

BLS Advances in Expenditure and Consumption Measurement

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CNSTAT Panel Session:

Projects at Federal Agencies to Support Data & Estimates of Income, Consumption, and Wealth
Integrated System of Household Income, Consumption, and Wealth Data Event
May 16, 2022 (edited May 20, 2022)



Topics

1. Update on CE Data Quality Projects
2. CE-based Research Related to the Distribution of
 - a. Personal Consumption Expenditures (PCE)
 - b. Consumption as defined for BLS Comprehensive Consumption Initiative



Topic 1

Update on CE Data Quality Projects

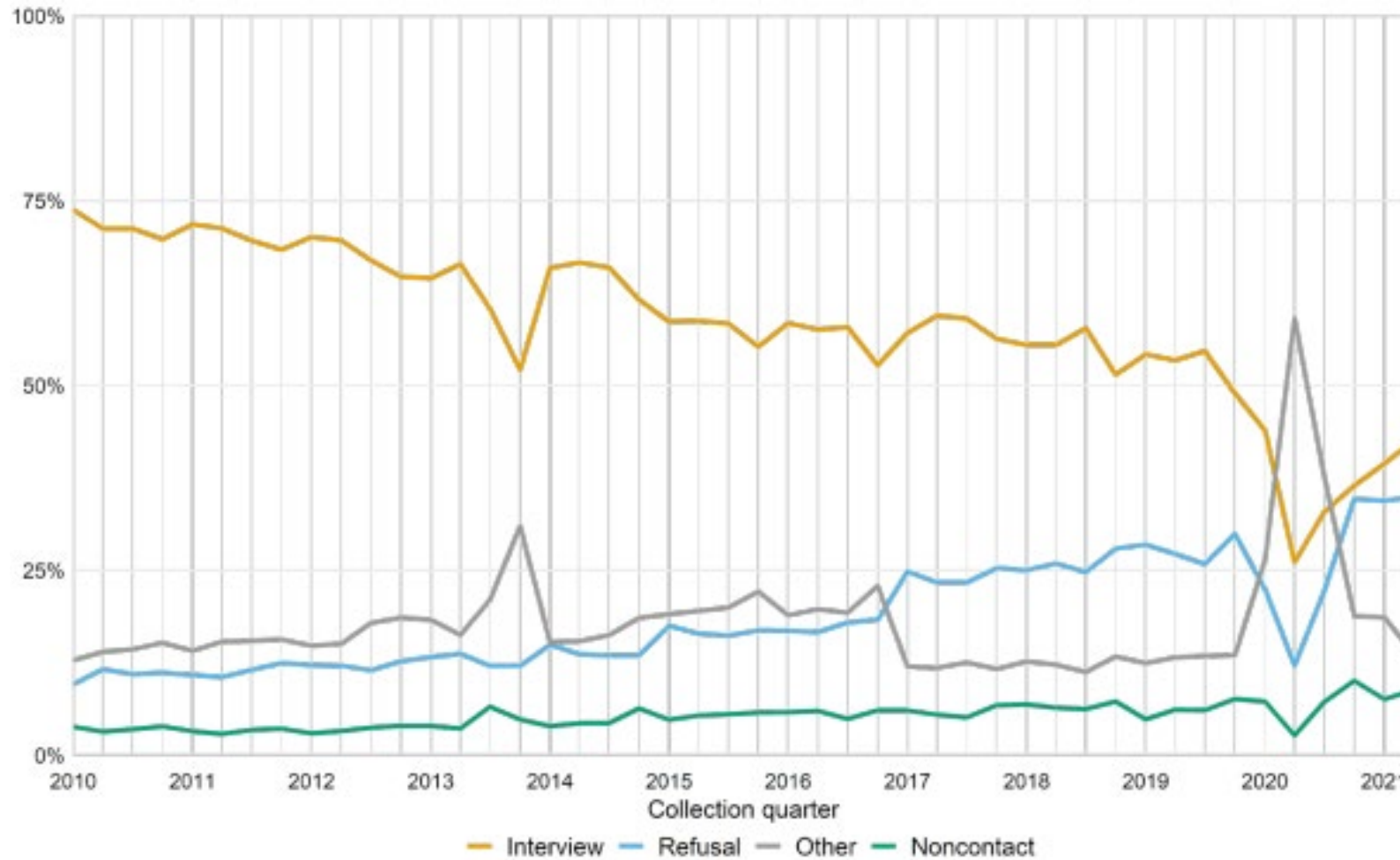


Addressing Weaknesses in CE Data

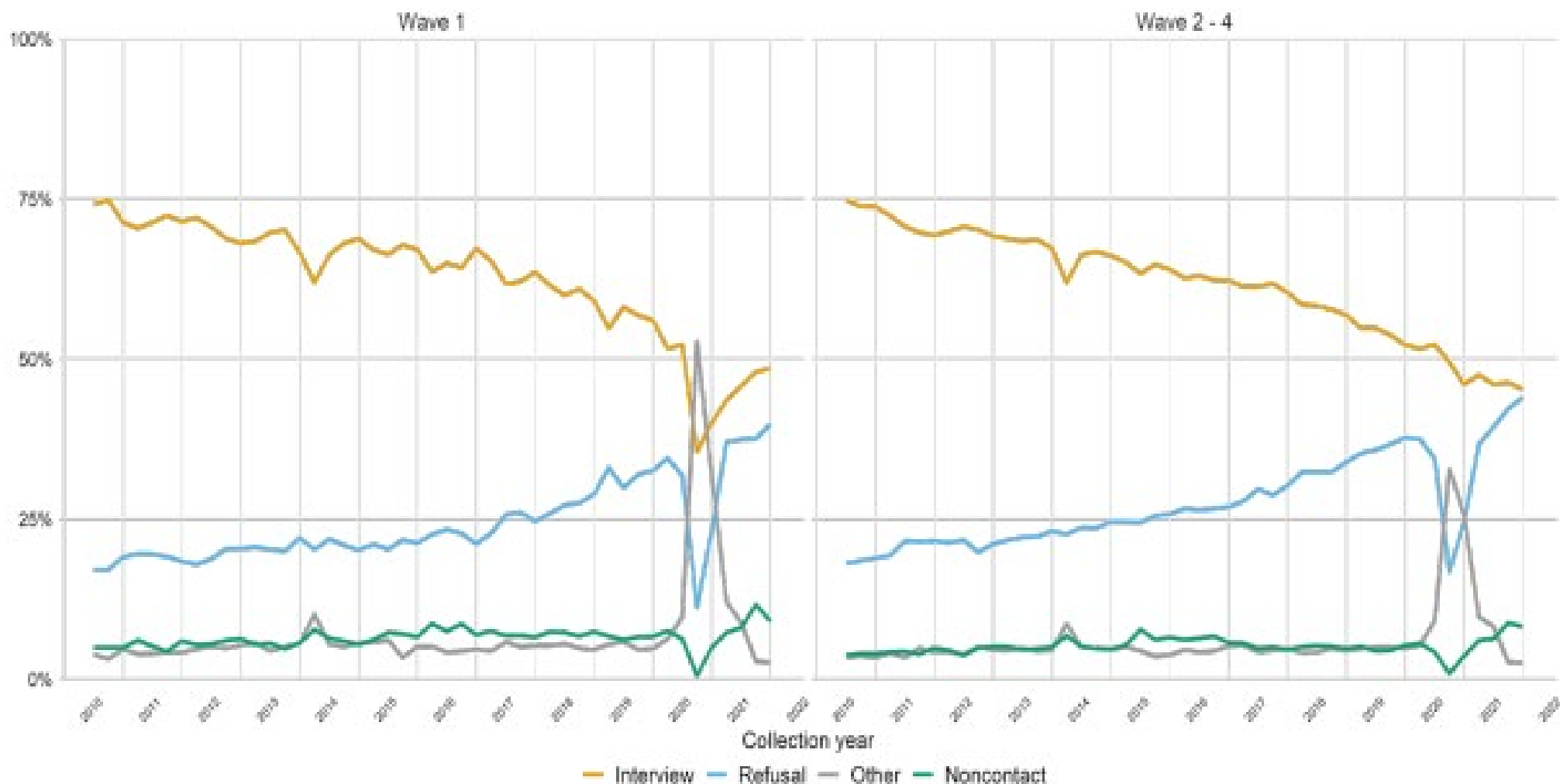
- Declining response rates
- Lower CE aggregates vs. PCE
- Missed CUs in the upper end of the income distribution



CE Diary Survey Response Rates



CE Interview Survey Response Rates



CE Data Comparisons

Data Type	American Community Survey (ACS)	Current Population Survey (CPS)	Medical Expenditure Panel Survey Home (MEPS)	National Health Expenditure Accounts (NHEA)	Personal Consumption Expenditure (PCE)	Panel Study of Income Dynamics (PSID)	Residential Energy Consumption Survey (RECS)
Income	✓	✓					
Total Expenditures					✓		
Healthcare			✓	✓	✓	✓	
Hospital Care			✓	✓	✓		
Prescription drugs			✓	✓	✓	✓	
Medical supplies and non-prescription drugs			✓	✓	✓		
Physician's services			✓		✓		
Dental services			✓	✓	✓		
Rent	✓				✓	✓	
Utilities	✓				✓	✓	
Natural gas	✓				✓		✓
Electricity	✓				✓		✓
Property taxes					✓	✓	
Mortgages	✓				✓	✓	



Aggregate Expenditures: CE vs. PCE

Summary comparison of aggregate Consumer Expenditures (CE) and Personal Consumption Expenditures (PCE) [In millions of dollars]	2020		
	PCE	CE	CE-to-PCE ratio
Total durables, nondurables, and services			
Total	\$13,526,689	\$8,343,647	.62
Comparable items	8,650,873	6,280,753	.73
Ratio of comparable items to total	.64	.75	
Durable goods			
Total durable goods	1,616,408	938,436	.58
Comparable durable goods	1,306,577	838,840	.64
Ratio of comparable durables to total durables	.81	.89	
Nondurable goods			
Total nondurable goods	3,037,413	1,472,744	.48
Comparable nondurable goods	2,825,314	1,367,465	.48
Ratio of comparable nondurables to total nondurables	.93	.93	
Services - household consumption expenditures			
Total services (Household consumption expenditures)	8,872,868	5,932,468	.67
