

35th Annual Conference
National Association of Health Data Organizations
Building a Bridge Between Data and Policy

Evaluating Healthcare: Comprehensive Data for a Complex System

NAHDO Session Topic
Building a Broader Vision of Healthcare Data: Thinking Outside the Box
August 26, 2020

Brian Williams and David Stern
Stern Consulting, LLC
www.sternconsulting.com

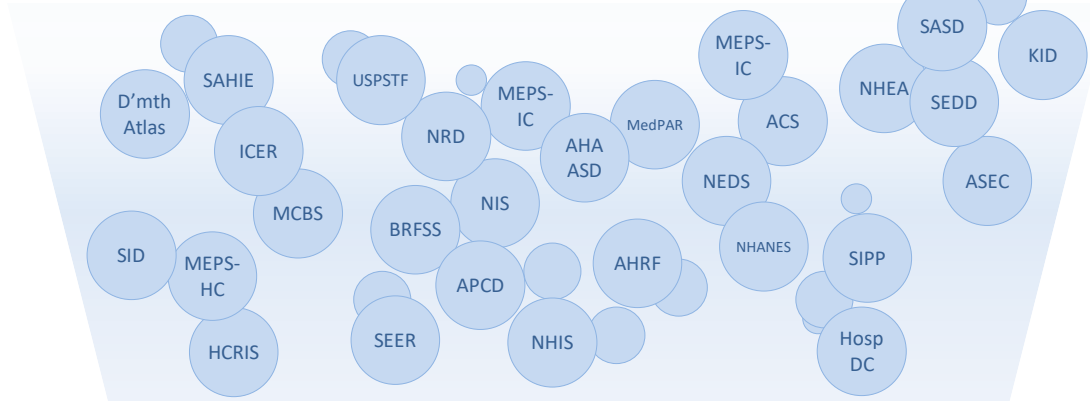


The Challenge

Universe of Datasets

Many are Called

There are thousands of healthcare datasets.

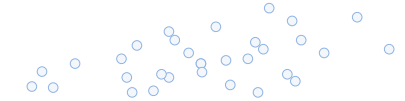


Each project has selection criteria that determine the best resource(s) for the task.

Few are Chosen

A handful may be suitable for a particular need.

A Framework for Meeting the Challenge



Dimensions

Mechanism

- Administrative
- Survey
- Disease Surveillance
- Evidence Based Healthcare
- Regulatory (e.g. Cost Reports)
- Medical Record Abstracts
- Vital Records
- Peer Reviewed Literature
- Gray Literature
- Directories/Code Books/Lists
- Other

Granularity

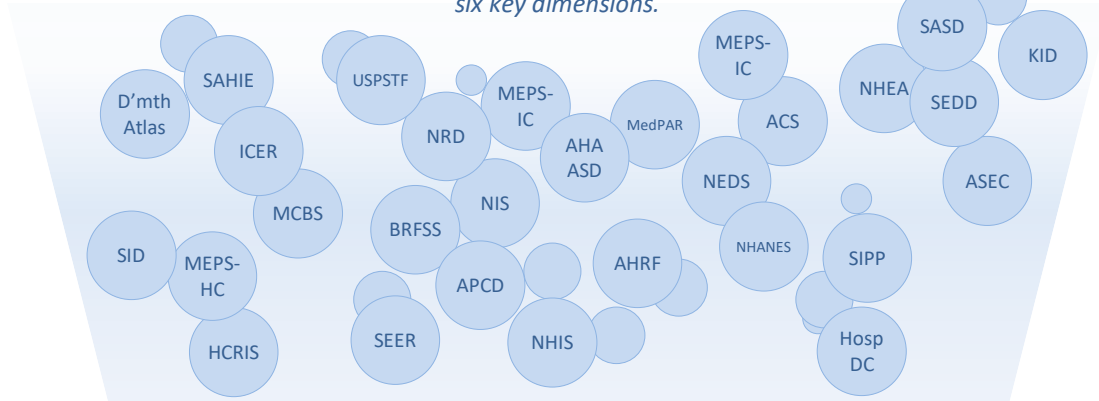
- Microdata
- Macrodata
 - Tables
 - Online Queries
 - Other

Unit of Analysis

- Person
- Household
- Employer
- Encounter/Claim
- Diagnosis
- Procedure
- Provider
- Location
- Other

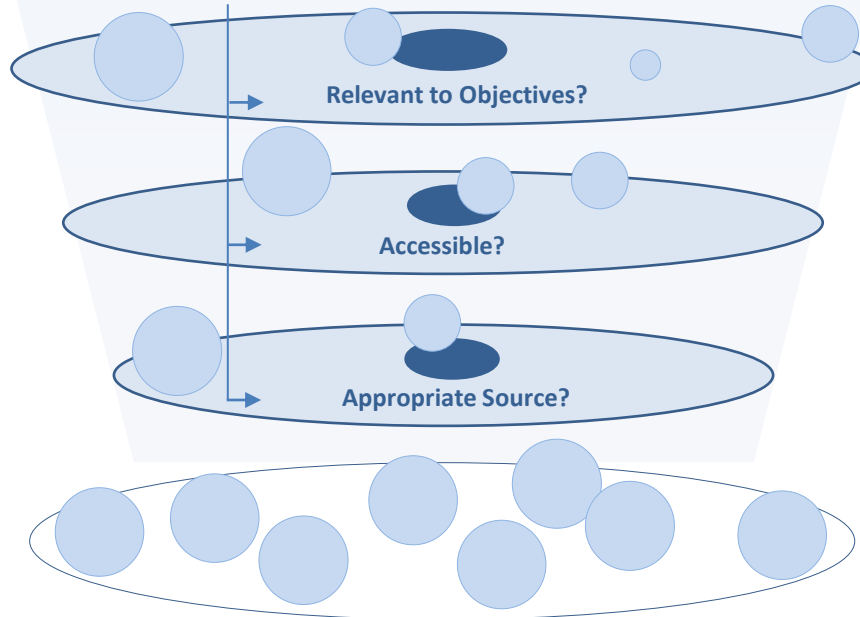
Universe of Datasets

Datasets are defined by six key dimensions.



Project Screening Criteria

Project criteria dictate data requirements.



Dimensions

Content

- Access
- Charges/Cost of Care
- Utilization
- Health Status
- Quality/Satisfaction
- Clinical Results
- Clinical Classification
- Demographic
- Economic
- Social
- Other

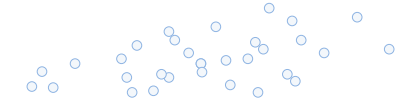
Constraints & Use

- Acquisition requirements
- Hardware and software
- Ease of use/Required expertise
- Restrictions on use
- Cost
- Time span availability
- Other

