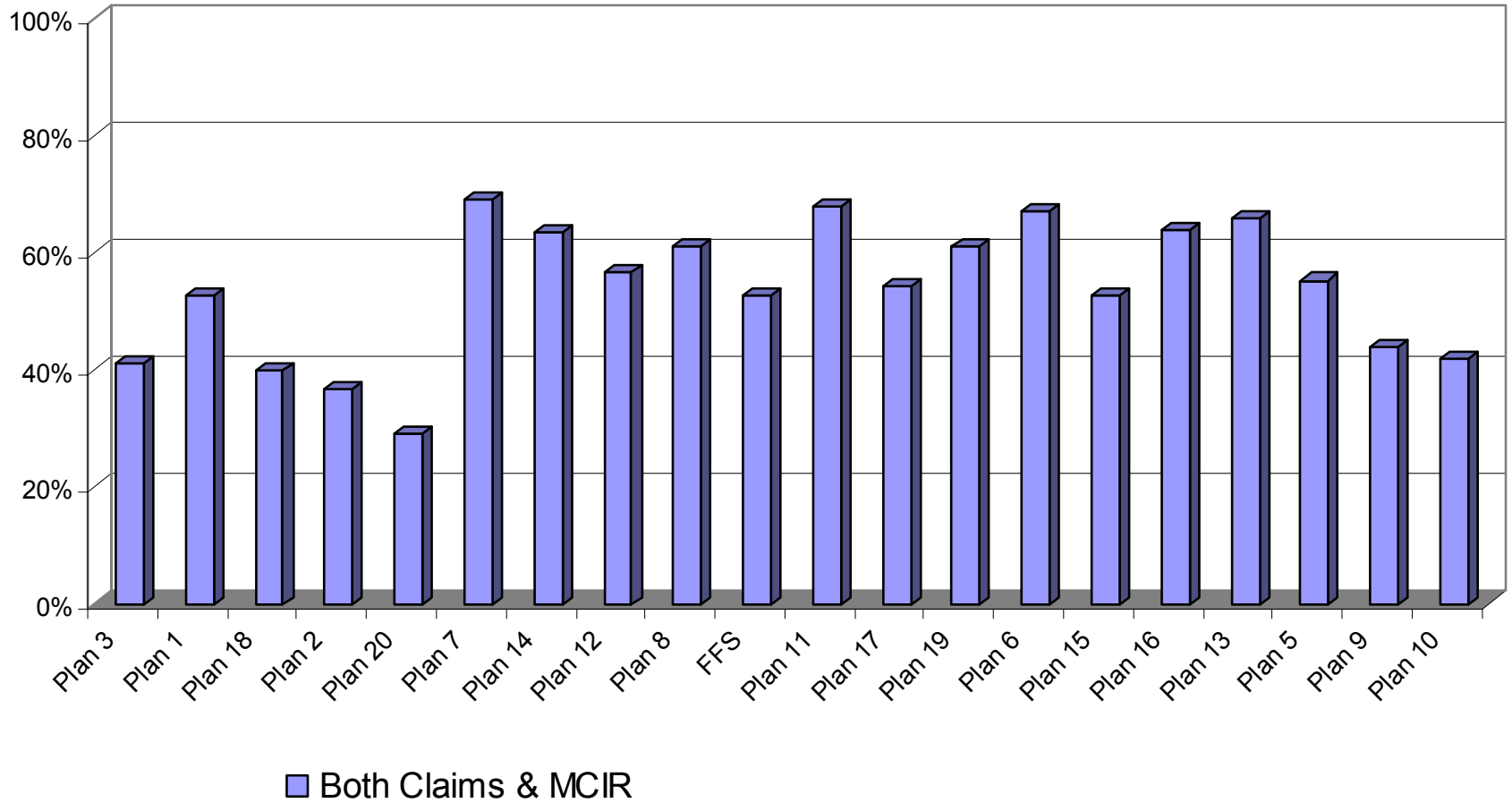0   20   40   80   120   160

Completeness by Region
3-6 yrs.