Comparable services	4,306,883	3,969,170	.92
Ratio of comparable services to total services	.49	.67	



Update on CE Data Quality Projects

Online diary

- Implementing an online diary to encourage contemporaneous reporting and provide a technological platform for future enhancements (e.g., receipt capture, geolocation features, etc.)

Streamlined questionnaire

- Implementing a streamlined questionnaire to:
 - reduce the number of questions
 - facilitate the use of records
 - cluster questions together more logically from a respondent's point of view, and
 - eliminate many kinds of follow up questions



Update on CE Data Quality Projects

Data imputation

- Developing programs to impute assets and liabilities data using CE reporters only
 - Retirement accounts, IRA, 401(k), thrift savings plans, checking accounts, savings accounts, money market, CDs, stocks, bonds, whole life insurance, annuities, trusts, and royalties, other assets
 - Student loans, credit cards, other types of loans

Data linking

- Evaluate matched IRS data for potential use in imputation and other production procedures or edits
- Link Interview Survey and HUD addresses to assess potential benefit of using administrative data in CE processing for questions involving housing (not all inclusive; many other rental assistance programs, e.g., USDA)



Topic 2

CE-based Research Related to the Distribution of

- Personal Consumption Expenditures (PCE)
- Consumption (and joint with Income)

Main difference focused on “fit for purpose”

Follow OECD 2013 Framework for Underlying Concepts

- **Consumption expenditure** - value of consumption goods and services used or paid for by a household to directly meet its needs
 - ▶ Purchase of select goods and services in the market
 - ▶ In-kind transfers from employers (e.g., health insurance)
 - ▶ Household's own production of goods and services consumed
 - Owner-occupied housing
 - Owned vehicles
 - Durables
 - Other (e.g., child/elder care, meals)
 - ▶ In-kind transfers from other households and from businesses
- **Actual final consumption** - sum of
 - ▶ Consumption expenditure
 - ▶ Public in-kind transfers

Source: OECD (2013), *OECD Framework for Statistics on the Distribution of Household Income, Consumption and Wealth*, OECD Publishing, Paris, Chapter 5. Household Consumption, p.104.