Sponsor

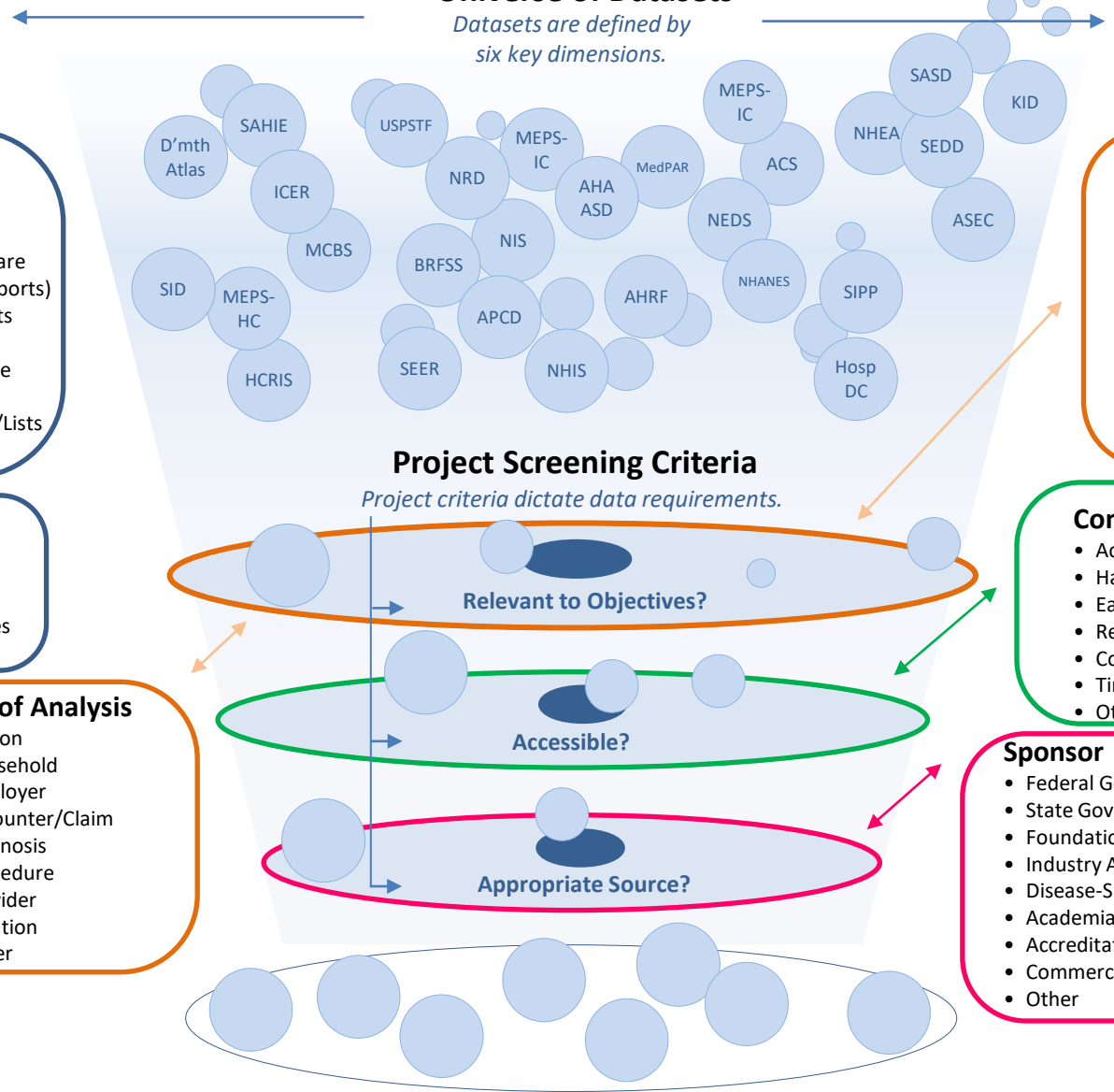
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Data Dimensions Guide the Search



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Relevant to Objectives?

Accessible?

Appropriate Source?

Our case study required publicly available datasets able to reflect the complex impacts of “National Healthcare Policy,” over time, for the U.S. population.

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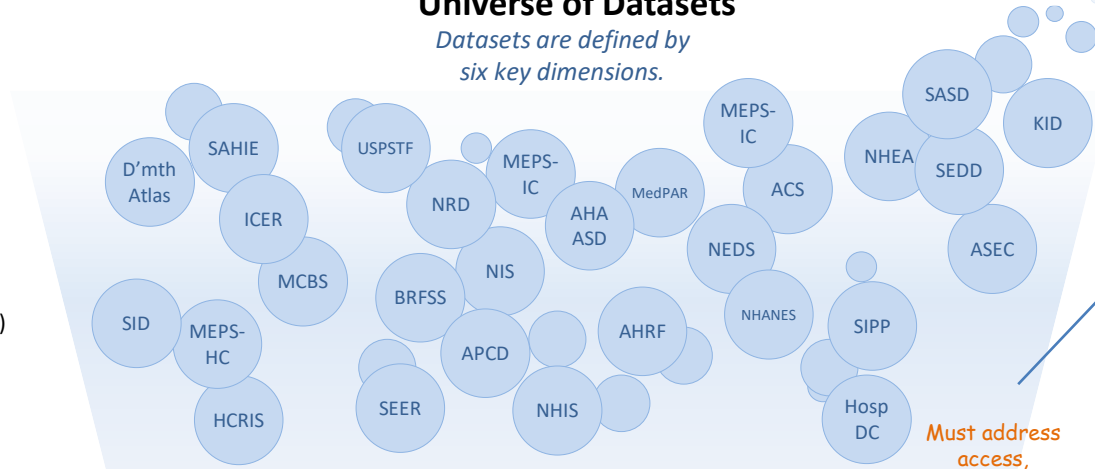
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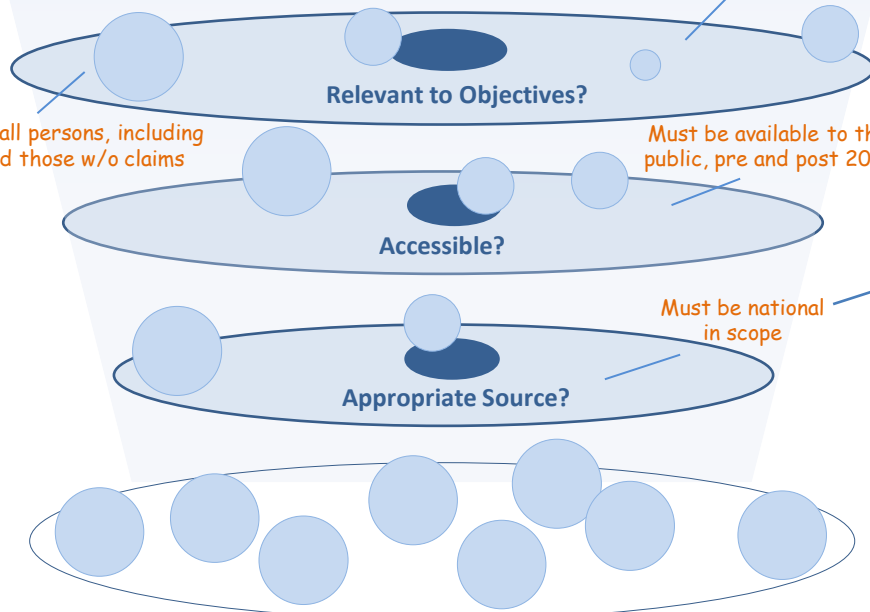
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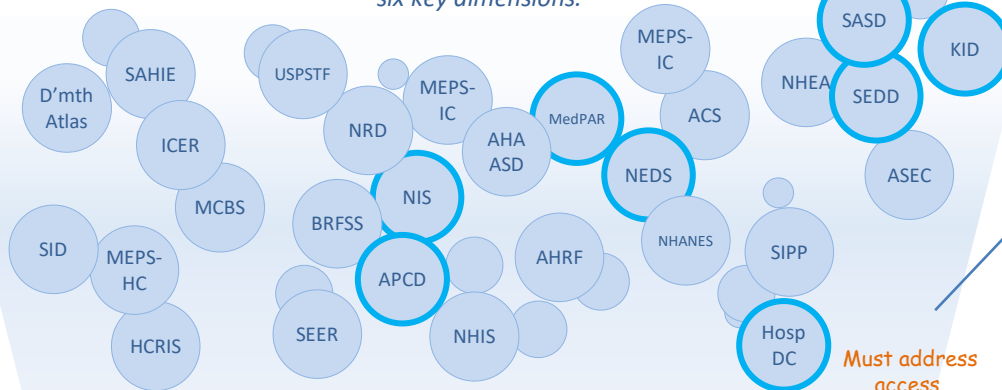
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Note that typical administrative data do not address “access” or “healthiness.” Nor do they capture data on the uninsured or, aside from eligibility, persons without claims.

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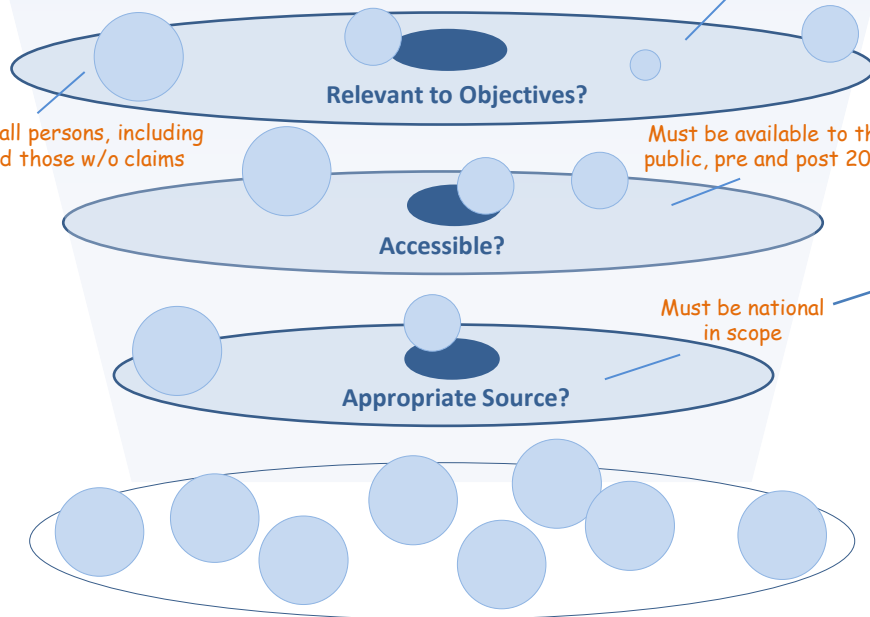
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*“Administrative” is defined herein as data generated pursuant to an encounter with the healthcare system or to an associated claim. It also includes eligibility and enrollment files such as those included in All Payer Claims Data (APCD) and Medicaid program data.

