

IUCRC Program Investment

FY 2021-22



Goals

1. **Review, Evaluate, and Adopt** methods from precedent.
2. **Provide key stakeholders information they need to compare Centers across time.**
3. **Refocus Analysis based on concept area** and with the Center as the unit of analysis
4. **Identify ripe topics** for future research
5. **Disseminate useful findings to those that can use them.**

FY22 Dissemination Plan

- **Economic Impact**
 - **INVESTMENT**
 - Workforce Development
 - Membership/ Industry Relations
- **Research Impact**
 - Intellectual Property
 - Center Life Cycle and Phases

Data Source

- Structural Data Collection, Tables 2-3

**FY2005-2020: Industry/University
Cooperative Research Centers Program
Evaluation Project, [North Carolina State
University](#)**

**Primary Authors: L. McGowen, D.O. Gray,
D.C. Rivers, O. Leonchuk, et al.**

FY 2021-2022: VentureWell

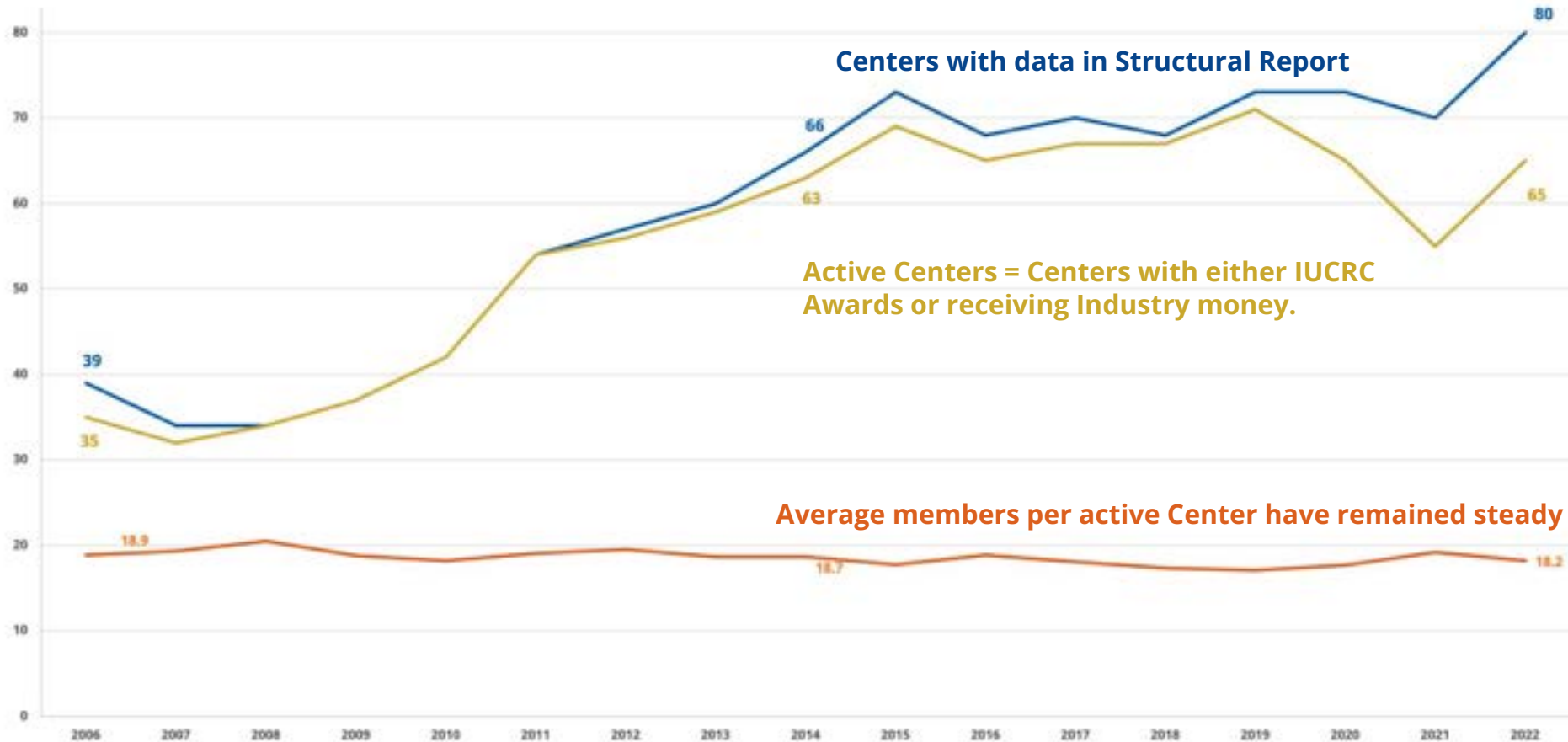
**Data Collection: H. Sharitt, C. Archuleta, M.
Kinney-Petrucha, O. Arstein-Kerslake, C.
Teixeira**

**Analysis and Reporting: A. Blandford, C.
Adams**

Takeaways

1. **From 2006-2014 Active Centers increased by 80%, but by just 3% since 2014.**
2. **From 2006-2014, Core Program Investment grew by 129%, but decreased by 11%, between 2014 and 2022.**
3. **Centers rely more than ever on industry dollars**, as other federal, state, and non-federal investment have all decreased.
4. **Inflation increases the cost of running a Center over time.** Average Center input costs have increased by at least 50% since 2006.
5. **Leverage Ratios tell part of the story** of Center financial health and sustainability, but vary depending on the presence of investment from other sources.

Active Centers, 2006-2014: +80% 2014-2022: +3%



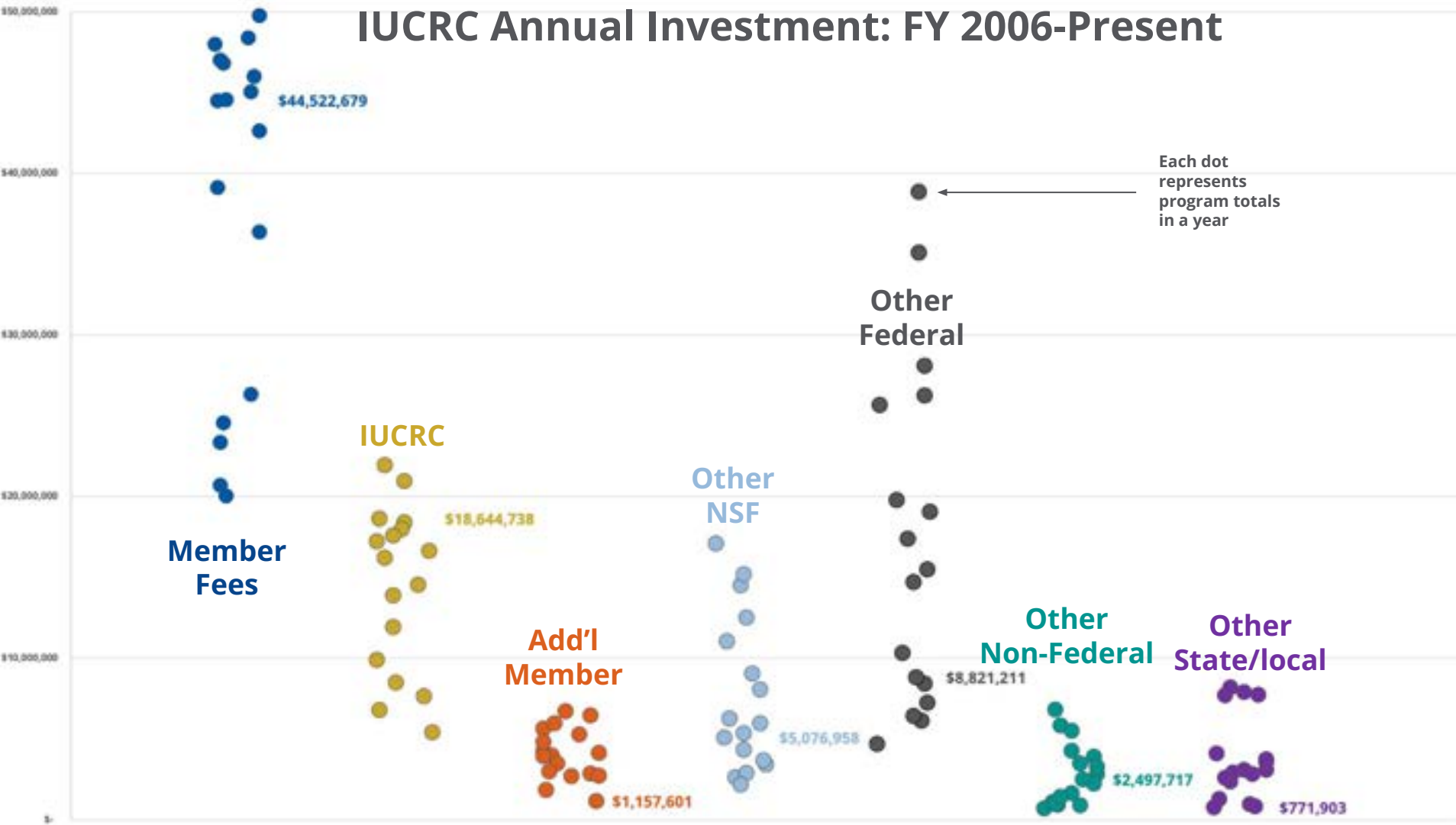
*We explain more below regarding the importance of this distinction.

