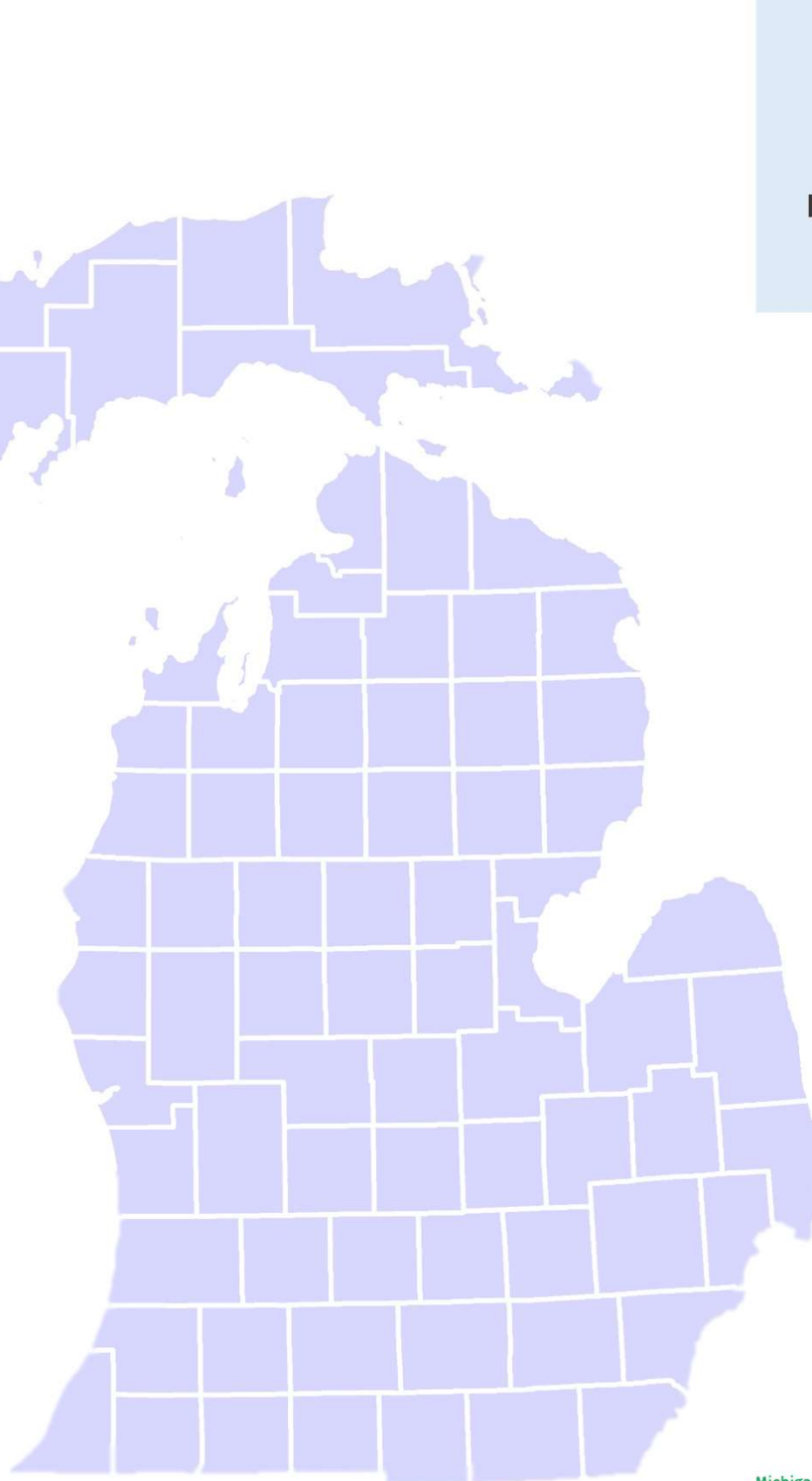




December 2019

Asthma Among Children in Michigan Medicaid:

2016 County Maps



Michigan Department of Health & Human Services

Asthma Among Children on Michigan Medicaid Overview

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Introduction

Asthma is a health condition in which swelling and mucus in the lungs cause narrow airways and make breathing difficult. While there is no cure for asthma, proper treatment can improve symptoms and prevent negative outcomes, such as hospitalization.

Michigan Medicaid is a program providing access to healthcare for Michigan residents with low incomes. The Michigan Department of Health and Human Services analyzes the records of Medicaid enrolled children to identify populations and areas that have a high burden of asthma, or low access to asthma care.

This report presents maps of asthma indicators that indicate the asthma burden for Medicaid enrolled children. These asthma indicators include emergency department (ED) and hospital visits, measures of treatment (e.g. 1+ Long Term Controller), and measures of healthcare access (e.g. Reliance on ED for Outpatient Care).

More information and data on asthma can be found at www.Michigan.gov/Asthma and www.Michigan.gov/AsthmaEPI.

Suggested citation: Daniel-Wayman S, Anderson B. Asthma Among Children on Michigan Medicaid: 2016 County Maps. Lansing, MI: Michigan Department of Health and Human Services, Lifecourse Epidemiology and Genomics Division, December 2019.

Medicaid Asthma Indicator Definitions

Persistent Asthma

The proportion of children in Medicaid (ages 5-17) with persistent asthma. Persistent asthma is defined according to the Health Plan and Employer Data and Information Set (HEDIS®) definition from the National Committee for Quality Assurance (NCQA). The criteria for this definition are:

- at least four occasions where asthma medicine is given out **OR**
- at least one visit to an emergency room where the primary reason was asthma **OR**
- at least one visit to the hospital where the primary reason was asthma **OR**
- at least four visits to a doctor where the primary reason was asthma and at least two occasions where asthma medicine is given out.

1+ Asthma Hospital Visits Among All Children in Medicaid

The number of children with one or more asthma hospital visits per 10,000 children (ages 5-17) in Medicaid in a year. An asthma hospital visit is one where asthma is the primary reason for the visit.

1+ Asthma ED Visits Among Children with Asthma (%)

The proportion of children (ages 5-17) in Medicaid with persistent asthma that had one or more asthma emergency department (ED) visits in a year. An asthma emergency department visit is one where asthma is the primary reason for the visit.

1+ Asthma ED Visits Among All Children in Medicaid

The number of children (ages 5-17) with one or more asthma emergency department visits per 10,000 children in Medicaid in a year. An asthma emergency department visit is one where asthma is the primary reason for the visit.

2+ Asthma ED Visits Among Children with Asthma (%)

The proportion of children (ages 5-17) in Medicaid with persistent asthma that had two or more asthma emergency department visits in a year. An asthma emergency department visit is one where asthma is the primary reason for the visit.

2+ Asthma ED Visits Among All Children in Medicaid

The number of children (ages 5-17) with two or more asthma emergency department visits per 10,000 children in Medicaid in a year. An asthma emergency department visit is one where asthma is the primary reason for the visit.

1+ Asthma Hospitalizations Among Children with Asthma (%)

The proportion of children (ages 5-17) in Medicaid with persistent asthma that had two or more asthma emergency department visits in a year. An asthma emergency department visit is one where asthma is the primary reason for the visit.

Medicaid Asthma Indicator Definitions

1+ Inhaled Steroids (%)

The proportion of children (ages 5-17) with persistent asthma in Medicaid who filled one or more prescriptions for inhaled steroids in a year.

1+ Long-Term Controller (%)

The proportion of children (ages 5-17) with persistent asthma in Medicaid who filled one or more prescriptions for a long-term controller medication in a year.

2+ Asthma Office Visits (%)

The proportion of children (ages 5-17) with persistent asthma in Medicaid that had 2 or more office visits for asthma in a year. This includes visits to a physician's office, but some home and urgent care visits may be included in this measure.

2+ Oral Corticosteroids (%)

The proportion of children (ages 5-17) with persistent asthma in Medicaid who filled two or more prescriptions for oral corticosteroids in a year.

7+ SABA Fills (%)

Short-acting Beta2-agonist (SABA). The proportion of children (ages 5-17) with persistent asthma in Medicaid who filled 7 or more prescriptions for quick relief medications in a year (SABAs) - an indicator of overuse of this medication.

Medication Adherence \geq 50% (%)

The percentage of children (ages 5-17) in Medicaid with persistent asthma who remained on an asthma controller medication at least 50 percent of the time from when the prescription was initially filled until the end of the calendar year.

Medication Adherence \geq 75% (%)

The percentage of children (ages 5-17) in Medicaid with persistent asthma who remained on an asthma controller medication at least 75 percent of the time from when the prescription was initially filled until the end of the calendar year.

Reliance on ED for Outpatient Care (%)

The percentage of children (ages 5-17) in Medicaid with persistent asthma who relied on the ED for more than one third of their outpatient doctor visits. ED reliance is defined as the percentage of all outpatient doctor visits for asthma that occur in the ED in a year. A higher percentage can indicate problems with access to coordinated care provided by a patient's regular doctor.

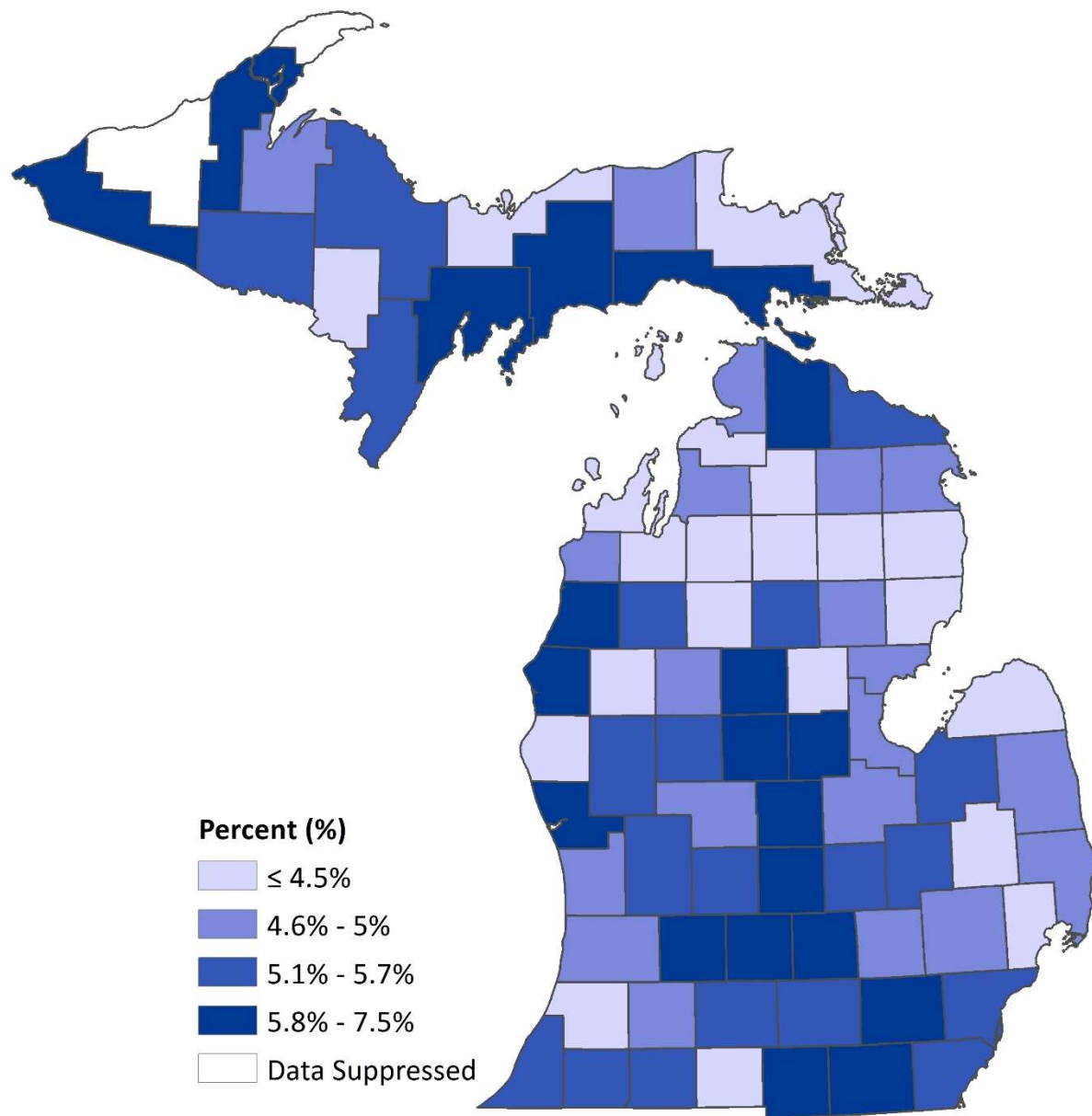
Population

These data include the Michigan Medicaid population aged 5 to 17 years of age (as of the last day of each respective calendar year) who had full Medicaid coverage and were not dually enrolled in any other insurance plan (such as Medicare) for at least 11 months of the measurement year.

