The Census Multidimensional Deprivation Index (MDI): Revised and Updated

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What is multidimensional deprivation?

- Cumulative effect of income and non-income-based deprivations
- A more expansive view of well-being than income-based poverty measures.
- As of 2020, 26 countries used multidimensional measures as their official measure of poverty
- United Nations 2030 Sustainable Development Goal – reduce poverty in all its dimensions

Motivation

The Census Bureau released its first MDI report in the Spring of 2019

- The MDI included six dimensions: standard of living; education; health; economic security; housing quality; and neighborhood quality

Neighborhood quality was measured at the county level

- Most counties are too large to represent neighborhoods

- Masks significant heterogeneity within counties

Economic security, housing quality, and health dimensions needed revisions

- Indicators not adequately measuring the dimensions

Purpose

1. Revise the definitions of four out of the six dimensions of the MDI and provide revised estimates for 2010 through 2017.

2. Provide new MDI rates for 2018 and 2019.

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Data & Methods

Data

- 1-year American Community Survey (ACS)

- Area Deprivation Index (ADI) – index of 17 socioeconomic indicators from the 5-year ACS at the block group level; created by researchers at the University of Wisconsin-Madison

  - Education, employment, income, housing, household composition, and household resources

  - Block groups are ranked from 1=least disadvantaged to 100=most disadvantaged

Methods

- Alkire-Foster Method

  - Calculate deprivation in individual dimensions

  - Count number of deprivations for each person

  - MDI = Percent of people deprived in at least two dimensions

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Changes to the Multidimensional Deprivation Index

Dimensions	2019 Census Report	Current paper
Standard of living	In poverty according to the official poverty measure	No change
Education	Aged 19 or older and without a high school diploma or GED[a]	No change
Health	Predicted health status[b] is poor.	**Under age 65:** Lacked health insurance. **Age 65 and over:** Lacked health insurance or Reported at least two disabilities.
Economic security	At least two of the following conditions[c]: 1) Lacked health insurance 2) Unemployed at the time of the survey AND did not work during the prior 12 months[a] 3) Average hours worked was less than 20 hours and there was no retirement income in the household.	**Under age 65:** • Over age 18 and unemployed at time of the survey OR • Average household hours worked OR average household weeks worked for working-age adults was less than 20 hours a week or less than 26 weeks a year, respectively **Age 65 and over:** • Unemployed at the time of the survey OR • Worked less than 20 hours a week OR less than 26 weeks a year AND had minimal retirement income
Housing quality	At least two of the following conditions: 1) Lacked complete kitchen 2) Lacked complete plumbing 3) Overcrowded housing unit 4) High cost burden	Lived in a housing unit with more than two people per bedroom or lived in an emergency or transitional shelter.
Neighborhood quality	Lived in a county with at least two of the following: 1) High crime 2) Poor air quality 3) Poor food environment	Lived in a deprived block group as measured by the Area Deprivation Index (ADI): all block groups with an ADI score greater than 90.

[a] For people age 18 and under, this is with respect to the householder.
[b] There are no questions about health status in the ACS. However, data on both age and disabilities are available in both the ACS and the CPS ASEC and the CPS ASEC asks about health status. Health status is regressed on age and disabilities in the CPS ASEC and these values are used to predict health status in the ACS. Based on cutoff value of 3 for people under age 65 and 3.5 for people age 65 and over.
[c] For people 65 and over, only one of these conditions is necessary.

Why neighborhood quality is important

Among people in poverty:

- Those who live in wealthier neighborhoods have better outcomes than those in disadvantaged neighborhoods (Ludwig et. al 2011; Ludwig et. al 2012; Hu et. al 2018)
    - Health, subjective well-being, child success

Negative effects for people living in deprived areas:

- With respect to earnings, education, health, crime involvement, and other life outcomes (Jencks and Mayer 1990; Ellen and Turner 1997; Sampson, Raudenbush, and Earls 1997; Kawachi and Berkman 2003; Sampson, Morenoff, and Gannon-Rowley 2002; Sampson 2012; Ludwig et. al 2013)

**Moving to Opportunity project - Moving to lower poverty neighborhoods led to:**

- Improved college attendance rates and earnings (Chetty, Hendren, and Katz 2015)
- Improved adult physical and mental health and subjective well-being (Ludwig et. al 2013)
- Lower poverty rates (Kling, Liebman, and Katz 2005)
- Increased safety and improved health among household heads(Katz, Kling, and Liebman 2000)