Core Program Investment Was 79% of 2022 Funding While Leveraged Funding was 21%.

Categories	Funding Type	2022		Definition
		\$	%	
Core Program Investment	Member Fees:	\$44,522,679	55%	<i>Fees paid by member organizations (large and small industry, federal, state, and local govt, and nonprofits), including fed membership fees paid via IAA/MIPR, for IAB voted funding pool</i>
	IUCRC Awards & Supplements:	18,644,738	23%	<i>Annual base IUCRC award and grant supplements</i>
	Additional Member Support:	\$1,157,601	1%	<i>Add'l funding from member organizations, not voted, but results shared with the IAB, including (but not limited to) additional fed funds transferred via IAA/MIPR <u>by member agencies</u>.</i>
\$64,325,018				
Leveraged Funding	Other NSF:	\$5,076,958	6%	<i>Any other grant funding from NSF for research that is shared with the IAB, not included in the IUCRC award & supplements.</i>
	Other Federal:	\$8,821,211	11%	<i>Other grant funding from federal agencies for research that is shared with the IAB.</i>
	Other Non-federal:	\$2,497,717	3%	<i>Funding from non-federal sources (e.g. foundations) for research that is shared with the IAB.</i>
	Other State/local:	\$771,903	1%	<i>Funding from state or local government agencies for research that is shared with the IAB.</i>
\$17,167,789				
TOTAL				
\$81,492,807				

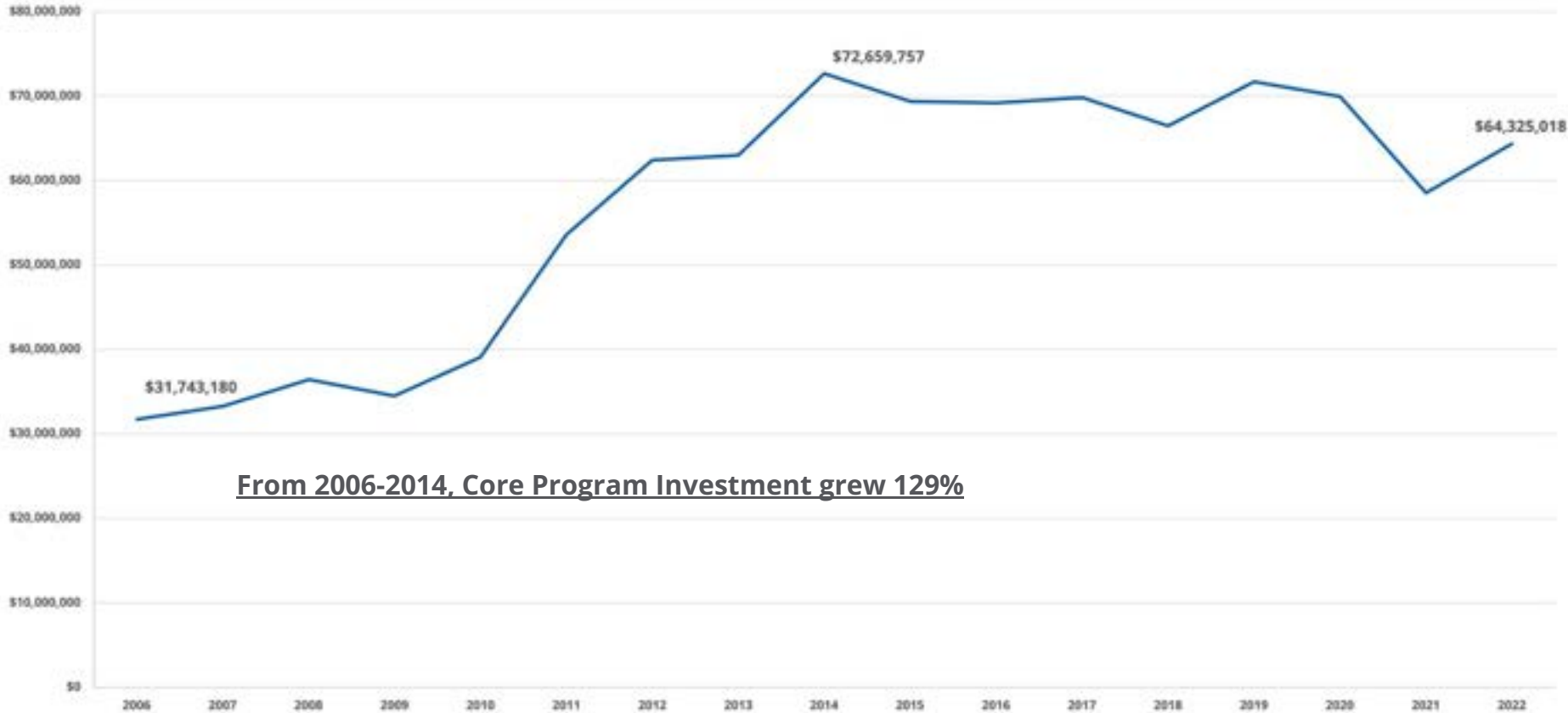
* University support and all other cash categories were discontinued in 2015.

IUCRC Program Investment, 2022



2022 values are labelled parallel with their values, helping show how 2022 values compare with the previous 16 years.

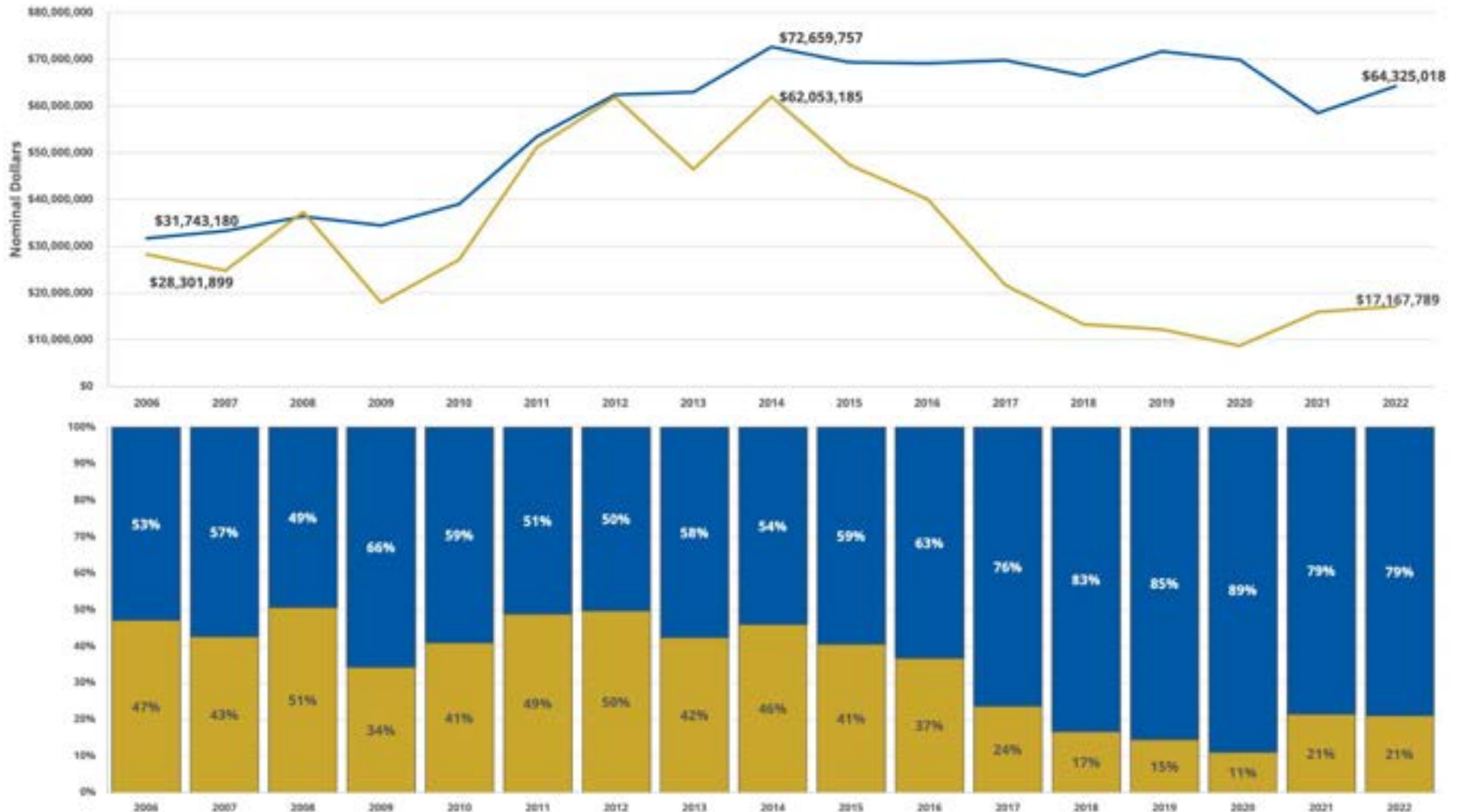
Core Program Investment has decreased by 11% Since 2014.