Map of Michigan with County Names



Persistent Asthma

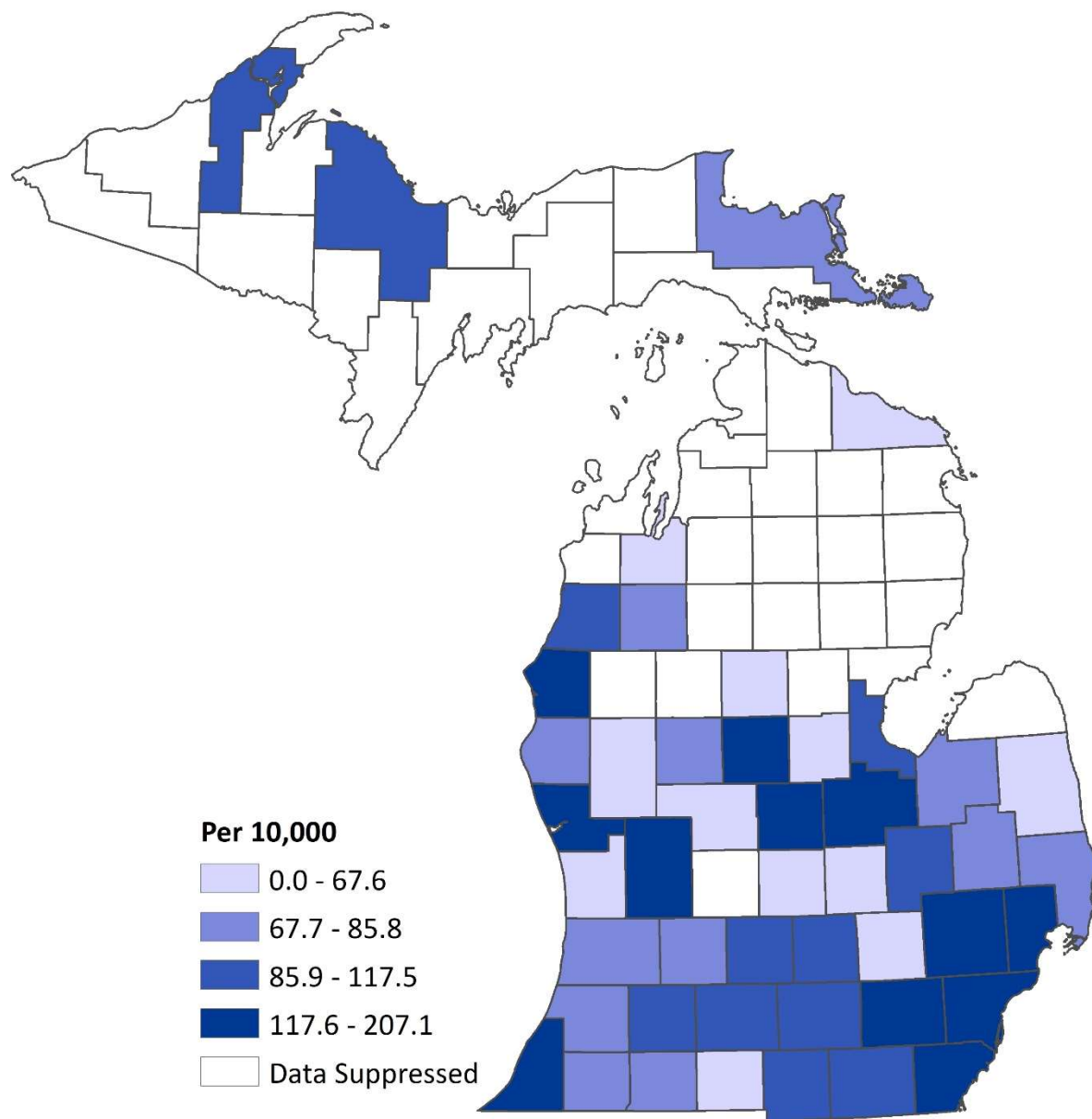


Persistent Asthma ^{a,b}			
County	Percent (%)	County	Percent (%)
Alcona	4.4	Lake	4.2
Alger	4.5	Lapeer	3.5
Allegan	4.8	Leelanau	4.0
Alpena	4.9	Lenawee	6.4
Antrim	4.7	Livingston	4.9
Arenac	4.8	Luce	4.6
Baraga	4.6	Mackinac	5.9
Barry	6.4	Macomb	4.5
Bay	5.0	Manistee	6.4
Benzie	4.6	Marquette	5.5
Berrien	5.1	Mason	5.9
Branch	4.3	Mecosta	5.2
Calhoun	5.2	Menominee	5.5
Cass	5.7	Midland	6.1
Charlevoix	4.3	Missaukee	4.0
Cheboygan	6.3	Monroe	5.1
Chippewa	4.3	Montcalm	5.0
Clare	5.9	Montmorency	4.7
Clinton	6.5	Muskegon	6.1
Crawford	3.8	Newaygo	5.4
Delta	6.1	Oakland	4.5
Dickinson	4.3	Oceana	4.4
Eaton	6.5	Ogemaw	4.7
Emmet	5.0	Ontonagon	~
Genesee	5.2	Osceola	4.7
Gladwin	4.4	Oscoda	4.4
Gogebic	6.1	Otsego	3.1
Grand Traverse	3.4	Ottawa	4.6
Gratiot	6.3	Presque Isle	5.2
Hillsdale	6.9	Roscommon	5.1
Houghton	7.0	Saginaw	4.6
Huron	4.1	St Clair	4.7
Ingham	6.6	St Joseph	5.1
Ionia	5.2	Sanilac	4.8
Iosco	4.1	Schoolcraft	6.3
Iron	5.7	Shiawassee	5.3
Isabella	7.5	Tuscola	5.4
Jackson	5.2	Van Buren	4.2
Kalamazoo	5.0	Washtenaw	7.3
Kalkaska	3.4	Wayne	5.5
Kent	5.5	Wexford	5.7
Keweenaw	~	State of Michigan	5.3

Data Notes:

^a Prevalence data taken from the Medicaid Data Warehouse, MDHHS, 2016. ^b County rate suppressed for total populations between 1 and 20 or numerators between 1 and 10.

1+ Asthma ED Visits Among All Children in Medicaid

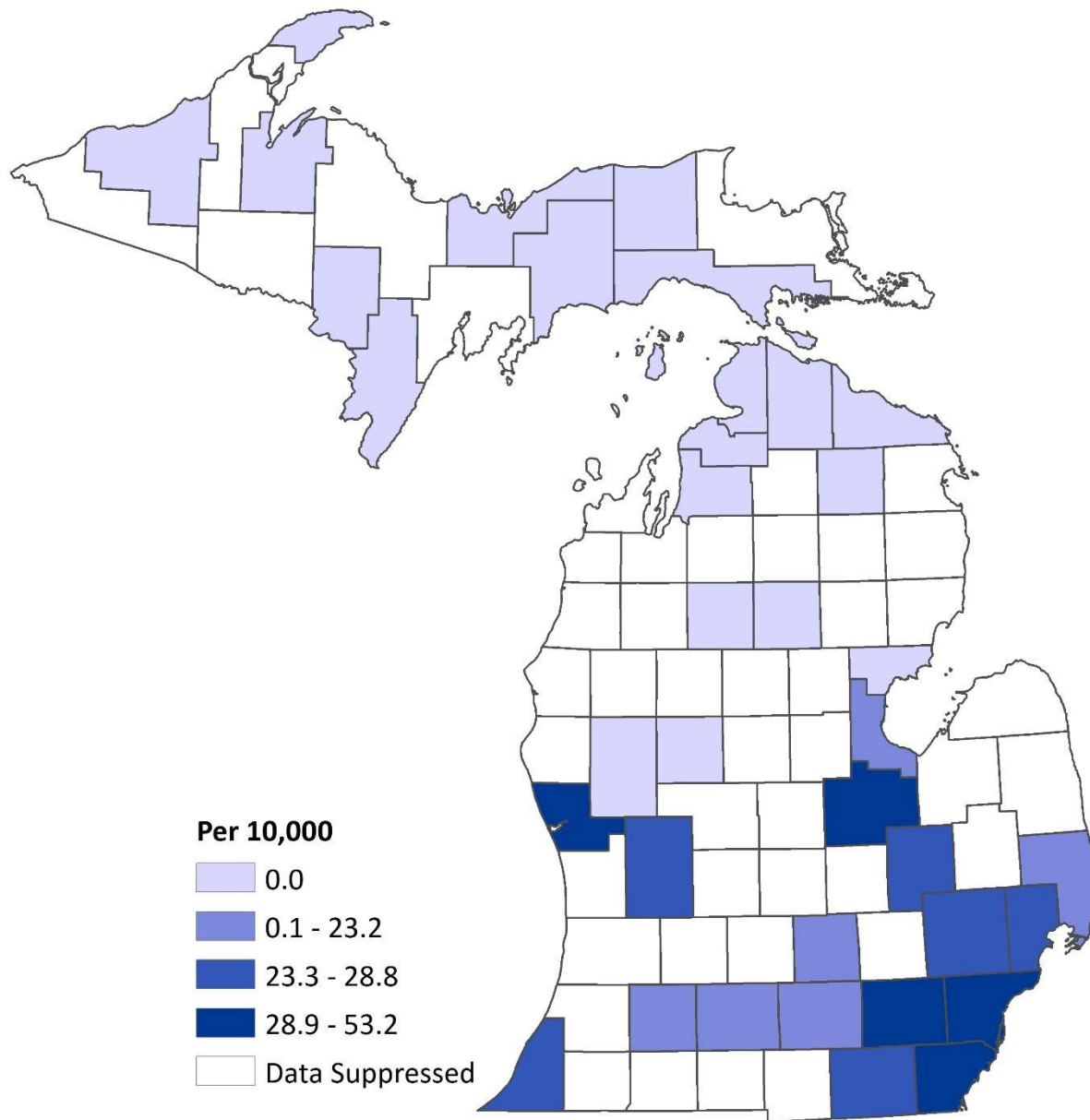


Asthma 1+ ED Visits Among All Children in Medicaid ^{a,b}			
County	Per 10,000	County	Per 10,000
Alcona	~	Lake	~
Alger	~	Lapeer	75.1
Allegan	75.4	Leelanau	~
Alpena	~	Lenawee	90.9
Antrim	~	Livingston	65.4
Arenac	~	Luce	~
Baraga	~	Mackinac	~
Barry	84.7	Macomb	126.6
Bay	98.5	Manistee	105.0
Benzie	~	Marquette	117.5
Berrien	132.9	Mason	123.9
Branch	56.1	Mecosta	75.1
Calhoun	96.1	Menominee	~
Cass	71.2	Midland	56.9
Charlevoix	~	Missaukee	~
Cheboygan	~	Monroe	130.0
Chippewa	70.2	Montcalm	65.6
Clare	59.1	Montmorency	~
Clinton	56.3	Muskegon	157.1
Crawford	~	Newaygo	67.6
Delta	~	Oakland	131.8
Dickinson	~	Oceana	85.1
Eaton	100.1	Ogemaw	~
Emmet	~	Ontonagon	~
Genesee	106.0	Osceola	~
Gladwin	~	Oscoda	~
Gogebic	~	Otsego	~
Grand Traverse	34.1	Ottawa	55.5
Gratiot	131.6	Presque Isle	0.0
Hillsdale	97.2	Roscommon	~
Houghton	87.0	Saginaw	119.0
Huron	~	St Clair	77.3
Ingham	110.2	St Joseph	85.8
Ionia	~	Sanilac	58.6
Iosco	~	Schoolcraft	~
Iron	~	Shiawassee	64.3
Isabella	131.3	Tuscola	75.4
Jackson	106.7	Van Buren	80.8
Kalamazoo	98.7	Washtenaw	161.7
Kalkaska	~	Wayne	207.1
Kent	124.9	Wexford	84.5
Keweenaw	~	State of Michigan	132.1