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Must address access, costs, and/or healthiness

Must address all persons, including uninsured and those w/o claims

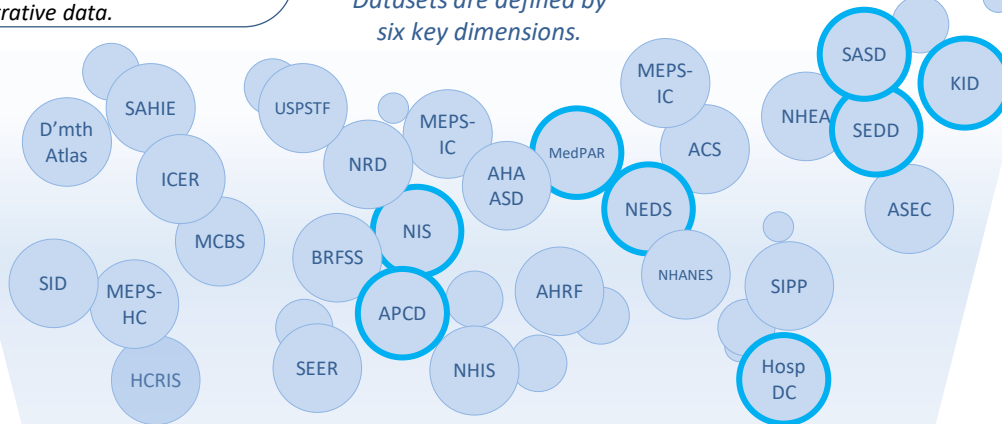
Must be available to the public, pre and post 2014

Must be national in scope

All of the circled data represent opportunities outside of the box of administrative data.

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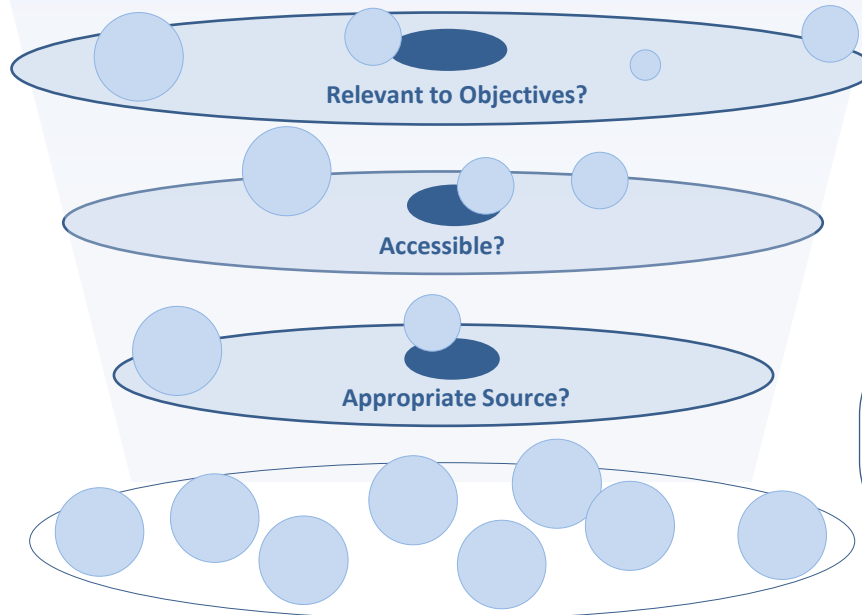
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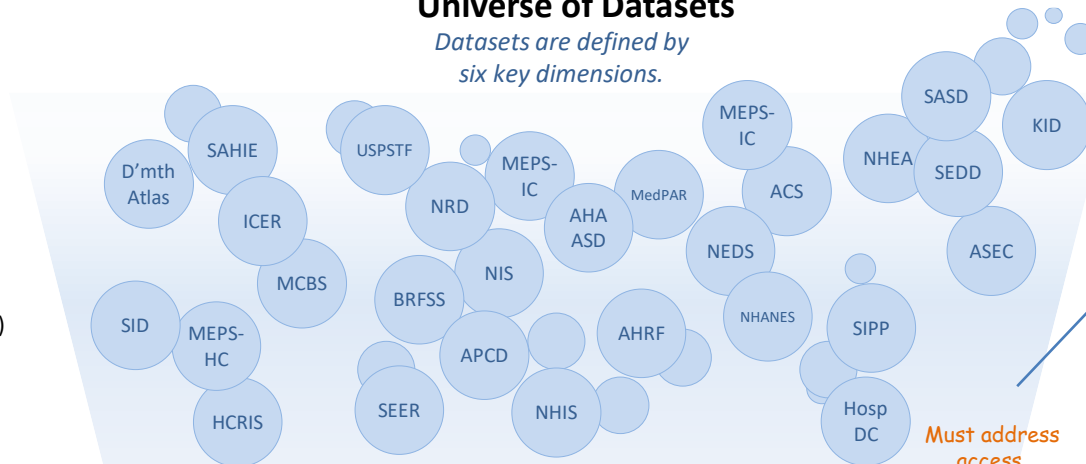
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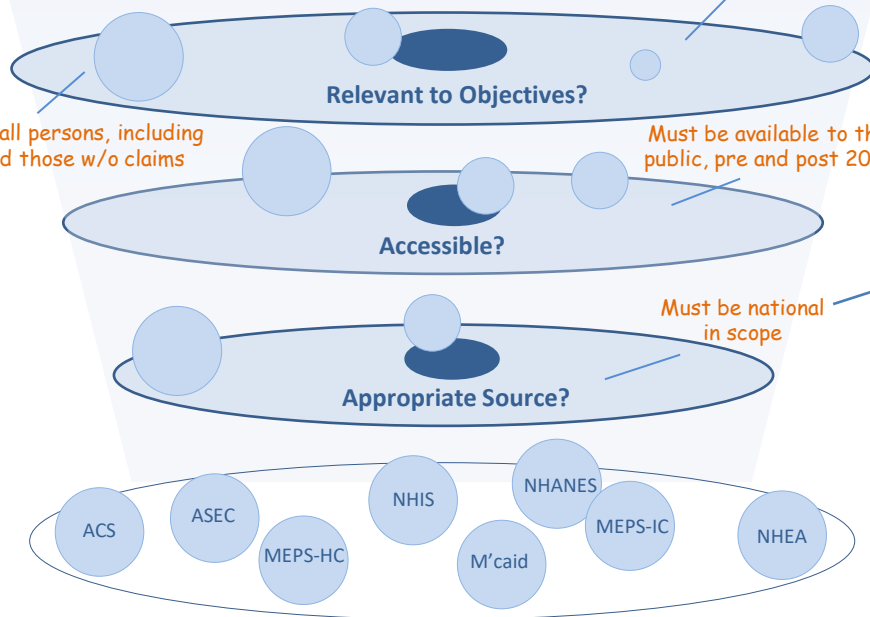
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Eight datasets “made the cut” for our “Datasets to Evaluate the Impact of National Healthcare Policy” case study.