Framework Comparison

Item	Consumption Exp or Final Consump. (OECD /PCE)	Proposed BLS Consumption	Planned Research
Acquisition cost of services and non-durable goods	Yes	Yes	n/a
Financial services	Yes	Yes	n/a
Service flow from housing	Yes	Yes	n/a
Service flow from vehicles *	Yes/No	Yes	Yes
Service flow from other durable goods *	Yes/No	Yes	No
In-kind receipt of goods and services **	Yes/Partial	Yes	Yes
Other home production *	Yes/No	Yes	Yes
Interhousehold transfers (including gifts received) *	Yes/No	Yes	Yes
Health***	Yes	Partial	Yes
Education	Yes	??	n/a

* Yes/no: in OECD, not PCE

** For renters living in housing units that are subsidized (e.g., rent-control, section 8, public housing), PCE includes the rent paid, not flow of services

*** Restricted to health insurance for BLS consumption



Framework Comparison

Item	Consumption Exp or Final Consump. (OECD /PCE)	Proposed BLS Consumption	Planned Research
Gifts of goods & services given outside household	Yes	No	No
Life insurance/other personal insurance	Yes	No	No
Purchase price of vehicles **	No/Yes	No	No
Purchase price of other durables **	No/Yes	No	No

** No/Yes: Not OECD but in PCE



Topic 2a

Distribution of PCE over Households

Researchers: S. Curtin, T. Garner, B. Martin, and B. Matsumoto



Overview of Research

- Goal: to estimate distribution of BEA's Personal Consumption Expenditures (PCE) by combining data from the PCE and BLS's Consumer Expenditure (CE) Survey
- Work being done in coordination with BEA
 - ▶ Part of a larger project organized by the OECD
 - ▶ Similar to BEA's Distribution of Personal Income product (Fixler, Gindelsky, and Johnson)
- Consumer expenditures organized into PCE "Major Type of Product"
 - ▶ Series presented in NIPA Table 2.3.5
 - ▶ Excludes final consumption expenditures of non-profits serving households
- Prototype focuses on data for calendar year 2019
- Preliminary results
 - ▶ 9.0% of equivalized PCE accounted for by the bottom 20% of population; 37.0% of PCE accounted for by the top quintile (80-100%)
 - ▶ Gini: 0.28



Method to Produce PCE-defined Consumption Expenditures

- Time period for CE Interview: November 2018 – February 2020 (collection: 2019Q1-2020Q1)
- Sample
 - ▶ Restrict to CUs with 2, 3 or 4 interviews
 - ▶ Recalibrate sampling weights to match 2019 counts and average demographic characteristics from CPS
- Use Interview as base (represents ~ 95% of total expenditures)
- Apply statistical matching to impute the remaining 5% from the Diary using procedure based on Hobijn et al. (2009)
- CE expenditures mapped to PCE categories (w/adjustments and imputations)
 - ▶ Mapping based on product and definitions (e.g., no household-to-household vehicle sales)
 - ▶ Supplement CU reported out-of-pocket healthcare (including insurance) expenditures using
 - Center for Medicare and Medicaid Services (CMS) National Health Expenditure (NHE)
 - Medical Expenditure Panel Survey (MEPS-IC) from the Agency for Healthcare Research and Quality



CE/PCE Ratios After All Adjustments to CU Expenditures, but before “Scaling up” to PCE Totals

Preliminary Estimates 2019

	CE/PCE research	CE/PCE published	CE/PCE published “comparables”
PCE less final Cons. Exp. of NPISHs	0.73	0.60	0.73
Durable goods	0.56	0.59	0.65
Nondurable goods	0.63	0.52	0.53
Services	0.78	0.63	0.87

Source for published CE/PCE: https://stats.bls.gov/cex/cecomparison/pce_profile.htm



Method to “CE Scaled-up to PCE” and Produce Distributions

- CE-sourced, PCE-defined expenditures scaled up so that major product totals match published PCE estimates; scaling based on CU share of total CE expenditures, e.g.,
 - ▶ 2019 PCE for Healthcare = \$2,450,839 million
 - ▶ CU “X” had 0.000005% of total PCE-defined CE healthcare spending
 - ▶ CU “X” assigned $0.000005\% * \$2,450,839$ million (PCE healthcare total \$) as CU “X’s” expenditure
- Apply equivalence scale, square root of CU size, to produce distributional statistics
- Rank consumer units by equivalized “CE scaled-up to PCE” population weighted (by number of consumer units and members within), referred to a “Equivalized PCE”

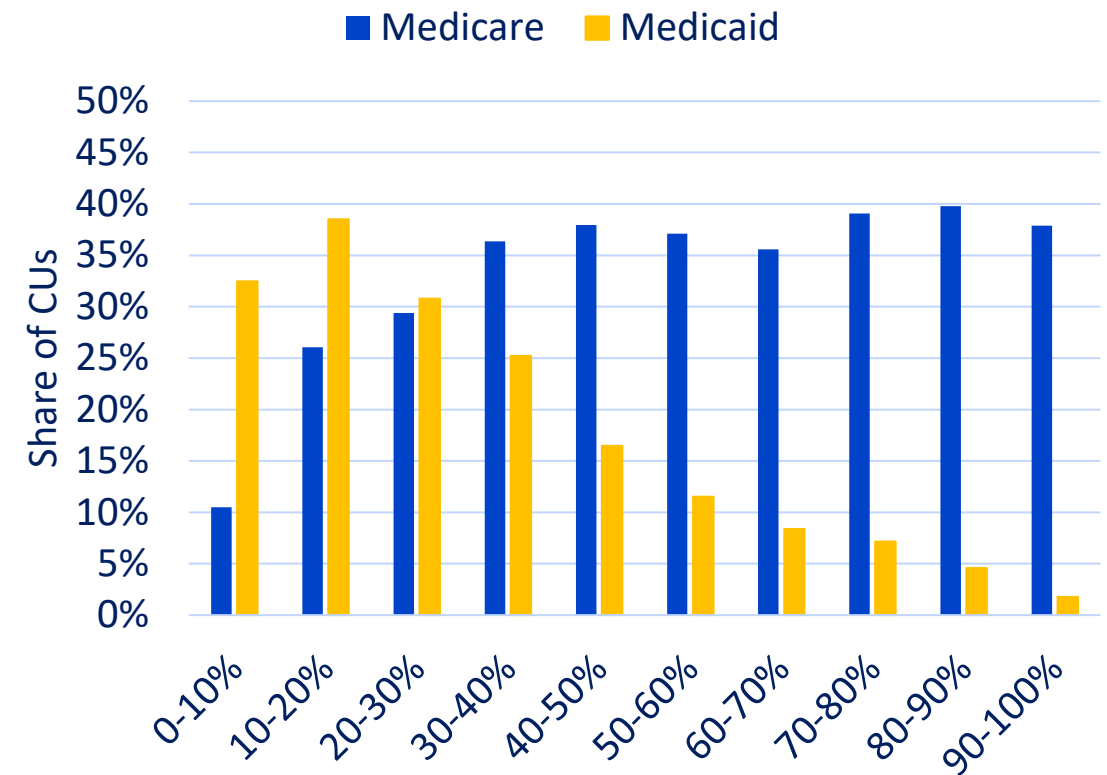


CE /PCE Ratios with Adjustments & Shares of Households with Medicare and Medicaid Recipients within Deciles