Data Notes:

^a Prevalence data taken from the Medicaid Data Warehouse, MDHHS, 2016. ^b County rate suppressed for total populations between 1 and 20 or numerators between 1 and 10.

2+ Asthma ED Visits Among All Children in Medicaid

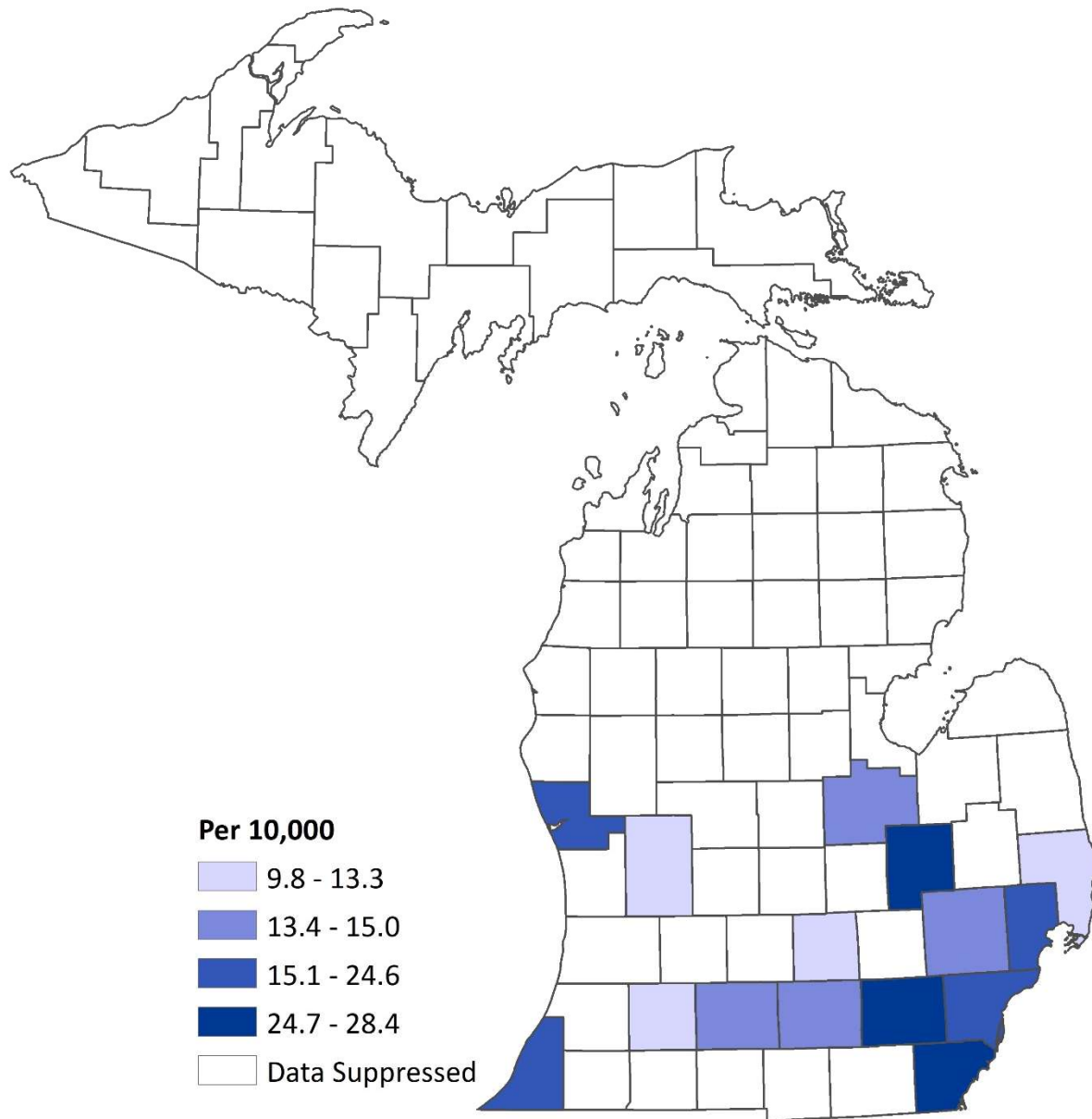


Asthma 2+ ED Visits Among All Children in Medicaid ^{a,b}			
County	Per 10,000	County	Per 10,000
Alcona	~	Lake	~
Alger	0.0	Lapeer	~
Allegan	~	Leelanau	~
Alpena	~	Lenawee	24.4
Antrim	0.0	Livingston	~
Arenac	0.0	Luce	0.0
Baraga	0.0	Mackinac	0.0
Barry	~	Macomb	27.4
Bay	23.2	Manistee	~
Benzie	~	Marquette	~
Berrien	26.8	Mason	~
Branch	~	Mecosta	0.0
Calhoun	17.7	Menominee	0.0
Cass	~	Midland	~
Charlevoix	0.0	Missaukee	0.0
Cheboygan	0.0	Monroe	28.9
Chippewa	~	Montcalm	~
Clare	~	Montmorency	0.0
Clinton	~	Muskegon	41.1
Crawford	~	Newaygo	0.0
Delta	~	Oakland	27.7
Dickinson	0.0	Oceana	~
Eaton	~	Ogemaw	~
Emmet	0.0	Ontonagon	0.0
Genesee	26.6	Osceola	~
Gladwin	~	Oscoda	~
Gogebic	~	Otsego	~
Grand Traverse	~	Ottawa	~
Gratiot	~	Presque Isle	0.0
Hillsdale	~	Roscommon	0.0
Houghton	~	Saginaw	29.1
Huron	~	St Clair	15.7
Ingham	21.1	St Joseph	~
Ionia	~	Sanilac	~
Iosco	~	Schoolcraft	0.0
Iron	~	Shiawassee	~
Isabella	~	Tuscola	~
Jackson	14.5	Van Buren	~
Kalamazoo	18.7	Washtenaw	29.8
Kalkaska	~	Wayne	53.2
Kent	28.8	Wexford	~
Keweenaw	0.0	State of Michigan	29.9

Data Notes:

^a Prevalence data taken from the Medicaid Data Warehouse, MDHHS, 2016. ^b County rate suppressed for total populations between 1 and 20 or numerators between 1 and 10.

1+ Asthma Hospital Visits Among All Children in Medicaid

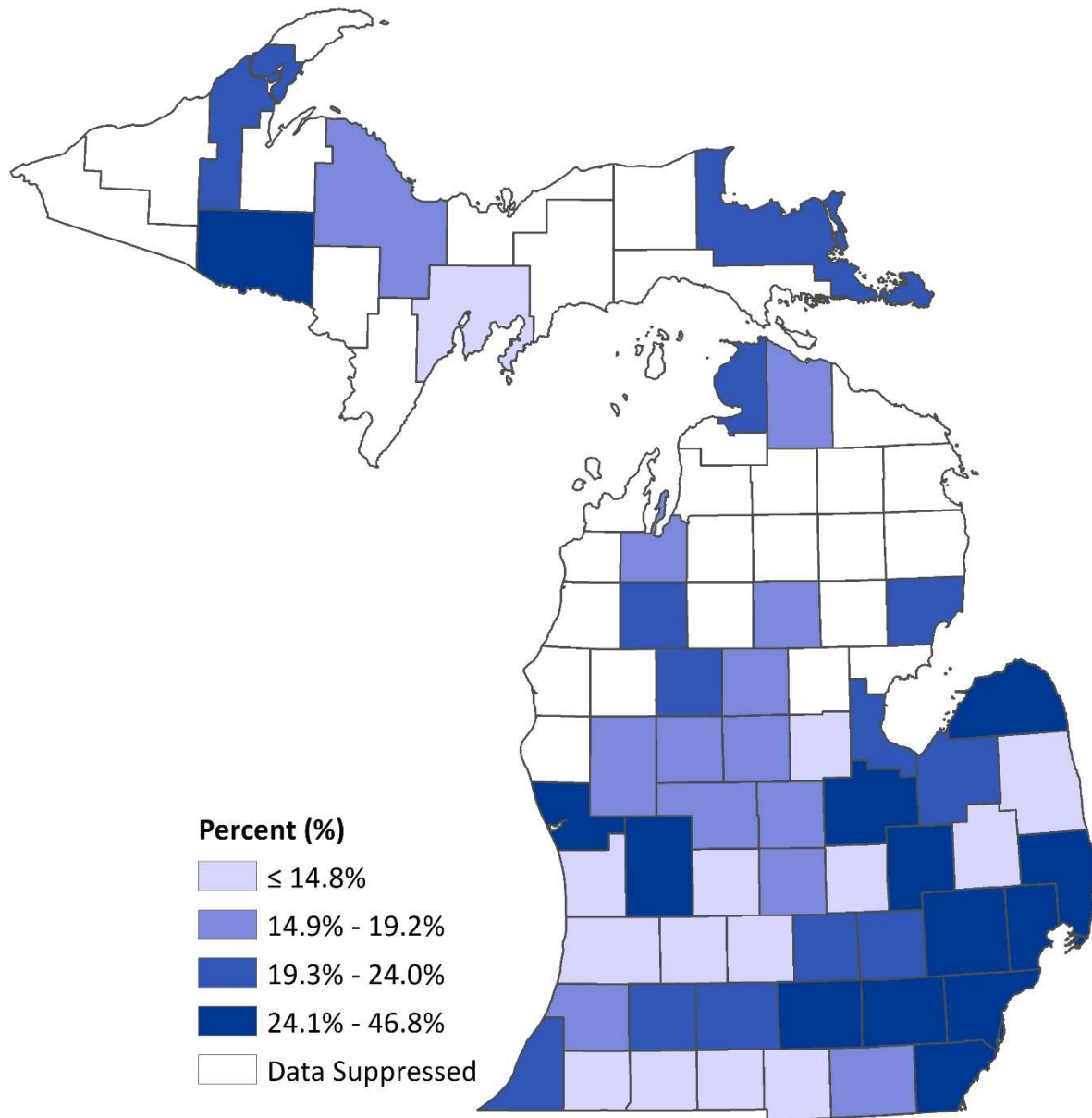


Asthma 1+ Hospital Visits Among All Children in Medicaid ^{a,b}			
County	Per 10,000	County	Per 10,000
Alcona	~	Lake	~
Alger	~	Lapeer	~
Allegan	~	Leelanau	~
Alpena	~	Lenawee	~
Antrim	~	Livingston	~
Arenac	~	Luce	~
Baraga	~	Mackinac	~
Barry	~	Macomb	18.0
Bay	~	Manistee	~
Benzie	~	Marquette	~
Berrien	15.6	Mason	~
Branch	~	Mecosta	~
Calhoun	13.9	Menominee	~
Cass	~	Midland	~
Charlevoix	~	Missaukee	~
Cheboygan	~	Monroe	25.3
Chippewa	~	Montcalm	~
Clare	~	Montmorency	~
Clinton	~	Muskegon	17.0
Crawford	~	Newaygo	~
Delta	~	Oakland	14.7
Dickinson	~	Oceana	~
Eaton	~	Ogemaw	~
Emmet	~	Ontonagon	~
Genesee	28.4	Osceola	~
Gladwin	~	Oscoda	~
Gogebic	~	Otsego	~
Grand Traverse	~	Ottawa	~
Gratiot	~	Presque Isle	~
Hillsdale	~	Roscommon	~
Houghton	~	Saginaw	15.0
Huron	~	St Clair	13.3
Ingham	9.8	St Joseph	~
Ionia	~	Sanilac	~
Iosco	~	Schoolcraft	~
Iron	~	Shiawassee	~
Isabella	~	Tuscola	~
Jackson	14.5	Van Buren	~
Kalamazoo	9.8	Washtenaw	25.8
Kalkaska	~	Wayne	24.6
Kent	13.1	Wexford	~
Keweenaw	~	State of Michigan	16.4