Selected Datasets by Key Dimensions

		Dimensions of Data						
Datasets	Notes	Mechanism	Sponsor (Data Collector)	Content Variable Counts: ¹		Primary Unit of Analysis	Granularity ^{II}	Constraints & Use* Skill level/ Accessibility
				Health Care	Non-Healthcare			
ACS American Community Survey	Extensive geographic and demographic drill downs on disability and health insurance.	Survey	Census Bureau	Healthcare	171	Person	Micro Macrodata	Requires Skills**
ASEC Annual Social and Economic Supplement to the Current Population Survey	Labor force data with health insurance, out-of-pocket \$ and health status fields.	Survey	BLS (Census Bureau)	Healthcare	182	Person	Micro Macrodata	Requires Skills**
MEPS-HC Medical Expenditure Panel Survey, Household Component	Person-level health expenditures with longitudinal capabilities.	Survey	AHRQ (Westat)	Healthcare	1,252	Person	Micro Macrodata	Requires Skills**
NHANES National Health and Nutrition Examination Survey	Survey combines interviews and physical examination, including lab tests.	Survey	NCHS/CDC	Healthcare	1,733	Person	Microdata	Requires Skills**
NHIS National Health Interview Survey	Principal source of information on health of U.S. population. Robust demographic, socioeconomic data.	Survey	CDC (NCHS)	Healthcare	1,388	Person	Micro Macrodata	Requires Skills**
MEPS-IC Medical Expenditure Panel Survey, Insurance Component	Factors contributing to use of employer sponsored insurance. Premiums and cost sharing.	Survey	AHRQ (Census Bureau)	Healthcare	153	Employers, Employees	Macrodata	Ready-to-use
Medicaid (various program data)	Actual enrollment data. Breakouts of new eligibility categories created by ACA.	Admin	CMS	Healthcare	30 ^I	Person	Macrodata	Ready-to-use
NHEA National Health Expenditure Accounts	Official estimates of healthcare spending in U.S. Includes care, admin, research and infrastructure.	Multiple Sources	HHS	Healthcare	640	Services, Payers, Sponsors	Macrodata	Ready-to-use

BLS: Bureau of Labor Statistics
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¹ “Counts of variables” by topic is a reasonable method of determining a dataset’s areas of focus. Each variable from the eight selected datasets has been categorized by subject matter. All ultimately roll up to either “non-healthcare” or “healthcare.” Additional detail on content is provided below. (Counts exclude sample weights and variables related to survey administration.)

^{II} Microdata consist of information at the unit level and provide the highest degree of analytic flexibility. Macrodata represent a broad range of pre-aggregated data, typically in ready-to-use format, as well as online utilities that enable users to generate their own queries against the underlying source data.

* All are publicly available at no cost and include data pre- and post -2014.

** For the microdata versions, users must have database management skills and ability to generate population estimates (relatively easy) and margins of error (more complicated) from raw survey data. Microdata are typically too large for MS Excel or MS Access.

Selected Datasets by Key Dimensions

Six of the eight selected datasets are surveys, one is based on administrative data (Medicaid enrollment) and the other on multiple mechanisms.

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Five of the datasets provide microdata. Three are macrodata only.

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Additional detail on the “Content” dimension

Variable Counts by Content Category by Dataset

	Present
	Better
	Best

Categories of Variables			Total	Datasets								
				Microdata (Macrodata also provided)					Macrodata Only			
1	2	3	Total	ACS	ASEC	MEPS-HC	NHANES	NHIS	MEPS-IC	M'caid	NHEA	
		Total	6,806	216	661	1,582	1,880	1,600	175	38	654	
Healthcare <i>The “Access” and “Healthiness” data are beyond what is available in administrative datasets...</i>	Access	Ability to Pay for Care	1,053	10	157	546	17	203	87	22	11	
		Ability to Get Care	546	<i>All address ability to pay for care.</i>			178	106	262	<i>MEPS-HC and NHIS are strong on “getting” care.</i>		
	Cost	Charges	19	<i>NHEA and MEPS-HC are strongest on costs.</i>			19					
		Encounters	107			21	69	17				
		Expenditures	894			300						
	Healthiness	Expenditures by Sponsor	128		15				4	66	8	586
		Behavior/Attitude	290			4	224	62				43
		Body Composition	160			1	151	8				
		Child-Specific Problems	39			28		11				
		Clinical Results	376				376			<i>NHANES is the only dataset to include clinical results. NHIS and MEPS-HC are also strong on healthiness.</i>		
		Condition	1,095			81	311	703				
		Days Lost Due to Illness	8			3		5				
		Diet	406				406					
	Non-Healthcare <i>...The “non-healthcare” variables are likewise more comprehensive than those typically provided in administrative data.</i>	Demographic	Age	20	2	2	7	5	3			1
Race/Ethnicity			44	12	7	8	2	15				
Sex			9	1	1	1	2	3				1
Economic		Income	303	13	211	25	3	51	<i>ASEC and MEPS-HC are strong on economic issues, particularly income, labor force participation and job characteristics.</i>			
		Other Benefits	38	1	19		10	8				
		Taxes	26		20	6						
		Food Security	10					10				
		Job Characteristics	229	15	47	139	4	12	12			
		Labor Force	123	13	37	48	5	15	5			
		Economic Indicators/Population	7									7
Geographic		Specified Areas	47	8*	13	4		4	5	8	5	
Housing		Financial	32	27	4			1				
		Physical	28	17	5			6				
Social		Family/Household Composition	306	33	78	65	88	42				
	Marital Status	23	6	2	8	2	5					
	Military Status	37	13	5	6	2	11					
	Neighborhood Characteristics	5					5					
	Child Care	12		9			3					
	Education	25	7	4	6	4	4					
	Heritage	55	17	5	7	19	7					
	Migration	13	3	10								
Internet/Computer Use	19	11				1	7					

American Community Survey (ACS)

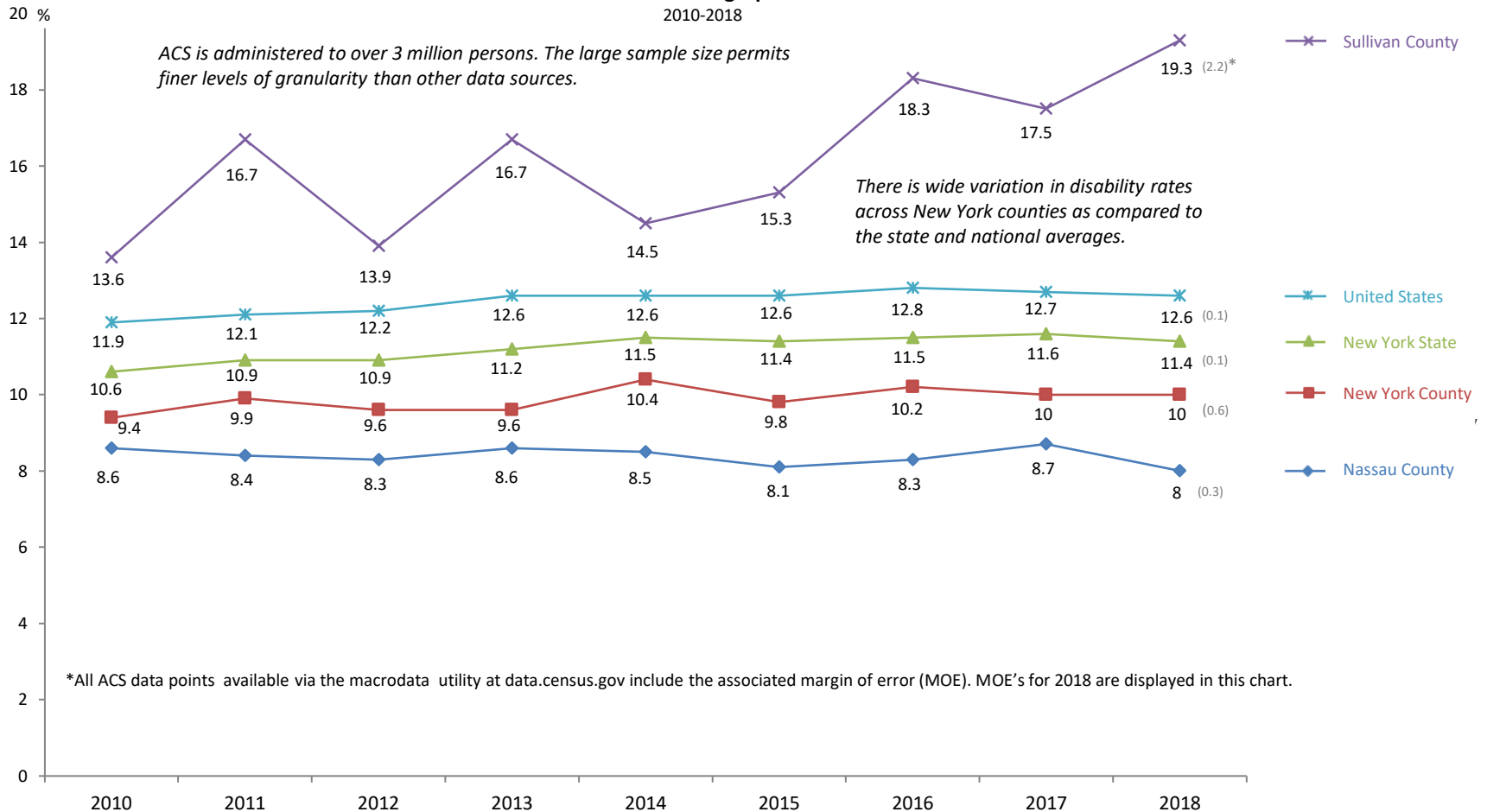
- Broad ranging survey addressing demographic, social, economic and housing information
 - Contains two healthcare variables: health insurance coverage and disabilities
- Robust geographic and demographic drill down capabilities for healthcare (and other) variables
- Conducted annually by US Census Bureau (designed to assist US Congress in designing and funding programs)

Sample ACS Data

Percent of Population with a Disability

Selected Geographies

2010-2018



*All ACS data points available via the macrodata utility at data.census.gov include the associated margin of error (MOE). MOE's for 2018 are displayed in this chart.