Centers rely more than ever on industry dollars, as other federal, state, and non-federal investment have all decreased.

- 1. Core Program Investment Was 79% of 2022 Investment while Leveraged Funding was 21%.** Member Fees are the largest investment category IUCRC Awards and Supplements provide the foundational support for the Centers
- 2. Core Program Investment Used to Be ~50%, but since 2014, Leveraged Funding has decreased.** Federal Support had provided up to 33% of Total Investment in FY 2005-2006, but has decreased to 11% of Total Investment in FY 2021-2022.

Core Program Investment Was ~50%, but since 2014, **Leveraged Funding** has decreased.



IUCRC Program Investment, 2022

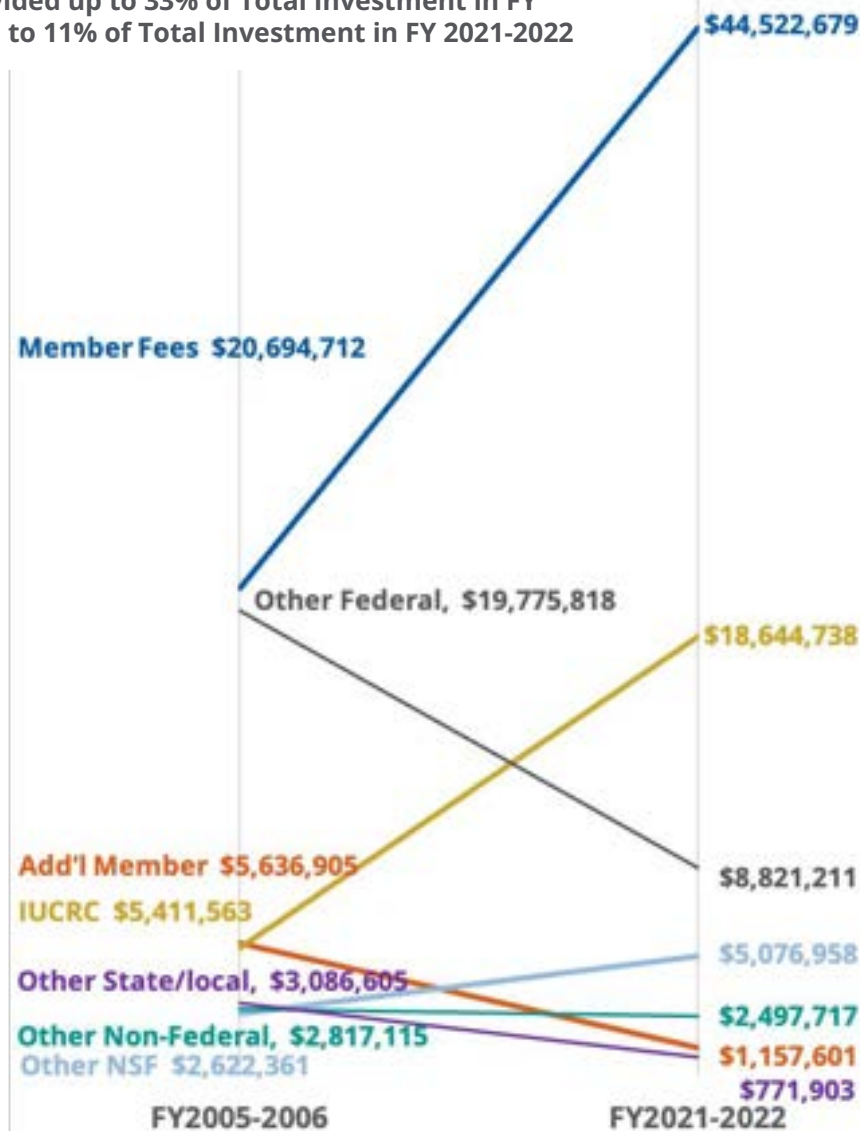
Member Fees are the largest investment category.
IUCRC Awards and Supplements provide the foundational support for the Centers.



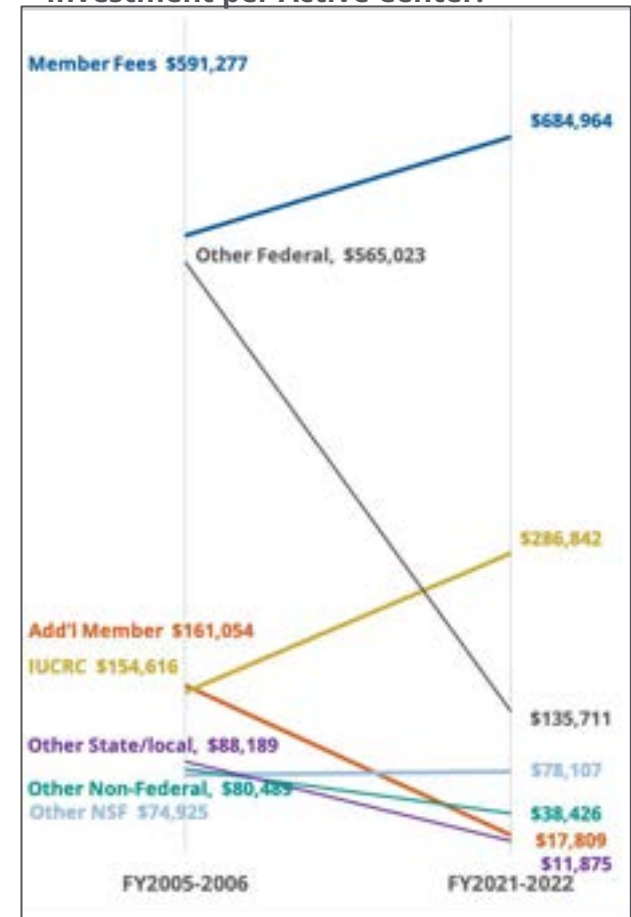
IUCRC Program Investment, 2022

Total Member Fees increased by 115%, FY 2021-2022

Federal Support Had Provided up to 33% of Total Investment in FY 2005-2006, But Decreased to 11% of Total Investment in FY 2021-2022



Investment per Active Center:



Discussion:

What questions do you have about program-level funding?

1. What explains the increase in Member Fees?
2. What explains the decrease in Other categories?
 1. Other Federal,
 2. Other NSF,
 3. Others?

Inflation Increases the cost of running a Center over time.

1. **Inflation adjustments are key to comparing the cost of running a Center through time.**
2. To compare investment and other financial data across time, **we utilize the GDP Deflator**, measured by the Bureau of Economic Analysis, to adjust to 2012 inflation-adjusted (real) dollars.*
3. When we control for the number of active Centers and inflation, **\$ per Center have decreased by 17%**

*National Bureau of Economic Statistics (NBER): [Big Data for 21st Century Economic Statistics](#)

Inflation adjustments are key to comparing the cost of running a Center through time.