Data Notes:

^a Prevalence data taken from the Medicaid Data Warehouse, MDHHS, 2016. ^b County rate suppressed for total populations between 1 and 20 or numerators between 1 and 10.

1+ Asthma ED Visits Among Children with Asthma (%)

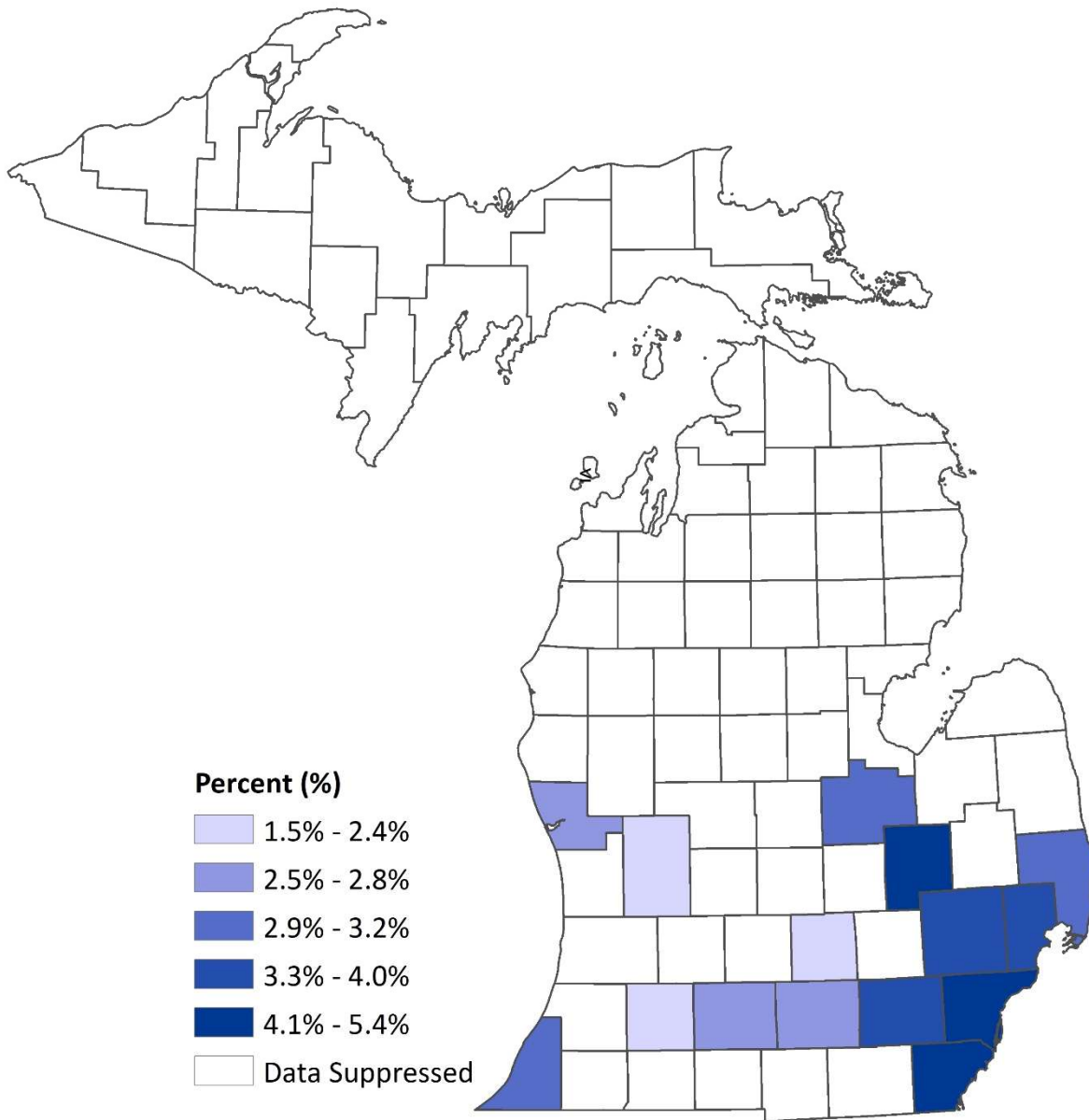


1+ Asthma ED Visits Among Children with Asthma ^{a,b}			
County	Percent (%)	County	Percent (%)
Alcona	~	Lake	~
Alger	~	Lapeer	14.6
Allegan	12.8	Leelanau	~
Alpena	~	Lenawee	16.4
Antrim	~	Livingston	19.7
Arenac	~	Luce	~
Baraga	~	Mackinac	~
Barry	14.2	Macomb	33.6
Bay	24.0	Manistee	~
Benzie	~	Marquette	15.4
Berrien	22.6	Mason	~
Branch	12.2	Mecosta	15.1
Calhoun	23.8	Menominee	~
Cass	13.8	Midland	10.9
Charlevoix	~	Missaukee	~
Cheboygan	16.1	Monroe	36.9
Chippewa	21.7	Montcalm	17.2
Clare	18.1	Montmorency	~
Clinton	16.4	Muskegon	28.0
Crawford	~	Newaygo	16.5
Delta	11.8	Oakland	32.2
Dickinson	~	Oceana	~
Eaton	13.5	Ogemaw	~
Emmet	22.6	Ontonagon	~
Genesee	35.5	Osceola	21.6
Gladwin	~	Oscoda	~
Gogebic	~	Otsego	~
Grand Traverse	17.5	Ottawa	14.8
Gratiot	16.4	Presque Isle	~
Hillsdale	13.1	Roscommon	16.9
Houghton	19.6	Saginaw	46.8
Huron	26.8	St Clair	25.9
Ingham	20.7	St Joseph	12.7
Ionia	10.7	Sanilac	13.7
Iosco	22.2	Schoolcraft	~
Iron	34.3	Shiawassee	10.1
Isabella	14.9	Tuscola	22.2
Jackson	26.7	Van Buren	19.2
Kalamazoo	23.6	Washtenaw	27.0
Kalkaska	~	Wayne	45.3
Kent	24.8	Wexford	23.9
Keweenaw	~	State of Michigan	25.1

Data Notes:

^a Prevalence data taken from the Medicaid Data Warehouse, MDHHS, 2016. ^b County rate suppressed for total populations between 1 and 20 or numerators between 1 and 10.

1+ Asthma Hospital Visits Among Children with Asthma (%)