National Health Interview Survey (NHIS)

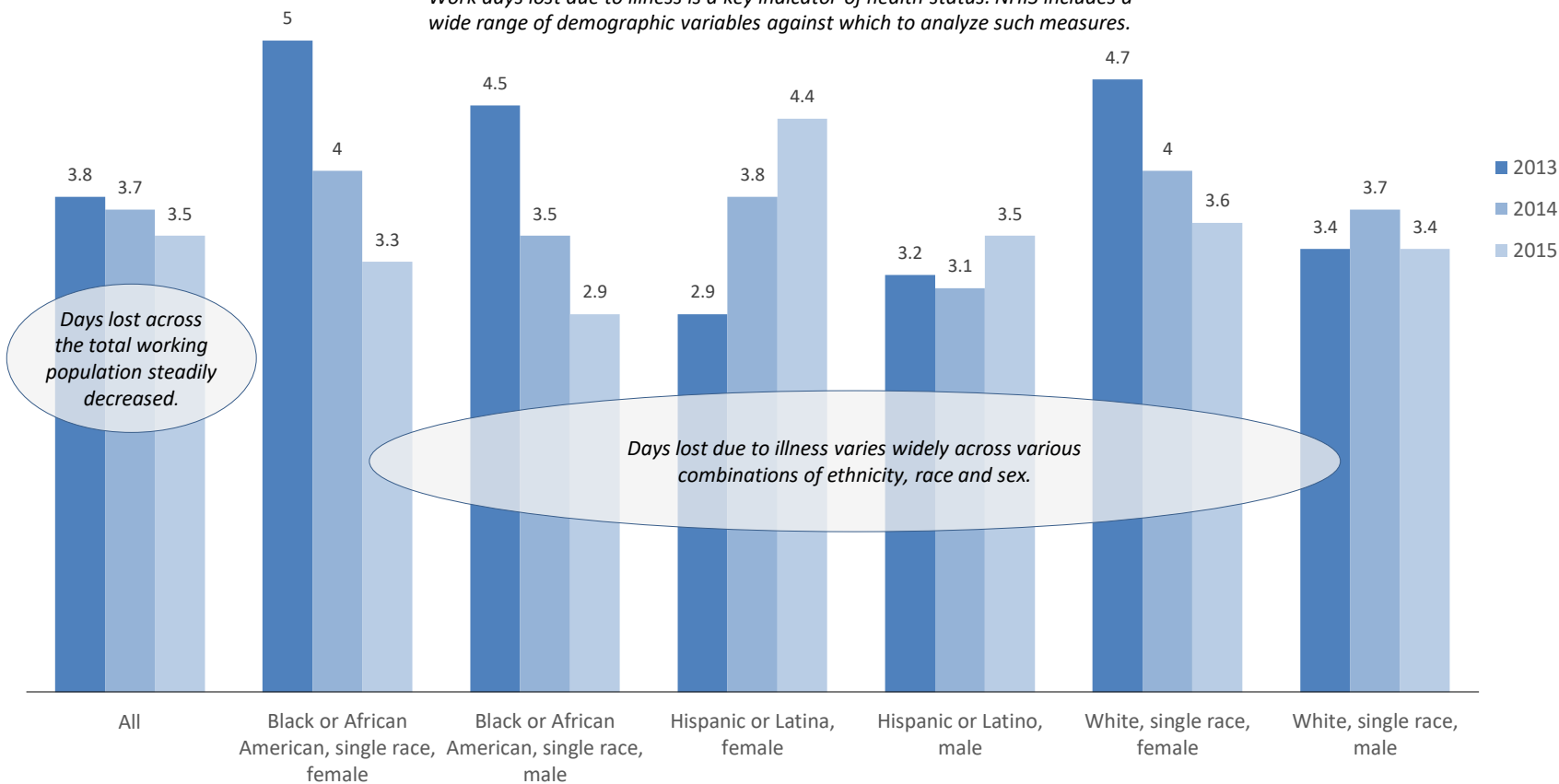
- Principal source of information on health of the U.S. population
- Addresses access, utilization, conditions, limitations, behaviors and insurance coverage
- Enables analysis of comprehensive healthcare data across wide range of demographic and socioeconomic variables
 - Produced annually by the Centers for Disease Control and Prevention (CDC)

Sample NHIS Data

Average Number of Work Days Lost Due to Illness Over Past Twelve Months

Employed Adults By Ethnicity, Race and Sex, 2013-2015

Work days lost due to illness is a key indicator of health status. NHIS includes a wide range of demographic variables against which to analyze such measures.



Source: NHIS. Chart created by Stern Consulting based on data from “Tables of Summary Health Statistics,” Table A-9, cdc.gov/nchs/nhis/shs/tables.htm

Summary Thoughts On Selecting Data Sets

- **Think broadly:**

- Complex system
- Many players, all generate data



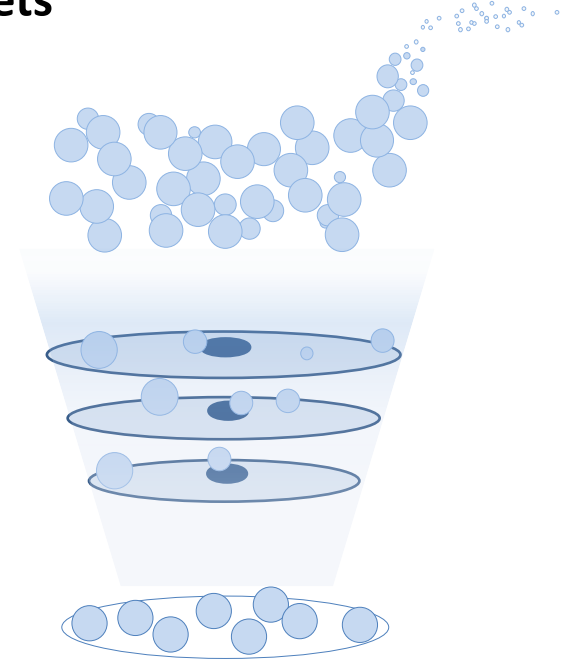
- **Filter wisely:**

- Don't write off "non-healthcare" data
- Micro- & macro-data
- Admin data, surveys, regulatory...
- Many sources: government, private, industry ...



- **Consider these eight:**

- **ACS** (American Community Survey)
- **ASEC** (Annual Social and Economic Supplement to the Current Population Survey)
- **Medicaid** (various program data)
- **MEPS-HC** (Medical Expenditure Panel Survey, Household Component)
- **MEPS-IC** (Medical Expenditure Panel Survey, Insurance Component)
- **NHANES** (National Health and Nutrition Examination Survey)
- **NHEA** (National Health Expenditure Accounts)
- **NHIS** (National Health Interview Survey)



Appendix

I. Additional Resources

II. Sample Data

III. About Us

Additional Resources, 1 of 2

In addition to our eight profiled datasets, the following four resources each contribute a particular perspective on national healthcare policy.

Selected Other (Non-Administrative) Datasets by Key Dimensions

Datasets	Notes	Dimensions of Data					Constraints & Use* Skill level/ Accessibility
		Sponsor	Healthcare Content	Mechanism	Primary Unit of Analysis	Granularity	
BRFSS Behavioral Risk Factor Surveillance System	State-based data on health-related risk factors, preventive services and conditions (with significant overlap with NHIS subject matter)	States in coordination with CDC	Primary focus	Survey	Person	Micro Macrodata	Requires Skills**
SAHIE Small Area Health Insurance Estimates	Health insurance coverage by county by demographic and economic characteristics	Census Bureau	Primary focus	Based on ACS/other Census data	County	Macrodata	Ready-to-use
AHRF Area Health Resources File	Healthcare workforce data, training, utilization, expenditures, shortage areas	Health Resources & Services Administration	Primary focus	Multiple Sources	County, Congress'l District	Macrodata	Requires Skills**
SIPP Survey of Income and Program Participation	Income and government transfer data and multiple health variables; longitudinal capabilities	Census Bureau	Secondary Focus	Survey	Person	Microdata	Requires Skills**

CDC: Centers for Disease Control and Prevention

* All are publicly available at no cost and include data pre- and post -2014.

