

Consumption Inequality Before, During, and After the COVID-19 Pandemic

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Objectives of this Study

- Objective 1: Continue research on creating a household-level (micro) consumption measure
 - ▶ Provide a framework focused on consumption as an outcome measure
 - ▶ Provide evidence on a dimension of welfare based on data from an expenditure survey as distinct from an income survey, along with administrative data
 - ▶ Address differences in expenditures and consumption
 - For example, expenditures do not equal consumption for owner-occupied housing and durables
- Objective 2: Examine drivers of change in consumption inequality by examining the contribution of subcomponents of consumption
 - ▶ Gini decomposition
 - ▶ Results from 2019-2023 *(last updated with results from March 18, 2025)*

Overview: COVID and Consumption Inequality

■ *Motivation:* COVID greatly impacted the economy

- ▶ Sudden shutdown private and government sectors of the economy in March 2020
 - Shifts in types of expenditures and consumption
 - Some of these were more affected than others
 - Resulted in trade-offs, substitutions, and changes in home production
- ▶ Unprecedented fiscal response

■ *Findings*

- ▶ Consumption inequality fell in 2020 but returned to 2019 levels in 2022-2023
- ▶ Decline driven by declining consumption in “pandemic sensitive” categories of consumption (*directly impacted by shutdown*) among those at the top of the distribution



Related Research

- Builds on work of Eurostat, ILO, OECD, World Bank, UN, and many researchers, e.g.,
 - ▶ U.S. perspective: Fisher, Johnson, Smeeding, and Thompson (2022) & Meyer, Han, and Sullivan (2024)
 - ▶ International perspective: Garner, Lanjouw, Matsumoto, Mazeikaite, Munzi, Neugschwender, Omar, and Schild“ (2025). “Building a Comparable Measure of Consumption: Concepts and Measurement Challenges Faced by Emerging and Advanced Economies.” LIS Working Paper Series 912. December. <https://www.lisdatacenter.org/wps/liswps/912.pdf>
- Supports the work of
 - ▶ U.S. Interagency Technical Working Group (ITWG) on Evaluating Alternative Measures of Poverty (2020) and Committee on National Statistics Panel’s report (2023) that focuses on consumption needs as part of a proposed Principal Poverty Measure
 - ▶ OECD joint distributions of income, consumption, and wealth (micro and macro groups)

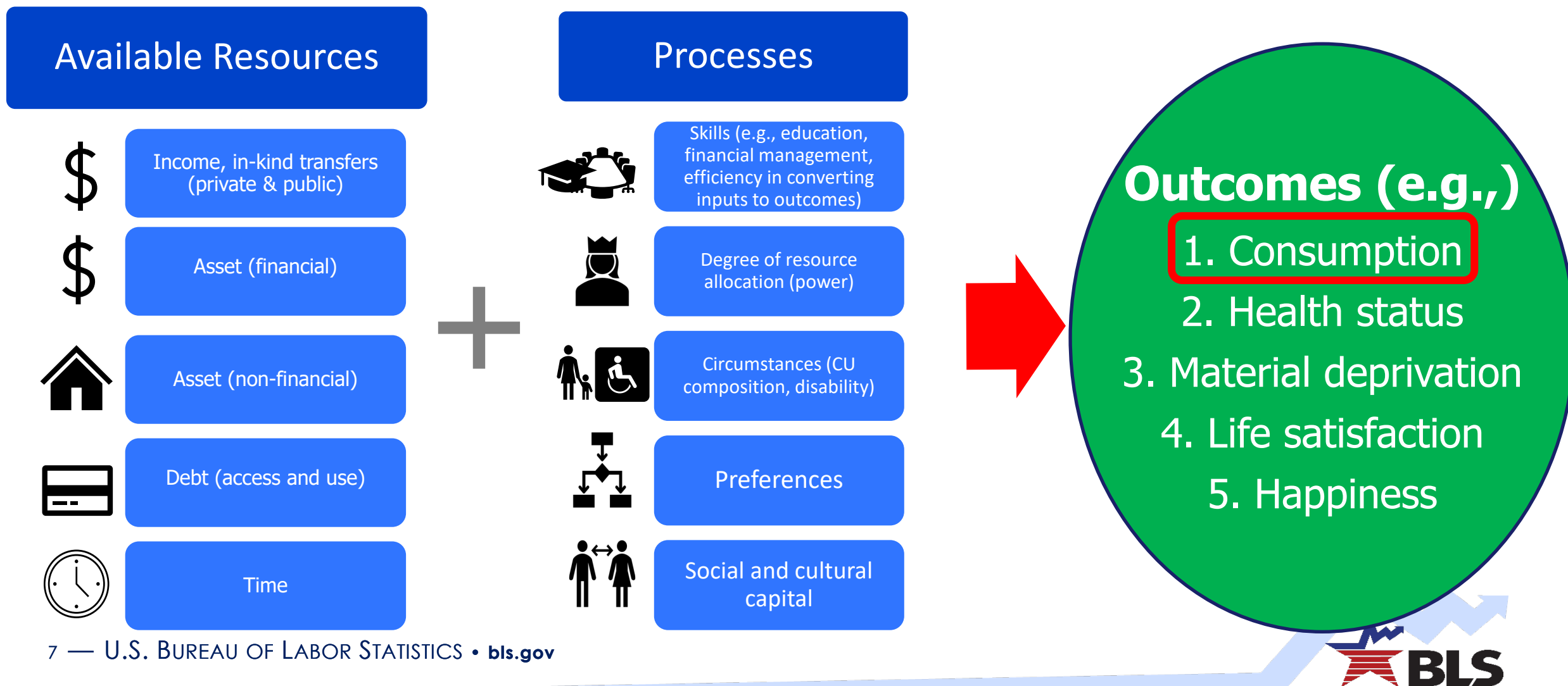


Builds on Previous and Ongoing BLS Research

- Garner, Matsumoto, and Schild (2024). "Consumption Inequality During and After the COVID-19 Pandemic." BLS Working Paper 571, March.
<https://stats.bls.gov/osmr/research-papers/2024/pdf/ec240030.pdf>
- Cho, Matsumoto, and Smith (2024). "A Consumption Measure for Automobiles." *Monthly Labor Review*. <https://www.bls.gov/opub/mlr/2024/article/a-consumption-measure-for-automobiles.htm>
- Garner, Martin, Matsumoto, and Curtin (2024). "A Distributional Approach to U.S. Personal Consumption Expenditures: An Overview." *Business Economics*. Vol 59, Issue 3.
<https://www.bls.gov/cex/a-distributional-approach-to-us-personal-consumption-expenditures-overview.pdf>
- BLS links for ongoing research
 - ▶ Building a Comprehensive Consumption measure <https://stats.bls.gov/cex/consumption-home.htm>
 - ▶ Distribution of National Accounts <https://stats.bls.gov/cex/pce-ce-distributions.htm>



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



Conceptual Leading to Empirical Challenges

Expenditures=

- What is spent or obligated for consumption (current or future)

Consumption=

- The value of what is consumed

Implications for...