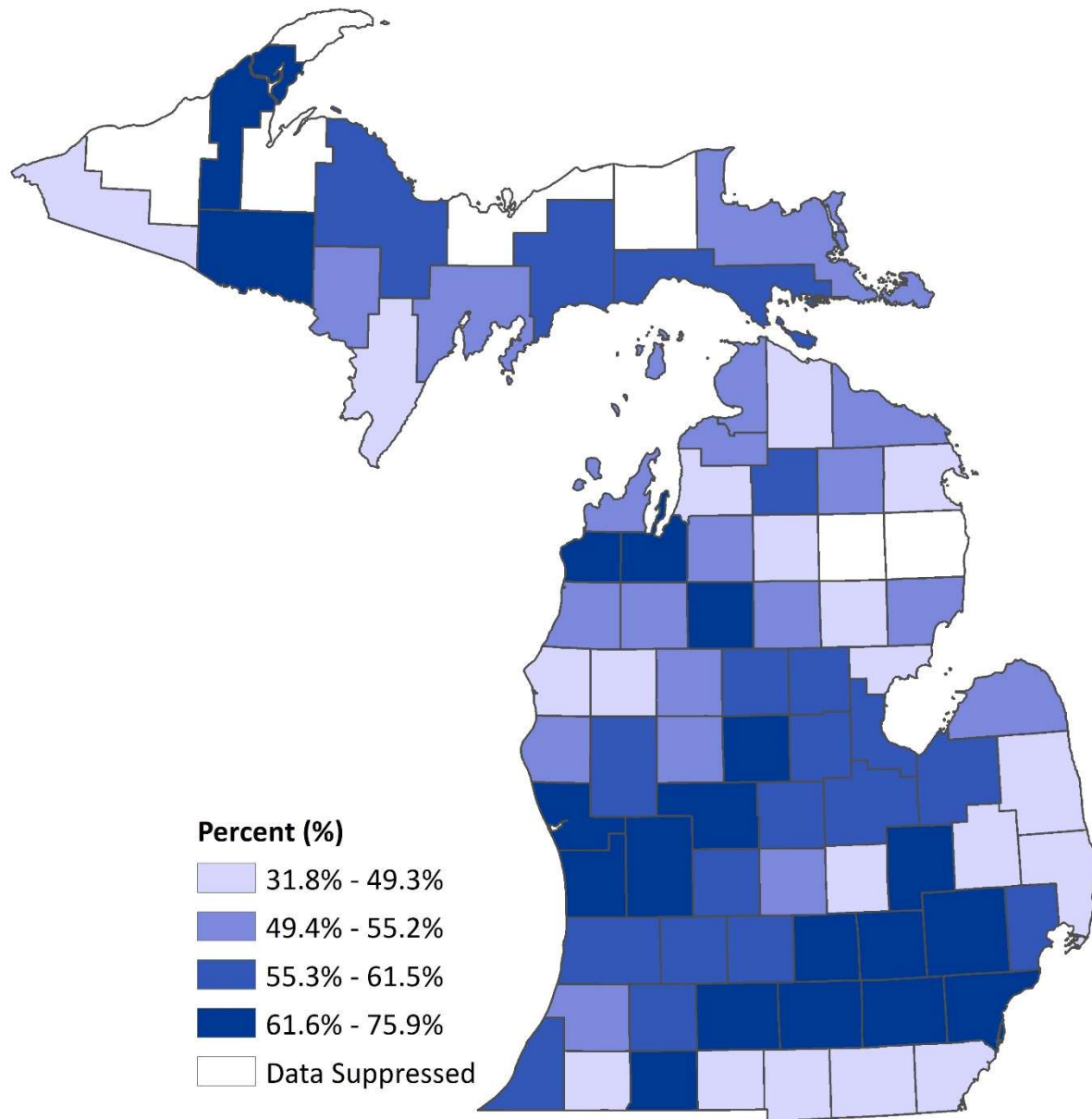


1+ Asthma Hospital Visits Among Children with Asthma ^{a,b}			
County	Percent (%)	County	Percent (%)
Alcona	~	Lake	~
Alger	~	Lapeer	~
Allegan	~	Leelanau	~
Alpena	~	Lenawee	~
Antrim	~	Livingston	~
Arenac	~	Luce	~
Baraga	~	Mackinac	~
Barry	~	Macomb	4.0
Bay	~	Manistee	~
Benzie	~	Marquette	~
Berrien	3.0	Mason	~
Branch	~	Mecosta	~
Calhoun	2.7	Menominee	~
Cass	~	Midland	~
Charlevoix	~	Missaukee	~
Cheboygan	~	Monroe	5.0
Chippewa	~	Montcalm	~
Clare	~	Montmorency	~
Clinton	~	Muskegon	2.8
Crawford	~	Newaygo	~
Delta	~	Oakland	3.2
Dickinson	~	Oceana	~
Eaton	~	Ogemaw	~
Emmet	~	Ontonagon	~
Genesee	5.4	Osceola	~
Gladwin	~	Oscoda	~
Gogebic	~	Otsego	~
Grand Traverse	~	Ottawa	~
Gratiot	~	Presque Isle	~
Hillsdale	~	Roscommon	~
Houghton	~	Saginaw	3.2
Huron	~	St Clair	2.8
Ingham	1.5	St Joseph	~
Ionia	~	Sanilac	~
Iosco	~	Schoolcraft	~
Iron	~	Shiawassee	~
Isabella	~	Tuscola	~
Jackson	2.8	Van Buren	~
Kalamazoo	2.0	Washtenaw	3.5
Kalkaska	~	Wayne	4.4
Kent	2.4	Wexford	~
Keweenaw	~	State of Michigan	3.1

Data Notes:

^a Prevalence data taken from the Medicaid Data Warehouse, MDHHS, 2016. ^b County rate suppressed for total populations between 1 and 20 or numerators between 1 and 10.

1+ Inhaled Steroids (%)

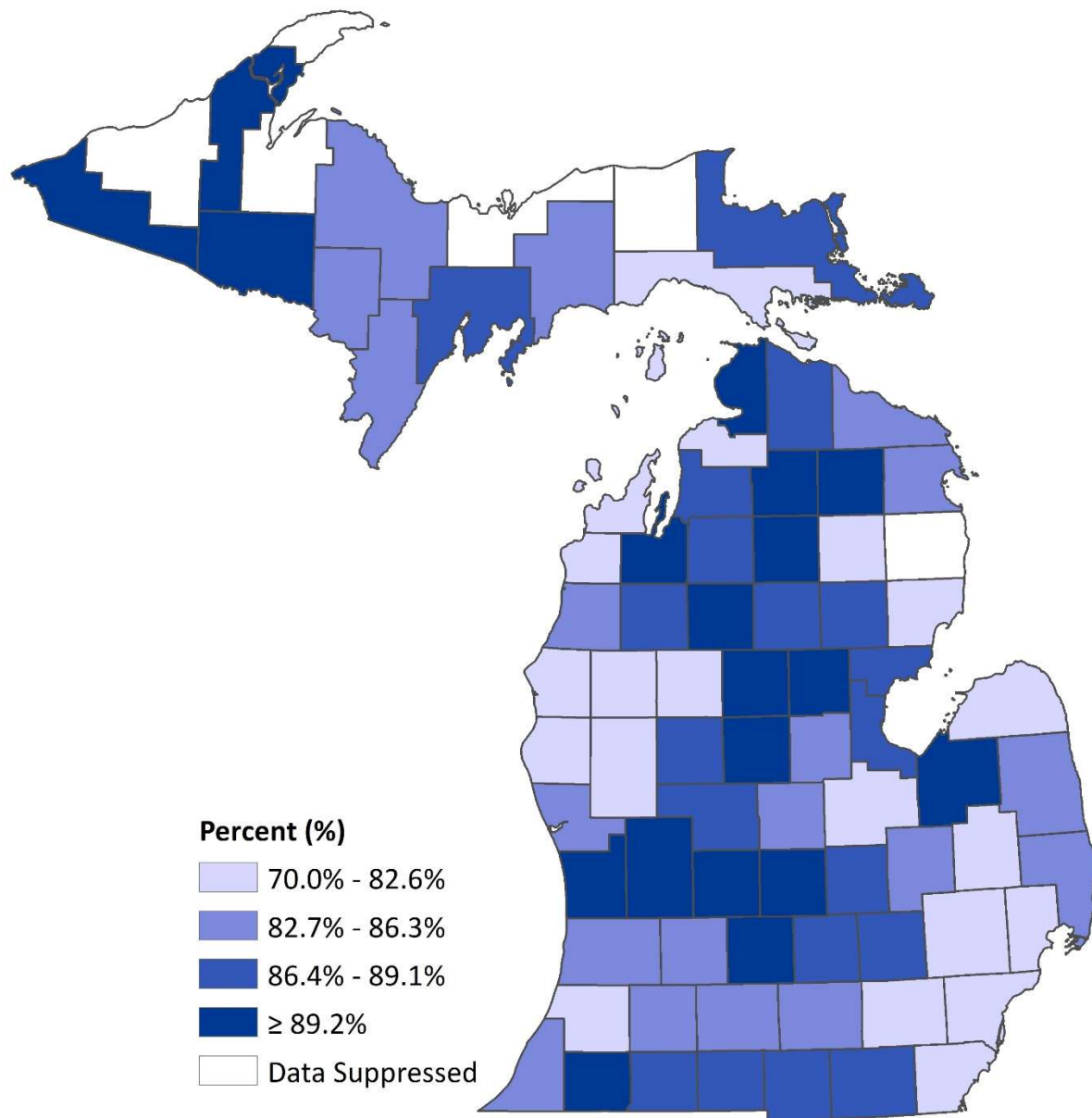


1+ Inhaled Steroids ^{a,b}			
County	Percent (%)	County	Percent (%)
Alcona	~	Lake	40.0
Alger	~	Lapeer	47.1
Allegan	61.2	Leelanau	54.5
Alpena	48.6	Lenawee	48.6
Antrim	35.2	Livingston	74.8
Arenac	47.5	Luce	~
Baraga	~	Mackinac	56.5
Barry	59.7	Macomb	59.8
Bay	59.5	Manistee	50.7
Benzie	62.2	Marquette	59.5
Berrien	56.2	Mason	38.5
Branch	37.4	Mecosta	52.1
Calhoun	64.7	Menominee	49.0
Cass	41.4	Midland	59.8
Charlevoix	53.1	Missaukee	63.2
Cheboygan	45.5	Monroe	49.3
Chippewa	52.9	Montcalm	62.6
Clare	57.3	Montmorency	52.2
Clinton	53.2	Muskegon	63.7
Crawford	46.4	Newaygo	59.4
Delta	55.2	Oakland	61.5
Dickinson	52.1	Oceana	51.1
Eaton	61.0	Ogemaw	40.6
Emmet	52.9	Ontonagon	~
Genesee	69.0	Osceola	50.7
Gladwin	57.4	Oscoda	~
Gogebic	31.8	Otsego	57.8
Grand Traverse	65.3	Ottawa	62.6
Gratiot	57.8	Presque Isle	53.3
Hillsdale	39.2	Roscommon	51.5
Houghton	74.4	Saginaw	58.5
Huron	50.9	St Clair	48.5
Ingham	66.4	St Joseph	63.9
Ionia	59.0	Sanilac	49.1
Iosco	51.8	Schoolcraft	60.7
Iron	66.7	Shiawassee	48.3
Isabella	70.6	Tuscola	58.6
Jackson	64.8	Van Buren	54.1
Kalamazoo	61.5	Washtenaw	72.3
Kalkaska	51.3	Wayne	64.6
Kent	75.9	Wexford	54.4
Keweenaw	~	State of Michigan	62.3

Data Notes:

^a Prevalence data taken from the Medicaid Data Warehouse, MDHHS, 2016. ^b County rate suppressed for total populations between 1 and 20 or numerators between 1 and 10.

1+ Long-Term Controller (%)