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Results

Compare estimates using new methodology to estimates using 2019 Census report methodology (2017 estimates)

The MDI and Individual Dimensions Compared: 2017
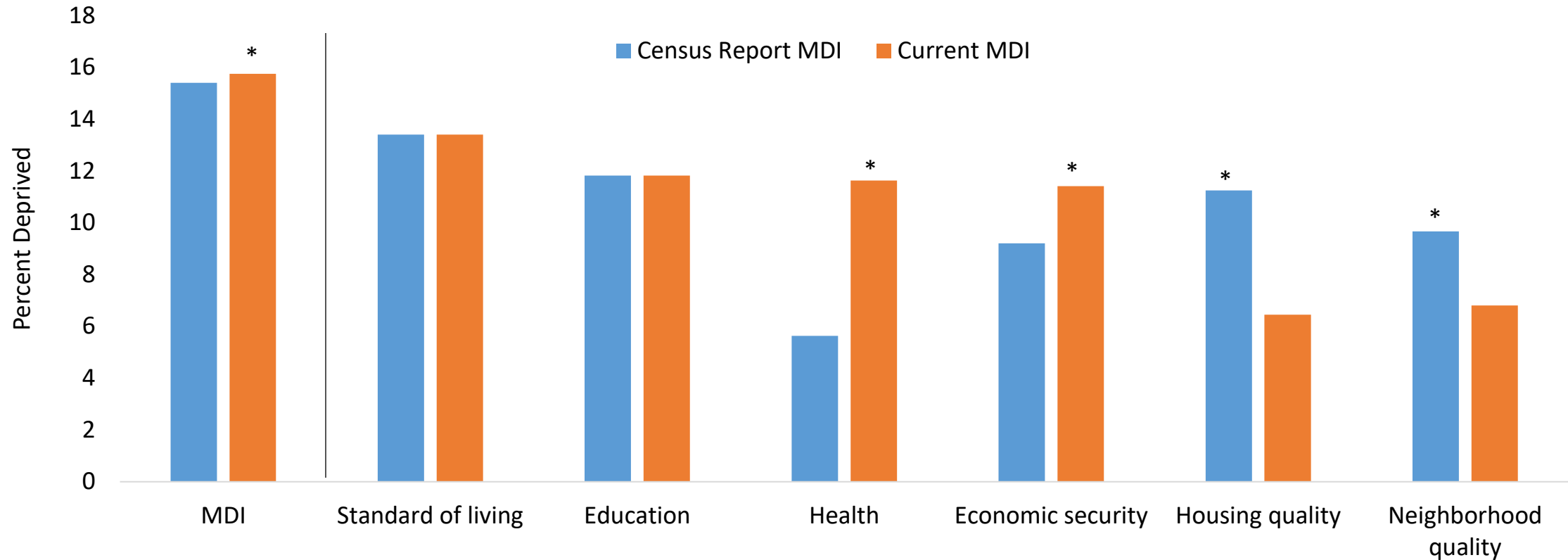
* Deprivation rate is higher at the 90 percent confidence level.
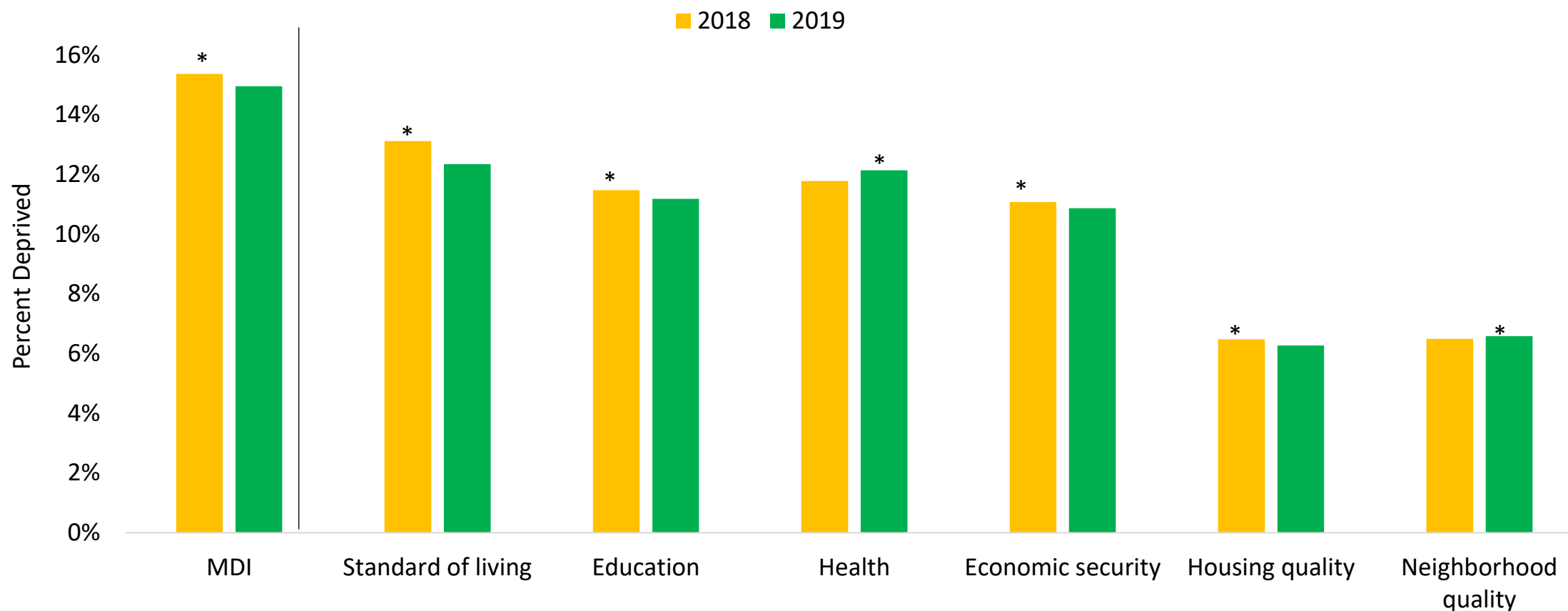Source: U.S. Census Bureau, 2017 American Community Survey and 2019 Census MDI Report.