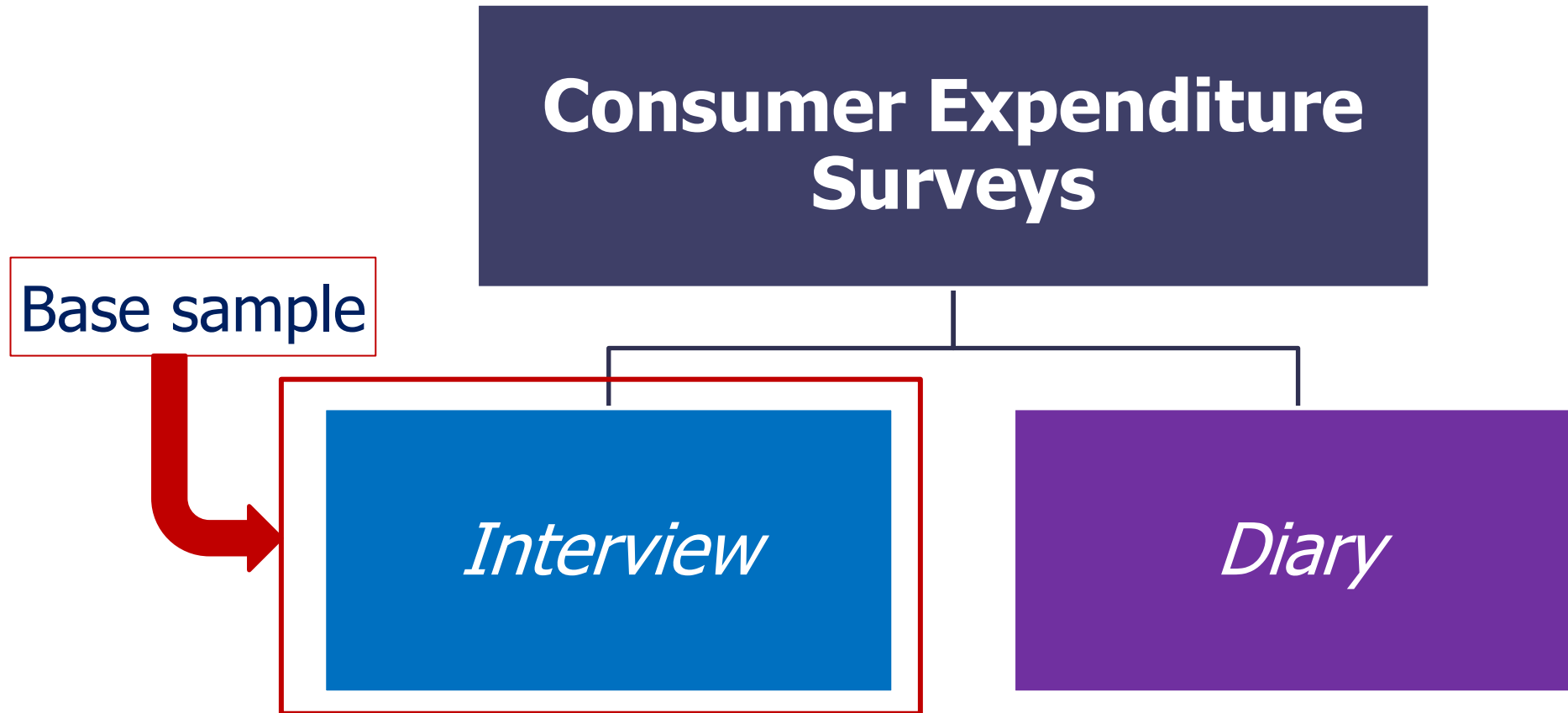
- Owned shelter
- Durables
- In-kind transfers
- Household Production
- Gifts and barter of goods and services received

- Problem categories (investment vs consumption)
 - ▶ Health
 - ▶ Education
- Allocations to pensions, savings, life insurance – deferred consumption

Treatment of Health and Education

- Researchers recommend excluding health expenditures for goods and services
 - ▶ Issue: greater expenditures do not equate to greater well-being
 - *For empirical analysis:* include health insurance (with a cap) as proxy for consumption
 - Out-of-pocket health insurance premiums for private insurance +
 - Employer share of private health insurance +
 - Full value of publicly provided health insurance
- More controversial, exclude education from consumption
 - ▶ Issue: consumption or investment in human capital
 - *For empirical analysis:* exclude out-of-pocket education (tuition & related) expenditures

Primary Data: U.S. Consumer Expenditure (CE) Surveys



Data to Build the Measure

- CE Survey Interview, 2019Q2 through 2024Q1 to represent 2019 through 2023
 - ▶ Approximately 20,000 consumer units (CUs) per quarter (21,280 to 18,871)
- Reference periods define what we refer to as a “year,” e.g., year 2023
 - ▶ Collection period: 2023Q2-2024Q1
 - ▶ Reference period: January 2023-February 2024 defines “2023”
- Assume quarterly data are independent (not restriction based on number of interviews)
- Include imputations based on
 - ▶ CE Interview
 - ▶ Diary
 - ▶ Other sources
- All results based on population weighting (consumer unit weighting and CU size)



Building the Measure Using CE Interview Survey

Expenditures

- Food
 - ▶ CE defined: food at “home” stores as 80% grocery for 2023 only
- Apparel
- Rent and associated expenses
- Other shelter (e.g., for travel)
- Utilities
- Health insurance premiums
- Transportation (e.g., airline fares, gasoline, tolls; excluding owned vehicles)
- Entertainment (e.g., theatre tickets, camping equipment; excluding owned recreational vehicles)