Preliminary Estimates 2019

CE to PCE Ratios

PCE_Title	Diary imputed to Interview	+ Split CE OOP health ins premium	+ With imputations for benefits
Pharm. and other medical goods	0.16	0.27	0.68
Health care ser.	0.05	0.20	0.80
health insurance prem (net for split)	1.85	0.19	0.79



Decile of Population based on Rank of Eq. PCE

NOTE: ranking of eq. PCE expenditures after scaling up

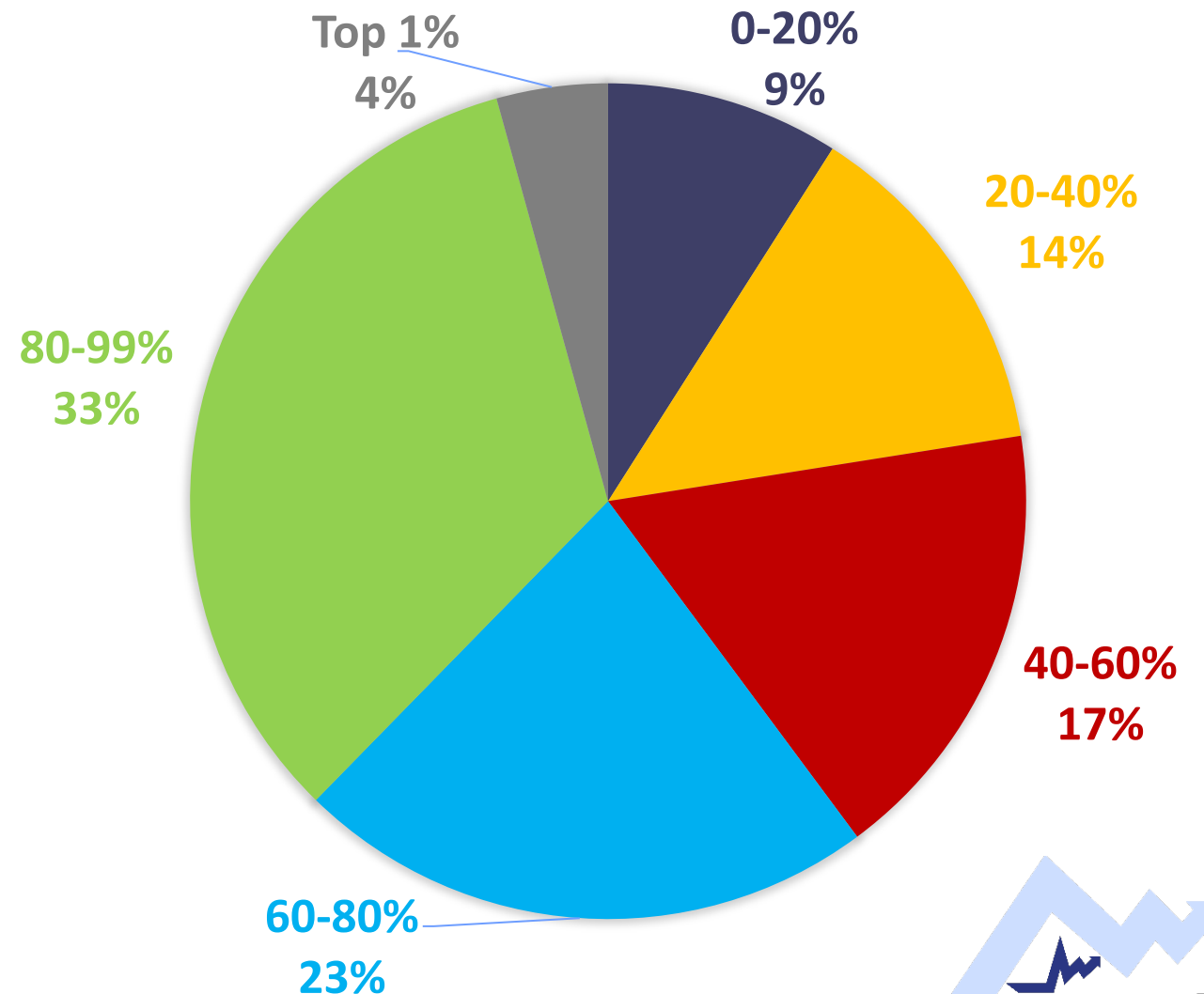
Shares of “Equivalized PCE” by Distribution of Population

Preliminary Estimates 2019

For example...

33% of Equivalized PCE accounted for by the population within 80-99th CE-PCE exp. percentile range