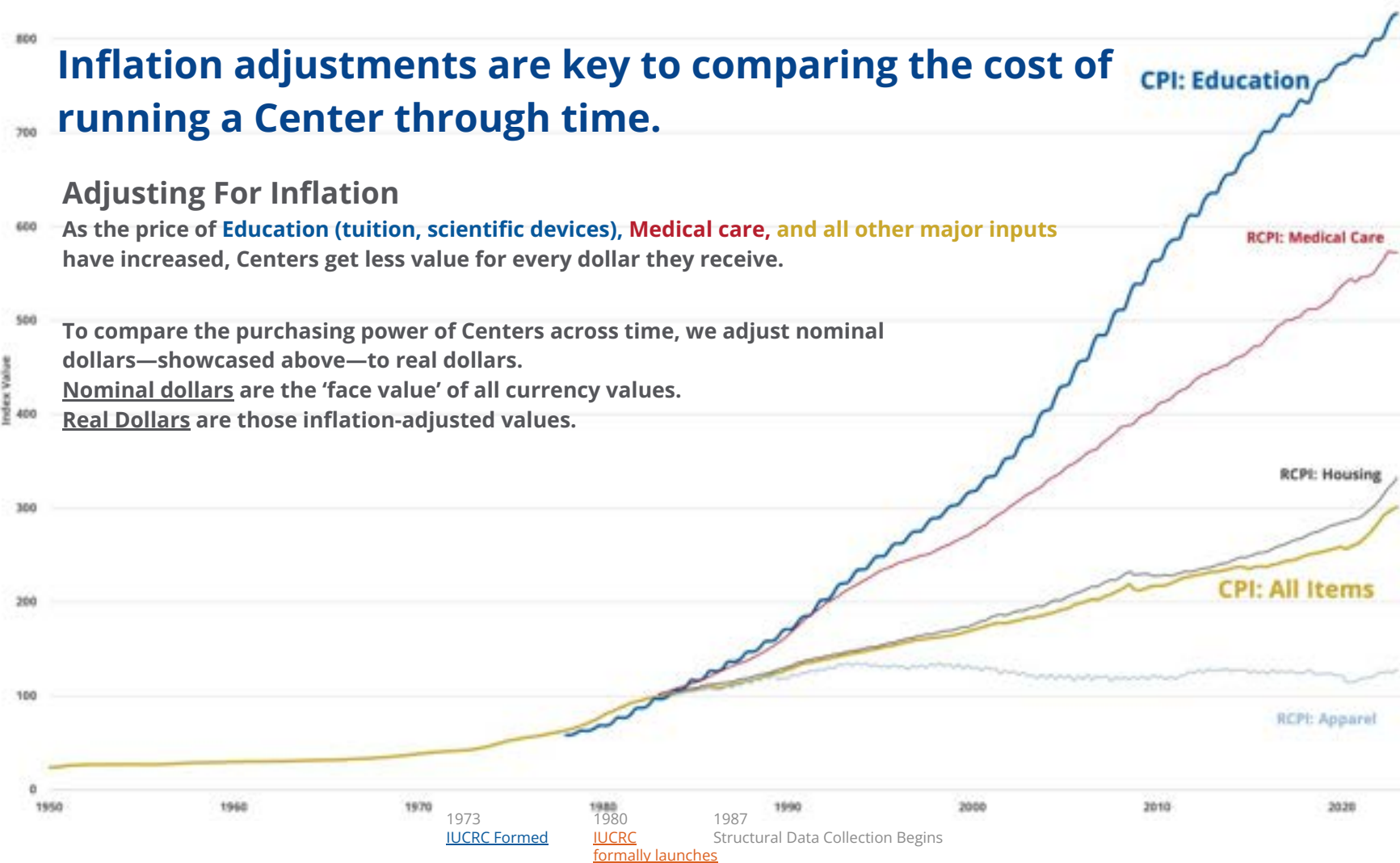
Adjusting For Inflation

As the price of **Education (tuition, scientific devices)**, **Medical care**, and **all other major inputs** have increased, Centers get less value for every dollar they receive.

To compare the purchasing power of Centers across time, we adjust nominal dollars—showcased above—to real dollars.

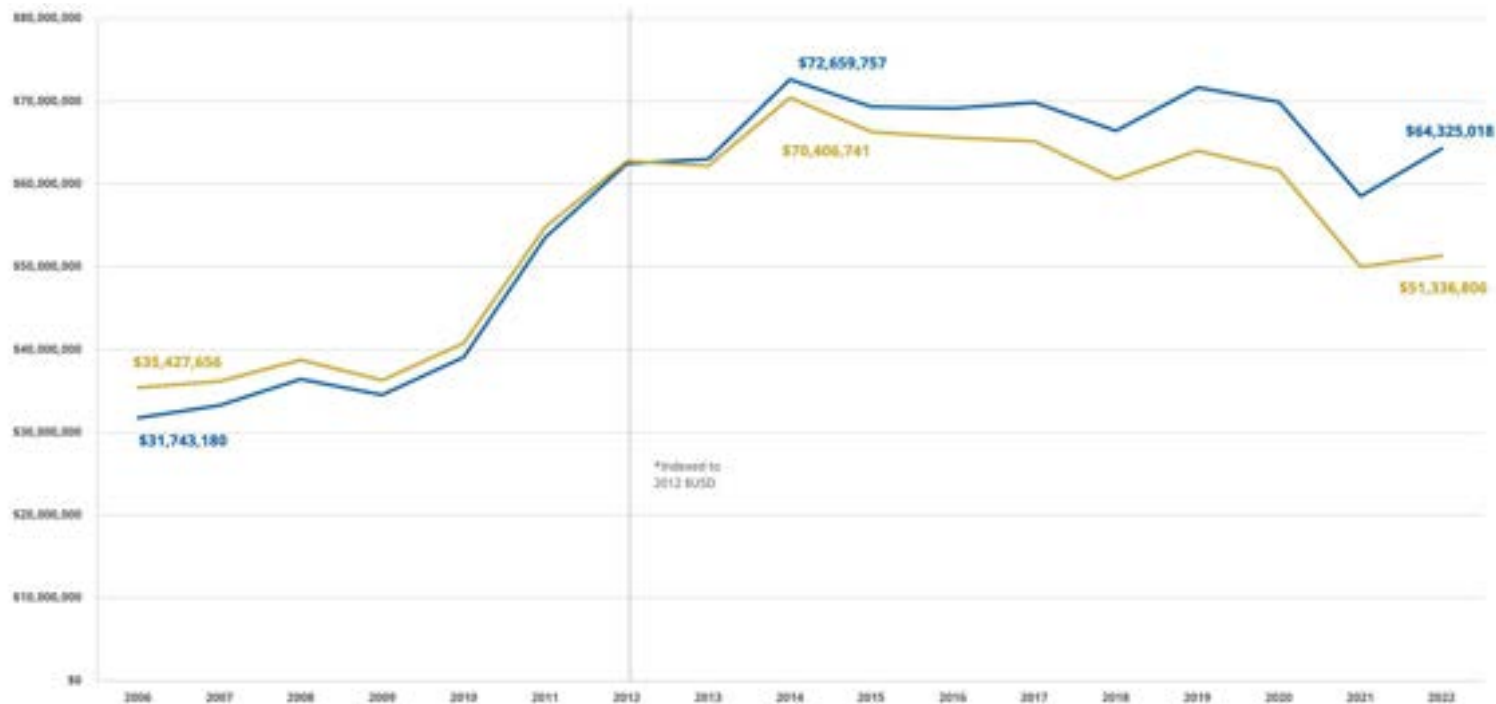
Nominal dollars are the 'face value' of all currency values.

Real Dollars are those inflation-adjusted values.



Adjusting for Inflation

To compare investment and other financial data across time, we utilize the GDP Deflator, provided by the Bureau of Economic Analysis to adjust to 2012 inflation-adjusted (real) dollars.