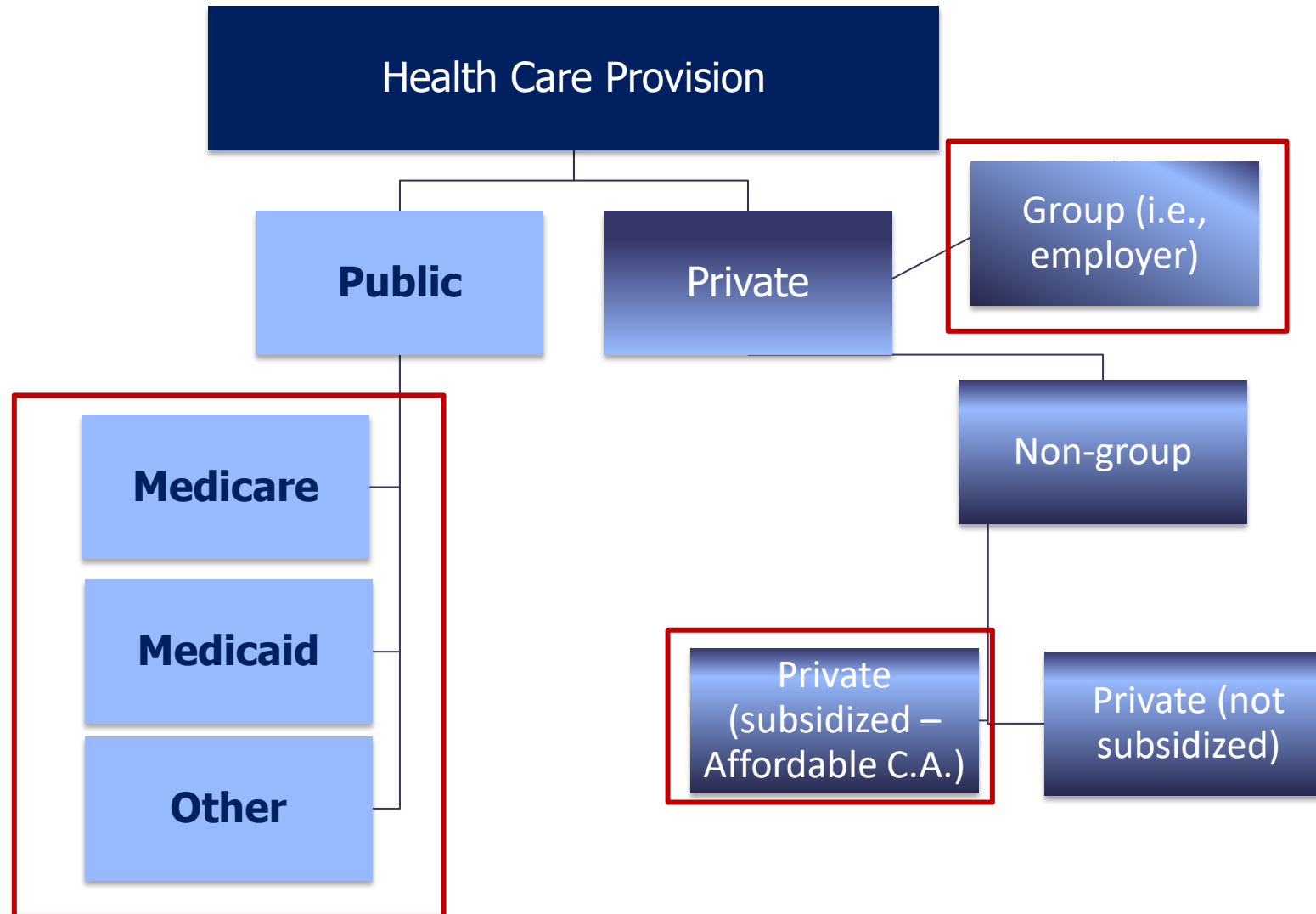
Flow of Services or Outlays

- Owner’s equivalent rent
 - ▶ Primary residence
 - ▶ Second and vacation homes
- Impute rents for subsidize housing
- Impute flow of services from stock of cars and trucks owned
 - ▶ User costs approach
- Outlays as proxy for consumption of other vehicles
 - ▶ Other transport vehicles (e.g., motorcycles, bicycles, airplanes)
 - ▶ Recreational motorized and non-motorized vehicles (e.g., RVs, boats)

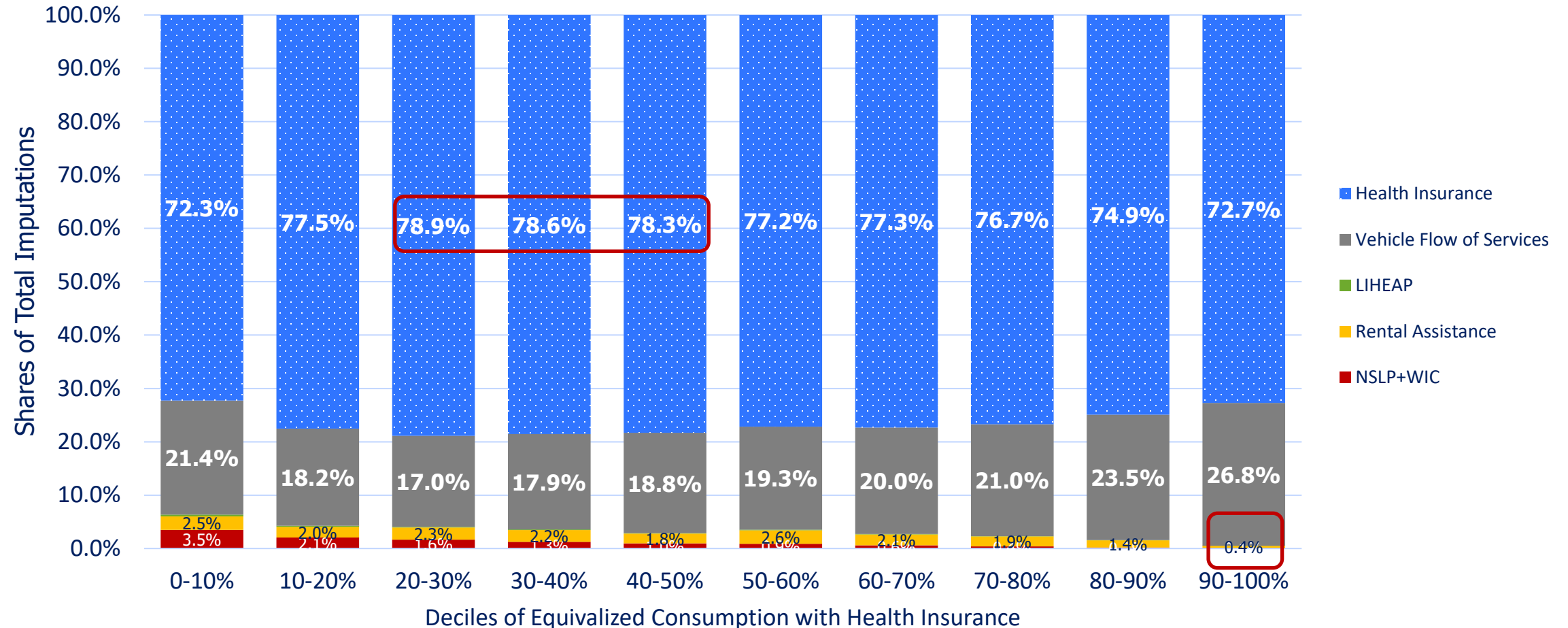
Other Imputations to Interview Sample

- Based on Diary data
 - ▶ Diary-only expenditures (e.g., personal care goods and services, non-prescription drugs, postage, newsletters)
- Use of additional data
 - ▶ Health insurance – private and public
 - *Private*: Interview data for reported premiums & Medical Expenditures Panel Survey Insurance Component & National Health Expenditure Database
 - *Public*: Centers for Medicare and Medicaid Services (CMS), CMS Medicare Trustees Report, National Health Expenditure (NHE), agency budgets;
 - ▶ Other in-kind benefits (e.g., LIHEAP, NSLP, WIC): CPS-ASEC and USDA Administrative Data
 - ▶ College dorm-based room and board: National Center for Education Statistics
 - ▶ Tenant’s portion of owner shelter insurance: National Association of Insurance Commissioners