** For the microdata versions, users must have database management skills and ability to generate population estimates (relatively easy) and margins of error (more complicated) from raw survey data. Microdata are typically too large for MS Excel or MS Access.

Additional Resources, 2 of 2

*“Data, Tools and Statistics”
from the National Library of
Medicine is particularly useful.*

Dataset Directories

List	Sponsor
Data, Tools and Statistics	National Institutes of Health, National Library of Medicine National Information Center on Health Services Research and Health Care Technology (NICHSR) https://hsric.nlm.nih.gov/hsric_public/topic/datasites/
Directory of Health and Human Services Data Resources	U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation https://aspe.hhs.gov/directory-health-and-human-services-data-resources
Guide to HHS Surveys and Data Resources	U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning and Evaluation http://aspe.hhs.gov/basic-report/guide-hhs-surveys-and-data-resources
HealthData.gov	U.S. Department of Health and Human Services, Office of the Chief Technology Officer https://healthdata.gov/
HealthyPeople.gov Data Sources	U.S. Department of Health and Human Services https://www.healthypeople.gov/2020/data-search/Data-Sources
Data Sources	Deloitte, DATA USA https://datausa.io/about/datasets/

Healthcare data may not always reside in obvious places. There are many federal and state agencies and departments, any of which may provide healthcare data. Lists of federal agencies may be found at:

- Federal Register (www.federalregister.gov/agencies)
 - USA.gov (www.usa.gov/federal-agencies).

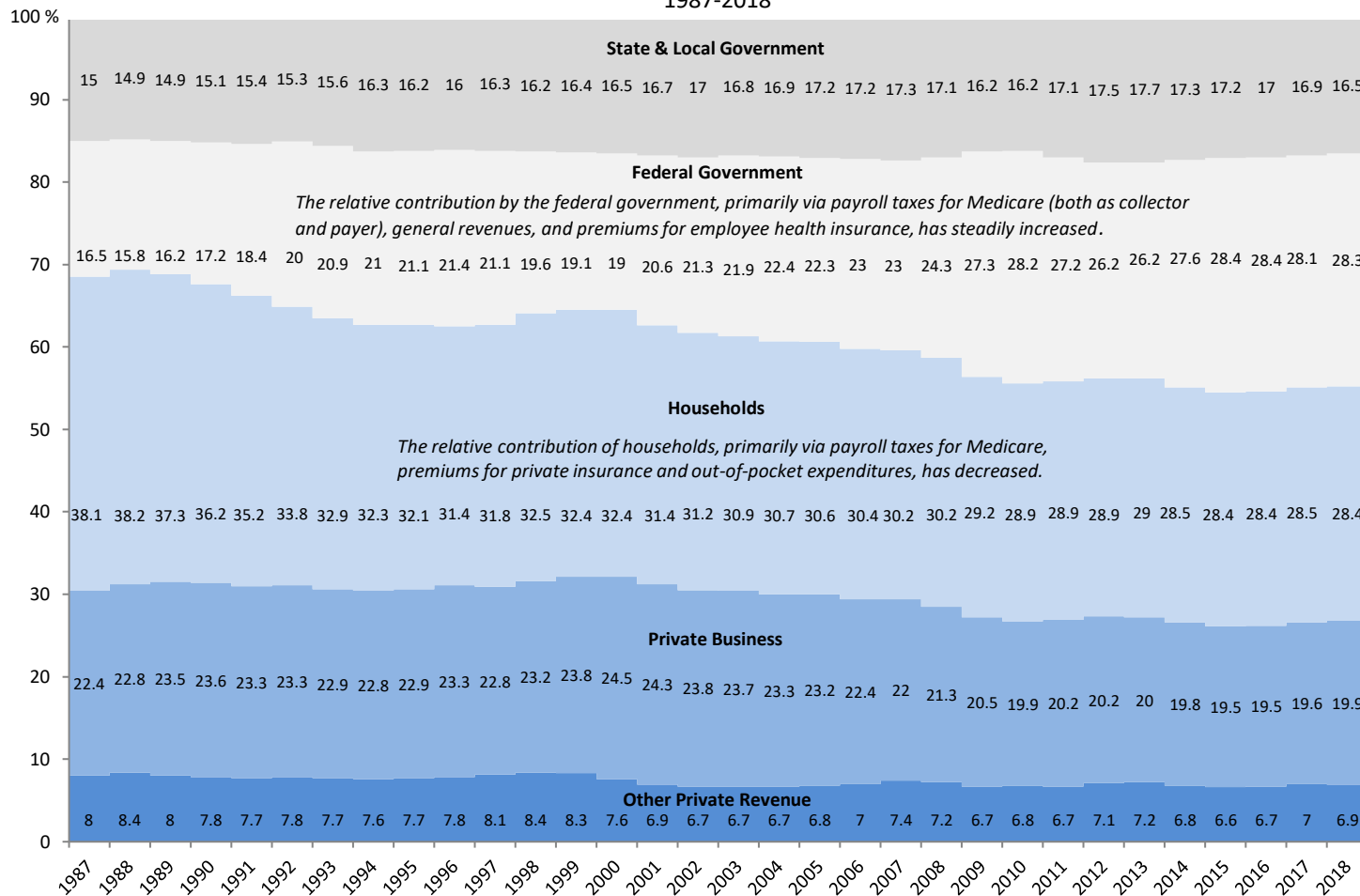
National Health Expenditure Accounts (NHEA)

- Official estimates of healthcare expenditures in the U.S.
- Reports personal care, administration, research and infrastructure spending by payer type
- Breaks out expenditures by sponsors of payers (e.g. households are “sponsors” of private insurance via premiums)
 - Produced annually by the U.S. Department of Health and Human Services (HHS)

Sample NHEA Data

Expenditures by Type of Sponsor (Percent Distribution)

1987-2018



Sponsors vs. Payers
 NHEA addresses both payers and sponsors of healthcare expenditures. Payers are the entities, such as private insurance companies, that transfer funds to the providers of care. Sponsors are the entities, such as households and businesses, that finance those payments. The relative burden borne by sponsors fluctuates over time.

Source: NHEA. Chart created by Stern Consulting based on data from Table 5, National Health Expenditures by Type of Sponsor, cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical

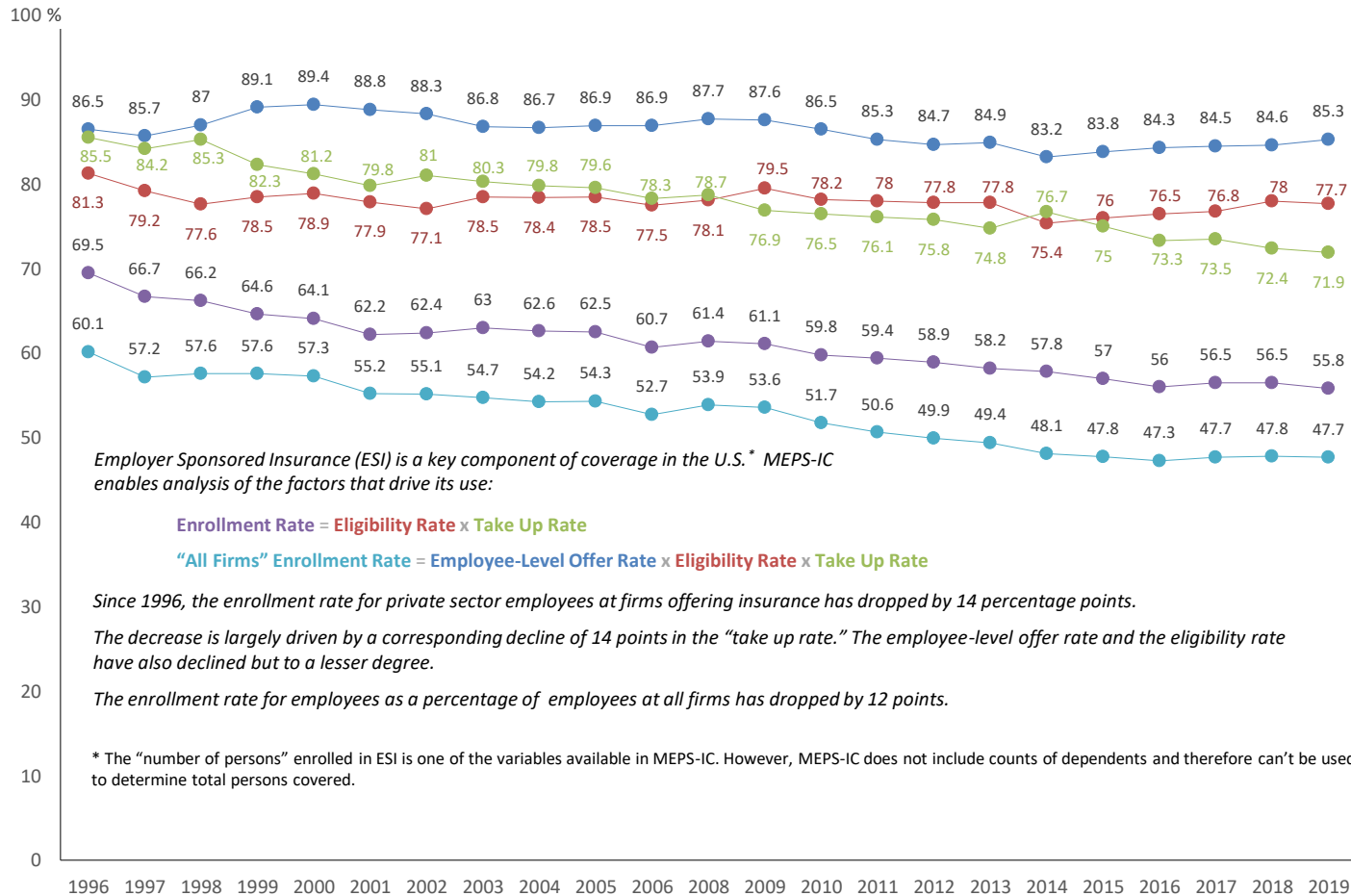
Medical Expenditure Panel Survey-Insurance Component (MEPS-IC)