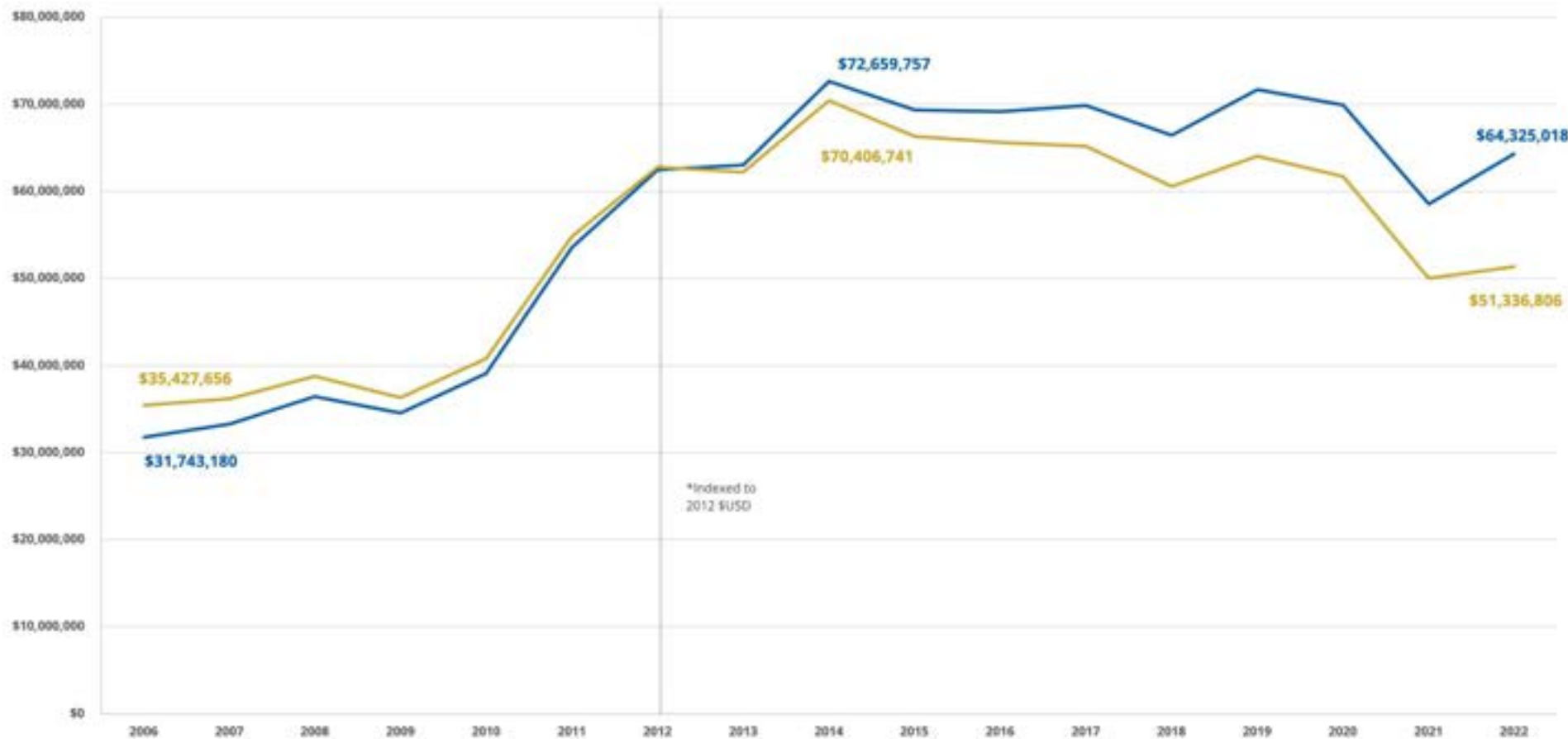


Two typical approaches (CPI vs. GDP), as the Bureau of Labor Statistics writes, “The CPI measures price change from the perspective of an urban consumer and thus pertains to goods and services purchased out of pocket by urban consumers. **The GDP price index and implicit price deflator measure price change from the perspective of domestic production of good and services and thus pertain to goods and services purchased by consumers, businesses, government, and foreigners**”

We are focused on investment in research, and therefore find the GDP deflator more appropriate.

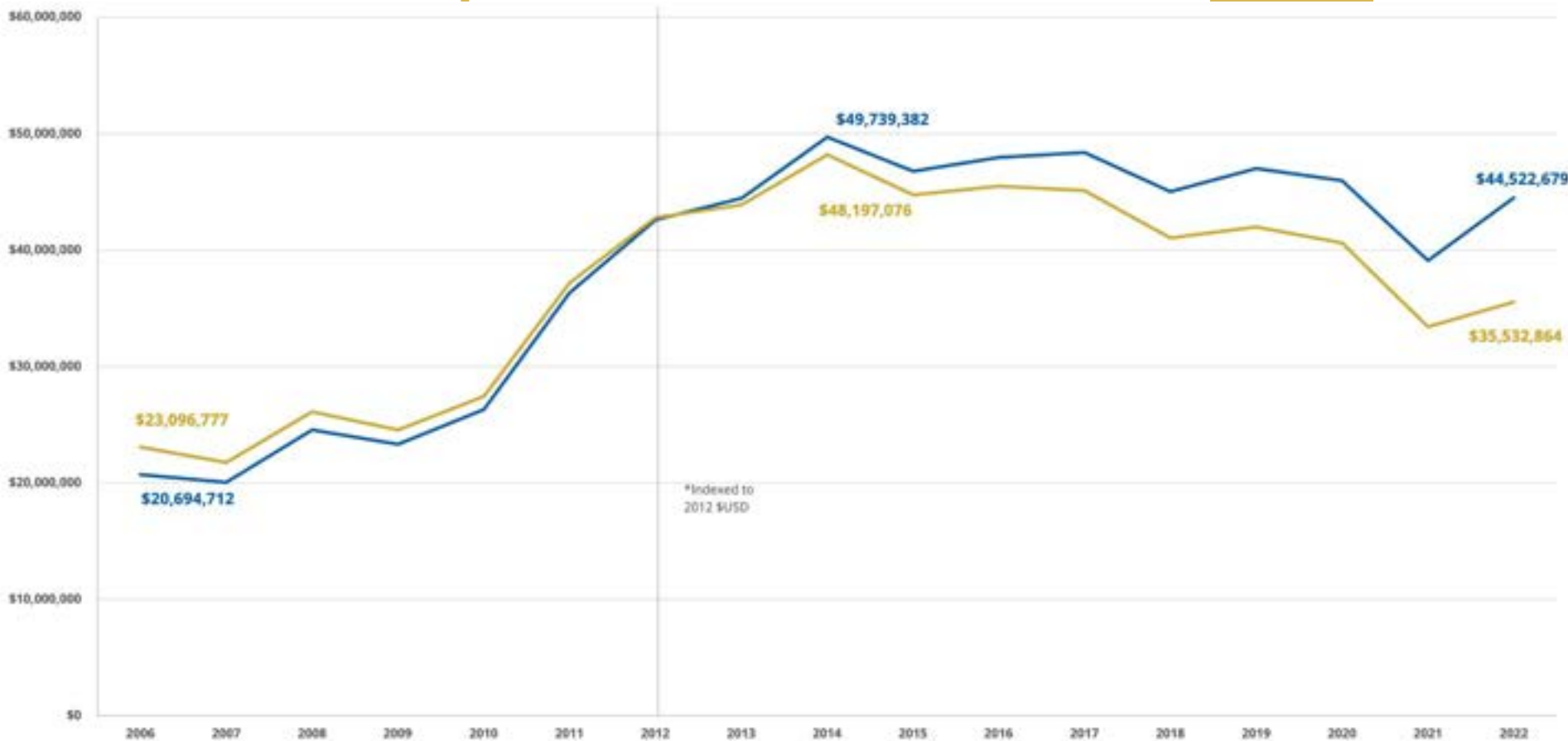
Nominal Core Program Investment Growth, 2006-2022 = 103%

Real Core Program Investment Growth, 2006-2022 = 45%



Nominal Membership Fees Growth, 2006-2022 = 115%

Real Membership Fees Growth, 2006-2022 = 54%

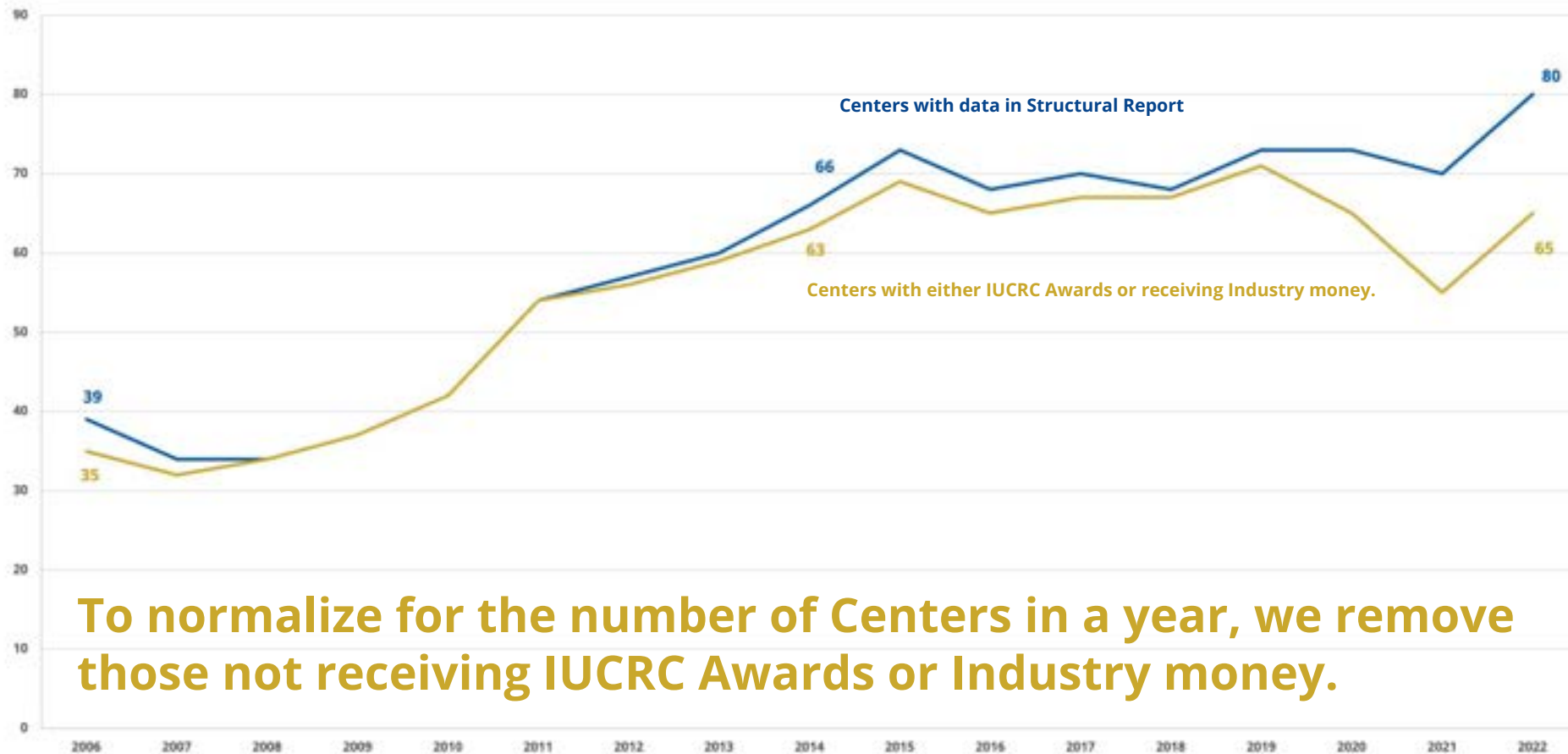


Discussion:

What questions do you have about inflation?