Structure of U.S. Health Care System – Need for Imputations



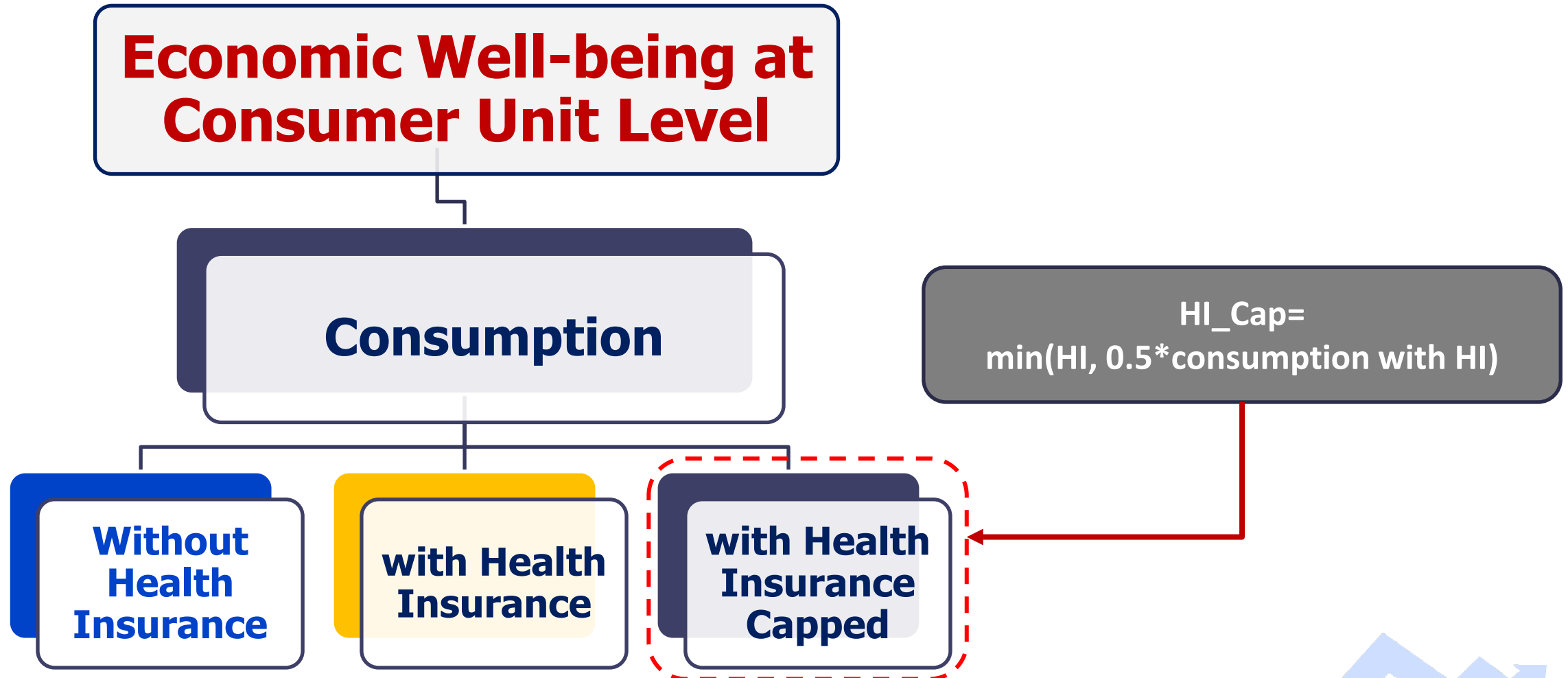
Shares of Aggregate Imputations within Deciles of Consumption with Health Insurance: 2019



NOTE: Percentage shares based on aggregate Consumer Unit consumption with health insurance within deciles; education is not included in the consumption measure; aggregates are based on CU weighted (FINLWT21) values; deciles are based on ranking of quarterly equivalized values with cutoffs based on person weighting (FINLWT(Cusize))

Figure from: *Are Expenditures Equal to Consumption? Research and Development at the BLS with Implications for Inequality and Poverty Measurement* by Garner, Matsumoto, and Schild. Presented during the Joint Statistical Meetings, Washington, DC. August 10, 2022.

Concepts of Consumption



NOTE: None of these measures include "Education"

Inequality Analysis: 2019 to 2023

- *Goal:* examine drivers of change in inequality through breaking down distributional analysis by type (subcomponents) of “consumption with health insurance capped”
- Data preparation
 - ▶ Group consumption subcomponents into 2 groups
 - More “COVID-sensitive” (*directly impacted through closures or limited access to business/government*)
 - Less “COVID-sensitive” (*secondary impact or no impact*)
 - ▶ Equivalized consumption using 3-parameter equivalence scale (*=total/sum of eq adults*)
 - ▶ Person weighted distributions (*weight = household weight * family size*)
- Inequality indexes
 - ▶ Overall
 - ▶ Gini decomposition of consumption inequality by subcomponents of consumption

Consumption Categories for Gini Decomposition

More COVID Sensitive

Food away from home

Shelter on trips

Away from home school shelter and food

Public transportation

Entertainment fees and tickets

Less COVID Sensitive

Food at home

All residences shelter (rent, owned, vacation home) and utilities

Consumption and operation of vehicles

Apparel

Health insurance

In-kind benefits

Other (e.g., non-fee-based entertainment, personal care, reading, tobacco, household operations, household operations and furnishings)

Consumption Inequality Measures ^(CE)

	2019	2020	2021	2022	2023
Gini	0.252	0.245	0.258	0.251	0.248
Theil	0.112	0.109	0.129	0.111	0.108
Mean log deviation	0.106	0.102	0.113	0.105	0.103
90/10	3.010	2.893	2.989	2.996	2.970
90/50	1.767	1.714	1.734	1.749	1.754
50/10	1.703	1.688	1.723	1.713	1.693

Post-tax Income ^(Current Pop. Survey-Annual Social and Economic Supplement)

	2019	2020	2021	2022	2023
Gini	0.416	0.399	0.394	0.417	0.416

Table results from March 18, 2025



Decomposition of Gini Inequality by Consumption Category

- Gini decomposition by type of consumption (Lerman and Yitzhaki 1985)

$$G = \sum_g G_g R_g S_g$$

- ▶ G_g : Within category Gini
- ▶ R_g : Correlation with rank of overall consumption
- ▶ S_g : Share of overall consumption
- ▶ $G_g R_g S_g$: the contribution of g to overall inequality