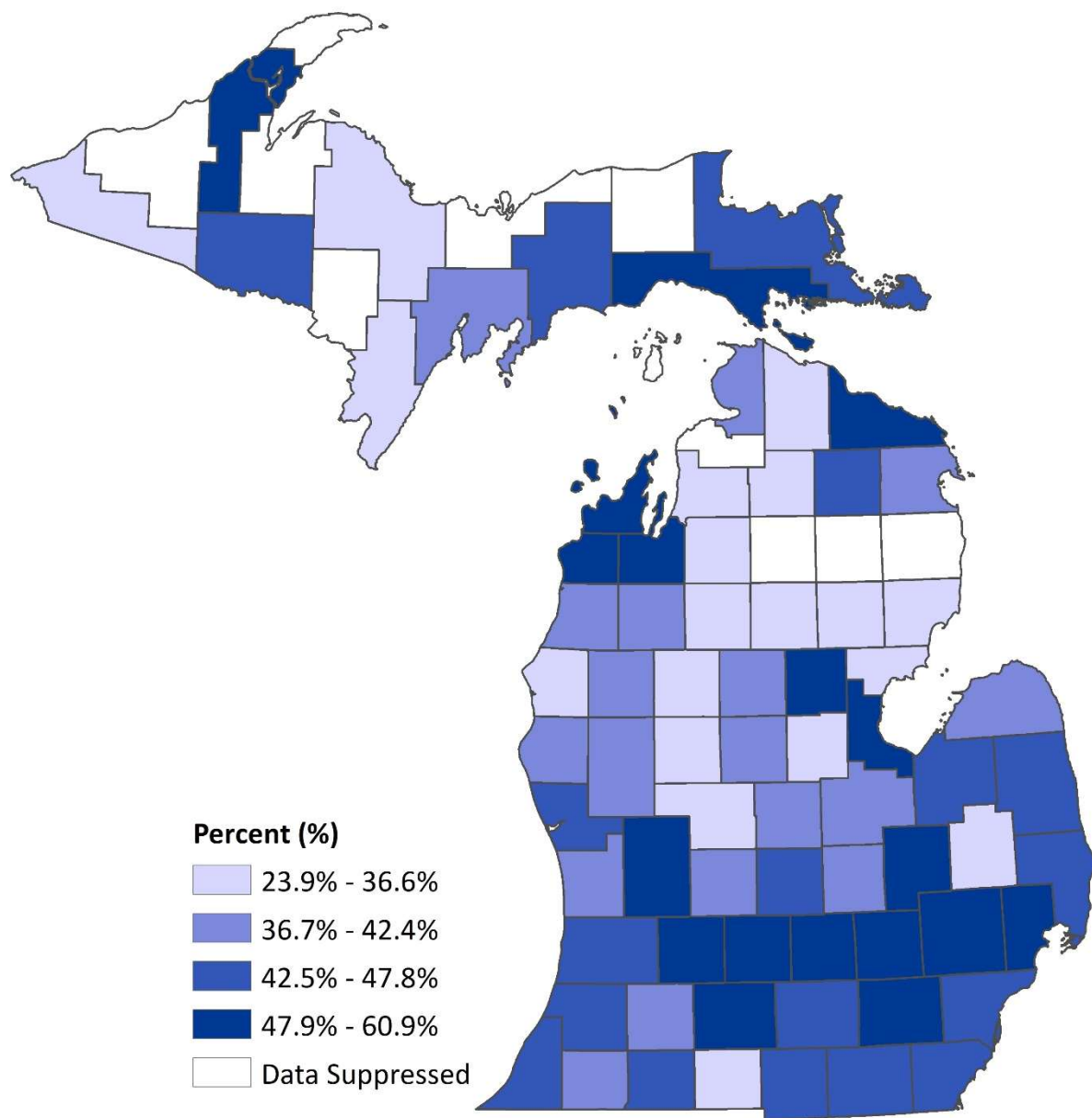


1+ Long-Term Controller ^{a,b}			
County	Percent (%)	County	Percent (%)
Alcona	~	Lake	70.0
Alger	~	Lapeer	77.9
Allegan	85.2	Leelanau	77.3
Alpena	83.8	Lenawee	87.5
Antrim	87.0	Livingston	87.6
Arenac	87.5	Luce	~
Baraga	~	Mackinac	82.6
Barry	86.1	Macomb	77.4
Bay	88.4	Manistee	86.3
Benzie	78.4	Marquette	83.3
Berrien	82.6	Mason	75.8
Branch	87.9	Mecosta	88.5
Calhoun	86.1	Menominee	83.7
Cass	89.7	Midland	85.1
Charlevoix	81.6	Missaukee	89.5
Cheboygan	87.1	Monroe	73.9
Chippewa	88.2	Montcalm	87.9
Clare	89.1	Montmorency	95.7
Clinton	92.8	Muskegon	85.4
Crawford	100.0	Newaygo	82.5
Delta	86.7	Oakland	77.8
Dickinson	83.3	Oceana	78.4
Eaton	89.4	Ogemaw	89.1
Emmet	94.1	Ontonagon	~
Genesee	85.2	Osceola	79.1
Gladwin	90.7	Oscoda	76.2
Gogebic	90.9	Otsego	91.1
Grand Traverse	90.1	Ottawa	91.4
Gratiot	85.9	Presque Isle	83.3
Hillsdale	88.3	Roscommon	88.2
Houghton	89.3	Saginaw	81.9
Huron	82.5	St Clair	83.5
Ingham	89.0	St Joseph	88.0
Ionia	92.4	Sanilac	84.0
Iosco	75.0	Schoolcraft	85.7
Iron	90.9	Shiawassee	87.8
Isabella	89.3	Tuscola	89.8
Jackson	82.9	Van Buren	80.7
Kalamazoo	82.8	Washtenaw	81.6
Kalkaska	87.2	Wayne	72.4
Kent	90.7	Wexford	86.8
Keweenaw	~	State of Michigan	81.0

Data Notes:

^a Prevalence data taken from the Medicaid Data Warehouse, MDHHS, 2016. ^b County rate suppressed for total populations between 1 and 20 or numerators between 1 and 10.

2+ Asthma Office Visits (%)

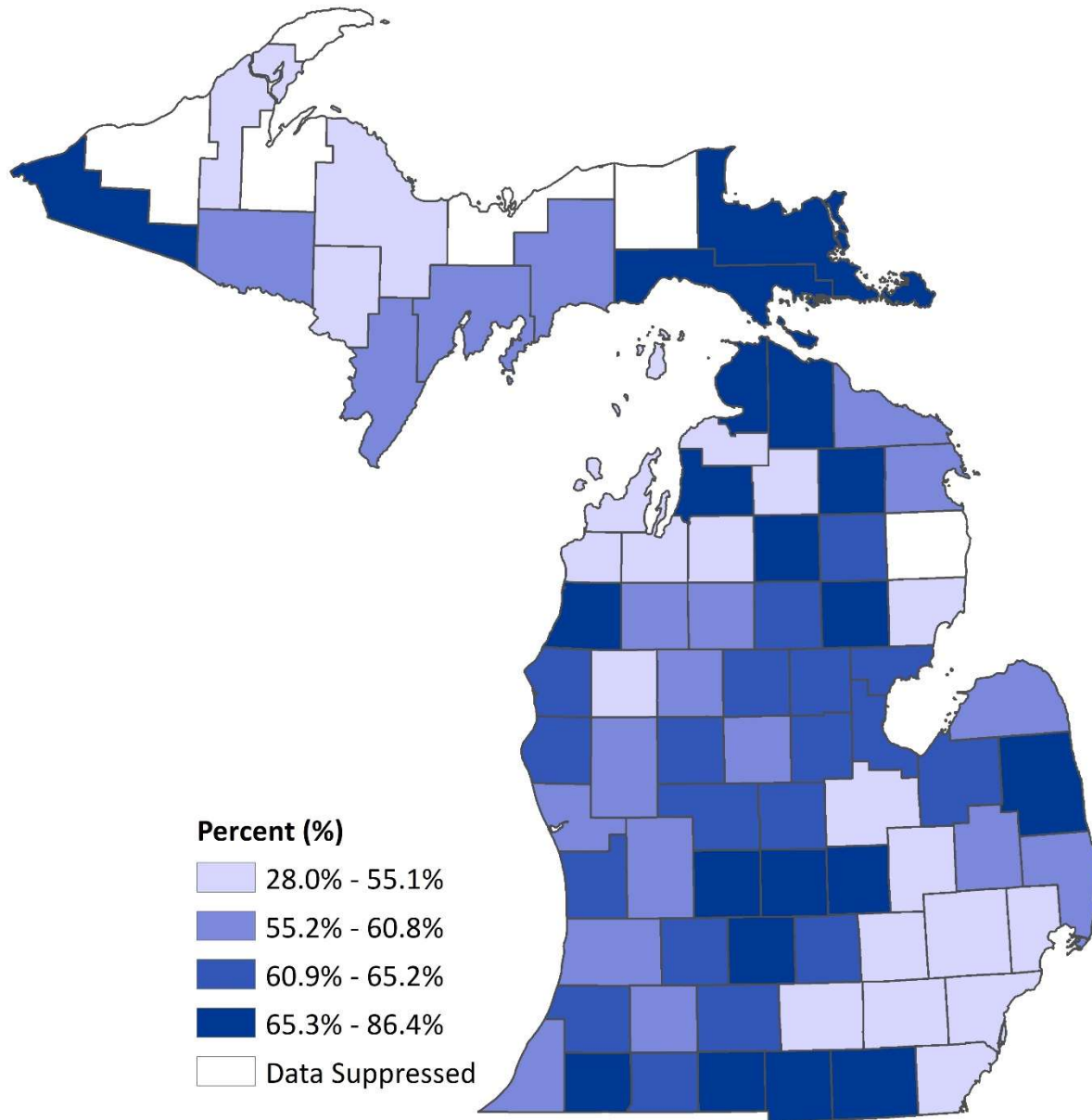


2+ Asthma Office Visits ^{a,b}			
County	Percent (%)	County	Percent (%)
Alcona	~	Lake	36.7
Alger	~	Lapeer	33.1
Allegan	43.6	Leelanau	50.0
Alpena	40.5	Lenawee	45.8
Antrim	33.3	Livingston	52.5
Arenac	32.5	Luce	~
Baraga	~	Mackinac	60.9
Barry	49.3	Macomb	56.2
Bay	48.3	Manistee	37.0
Benzie	51.4	Marquette	31.0
Berrien	47.7	Mason	31.9
Branch	33.6	Mecosta	33.3
Calhoun	52.3	Menominee	26.5
Cass	37.9	Midland	36.6
Charlevoix	~	Missaukee	34.2
Cheboygan	36.6	Monroe	43.2
Chippewa	44.1	Montcalm	34.5
Clare	40.9	Montmorency	47.8
Clinton	46.0	Muskegon	46.8
Crawford	~	Newaygo	41.3
Delta	39.0	Oakland	51.2
Dickinson	~	Oceana	37.5
Eaton	49.6	Ogemaw	28.1
Emmet	41.2	Ontonagon	~
Genesee	55.0	Osceola	23.9
Gladwin	51.9	Oscoda	~
Gogebic	25.0	Otsego	28.9
Grand Traverse	54.5	Ottawa	41.4
Gratiot	38.5	Presque Isle	50.0
Hillsdale	43.3	Roscommon	26.5
Houghton	55.4	Saginaw	41.3
Huron	36.8	St Clair	46.6
Ingham	50.5	St Joseph	43.5
Ionia	37.5	Sanilac	47.2
Iosco	35.7	Schoolcraft	46.4
Iron	42.4	Shiawassee	37.8
Isabella	42.4	Tuscola	43.3
Jackson	45.1	Van Buren	46.4
Kalamazoo	41.0	Washtenaw	57.0
Kalkaska	35.9	Wayne	45.2
Kent	48.2	Wexford	39.5
Keweenaw	~	State of Michigan	45.1

Data Notes:

^a Prevalence data taken from the Medicaid Data Warehouse, MDHHS, 2016. ^b County rate suppressed for total populations between 1 and 20 or numerators between 1 and 10.

2+ Oral Corticosteroids (%)