Completeness by Health Plan

- Analysis of health plans focused on continuous enrollees in same plan

- 103,818 vaccinations (56% of total)

- MCIR completeness by plan:
    - Highest –   92%
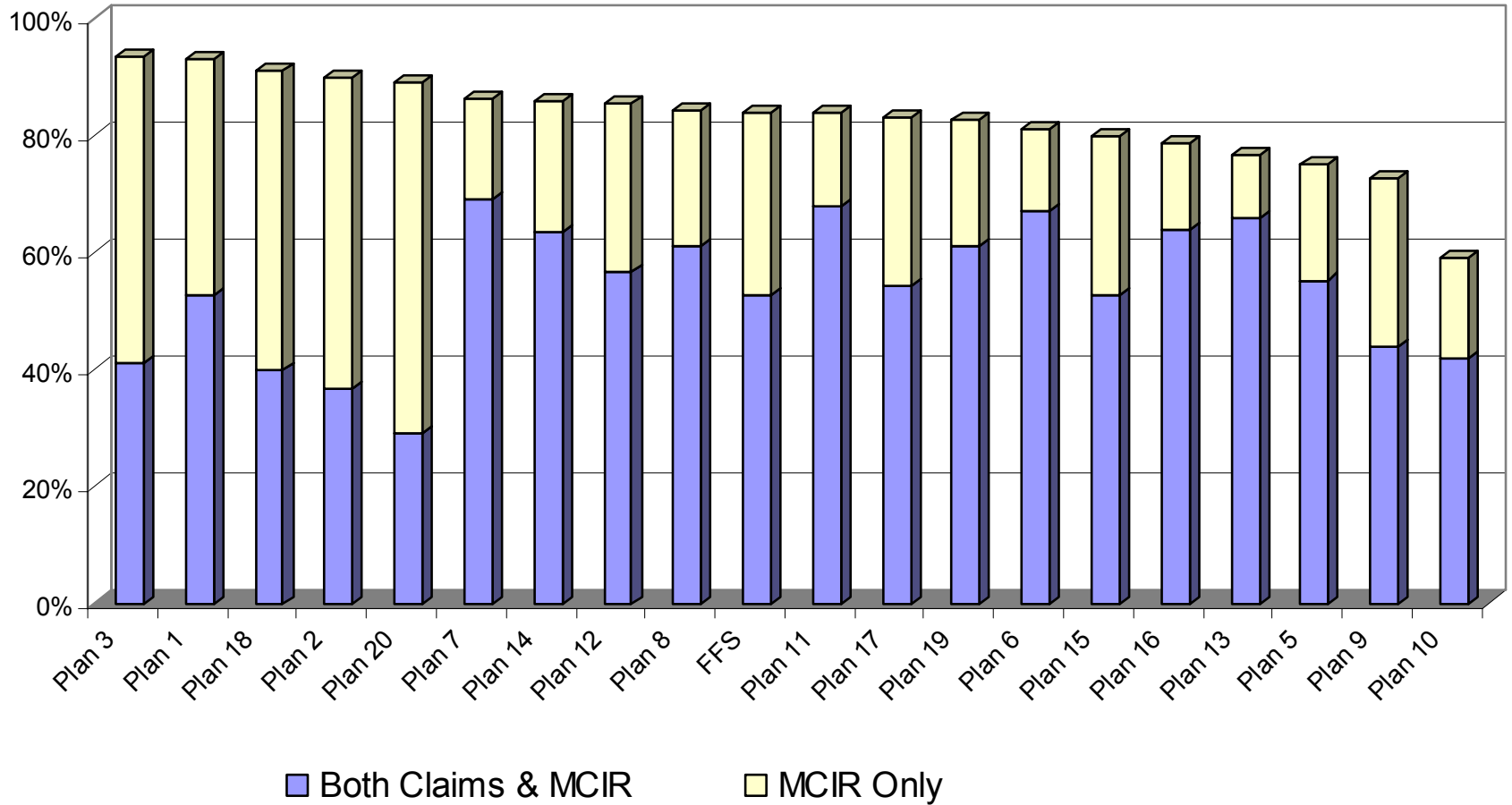   - Lowest –   56%
    - FFS –   82%