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Results

Compare estimates using new methodology to estimates using 2019 Census report methodology

Produce MDI estimates using current methodology and compare to OPM

- Individual dimensions and number of dimensions

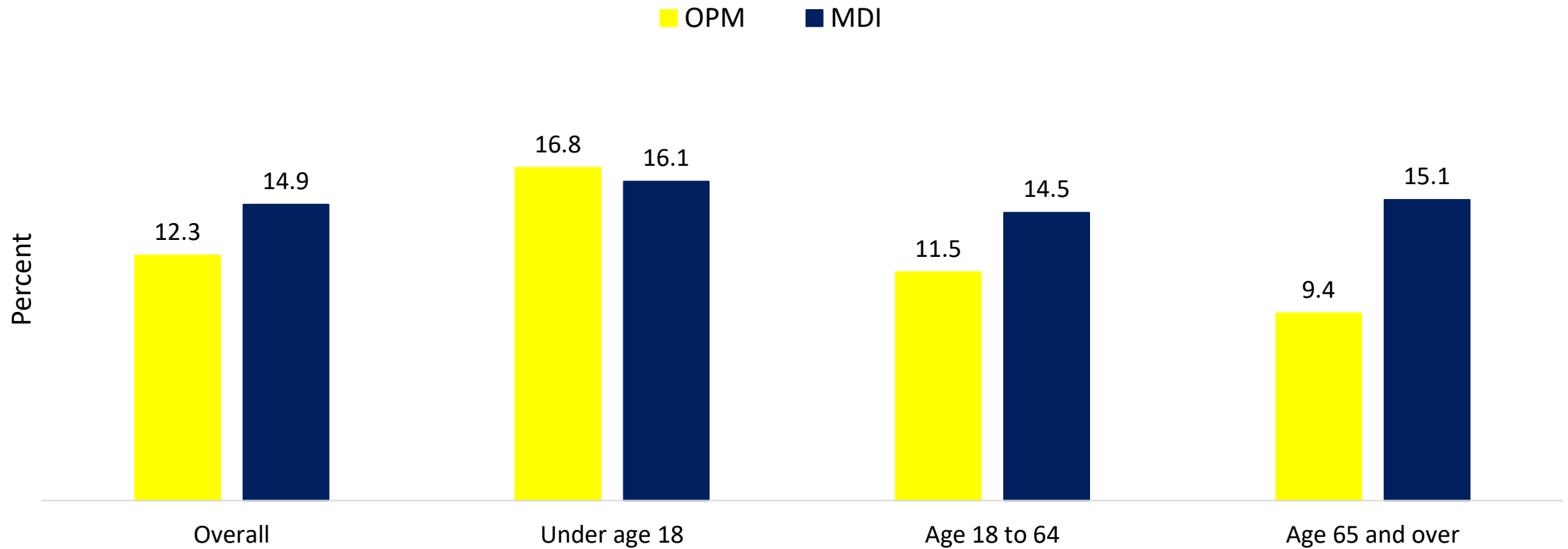- Demographic groups

- Over time

The MDI and Individual Dimensions: 2018 and 2019

* Deprivation rate is higher at the 90 percent confidence level.
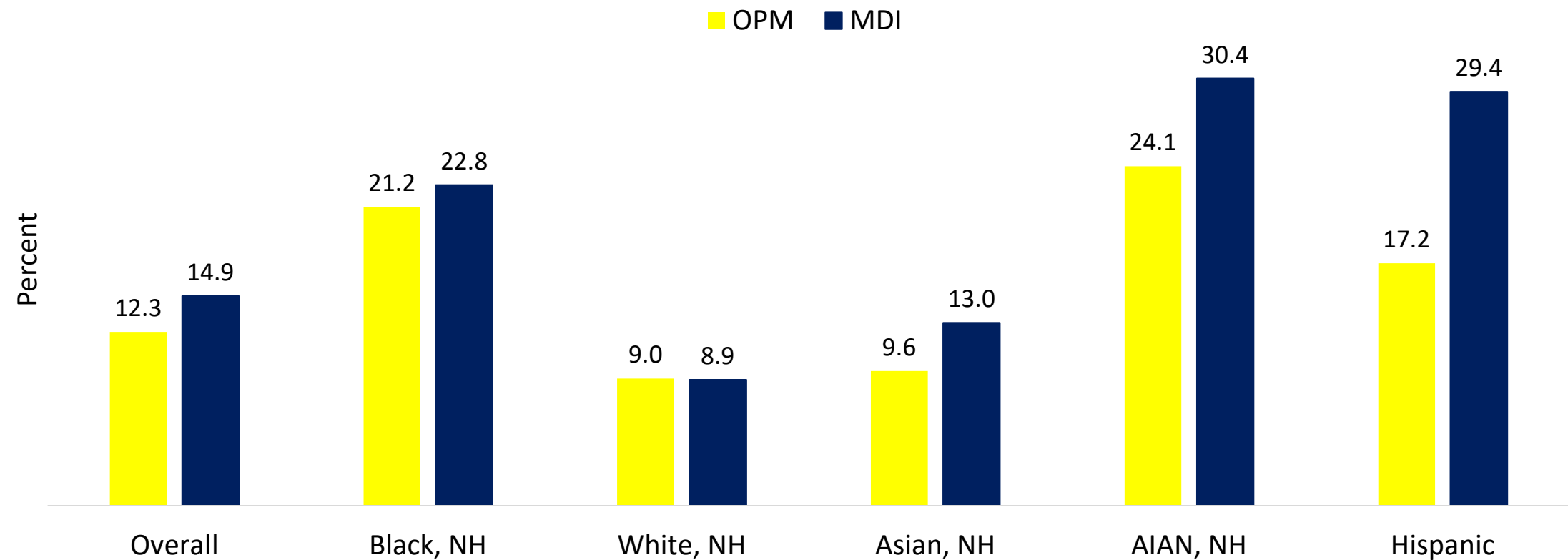Source: U.S. Census Bureau, 2018 and 2019 American Community Surveys.

OPM vs. MDI by Age: 2019

Note: MDI rates and OPM rates differ from each other at the 90 percent confidence level.
Source: U.S. Census Bureau, 2019 American Community Survey.

# OPM vs. MDI by Race and Hispanic Origin: 2019

Note: MDI rates are higher than OPM rates at the 90 percent confidence level for each race and Hispanic origin group, except for White, NH, in the figure.
NH = Non-Hispanic
Source: U.S. Census Bureau, 2019 American Community Survey.

