Measuring the Impact of COVID-19 on Businesses and People: Lessons from the Census Bureau's Experience

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We provide an overview of how the Census Bureau is enhancing the consistency, timeliness, and relevance of our data products in response to the COVID-19 pandemic when it is critically important to provide information on the U.S. population and economy. We focus on economic and household data while acknowledging the extensive efforts to maintain the collection and dissemination of the decennial census during the pandemic.

New information products developed during the pandemic are derived from two new surveys, two innovative uses of existing data, and enhancements to existing surveys (including processing changes). Many of our efforts focus on timeliness and granularity.

High frequency (weekly or bi-weekly) data became especially important as the economic and social impacts of the pandemic are swift. Granularity is important in order to capture the differential impacts of the pandemic within and across economic and demographic groups. Our COVID-19 website brings together many of these products (https://covid19.census.gov/).

Across the Census Bureau, these changes are devised and implemented by expert staff who continue to demonstrate creative problem solving and adaptability under challenging circumstances. Partnerships, both new and old, are another essential ingredient in our ability to provide information during the pandemic.

I. Business and Economic Information

In responding to the need for data on the impact of the pandemic on businesses and the economy, the Census Bureau leverages its underlying data infrastructure, survey expertise, holdings of administrative data, and research capabilities.

A. The Small Business Pulse Survey

The Small Business Pulse Survey (SBPS) provides timely, high-frequency, granular data on the effect of the pandemic on small, single

location employer businesses in the U.S. Due to the pandemic, we are constrained to use electronic contact only, however, this enables faster collection cycles. The SBPS uses email addresses collected on the Economic Census supplemented by more recent survey collections to invite more than one million small businesses to participate. Starting in late April, each phase lasts nine weeks with the target population split in order to create weekly nationally representative estimates.

The survey is designed to be quick and easy to answer on any mobile platform in order to encourage participation. Largely qualitative survey questions are centered on core concepts: overall effect, operations, challenges, finances, and outlook. Content on business fundamentals is constant between phases for comparability and longitudinal analysis but topical content can vary over the collection. Feedback on content is provided by seven agencies.[1]

Results are published at national, sectoral, state, and select Metropolitan Statistical Areas (MSA) levels providing important insights to differential impacts of the pandemic. Figure 1 shows sectoral variation in business expectations with responses stacked from most positive (light gray) to most negative (black) for six sectors. Small businesses in Finance and Insurance have more optimistic expectations, those in Accommodations and Food Services have more pessimistic.

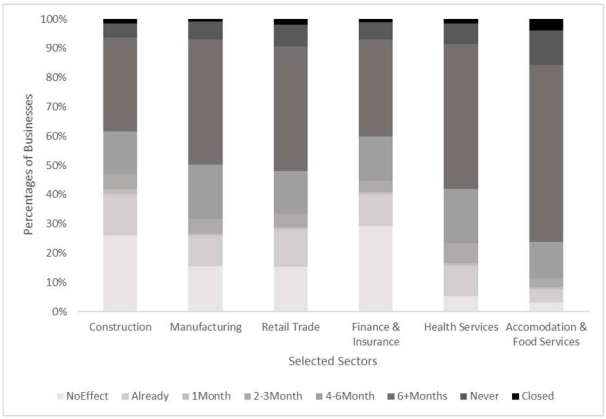

FIGURE 1. EXPECTED TIME UNTIL RETURN TO NORMAL LEVEL OF OPERATIONS

Note: From the Small Business Pulse Survey for data collected September 6-12, 2020.

B. Weekly Business Formation Statistics

Business Formation Statistics (BFS) have been published quarterly since 2018. The primary data underlying these series are applications for Employer Identification Numbers to the Internal Revenue Service which provides them to the Census Bureau.

The Census Bureau accelerated plans to produce the four business applications series from the BFS at a higher frequency and began publishing weekly in April. High Propensity Business Applications (HPBA) provides insights into where potential employer

[1] The Small Business Administration, the Federal Reserve Board of Governors, International Trade Administration, Minority Business Development Agency, Bureau of Transportation Statistics, National Telecommunications and Information Administration, Office of Tax Analysis of the Treasury Department, and the Bureau of Labor Statistics. See Buffington et al. (2020) for more information.

businesses may form over the next few years. Usually, more than one-third of HPBA businesses transition into employer status (see Bayard et al. (2018) for discussion).

Figure 2 plots weekly HPBA for 2019 and 2020. Publishing weekly data provided timely information on the immediate drop after the pandemic declaration during week 11 (and subsequent rise) in these applications.

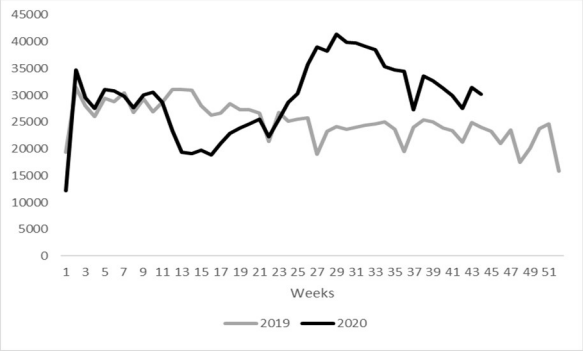

FIGURE 2. WEEKLY HIGH PROPENSITY BUSINESS APPLICATIONS

Note: Data downloaded on November 6, 2020 from https://www.census.gov/econ/bfs/csv/bfs_us_apps_weekly_nsa.csv

C. Annual Surveys

The Census Bureau conducts an Economic Census every five years to provide comprehensive statistics on U.S. business establishments; between Economic Census years, annual sectoral and cross-sectoral surveys provide national benchmarks and data critical for the construction of the national accounts by the Bureau of Economic Analysis. In order to understand differential impacts by sector the Census Bureau is researching additional content in future years for selected annual surveys.