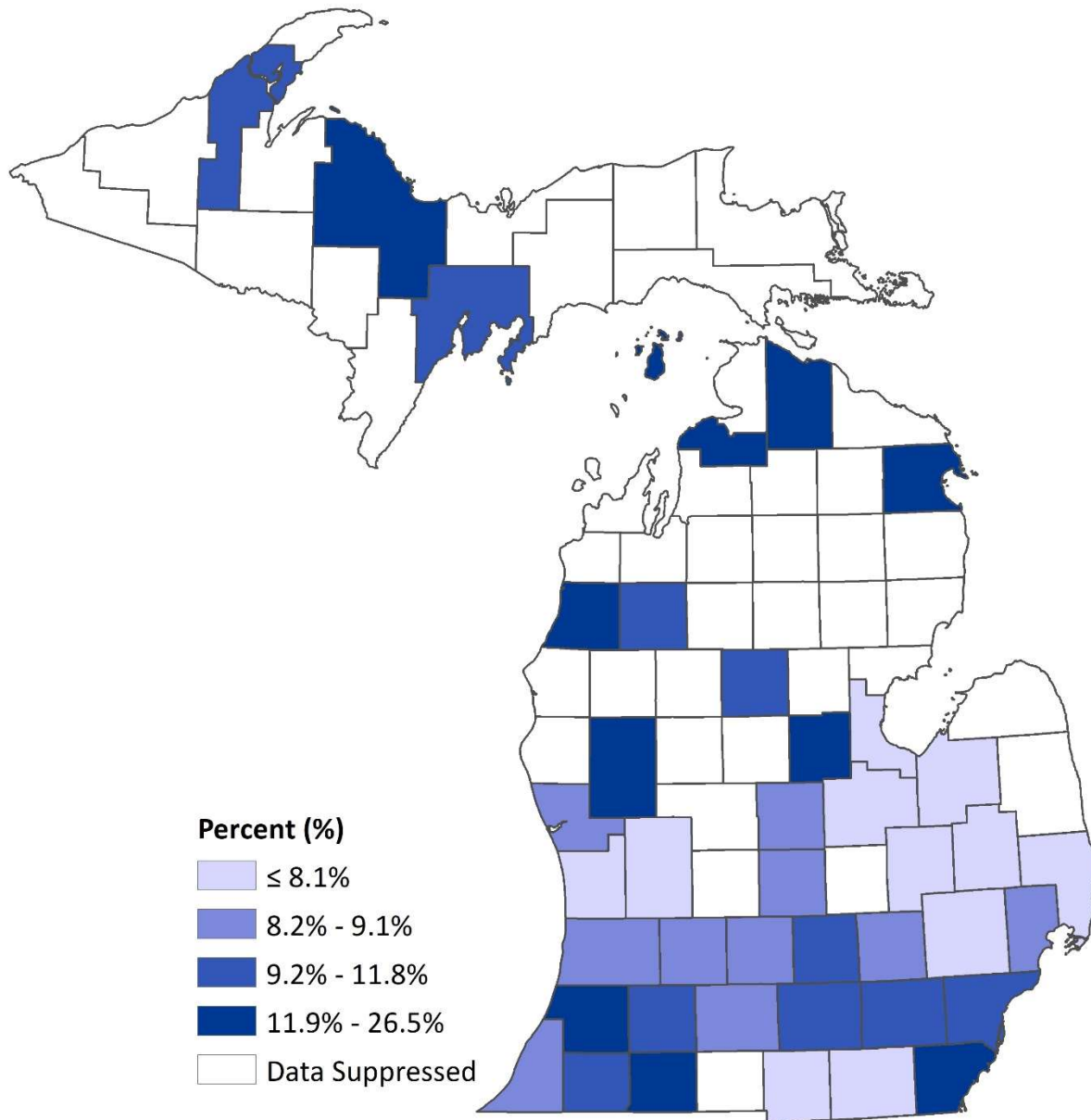


2+ Oral Corticosteroids ^{a,b}			
County	Percent (%)	County	Percent (%)
Alcona	~	Lake	50.0
Alger	~	Lapeer	55.1
Allegan	55.2	Leelanau	54.5
Alpena	60.8	Lenawee	67.0
Antrim	66.7	Livingston	43.6
Arenac	65.0	Luce	~
Baraga	~	Mackinac	65.2
Barry	64.6	Macomb	45.9
Bay	62.2	Manistee	69.9
Benzie	43.2	Marquette	54.8
Berrien	58.1	Mason	63.7
Branch	79.4	Mecosta	64.6
Calhoun	61.1	Menominee	59.2
Cass	77.2	Midland	63.9
Charlevoix	55.1	Missaukee	60.5
Cheboygan	69.3	Monroe	47.1
Chippewa	67.6	Montcalm	63.2
Clare	63.6	Montmorency	69.6
Clinton	75.5	Muskegon	59.9
Crawford	82.1	Newaygo	57.5
Delta	57.1	Oakland	44.7
Dickinson	50.0	Oceana	64.8
Eaton	67.3	Ogemaw	67.2
Emmet	70.6	Ontonagon	~
Genesee	53.5	Osceola	56.7
Gladwin	63.0	Oscoda	61.9
Gogebic	86.4	Otsego	46.7
Grand Traverse	52.9	Ottawa	64.0
Gratiot	65.2	Presque Isle	60.0
Hillsdale	73.7	Roscommon	64.7
Houghton	46.3	Saginaw	50.8
Huron	56.1	St Clair	60.6
Ingham	63.7	St Joseph	64.9
Ionia	75.7	Sanilac	66.0
Iosco	50.0	Schoolcraft	60.7
Iron	60.6	Shiawassee	67.8
Isabella	56.5	Tuscola	63.1
Jackson	46.5	Van Buren	60.9
Kalamazoo	58.1	Washtenaw	33.5
Kalkaska	51.3	Wayne	28.0
Kent	56.1	Wexford	60.5
Keweenaw	~	State of Michigan	47.6

Data Notes:

^a Prevalence data taken from the Medicaid Data Warehouse, MDHHS, 2016. ^b County rate suppressed for total populations between 1 and 20 or numerators between 1 and 10.

7+ SABA Fills (%)

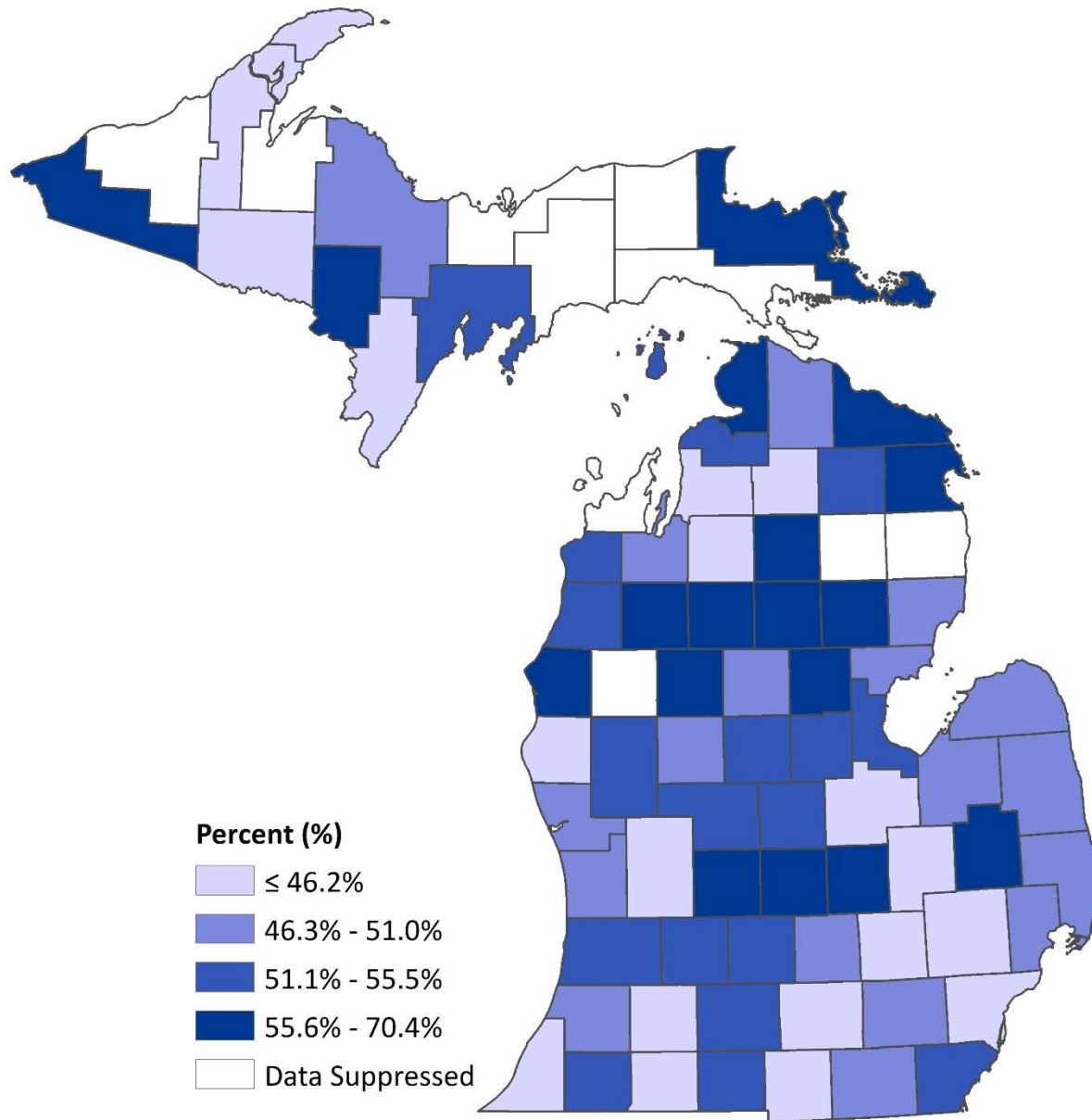


7+ SABA Fills ^{a,b}			
County	Percent (%)	County	Percent (%)
Alcona	~	Lake	~
Alger	~	Lapeer	8.1
Allegan	8.4	Leelanau	~
Alpena	18.9	Lenawee	4.9
Antrim	~	Livingston	8.9
Arenac	~	Luce	~
Baraga	~	Mackinac	~
Barry	8.3	Macomb	9.0
Bay	7.3	Manistee	17.8
Benzie	~	Marquette	16.7
Berrien	8.7	Mason	~
Branch	~	Mecosta	~
Calhoun	9.0	Menominee	~
Cass	9.7	Midland	13.4
Charlevoix	26.5	Missaukee	~
Cheboygan	11.9	Monroe	15.4
Chippewa	~	Montcalm	~
Clare	11.8	Montmorency	~
Clinton	8.6	Muskegon	8.5
Crawford	~	Newaygo	11.9
Delta	11.4	Oakland	7.8
Dickinson	~	Oceana	~
Eaton	9.1	Ogemaw	~
Emmet	~	Ontonagon	~
Genesee	8.1	Osceola	~
Gladwin	~	Oscoda	~
Gogebic	~	Otsego	~
Grand Traverse	~	Ottawa	5.6
Gratiot	8.9	Presque Isle	~
Hillsdale	7.6	Roscommon	~
Houghton	10.7	Saginaw	5.7
Huron	~	St Clair	8.0
Ingham	9.1	St Joseph	12.0
Ionia	~	Sanilac	~
Iosco	~	Schoolcraft	~
Iron	~	Shiawassee	~
Isabella	~	Tuscola	7.0
Jackson	11.0	Van Buren	14.5
Kalamazoo	9.6	Washtenaw	9.7
Kalkaska	~	Wayne	9.2
Kent	4.5	Wexford	9.6
Keweenaw	~	State of Michigan	8.8

Data Notes:

^a Prevalence data taken from the Medicaid Data Warehouse, MDHHS, 2016. ^b County rate suppressed for total populations between 1 and 20 or numerators between 1 and 10.

Medication Adherence ≥ 50% (%)