1. **How has inflation affected Center operations from your perspective?**
 - How are expenses similar/different across Centers?
2. **What affects a particular member/industry/organization's ability to pay for their membership?**
 - How much do current member fees match members' willingness/ability to pay?

Active Centers approximately doubled 2006-2014, and have remained relatively stable since 2014.

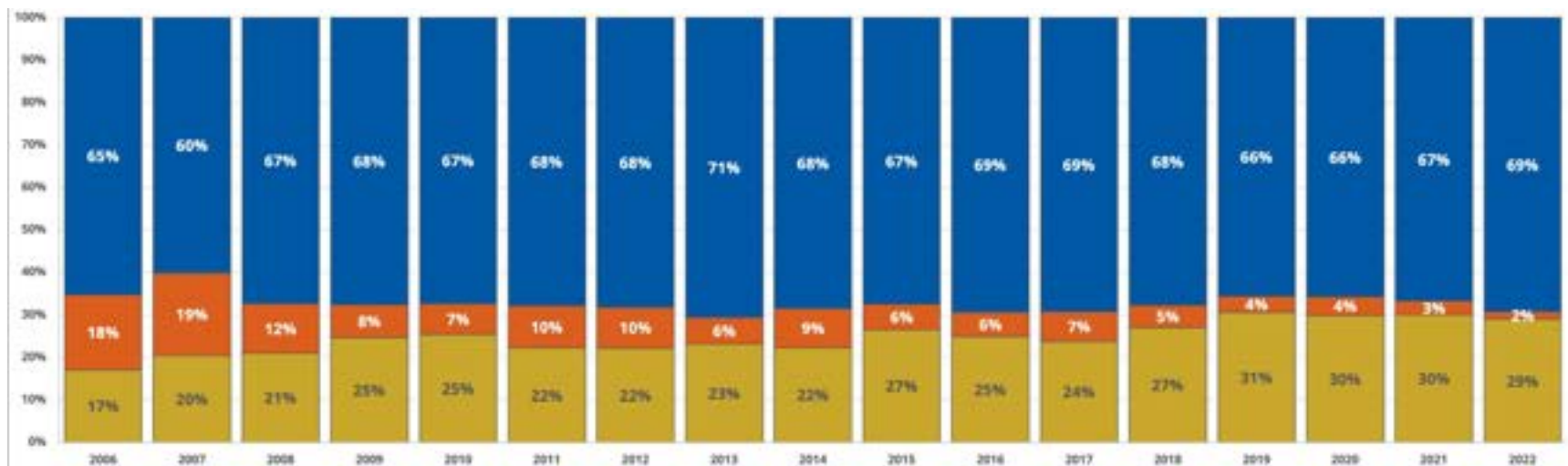


IUCRC Program Investment, 2022

Member Fees per Center: +16%

IUCRC Awards and Supplements per Center: +86%

Additional Industry Support: -89%



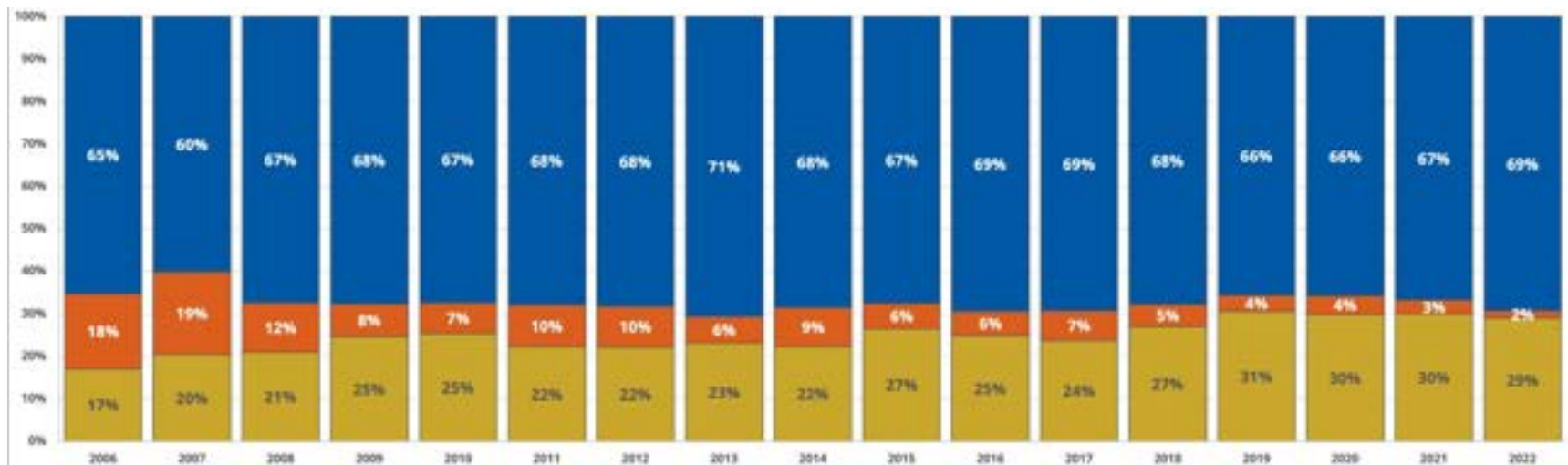
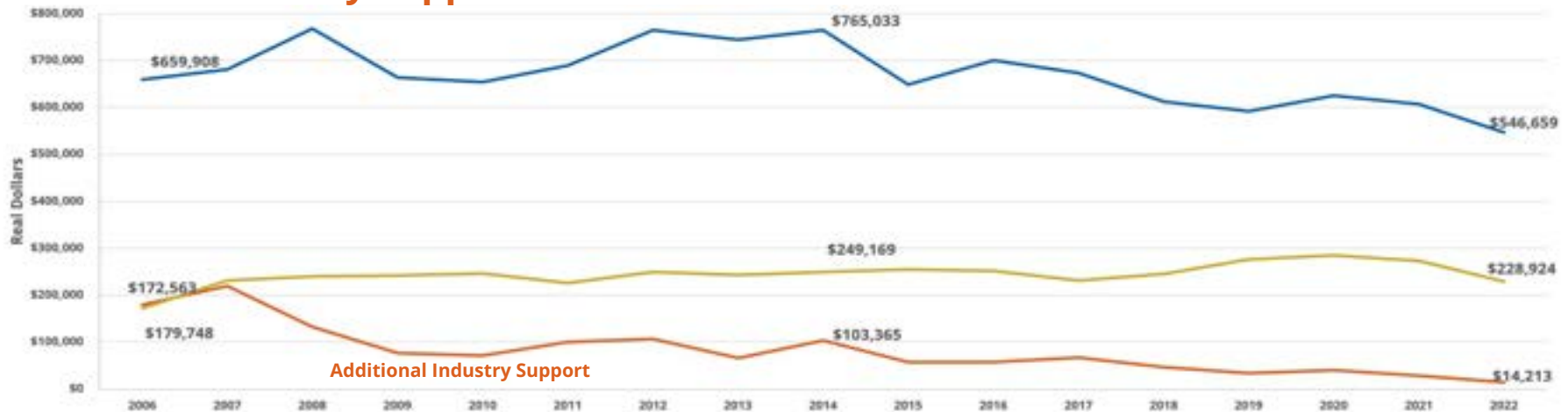
IUCRC Program Investment, 2022