- Deals exclusively with Employer-Sponsored Health Insurance (ESI)
- Administered to employers (private and public), not to persons
- Addresses premiums, cost-sharing, and extent to which employers offer, and employees accept, coverage
 - Produced annually by the Agency for Healthcare Research and Quality (AHRQ)

Sample MEPS-IC Data

Factors That Determine Employer Sponsored Insurance (ESI) Enrollment

Private Sector Employees, United States, 1996-2018



Employee-Level Offer Rate: Employees that work in firms offering health insurance as a percent of all employees

Eligibility Rate: Employees that are eligible as a percent of all employees that work in firms offering insurance

Take Up Rate: Employees that accept the insurance offered as a percent of eligible employees

Enrollment Rate: Employees that accept the insurance offered as a percent of all employees *at firms offering insurance*

“All Firms” Enrollment Rate: Employees that accept the insurance offered as a percent of all employees *at all firms* (Calculated by Stern Consulting based on MEPS-IC data)

Employer Sponsored Insurance (ESI) is a key component of coverage in the U.S.* MEPS-IC enables analysis of the factors that drive its use:

Enrollment Rate = Eligibility Rate x Take Up Rate

“All Firms” Enrollment Rate = Employee-Level Offer Rate x Eligibility Rate x Take Up Rate

Since 1996, the enrollment rate for private sector employees at firms offering insurance has dropped by 14 percentage points.

The decrease is largely driven by a corresponding decline of 14 points in the “take up rate.” The employee-level offer rate and the eligibility rate have also declined but to a lesser degree.

The enrollment rate for employees as a percentage of employees at all firms has dropped by 12 points.

* The “number of persons” enrolled in ESI is one of the variables available in MEPS-IC. However, MEPS-IC does not include counts of dependents and therefore can’t be used to determine total persons covered.

Annual Social and Economic Supplement (ASEC) to the Current Population Survey

- Primary source of monthly employment statistics along with a broad range of other social and economic topics
 - Used by Census Bureau as primary source of health insurance coverage information
- Strong on coverage obtained via exchanges; Also addresses health status and out-of-pocket medical expenditures
 - Conducted by the Census Bureau on behalf of the Bureau of Labor Statistics

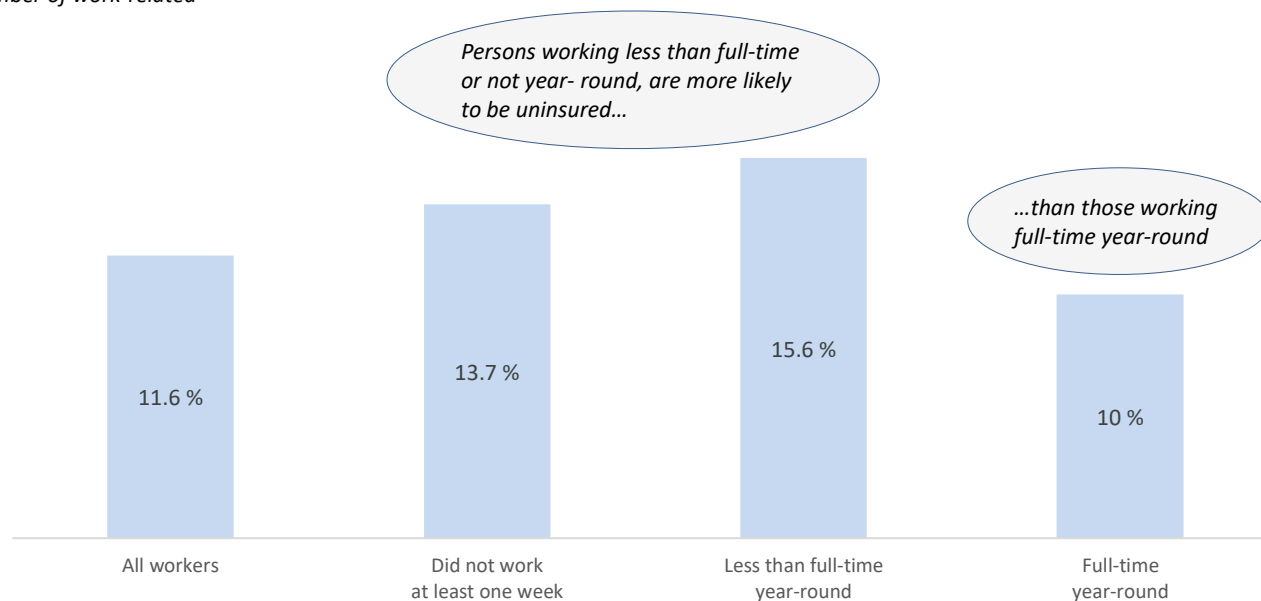
Sample ASEC Data

Percent of Persons With No Health Insurance Coverage

Broken out by Work Experience, 2019

Ages 15-64

ASEC's focus on labor and employment enables analysis of healthcare issues across a number of work-related variables.



Note: Coverage status is "as of date of interview."

Source: ASEC. Chart created by Stern Consulting based on data from Table H-02. Health Insurance Current Coverage Status and Type of Coverage by Selected Characteristics: 2019, [census.gov/data/tables/2019/demo/cps/health-insurance.html](https://www.census.gov/data/tables/2019/demo/cps/health-insurance.html)

Medical Expenditure Panel Survey-Household Component (MEPS-HC)

- Particularly broad range of healthcare and non-healthcare variables
- Person-level expenditures complement aggregate totals in National Health Expenditure Accounts (NHEA)
 - One of the few profiled datasets with longitudinal capabilities
- Produced annually by the Agency for Healthcare Research and Quality (AHRQ)
 - MEPS-HC is based on a subsample from the prior year’s National Health Interview Survey (NHIS)