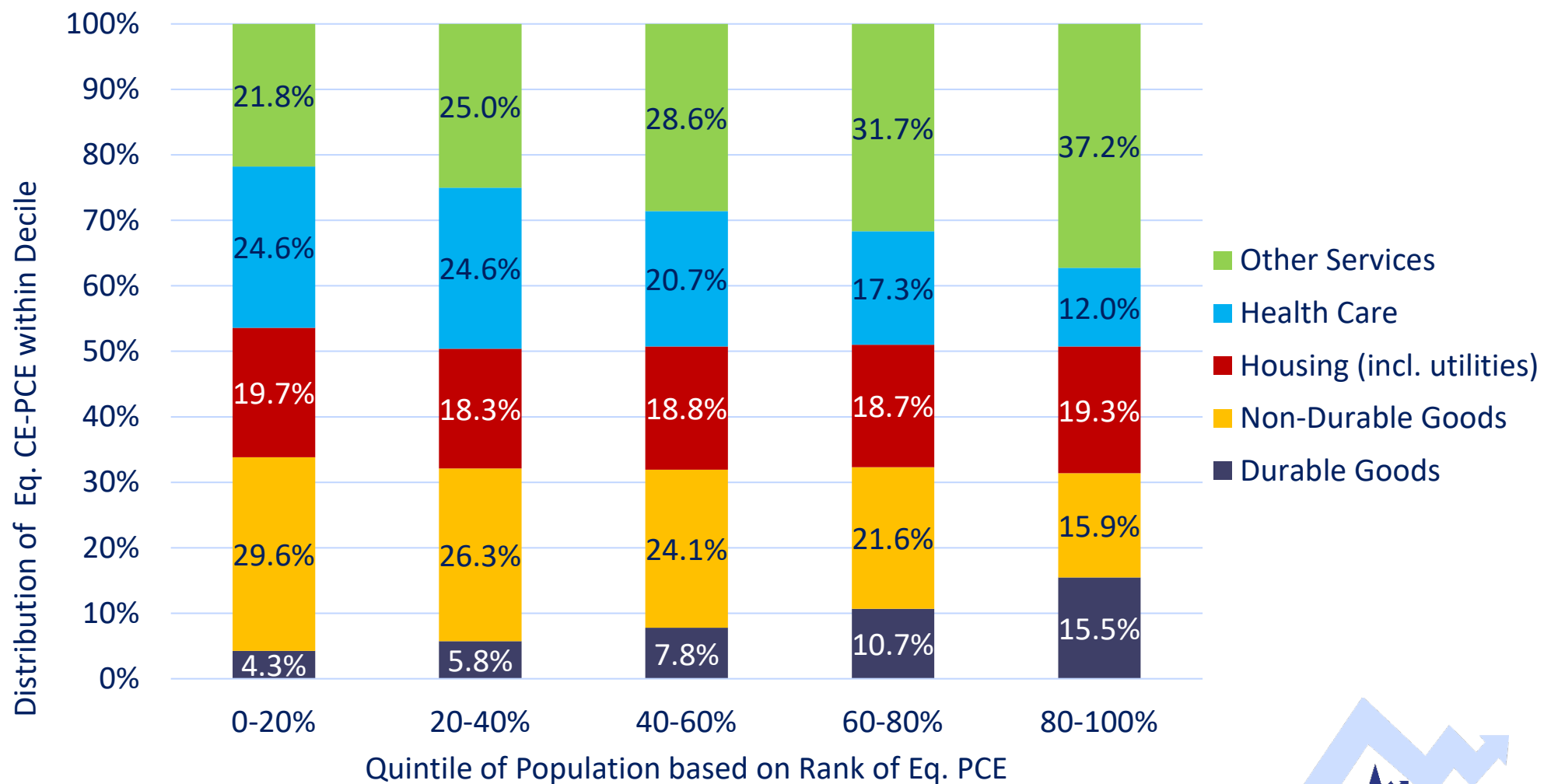
NOTE: Shares and rank percentiles based on CExp Scaled up to PCE, referred to a “Equivalized PCE”



Composition of “Equivalized PCE” by Quintile

Preliminary Estimates 2019

For example...
24.6% of PCE, accounted for by households in the bottom quintile, is for Health Care