Contribution Consumption Components to Overall Inequality

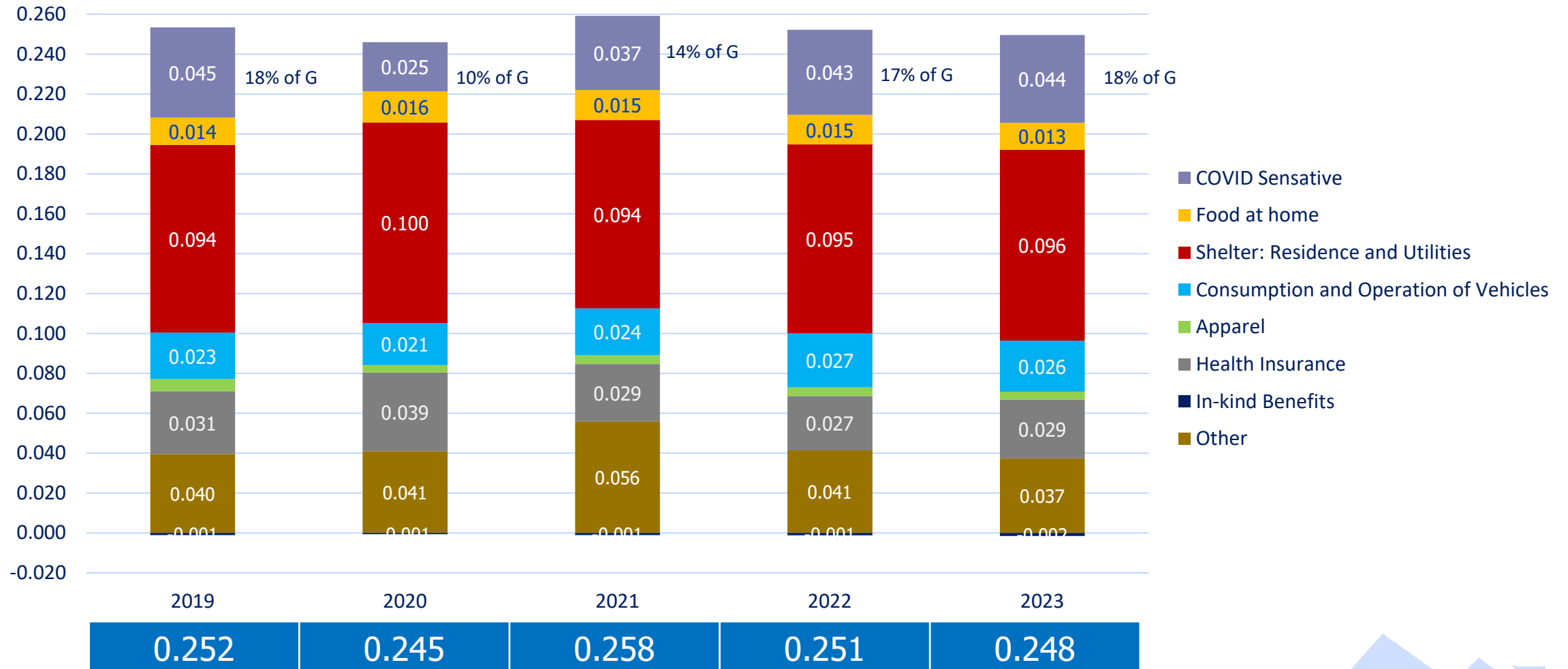


Figure based on results from March 18, 2025



Contributions to the 1-year Change in Gini

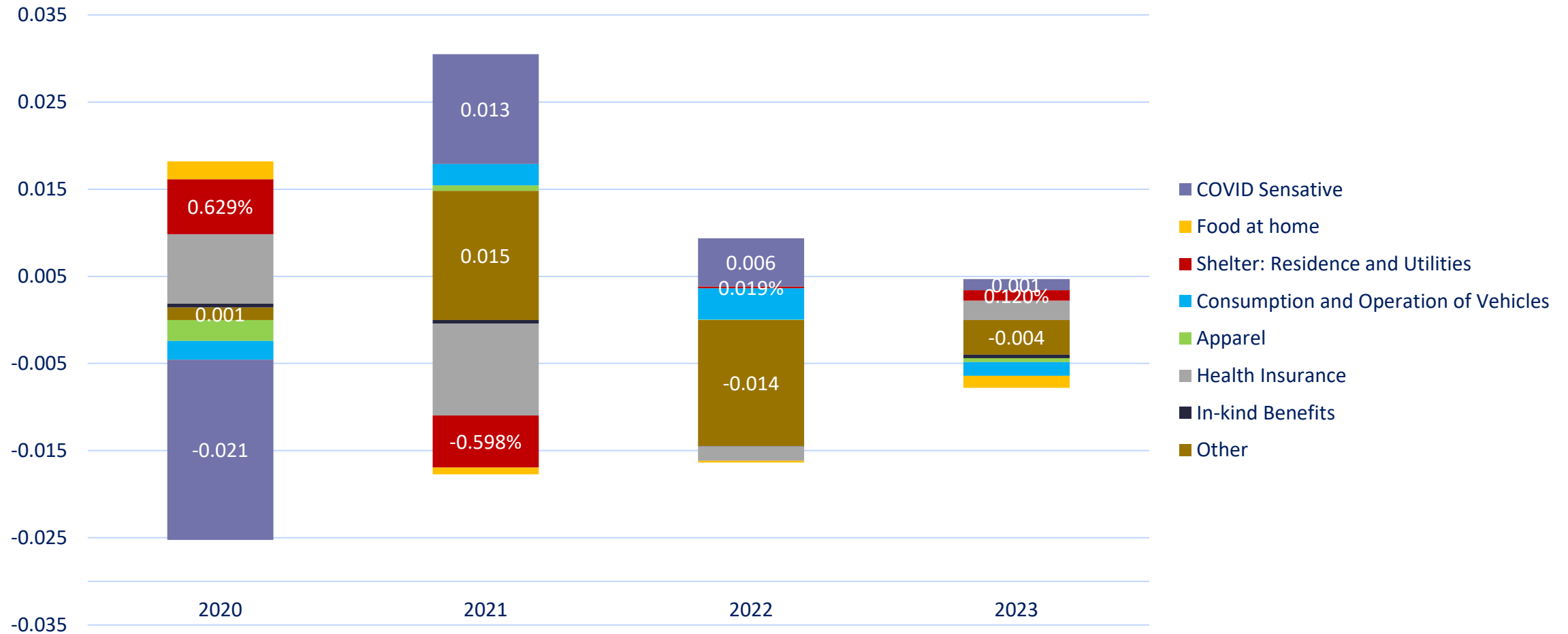


Figure based on results from March 18, 2025



Drivers of the Change in Gini Contribution by Category

- Covid sensitive categories tend to have
 - ▶ High within category Gini
 - ▶ High rank correlation
- From 2019 to 2020
 - ▶ Shares declined in covid sensitive categories offset by increases in other categories
 - ▶ Within Ginis relatively stable
 - ▶ Rank correlations relatively stable (exceptions: food away from home & public transportation relatively lower rank correlations in 2020)
 - ▶ Result: shift in consumption patterns led to lower overall inequality

Future Plans

- Continue consumption inequality and poverty research
 - ▶ Role of debt and dis-savings to “achieve” consumption
- Add joint distribution of consumption-income (wealth)
 - ▶ *Develop comparable income measure* – including value of in-kind benefits and net implicit rental income from owner-occupied housing
- Address
 - ▶ Challenges arising from changes in CE Surveys data collection instruments and samples
 - ▶ Trade-off in timeliness versus precision (e.g., health insurance)
- Continue cooperation with the Luxembourg Consumption Study

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Empirical: Consumption Measure

- Designed to reflect how CUs use resources (e.g., income, assets, financial credit, time, in-kind benefits, cultural and social capital) to meet their consumption/material “needs” (excludes what given to others outside CU)
- Defined in terms of....

- ▶ Expenditures (or out-of-pocket spending) for most goods and services

- ▶ Flow of services for

- Owner shelter

from Household Budget Surveys

- Durables

- ▶ *In-kind benefits, public and private*

impute

- ▶ *Home production for own consumption*

- ▶ *Barter of goods and services and gifts received*

not available

- ▶ *Expenditures for childcare and adult care*

exclude for this study

Consumption: Service Flows from Non-financial Assets

- Why account for service flows?
 - ▶ Because we do not “consume” the house or car, instead we “consume” the flows of services (market or consumption value) from these
- Primarily two main valuation approaches used internationally
 - ▶ User costs
 - ▶ Rental equivalence
 - ▶ Imputed rents
- Both to measure change over time in the value for the flow of services consumed by owner-occupants or vehicle owners
- In theory, both approaches should produce equivalent values, but rarely do empirically



Consumption: Service Flows Defined in Terms of Rental Equivalence

- ***Selling price of the service:*** “...rental equivalence approach attempts to measure the *change in the price* of the housing service consumed by owner-occupants by estimating the market value of those services” (ILO 2004, p. 180)
- Most often used valuation approaches
 - ▶ Imputed rents (e.g., from regression models) + “premium”
 - ▶ Reported rental equivalence (asked in CE Interview)
- Rental equivalence question in CE Interview
 - ▶ *If someone were to rent this “dwelling” how much do you think it would rent for monthly, unfurnished and without utilities?*
- In the U.S., service flows from major appliances (e.g., refrigerators, stoves) are included in comparable rental units, unlike in many European countries, and thus are implicitly included in rental equivalence

Rental Equivalence and Adjustments for Renter-like Expenditures

- Rental equivalence question in CE Interview
If someone were to rent this “dwelling” how much do you think it would rent for monthly, unfurnished and without utilities?
- Optional treatments for owner shelter-related expenses (those not implicitly included in rental equivalence)
 1. Exclude all
 2. Ratio adjust as is done for Consumer Price Index to make them “renter-like”, for example
 - Adjust expenditure for homeowners’ insurance premium by a factor of 0.41 to reflect the share that only covers “contents and personal items” (tenants’ insurance)
 - Adjust expenditures for homeowners’ landscape maintenance by a factor of 0.061 to reflect share not covered by rental equivalence (rental contracts that require renter to maintain the yard at their own expense)

Consumption: Service Flows Defined in Terms of User Costs

- ***Costs of producing (using) the service:*** “...**user cost approach** attempts to measure the *changes in the cost* to owner-occupiers of using the dwelling; user costs account for both recurring costs and the opportunity cost of having money tied up in the dwelling rather than being used for some other purpose” (ILO 2004, p. 179).