Sample MEPS-HC Data

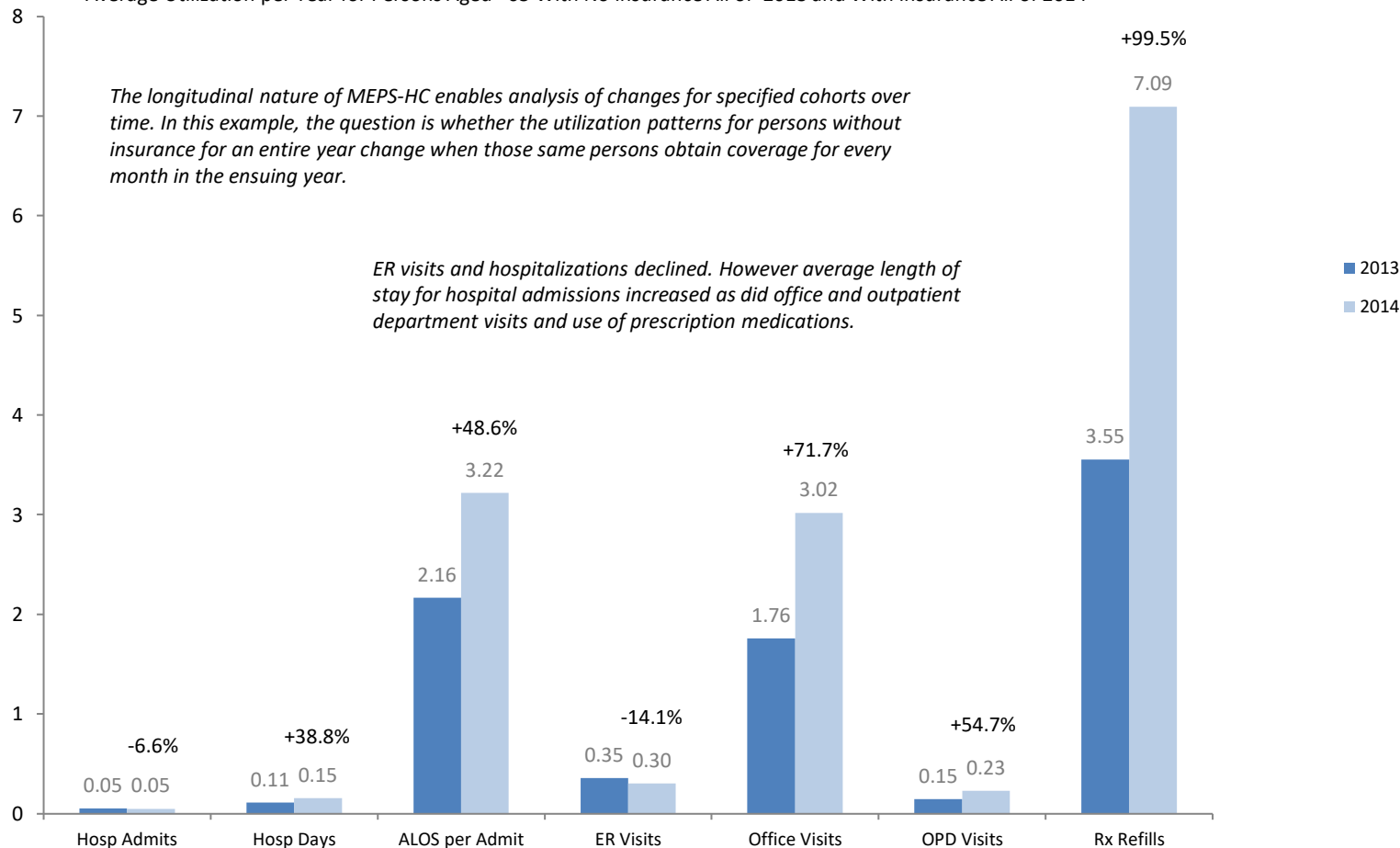
Changes in Utilization Upon Obtaining Health Insurance

Average Utilization per Year for Persons Aged <65 With No Insurance All of 2013 and With Insurance All of 2014

The longitudinal nature of MEPS-HC enables analysis of changes for specified cohorts over time. In this example, the question is whether the utilization patterns for persons without insurance for an entire year change when those same persons obtain coverage for every month in the ensuing year.

ER visits and hospitalizations declined. However average length of stay for hospital admissions increased as did office and outpatient department visits and use of prescription medications.

Average Number of Encounters



Source: MEPS-HC. Chart created by Stern Consulting based on data from Panel 18 Longitudinal File 2013-2014. meps.ahrq.gov/mepsweb/data_stats/download_data_files.jsp

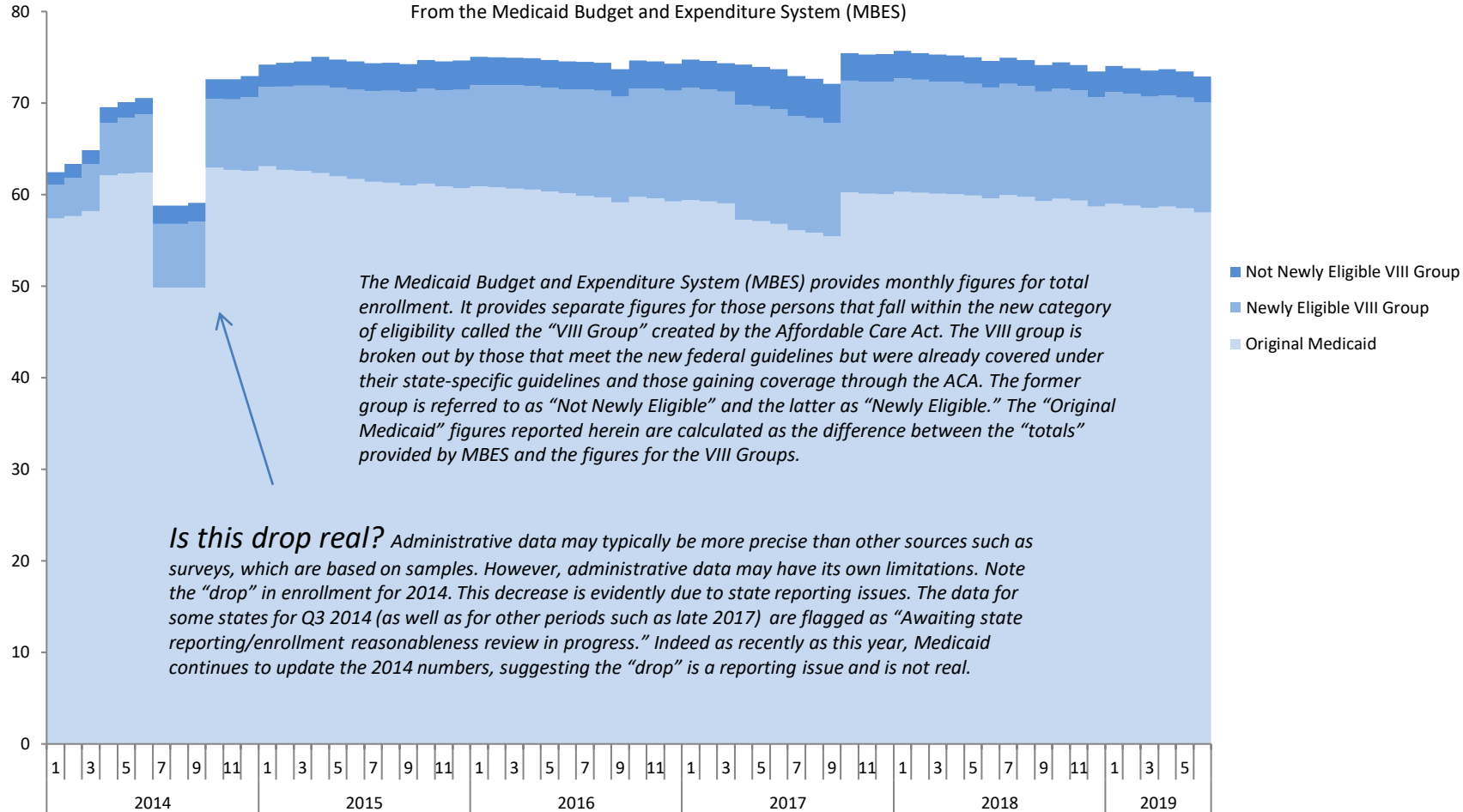
Medicaid Program Data

- Actual enrollment figures from multiple programs:
[Medicaid Budget and Expenditure System (MBES), Performance Indicator Project (PIP), Statistical Enrollment Data System (SEDS)]
- Data available for various eligibility types including new Affordable Care Act (ACA) categories
- Reports provided by the Centers for Medicare and Medicaid Services (CMS) by month, quarter and year depending on program

Sample Medicaid Program Data

Enrollment by Month, January 2014- June 2019

From the Medicaid Budget and Expenditure System (MBES)



Source: Medicaid Budget and Expenditure System. Chart created by Stern Consulting based on Quarterly Medicaid MBES Enrollment (includes monthly breakouts). [medicaid.gov/medicaid/national-medicare-chip-program-information/medicaid-chip-enrollment-data/medicaid-enrollment-data-collected-through-mbes/index.html](https://www.medicare.gov/medicaid/national-medicare-chip-program-information/medicaid-chip-enrollment-data/medicaid-enrollment-data-collected-through-mbes/index.html)

About Stern Consulting

Stern Consulting LLC provides specialty analytic and consulting services to healthcare leaders, hospital systems, healthcare companies, and investors. For more information, see www.sternconsulting.com.



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About NAHDO

The National Association of Health Data Organizations (NAHDO) is a national non-profit membership and educational association dedicated to improving health care data collection and use. NAHDO's members include state and private health data organizations that maintain statewide health care databases and stakeholders of these databases. For more information, see www.nahdo.org.



The current slides were prepared for presentation at NAHDO's 2020 annual conference entitled *Building a Bridge Between Data and Policy*.