2002 Primary Series Vaccination Events
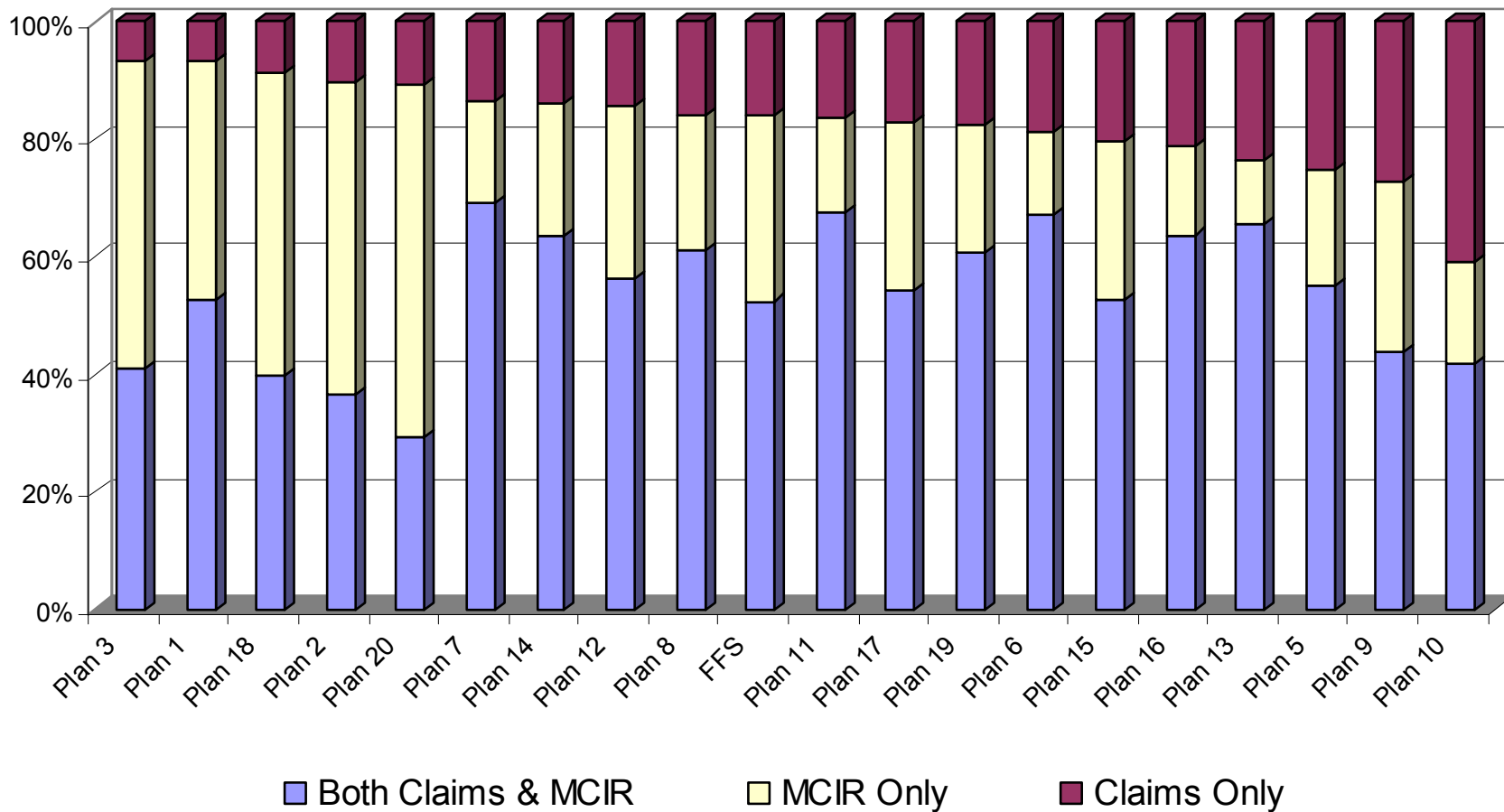## Medicaid Enrollees 0-2 Years Old

Both Claims & MCIR

2002 Primary Series Vaccination Events
Medicaid Enrollees 0-2 Years Old

Legend: ■ Both Claims & MCIR   □ MCIR Only

Categories (left to right): Plan 3, Plan 1, Plan 18, Plan 2, Plan 20, Plan 7, Plan 14, Plan 12, Plan 8, FFS, Plan 11, Plan 17, Plan 19, Plan 6, Plan 15, Plan 16, Plan 13, Plan 5, Plan 9, Plan 10