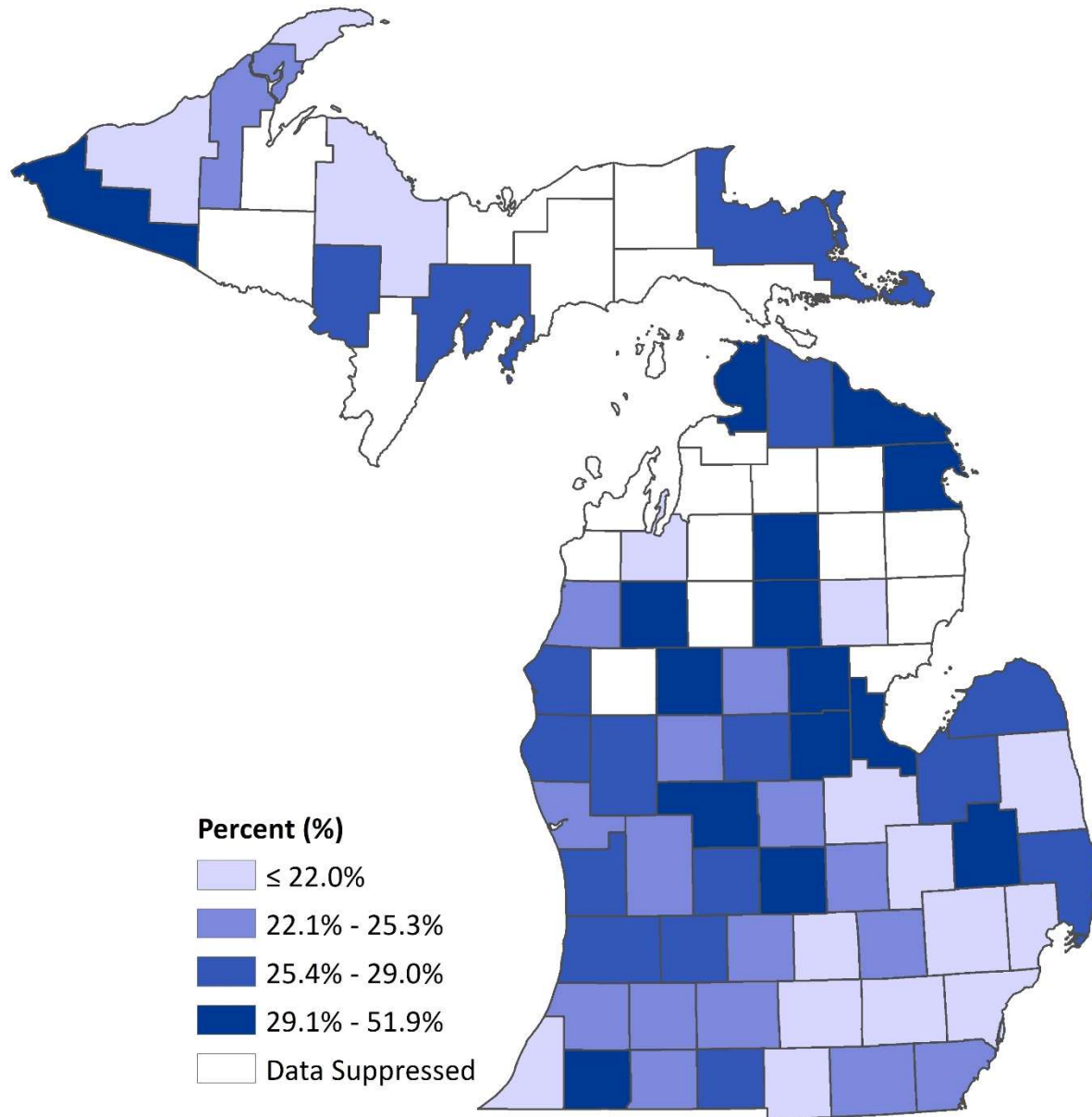


Medication Adherence 50% ^{a,b}			
County	Percent (%)	County	Percent (%)
Alcona	~	Lake	~
Alger	~	Lapeer	60.2
Allegan	54.5	Leelanau	~
Alpena	62.9	Lenawee	49.6
Antrim	34.8	Livingston	43.2
Arenac	48.6	Luce	~
Baraga	~	Mackinac	~
Barry	51.6	Macomb	46.4
Bay	54.8	Manistee	54.0
Benzie	55.2	Marquette	50.0
Berrien	44.6	Mason	67.6
Branch	54.8	Mecosta	48.2
Calhoun	51.7	Menominee	44.7
Cass	53.1	Midland	55.5
Charlevoix	55.0	Missaukee	55.9
Cheboygan	48.9	Monroe	51.9
Chippewa	59.3	Montcalm	53.3
Clare	48.5	Montmorency	52.4
Clinton	63.6	Muskegon	50.5
Crawford	70.4	Newaygo	51.5
Delta	52.7	Oakland	43.3
Dickinson	57.5	Oceana	45.6
Eaton	54.9	Ogemaw	56.1
Emmet	57.1	Ontonagon	~
Genesee	41.3	Osceola	66.0
Gladwin	67.3	Oscoda	~
Gogebic	57.5	Otsego	36.6
Grand Traverse	46.7	Ottawa	51.0
Gratiot	55.3	Presque Isle	64.0
Hillsdale	31.1	Roscommon	63.3
Houghton	45.8	Saginaw	46.2
Huron	47.8	St Clair	47.7
Ingham	46.3	St Joseph	45.8
Ionia	59.5	Sanilac	47.2
Iosco	50.0	Schoolcraft	~
Iron	41.4	Shiawassee	56.7
Isabella	51.6	Tuscola	49.6
Jackson	43.0	Van Buren	46.4
Kalamazoo	44.5	Washtenaw	46.5
Kalkaska	35.3	Wayne	39.1
Kent	45.8	Wexford	60.2
Keweenaw	0.0	State of Michigan	45.6

Data Notes:

^a Prevalence data taken from the Medicaid Data Warehouse, MDHHS, 2016. ^b County rate suppressed for total populations between 1 and 20 or numerators between 1 and 10.

Medication Adherence ≥ 75% (%)

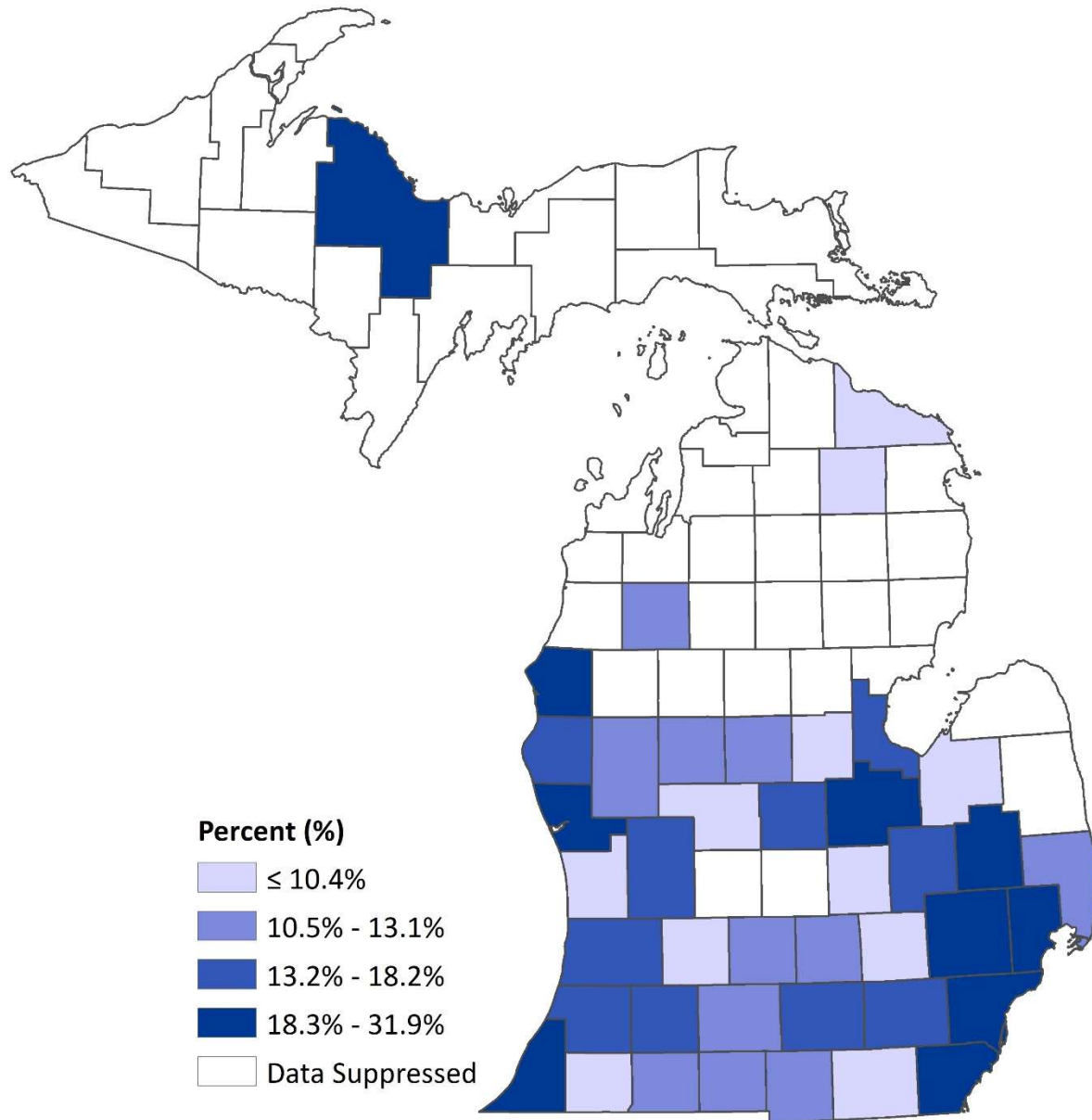


Medication Adherence 75% ^{a,b}			
County	Percent (%)	County	Percent (%)
Alcona	~	Lake	~
Alger	~	Lapeer	33.0
Allegan	28.9	Leelanau	~
Alpena	32.3	Lenawee	23.2
Antrim	~	Livingston	23.9
Arenac	~	Luce	~
Baraga	~	Mackinac	~
Barry	28.7	Macomb	22.0
Bay	29.4	Manistee	22.2
Benzie	~	Marquette	20.6
Berrien	18.2	Mason	26.5
Branch	28.0	Mecosta	23.5
Calhoun	22.9	Menominee	~
Cass	33.6	Midland	35.4
Charlevoix	~	Missaukee	~
Cheboygan	27.3	Monroe	22.8
Chippewa	25.4	Montcalm	31.6
Clare	23.7	Montmorency	~
Clinton	34.1	Muskegon	25.3
Crawford	51.9	Newaygo	26.5
Delta	28.6	Oakland	19.8
Dickinson	27.5	Oceana	27.9
Eaton	22.8	Ogemaw	21.1
Emmet	36.5	Ontonagon	0.0
Genesee	16.8	Osceola	34.0
Gladwin	38.8	Oscoda	~
Gogebic	45.0	Otsego	~
Grand Traverse	18.7	Ottawa	27.3
Gratiot	24.6	Presque Isle	44.0
Hillsdale	13.2	Roscommon	30.0
Houghton	22.4	Saginaw	20.1
Huron	28.3	St Clair	25.5
Ingham	21.9	St Joseph	23.8
Ionia	29.0	Sanilac	21.3
Iosco	~	Schoolcraft	~
Iron	~	Shiawassee	24.8
Isabella	25.8	Tuscola	25.9
Jackson	20.9	Van Buren	23.8
Kalamazoo	24.3	Washtenaw	21.8
Kalkaska	~	Wayne	15.7
Kent	22.7	Wexford	29.6
Keweenaw	0.0	State of Michigan	21.2

Data Notes:

^a Prevalence data taken from the Medicaid Data Warehouse, MDHHS, 2016. ^b County rate suppressed for total populations between 1 and 20 or numerators between 1 and 10.

Reliance on ED for Outpatient Care (%)



Reliance on ED for Outpatient Care ^{a,b}			
County	Percent (%)	County	Percent (%)
Alcona	~	Lake	~
Alger	~	Lapeer	18.4
Allegan	13.2	Leelanau	~
Alpena	~	Lenawee	10.4
Antrim	~	Livingston	10.4
Arenac	~	Luce	~
Baraga	~	Mackinac	~
Barry	9.7	Macomb	21.3
Bay	15.8	Manistee	~
Benzie	~	Marquette	18.3
Berrien	20.8	Mason	19.8
Branch	11.2	Mecosta	12.5
Calhoun	12.2	Menominee	~
Cass	7.6	Midland	7.2
Charlevoix	~	Missaukee	~
Cheboygan	~	Monroe	19.6
Chippewa	~	Montcalm	8.6
Clare	~	Montmorency	0.0
Clinton	~	Muskegon	20.4
Crawford	~	Newaygo	11.3
Delta	~	Oakland	23.6
Dickinson	~	Oceana	18.2
Eaton	12.2	Ogemaw	~
Emmet	~	Ontonagon	~
Genesee	15.6	Osceola	~
Gladwin	~	Oscoda	~
Gogebic	~	Otsego	~
Grand Traverse	~	Ottawa	9.9
Gratiot	15.6	Presque Isle	0.0
Hillsdale	11.7	Roscommon	~
Houghton	~	Saginaw	20.8
Huron	~	St Clair	12.6
Ingham	13.1	St Joseph	12.0
Ionia	~	Sanilac	~
Iosco	~	Schoolcraft	~
Iron	~	Shiawassee	7.8
Isabella	11.3	Tuscola	10.2
Jackson	16.7	Van Buren	14.6
Kalamazoo	14.9	Washtenaw	15.0
Kalkaska	~	Wayne	31.9
Kent	16.2	Wexford	10.5
Keweenaw	~	State of Michigan	20.2

Data Notes:

^a Prevalence data taken from the Medicaid Data Warehouse, MDHHS, 2016. ^b County rate suppressed for total populations between 1 and 20 or numerators between 1 and 10.