After Adjusting for Inflation

Member Fees per Center: -17%

IUCRC Awards and Supplements per Center: +33%

Additional Industry Support: -92%



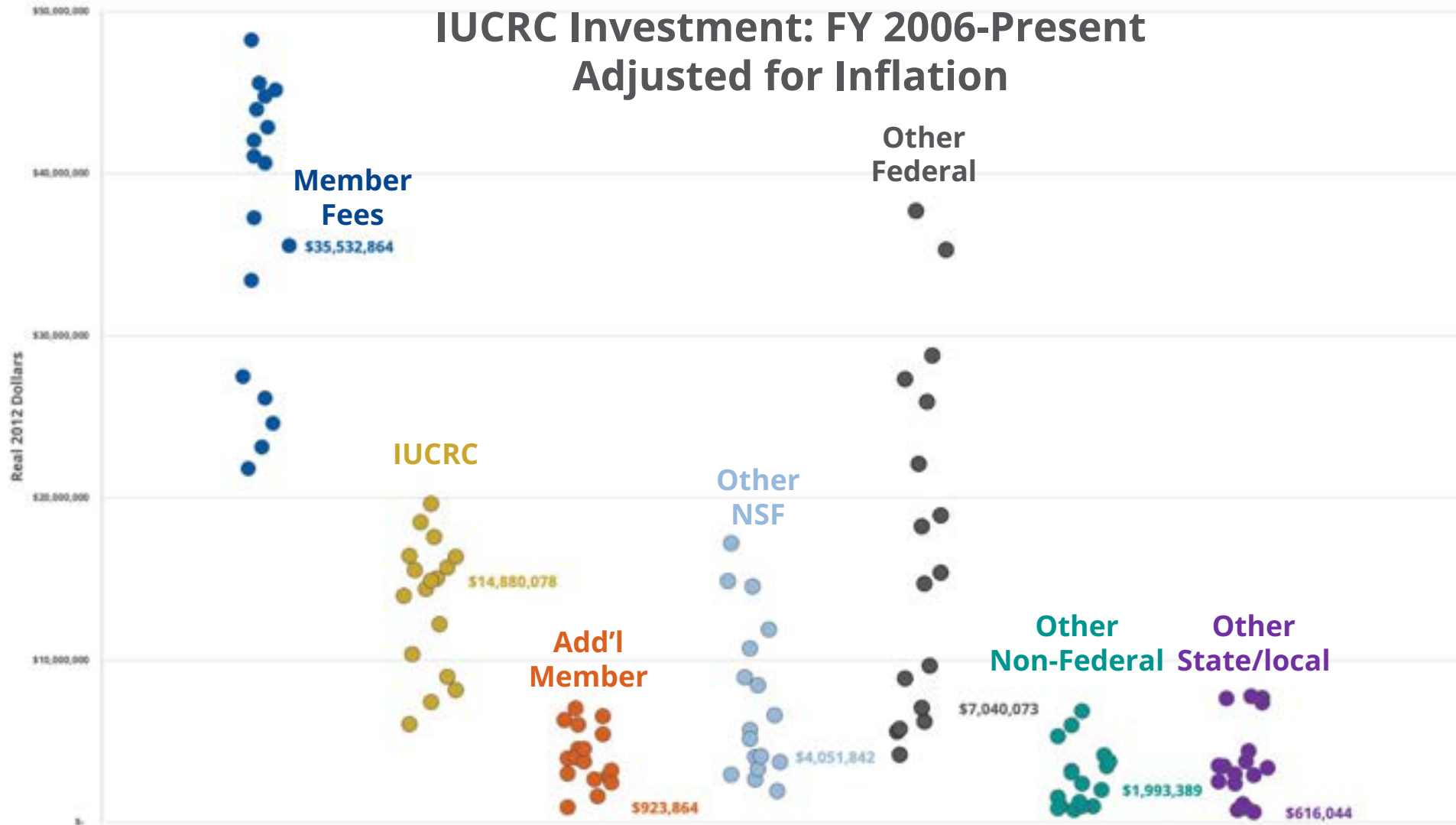
As the number of Centers has increased, the investment per Center has decreased.

Inflation-Adjusted Member Fees per Center: -17%
Inflation-Adjusted IUCRC Awards per Center: +33%

Categories	Funding Type	<u>Total</u>		<u>Per Center</u>	
		Nominal	Real	Nominal	Real*
Core Program Investment	Member Fees:	+115%	+54%	+16%	-17%
	IUCRC Awards & Supplements:	+245%	+146%	+86%	+33%
	Additional Member Support:	-79%	-85%	-89%	-92%

IUCRC Program Investment, 2022

IUCRC Investment: FY 2006-Present Adjusted for Inflation



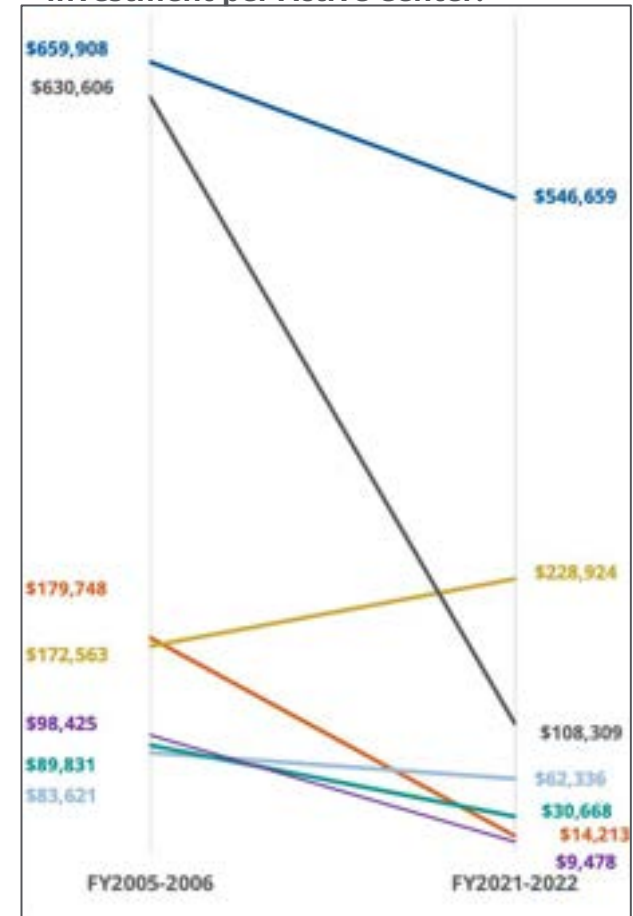
2022 values are labelled parallel with their values, helping show how 2022 values compare with the previous 16 years.

IUCRC Program Investment, 2022

Inflation-adjusted Program Investment, 2006-2022



Investment per Active Center:



Discussion:

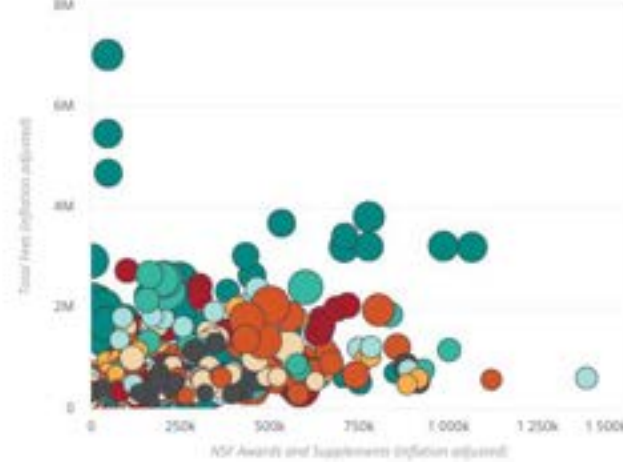
What questions do you have?

1. Does this align with your experience?
2. How can this information be communicated to key stakeholders?
 - Members (Business, Government, and others)
 - NSF
 - Other Federal Agencies
 - Others?
3. What are the optimal fee structures of Centers?
 - How may member discovery assist here?

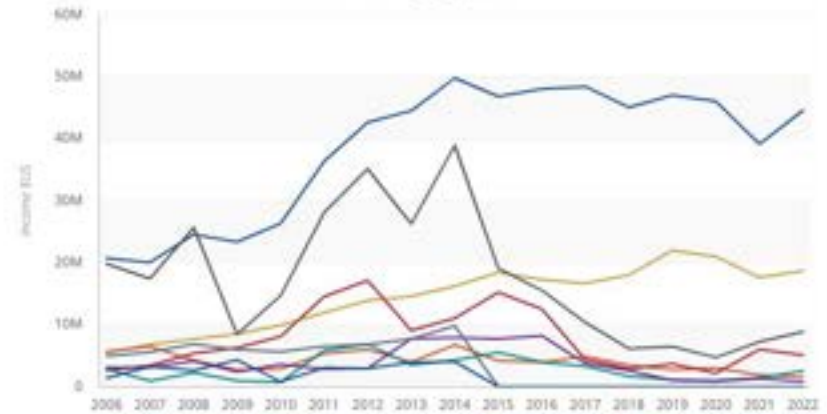
Investment Dashboard

- Search
- Select All
- Accelerated Real Time Analytics
 - Advanced Cutting Tools
 - Advanced Design and Man of Integrated Microfluidics
 - Advanced Electronics through Machine Learning
 - Advanced Forestry Systems
 - Advanced Knowledge Enablement
 - Advanced Mammalian Biomanufacturing Innovation Ce...
 - Advanced Non-Ferrous Structural Alloys
 - Advanced Polymer and Composite Engineering
 - Advanced Processing and Packaging Studies
 - Advanced Research in Drying
 - Advanced Research in Forensic Science
 - Advanced Space Technologies Research and Engineer...
 - Advanced Studies in Novel Surfactants
 - Advanced Subsurface Earth Resource Models
 - Advanced Sustainable Iron and Steel
 - Advanced Vehicle & Extreme Environment Electronics
 - Alternative Sustainable and Intelligent Computing
 - Anthropod Management Technologies
 - Atomically Thin Multifunctional Coatings
 - Berkeley Sensor & Actuator Center
 - Big Learning
 - Bioanalytic Metrology
 - Biocatalysis & Bioprocessing of Macromolecules
 - Bioenergy Research and Development
 - Biomolecular Interaction Technologies
 - Biophotonics Sensors and Systems
 - Bioplastics and Biocomposites
 - Broadband Wireless Access and Applications
 - Building Energy Smart Technologies
 - Building Reliable Advances and Innovation in Neurotech...
 - Built Environment
 - Center to Stream Health in Place
 - Ceramics Composites and Optical Materials Center
 - Child Injury Prevention Studies
 - Cloud & Autonomic Computing
 - Composite & Ceramic Materials
 - Composite and Hybrid Materials Interfacing
 - Computational Biotechnology and Genomic Medicine