Why the large difference for Hispanics?
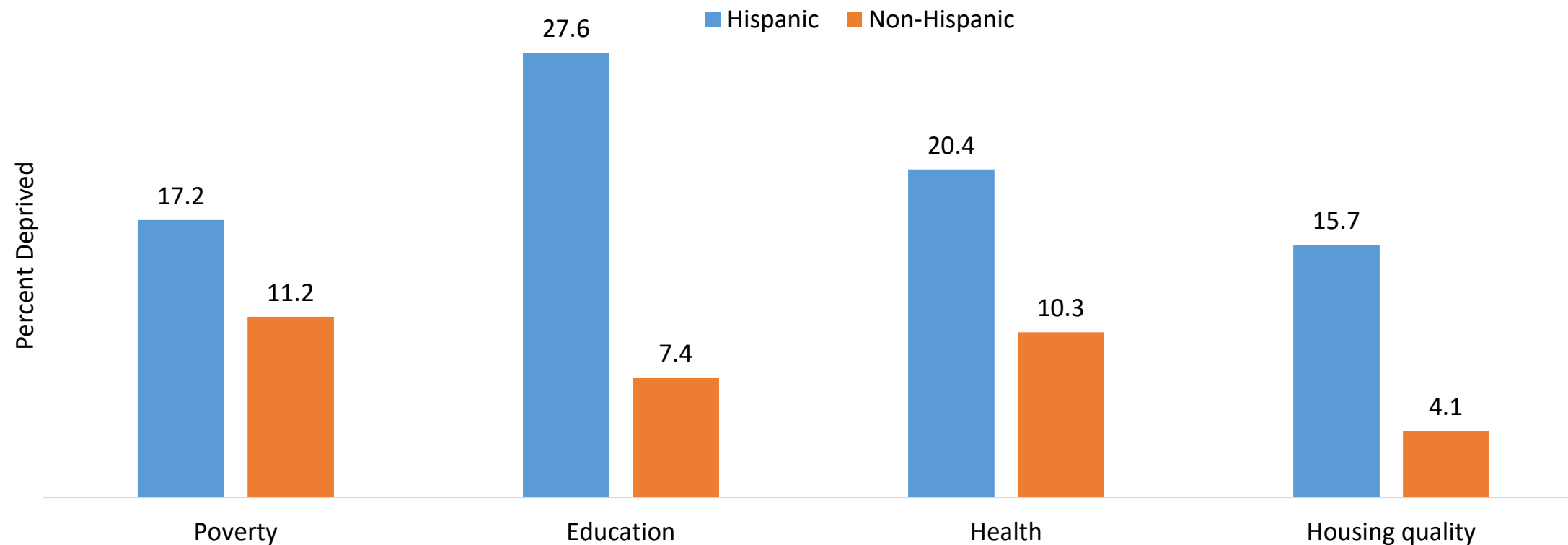
Source: U.S. Census Bureau, 2019 American Community Survey.