2002 Primary Series Vaccination Events
Medicaid Enrollees 0-2 Years Old

Legend: ■ Both Claims & MCIR   □ MCIR Only   ■ Claims Only

2002 Primary Series Vaccination Events
Medicaid Enrollees 3-6 Years Old

Legend: ■ Both Claims & MCIR □ MCIR Only ■ Claims Only

X-axis categories: Plan 1, Plan 2, Plan 3, Plan 18, Plan 11, Plan 20, Plan 14, Plan 12, Plan 7, Plan 15, Plan 6, FFS, Plan 8, Plan 17, Plan 16, Plan 9, Plan 5, Plan 13, Plan 19, Plan 10
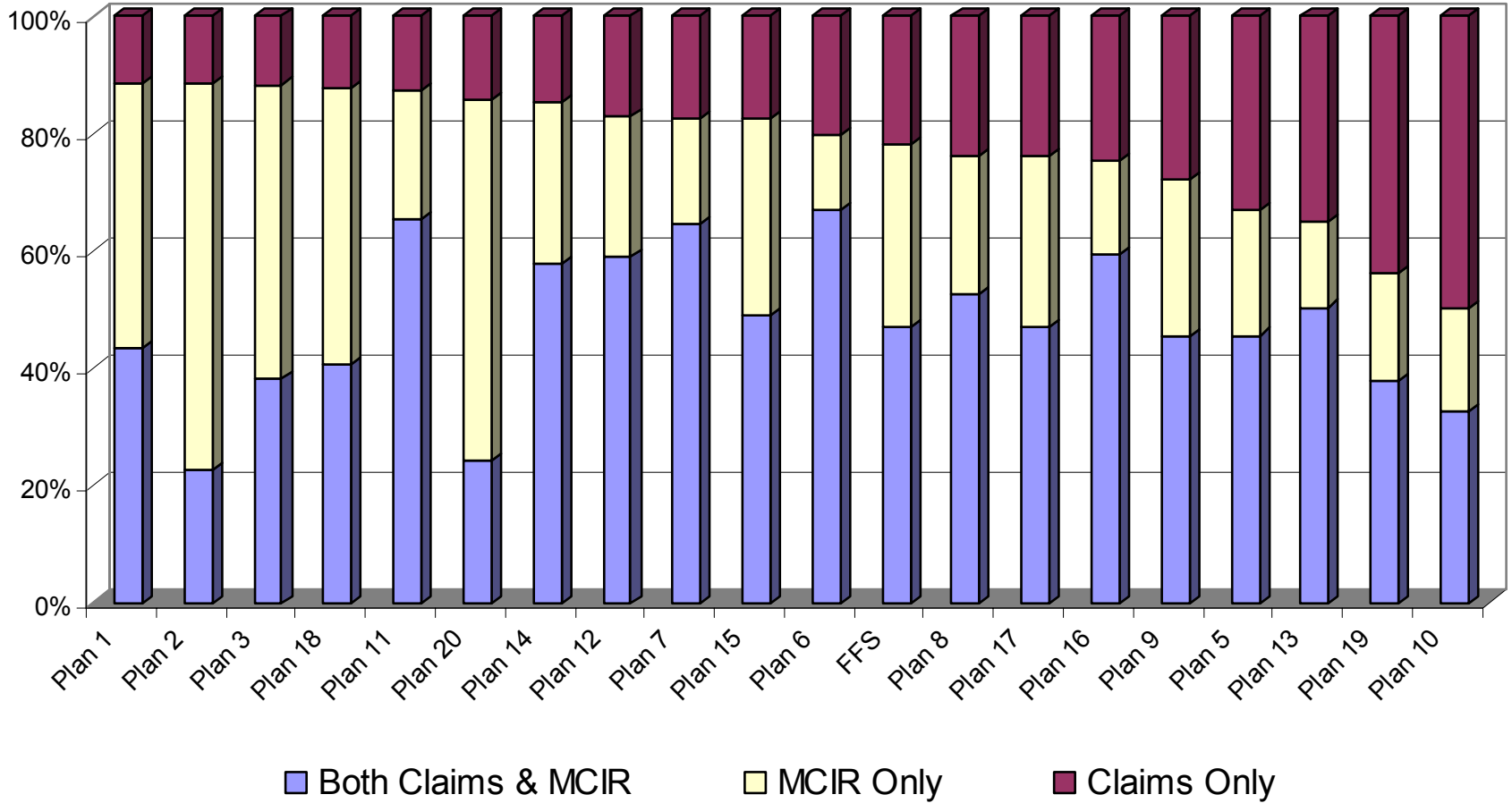
Identifying Administering Providers

- Dose administered / history code:
  - Tracks whether dose was administered or report vaccination history

  - Many doses are submitted to MCIR by batch process

  - 33% of vaccinations had missing codes

  - Difficult to determine administering provider records

Limitations

- Results reflect Medicaid enrollees only; MCIR completeness among other children may differ

- Claims data cannot reliably determine dose type

Conclusions

- MCIR completeness is:
  - highest among children < 36 months
  - lowest in urban areas
  - variable across health plans

- Provider profiling is limited by missing indicators for doses administered vs. history

Implications

- Important to continue MCIR efforts that focus on improving data quality

- Target MCIR outreach to urban providers

- Institute changes in MCIR design / data submission to improve completeness for vaccination administered / history indicator

Questions?

- E-mail: kjd@med.umich.edu