- **Components of user costs**
 - ▶ Recurring costs like mortgage interest payments, property taxes, property insurance, and routine maintenance and repairs (including those for major appliances included in the shelter unit when covered by the rental contract)
 - ▶ Opportunity costs of investing in this shelter property as opposed to another asset or for another purpose
 - ▶ Depreciation rate
 - ▶ Expected appreciation rate
 - ▶ Income tax rate (advantages of owning: lowers user costs)



Vehicle Flows Model

- User costs components
 - ▶ Depreciation
 - ▶ Opportunity costs
 - ▶ Recurring costs (vehicle insurance, maintenance & repairs, gasoline & oil, and electric for electric vehicles)
- Based on stock of vehicles
- Impute current market value for new and used cars and trucks using
 - ▶ Vehicle make, model, and year
 - ▶ Vehicle purchase price
- Derive *depreciation* from calculated depreciation rate applied to imputed current market value
- Derive *opportunity costs* by applying U.S. Securities rates (inflation indexed) to current market value
- *Recurring costs* added for all vehicles (cars, trucks, motorized camper-coach, motorcycle, boat with motor, private plane)

CE Survey: For Whom and Samples

- Consumer unit (CU): people living at the same address who share living expenses (in most cases, CUs are the same as households)
- Interview and Diary have their own samples (the same CU does not participate in both): nationwide household samples represent the entire U.S. civilian noninstitutional population



Data for Empirical Analysis

Most Goods and Services: *CE Interview Survey*

- Recall of 3-months of data; collected up to 4 times for each consumer unit (2019Q2-2024Q1)
- Out-of-pocket spending for most goods and services
- Rental equivalence
 - ▶ Primary residence
 - ▶ Second homes and vacation properties
- Characteristics to impute market rents when in-kind rental assistance
- Stock of cars and trucks to impute depreciation

Other Goods and Services: *CE Diary*

- Two consecutive weeks of daily recordkeeping (2019-2023)
- Out-of-pocket spending for more frequently purchased goods and services with shorter recall (e.g., personal care goods and services, non-prescription drugs, postage)
- Statistically matched to Interview consumer units

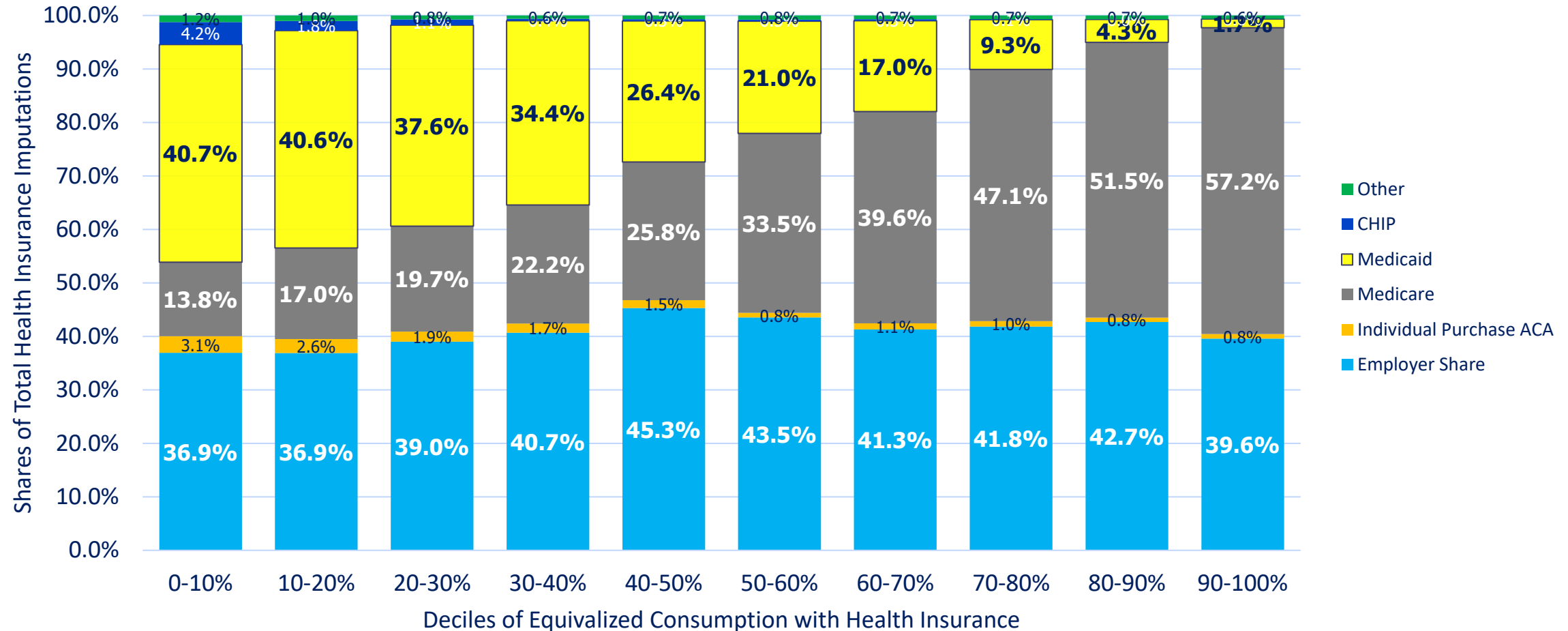
Other Sources for Imputations

- In-kind government benefits (e.g., subsidized school meals)
 - ▶ CPS-ASEC (households/members)
 - ▶ Government agencies
- Public health insurance
 - ▶ Centers for Medicare and Medicaid Services (CMS), CMS Medicare Trustees Report, National Health Expenditure (NHE), agency budgets
- Private health insurance
 - ▶ Medical Expenditure Panel Survey Insurance Component
 - ▶ Centers for Medicare and Medicaid Services (CMS)
- College room and board
 - ▶ U.S. Department of Education Statistics
- Boarding school room and board
 - ▶ “Average Cost of Private Schools” (Hanson, 2024)
- Renter-like owned home insurance
 - ▶ National Assoc. of Insurance Commissioners Reports

Health Insurance

- Assignment of average values – not econometrically based
- Using CE demographics and health insurance information, assigned state (or other) average to consumer units based on the following variables
 - ▶ Number of Medicare participants
 - ▶ Number of Medicaid participants
 - ▶ Etc.

Shares of Aggregate Health Insurance Imputations within Deciles of Consumption with Health Insurance: 2019



NOTE: Percentage shares based on aggregate Consumer Unit health insurance imputations within consumption with health insurance deciles; education is not included in the consumption measure; aggregates are based on CU weighted (FINLWT21) values; deciles are based on ranking of quarterly equivalized values with cutoffs based on person weighting (FINLWT(Cusize))

Figure from: *Are Expenditures Equal to Consumption? Research and Development at the BLS with Implications for Inequality and Poverty Measurement* by Garner, Matsumoto, and Schild.