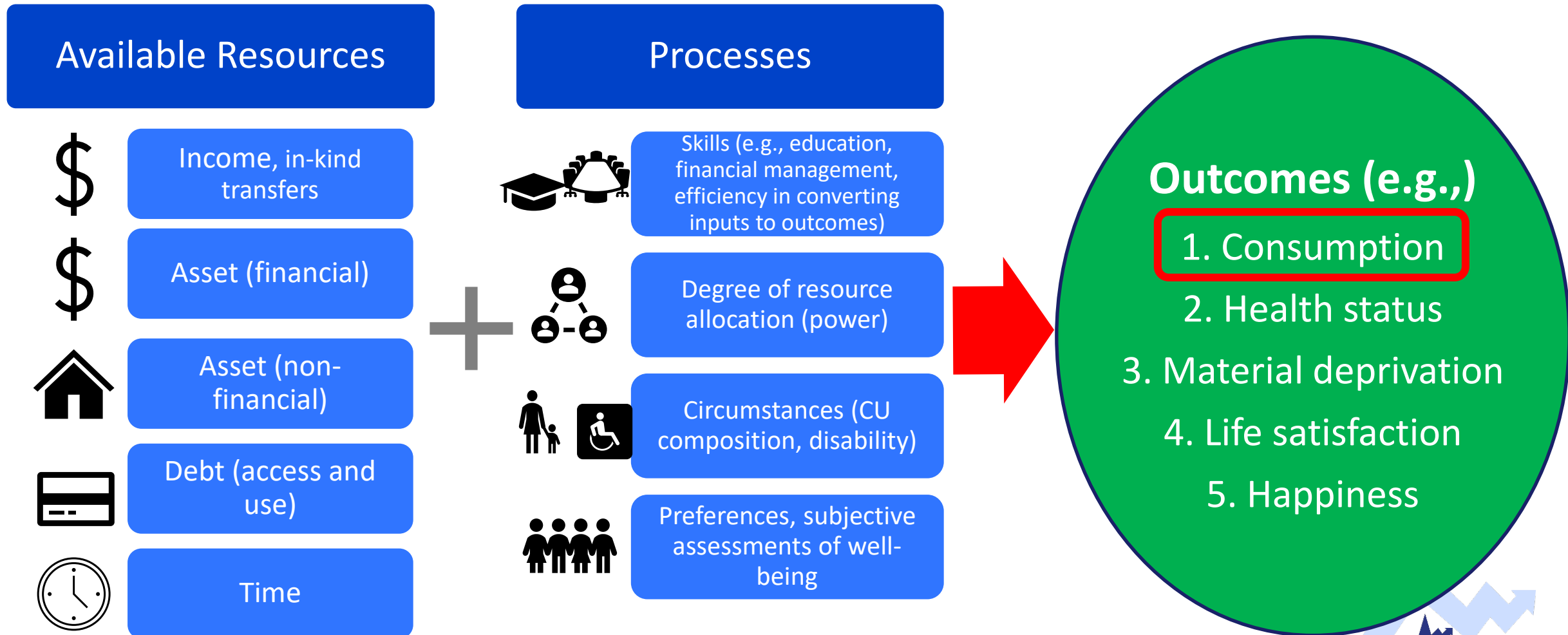
Topic 2b

BLS Initiative to Produce a Comprehensive Consumption Measure

Researchers: S. Curtin, T. Garner, B. Matsumoto, and J. Schild



Consumption as a Well-being Outcome: A Function of Resources and Processes



BLS Initiative to Produce a Comprehensive Measure of Consumption

- Measure being designed to reflect how consumer units (CUs) use resources (e.g., income, wealth, time, in-kind benefits) to meet their consumption/material “needs
- Motivation
 - ▶ BLS long term interest to produce consumption measure & CE data users
 - ▶ Period of COVID-19 with more goods and services produced by household members
 - ▶ BLS is the producer of CE and ATUS data
 - ▶ ITWG on Evaluating Poverty Measures
 - ▶ Commissioner Beach’s support
- Goal
 - ▶ Produce components at the micro level that can be used by researchers to produce his/her preferred consumption or consumption expenditure measure definition depending on purpose
 - ▶ Publish tables
 - ▶ Disseminate public use microdata



Overview of Research Presented Today

- Time period: January 2019-February 2020 (collection: 2019Q2-2020Q1)
- Sample: all consumer units participating in an Interview with 3-month recall for expenditures and 12 for income
- Measures: consumption & consumption expenditures for 3-months; 12-month after tax and transfer (TT) income divided by 4
- Method to produce distributions
 - ▶ Apply 3-parameter equivalence scale (same as for Supplemental Poverty Measure)
 - ▶ Rank consumer units by equivalized values population weighted (by number of consumer units and members within)
 - ▶ Shares and rank percentiles based on equivalized values
- Preliminary results for 2019
 - ▶ 9.0% of equivalized consumption accounted for by the bottom 20% of population; 39.0% of equivalized consumption accounted for by the top quintile
 - ▶ 5.0% of equivalized after tax and transfer income accounted for by bottom 20% of population; 46% accounted for by the top quintile
 - ▶ Gini for equivalized consumption: 0.30
 - ▶ Gini for equivalized after tax and transfer income: 0.40



Comprehensive Measure of Consumption

Item	Current	Planned Research
Acquisition cost of services and non-durable goods	Yes	n/a
Service flow from housing	Yes	n/a
Service flow from cars and trucks	Yes	Yes
In-kind receipt of goods and services (currently only: NSLP, LIHEAP, WIC, rental assistance)	Yes	Yes
Gifts of goods & services given outside household*	Yes	Yes
Other home production **	No	Yes
Interhousehold transfers (including gifts received)	No	Yes
Health***	No	Yes
Education	No	??

* Future: subtract for within household consumption

** Contract with outside vendor to estimate

***Restricted to health insurance



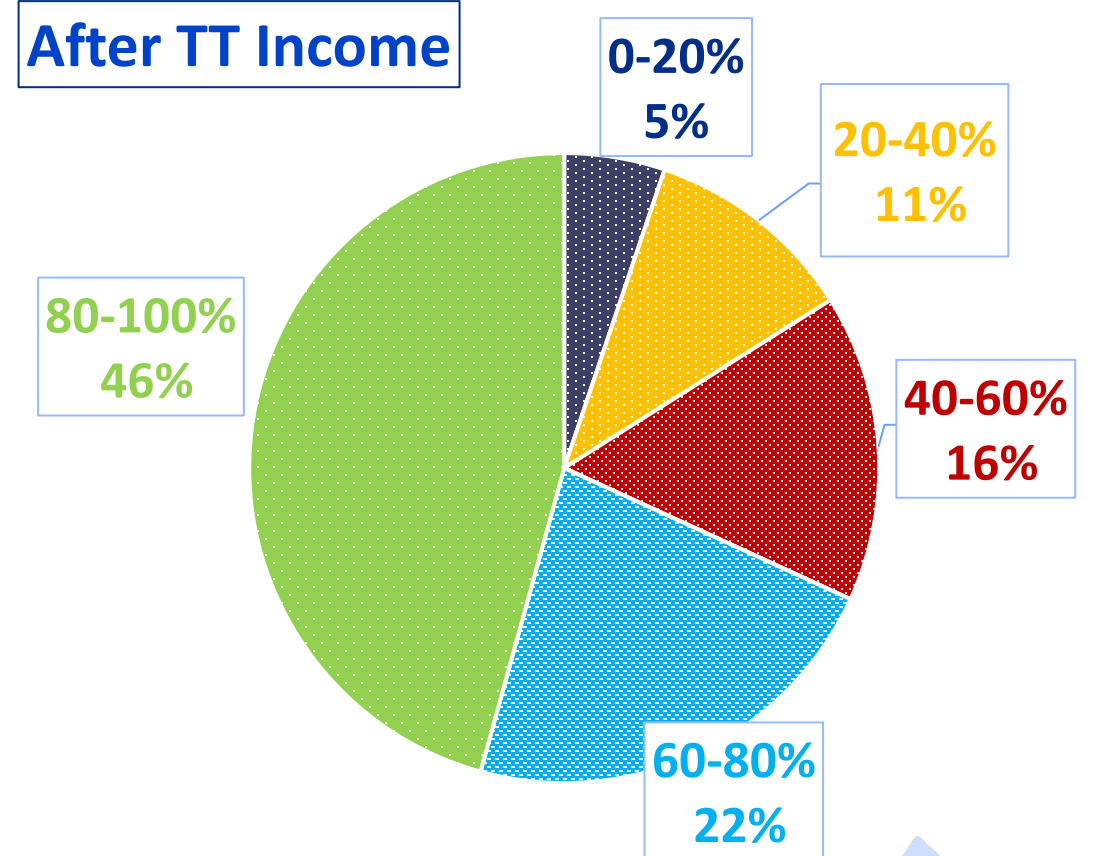
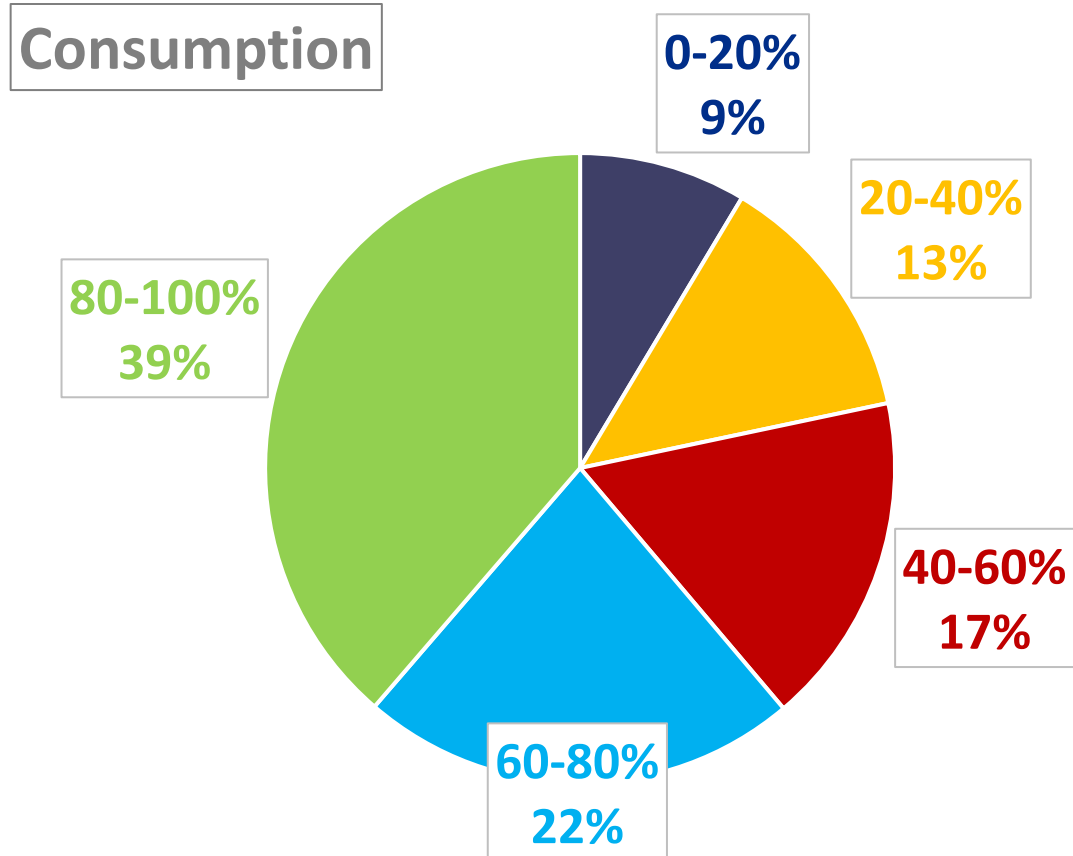
Construction of Comparison Measures