Hispanics are Not a Heterogenous Group
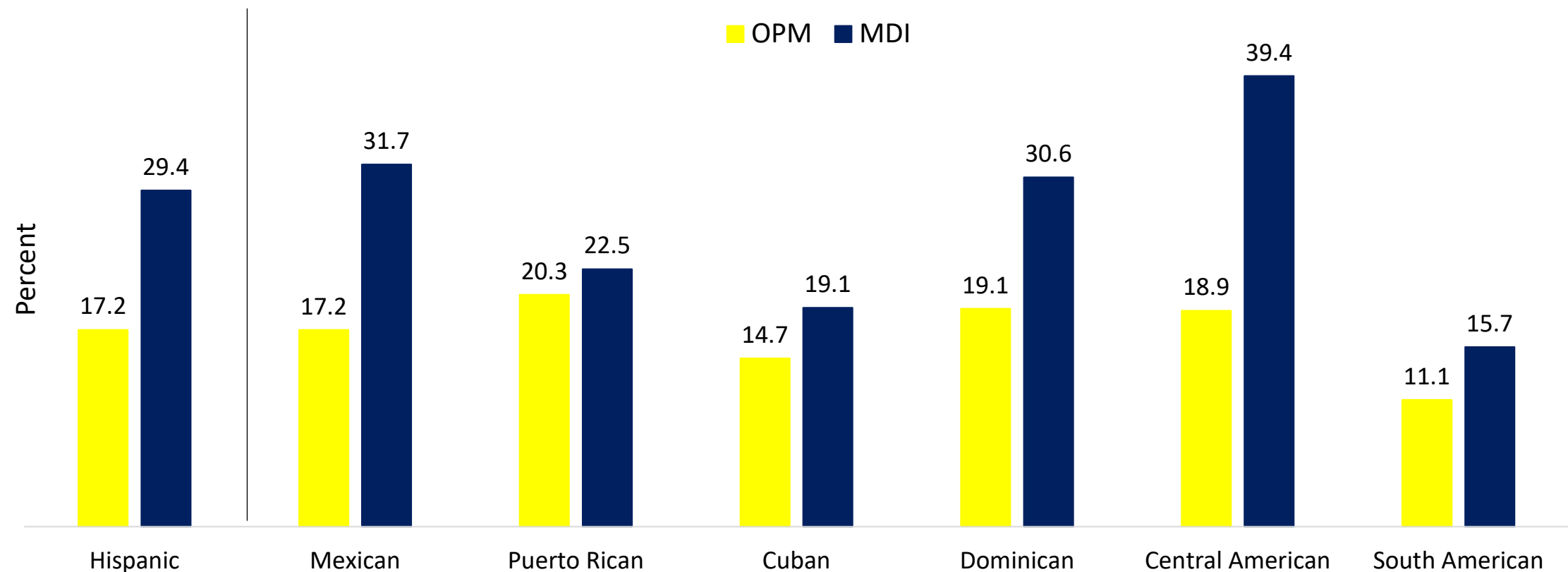
Note: MDI rates are higher than OPM rates at the 90 percent confidence level for group in the figure.
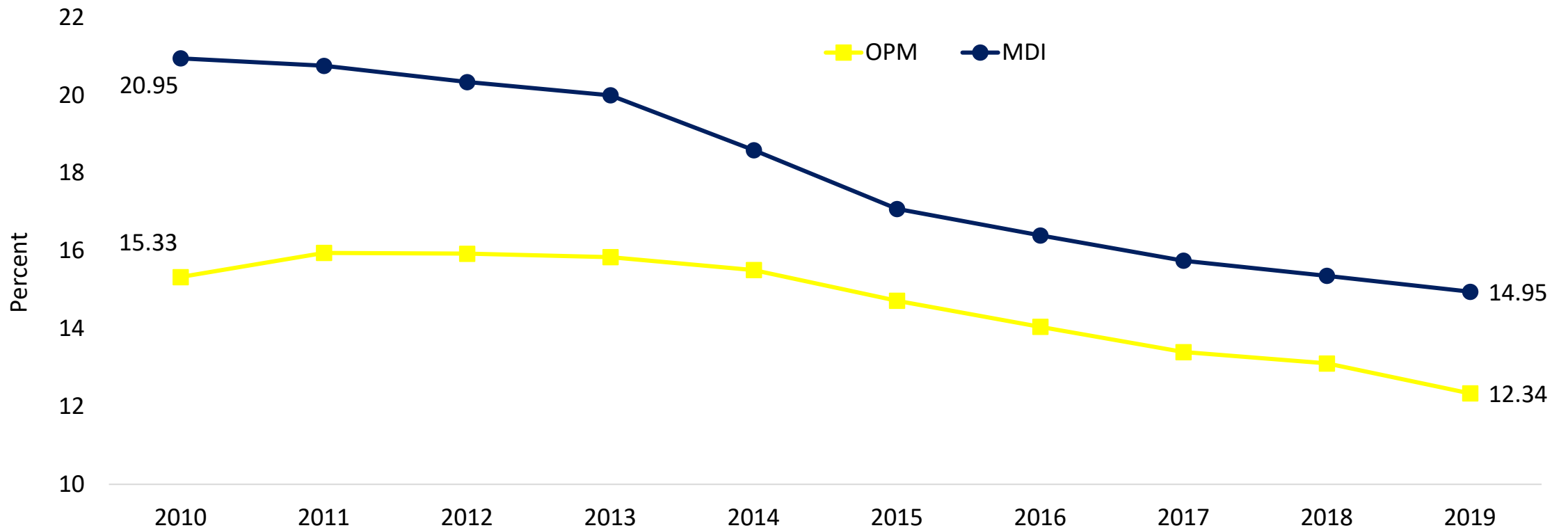Source: U.S. Census Bureau, 2019 American Community Survey.

The MDI Rate: 2019

Ranged from a low of 7.0 percent in New Hampshire to a high of 23.6 percent in Mississippi (U.S. overall rate was 14.9 percent)

- Higher than the OPM rate in 29 states

- Lower than the OPM rate in 8 states and the District of Columbia

- Not significantly different than the OPM rate in 13 states

Deprivation and Poverty Rates Over Time: 2010 to 2019

Source: U.S. Census Bureau, 2010 through 2019 American Community Surveys.

Discussion

Four out of the six dimensions in the Census Report MDI were revised for the Current MDI

Current MDI > Census Report MDI in 2017

- Also true in 21 states

- Current MDI < Census Report MDI in 19 states and the District of Columbia

- Current MDI and Census Report MDI were not significantly different in 9 states

Future Work

Delve further into demographic groups differences

Examine the value added of a multidimensional measure

Examine the relationship between MDI rates and county/state characteristics

Explore the effects of COVID-19 and relief packages on MDI rates

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