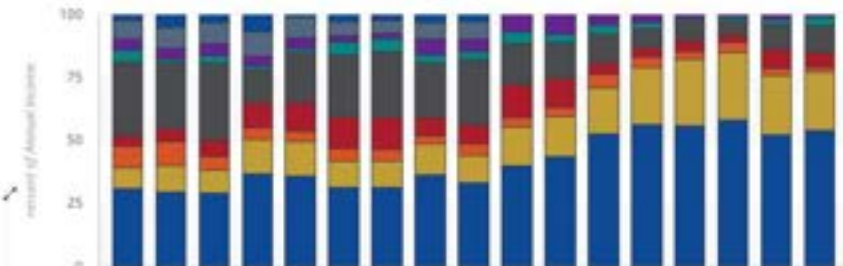
Total Funding by Source



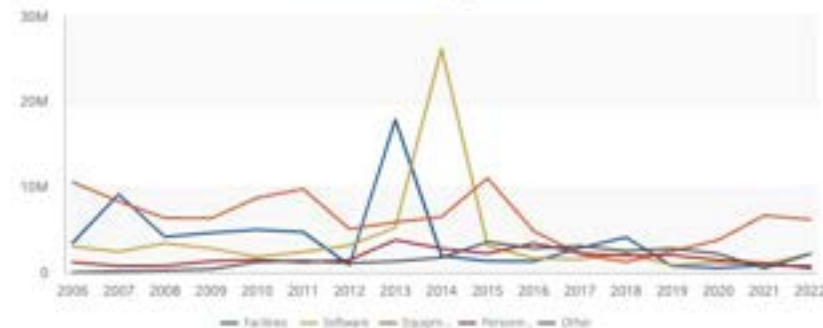
Total Funding by Source



Total Funding by Source

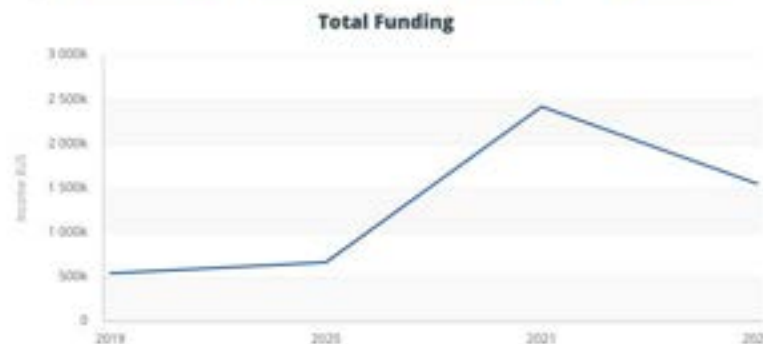
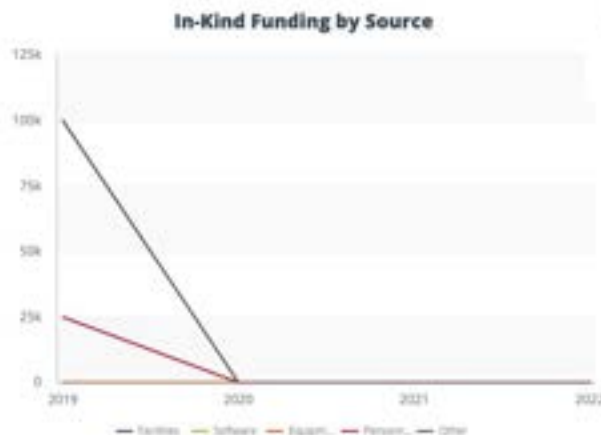
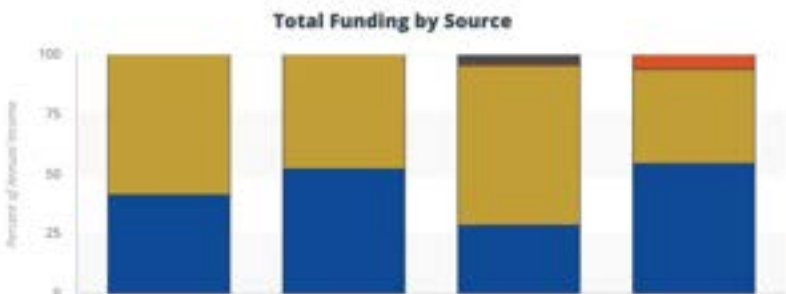
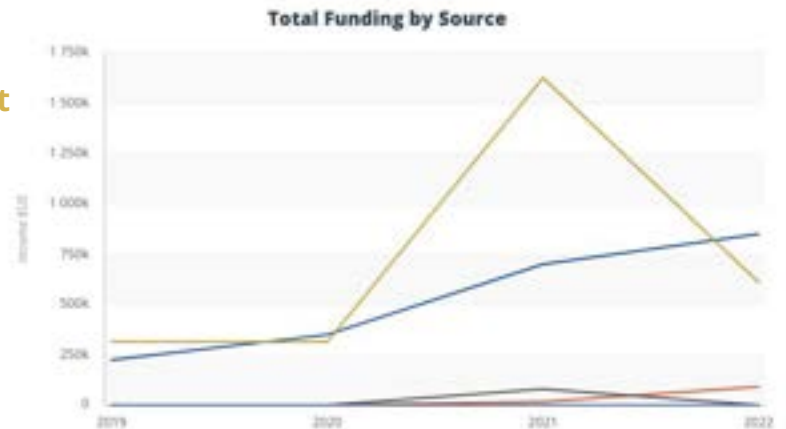


In-Kind Funding by Source



Center Examples: CASERM Advanced Subsurface Earth Resource Models

Membership fees have grown over time while 2021 brought a large IUCRC influx of investment



Center Examples: CenTiRe Tire Research



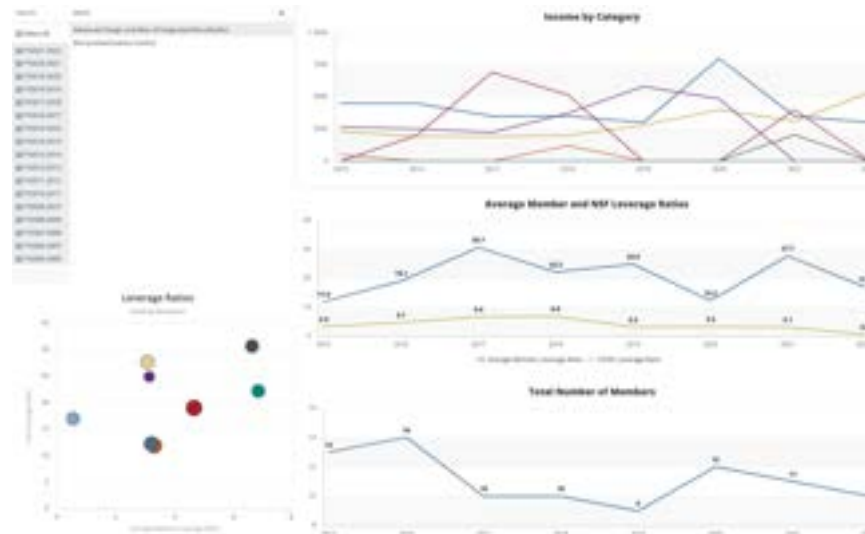
Leverage Ratios

2 major types

1. **NSF Leverage Ratio** - the amount of center funding matched by each dollar of **NSF Awards**.
 - **Total Funding from all non-NSF-IUCRC Sources / NSF IUCRC Awards and Supplements**
2. **Average Member Leverage Ratio** - the amount of center funding matched by each dollar of **membership fees**.
 - **(Total Center Budget / (Total Membership Fees / Number of Memberships))-1**

Leverage Ratios Vary Greatly Depending on the Presence of Investment from Other Sources

Little Other Investment
=
Low Member Leverage Ratio
Example: CADMIM



Large Amounts of Other Investment
=
High Member Leverage Ratio
Example: CAMTECH



What Questions Do You Have?

1. How can/should a Center's investment change over its operating life?
2. What is the 'ideal' composition of funds a Center can gather (including other sources)?
3. How should we compare Centers best, given the few Centers attracting large outside grants?
4. What future opportunities are available for Centers?

What have you heard regarding the economic impact of IUCRCs?

IUCRC Program Investment, 2022