Measure	Base	Not Included	Addition
Consumption Expenditures	CE Publication Definition of Total Expenditures	Cash contributions; allocations to and purchases of life insurance, endowments, annuities, and other personal insurance; retirement, pensions, and Social Security	
After Tax and Transfer Income	CE Defined After Tax Income		LIHEAP, NSLP, WIC, rental assistance in-kind transfers



Shares of Equivalized Consumption & Equivalized After TT Income by Quintile

Preliminary Estimates 2019



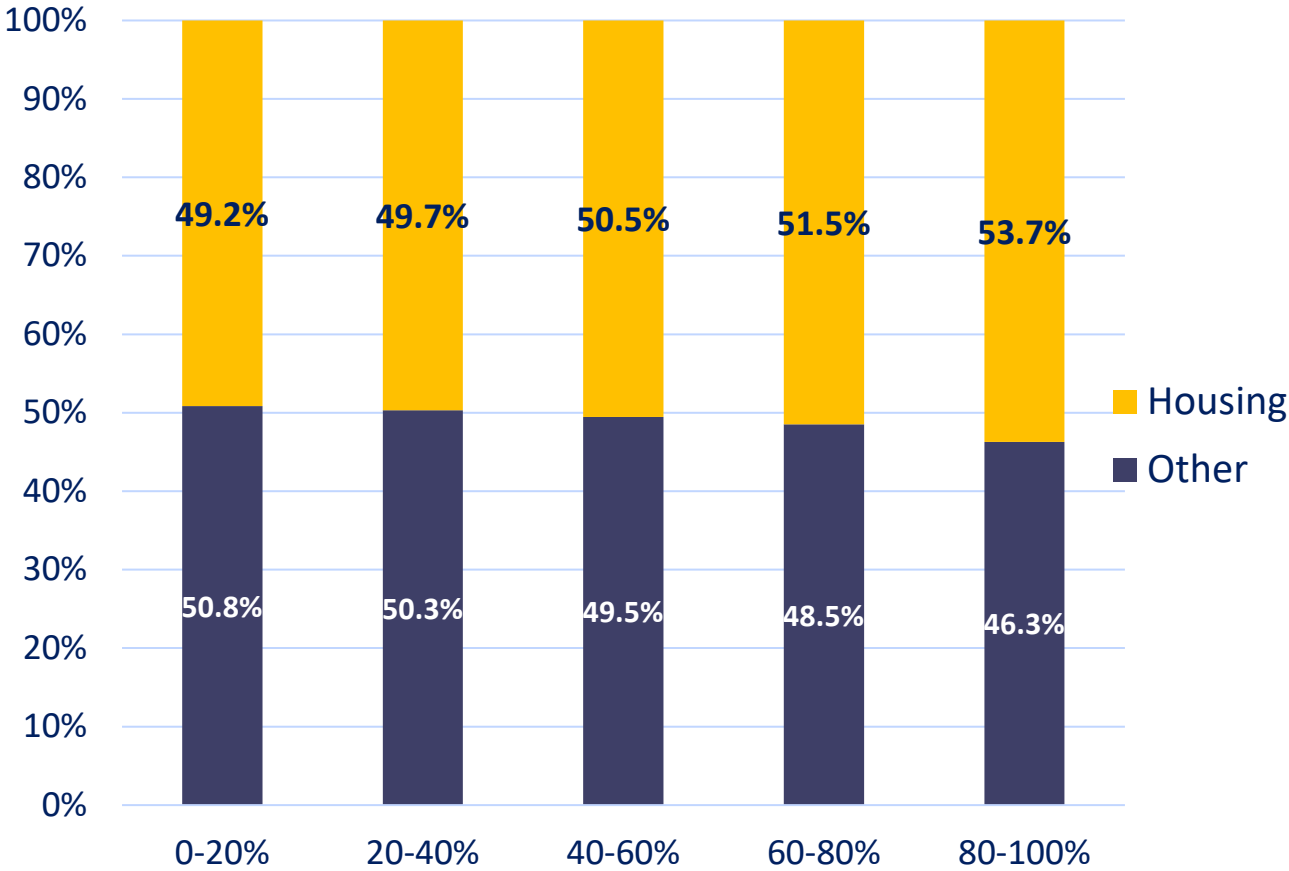
NOTE: Quintiles based on rank of population by equivalized consumption or after tax and transfer income