Presented during the Joint Statistical Meetings, Washington, DC. August 10, 2022

Quarterly Equivalized Consumption, Spending, and Income for 2022

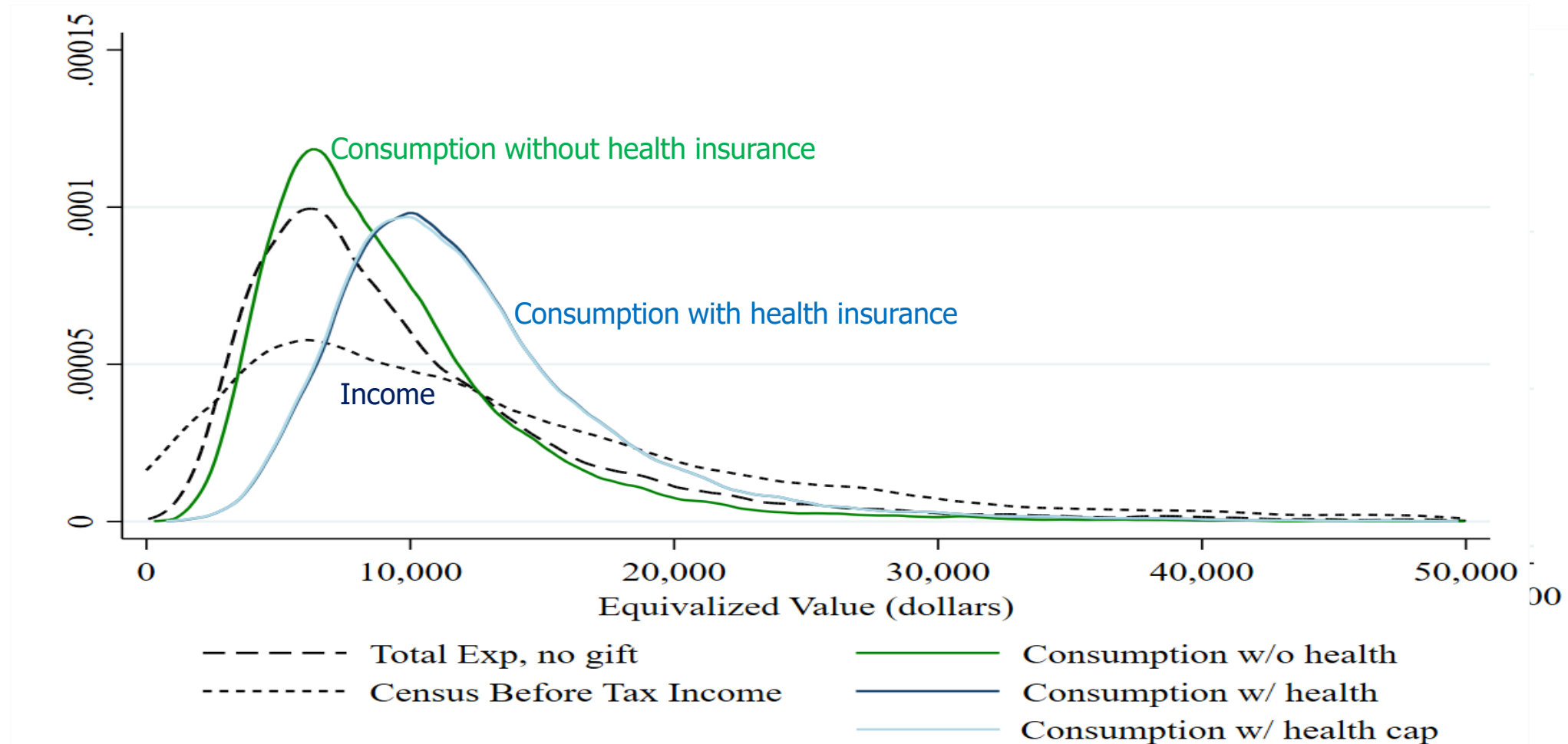


Figure from: *An Analysis of Poverty Through a Consumption Lens: Research from the U.S. Bureau of Labor Statistics* by Garner, Matsumoto, and Schild. Presented during the Joint Statistical Meetings, Portland, Oregon. August 5, 2024

Inequality: Lorenz Curves for of Equivalized Consumption, Expenditures, and Income: 2020

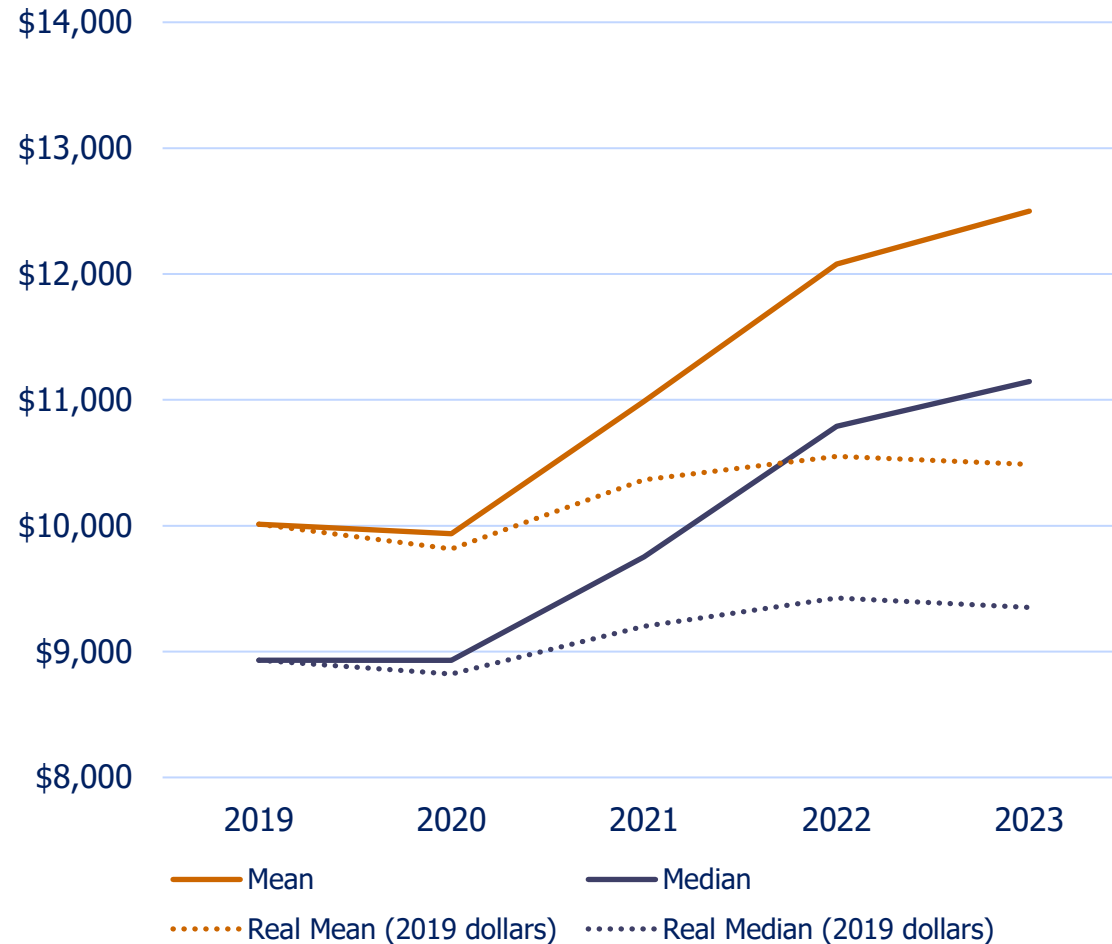


NOTE: Based on quarterly adult equivalized values; population weighted (FINLW21*CU_size); consumption with health only includes health insurance. Consumption measures do not include education