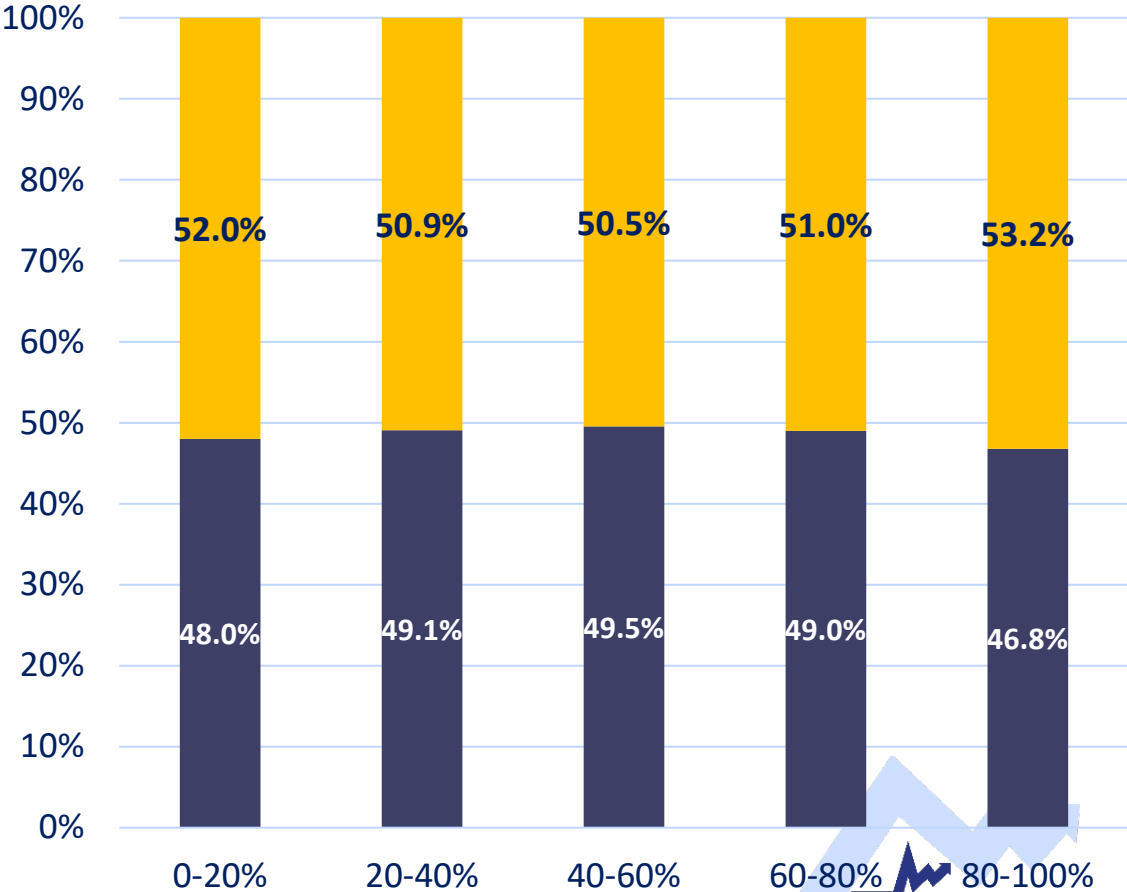
Housing (including Utilities) as Share of Total Consumption by Quintile

Preliminary Estimates 2019

By Consumption Quintile



By After TT Income Quintile



Joint Distribution of Consumption & After TT Income

Preliminary Estimates 2019

	Rank by Eq. Consumption									
	1	2	3	4	5	6	7	8	9	10
Rank by Eq. Income	1	17%	12%	7%	6%	5%	4%	4%	3%	3%
	26%	22%	16%	11%	8%	5%	4%	3%	2%	2%
	16%	21%	18%	13%	11%	8%	5%	4%	2%	2%
	11%	15%	15%	16%	13%	11%	8%	6%	3%	2%
	5%	10%	14%	17%	14%	12%	10%	8%	6%	3%
	3%	9%	11%	15%	14%	14%	13%	10%	7%	4%
	1%	3%	7%	10%	13%	17%	16%	16%	10%	5%
	1%	2%	4%	6%	11%	15%	18%	17%	17%	9%
	0%	0%	2%	3%	6%	9%	14%	20%	24%	20%
	0%	0%	1%	1%	2%	4%	6%	12%	25%	48%

Joint Distribution of Consumption & Consumption Exp.

Preliminary Estimates 2019

	Rank by Eq. Consumption									
	1	2	3	4	5	6	7	8	9	10
1	70%	18%	6%	3%	1%	1%	0%	0%	0%	0%
2	21%	41%	19%	9%	5%	3%	1%	1%	0%	0%
3	4%	24%	33%	18%	10%	6%	3%	2%	1%	0%
4	1%	9%	21%	31%	18%	9%	6%	3%	1%	0%
5	1%	3%	9%	19%	29%	19%	10%	6%	3%	1%
6	0%	1%	6%	11%	19%	26%	19%	12%	4%	1%
7	1%	1%	2%	5%	8%	18%	29%	24%	9%	3%
8	0%	1%	1%	2%	5%	8%	18%	30%	27%	8%
9	1%	1%	2%	2%	3%	5%	7%	15%	37%	27%
10	0%	1%	1%	2%	2%	4%	6%	9%	17%	60%

Summary

- Research continues to support data quality improvements in CE
- Research continues regarding distributional PCE
 - ▶ Refinements to CE allocations and adjustments
 - ▶ Update to more recent time periods
- Research continues regarding the development a comprehensive measure of consumption
 - ▶ Accounting for health insurance
 - ▶ Accounting for home production
 - ▶ Decomposition in inequality and poverty by demographic groups (e.g., education, race)
- Combine research on PCE and CE comprehensive consumption to move closer to OECD definitions of “consumption expenditures” and “final consumption”
- Joint distribution of consumption, income, and net worth
- Progress posted on <https://www.bls.gov/cex/consumption-home.htm>



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