Figure from: *Introducing a Consumption Measure with Examples for Poverty and Inequality Analysis: A New Measure from the U.S. Bureau of Labor Statistics* by Garner, Matsumoto, Schild, and Curtin. Presented before BLS Commissioner William Beach, Washington, DC. March 15, 2023



Quarterly Equivalized Means and Medians Consumption with Health Insurance Capped: 2019-2023

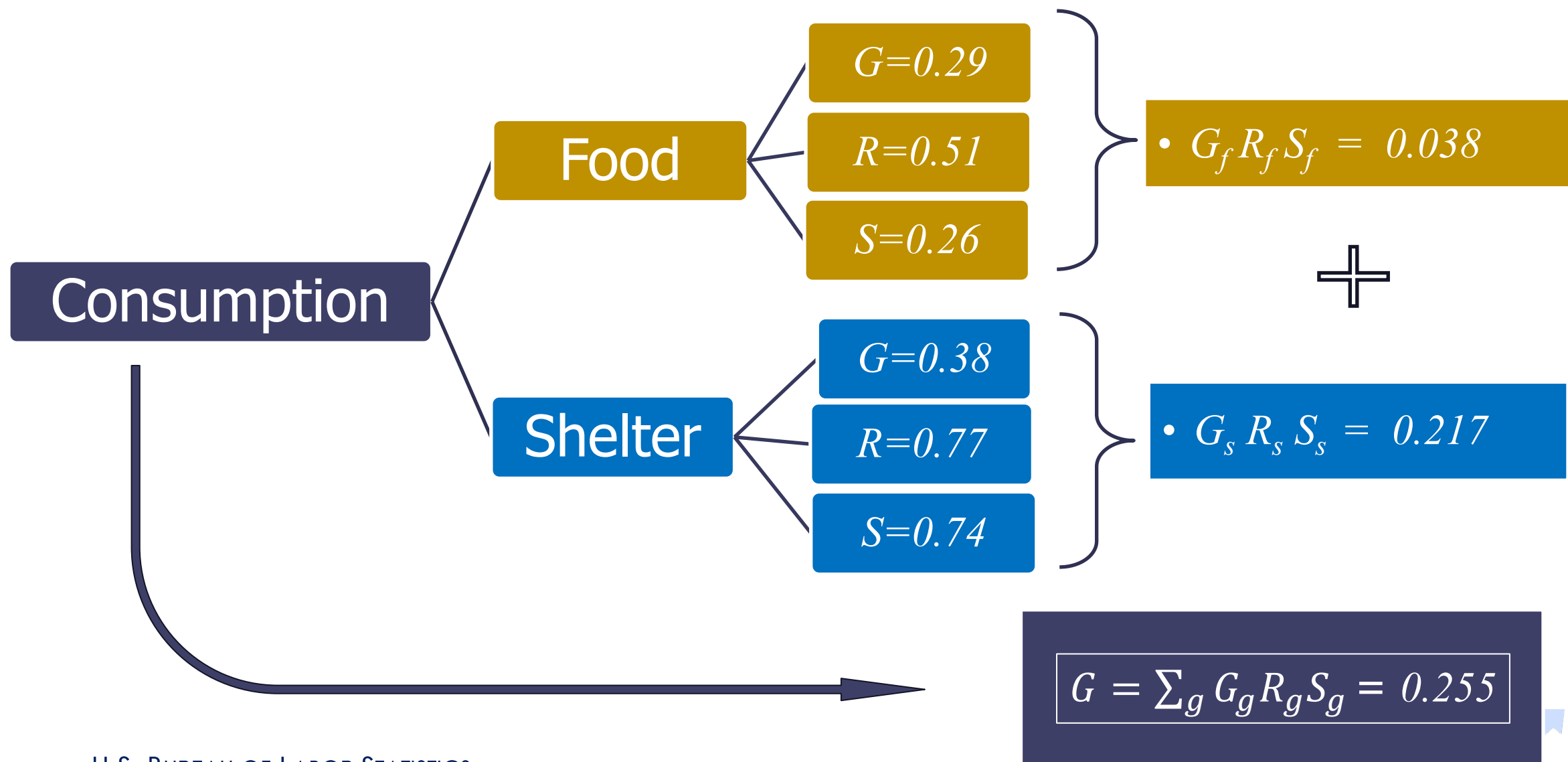


- Small declines in real mean and median consumption in 2020
- Large impact of inflation on 2021-2023 nominal values
- *Assumption:* higher consumption, higher welfare

Figure based on results from March 18, 2025



Gini Decomposition



Shares of COVID-Sensitive Components of Consumption

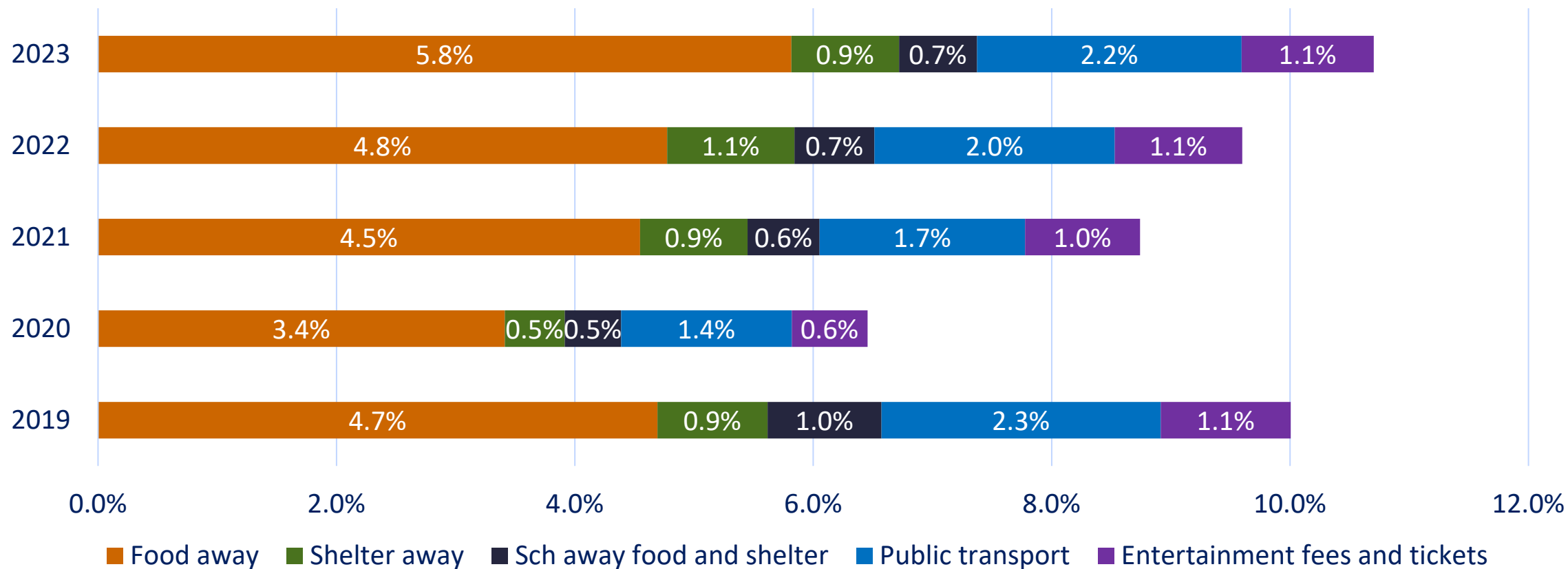


Figure based on results from March 18, 2025