Cross Sectoral Surveys — The 2019 Annual Business Survey surveyed approximately 300,000 employer firms across all non-farm sectors of the economy and contained questions on the ability of employees to work from home as well as factors that limit this ability. For reference year 2020, it will ask businesses about the effect of the pandemic on their sales, whether they requested or received federal or other assistance, as well as dollar amounts applied for and received and the share of assistance forgiven. The Annual Capital Expenditures Survey, a cross-sector survey of employer and non-employer firms, will include a question about the receipt of and uses for government assistance and the impact to payroll in the absence of financial assistance. The Census Bureau is researching adding questions about changes in capital expenditure plans and capital expenditures for safety or physical distancing measures.

Sectoral Surveys — The Annual Survey of Manufactures collects information about operations, revenues and expenses at the manufacturing plant level. Additional content related to measuring the impact of the coronavirus pandemic is under consideration and may include asking plants how many days they were closed due to the pandemic; quarterly payroll; additional detail for products including N95 respirators, soaps, and hand sanitizers; and

whether the plant had donated products and, if so, the dollar value of the donations.

The Service Annual Survey (SAS) collects revenue and expenses data from both taxable and tax-exempt firms classified in all service sectors of the economy. Currently, it collects revenue estimates from telemedicine for ambulatory health care services. Given the likely unprecedented growth in these services during the pandemic, the Census Bureau is researching adding similar questions for hospitals and nursing homes beginning in reference year 2020.

D. Economic Indicators

The Census Bureau's economic indicators provide critical information on the U.S. economy at monthly and quarterly frequencies. The quality of these products rests on many factors including response rates and the quality of responses. The Census Bureau temporarily added questions to five of its economic indicator programs to understand the impact of the pandemic on these series in order to maintain consistency. Businesses were asked whether changes in employment, temporary closures, or delays in the supply chain had an impact on their reported revenues, sales or inventories. Permit offices surveyed were asked if temporary closures created backlogs of permits.

II. Demographic Information

Across the federal statistical system, agencies recognized an urgent need to provide data about the health, social, and economic characteristics of American households during the COVID-19 pandemic. Given the rapidly changing dynamics of this situation for American households, the Census Bureau and other federal agencies quickly looked at opportunities to address the pandemic in current data collections, as well as leveraging infrastructure and resources to address the emerging data needs.

A. The Household Pulse Survey

Analogous to the SBPS, the Census Bureau addressed a gap in rapid high-frequency household data during the onset of the pandemic in the United States through the Household Pulse Survey (HPS) which started collection on April 23. The HPS was developed in collaboration with five federal agencies[2] to provide timely data on a range of ways in which people's lives were impacted by the COVID-

[2] The Department of Agriculture's Economic Research Service, the Bureau of Labor Statistics, the National Center for Health Statistics, the National Center for Education Statistics (NCES), the Department of Housing and Urban Development, and the Office of Management and Budget. See Fields et al. (2020) for more information.

19 pandemic: employment status, spending patterns, food security, housing, physical and mental health, access to healthcare, and educational disruption.

Because all mail-out, telephone center, and in-person interviewing was suspended due to the pandemic, the HPS employed an internet collection protocol. Utilizing a survey platform previously only used for research and survey development at the Census Bureau, and supplementing the Master Address File household sampling frame with email and mobile telephone numbers from the Census Contact Frame, the Census Bureau developed an ad hoc rapid-response framework for the HPS. The Phase 1 data collection was conducted for 12 cycles from April 23 through July 21. Phase 2 of the HPS includes additional content and agency partnerships[3], began collecting data on August 19, and is expected to continue through at least the end of December 2020.

The data collected enables the Census Bureau and partner agencies to produce statistics for the nation, at the state level, and for the 15 largest MSA, providing insights into how household experiences changed during the pandemic over time and place. For example, Figure 3 shows the mental health impact of the pandemic through the experience of anxiousness for adults in households with and without children for several periods.

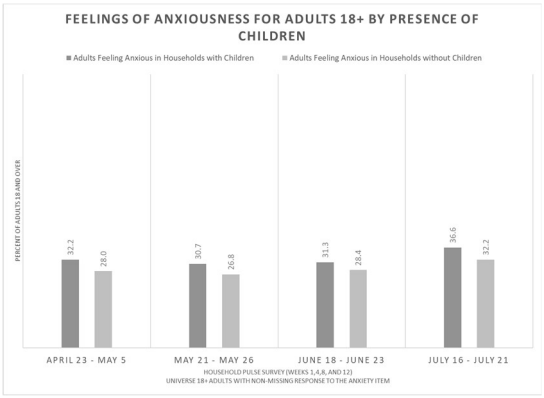

FIGURE 3. ANXIOUSNESS FOR ADULTS 18+ DURING WEEKS 1, 4, 8, AND 12 BY PRESENCE OF CHILDREN

Note: From the Household Pulse Survey for data collected between April 23, 2020 and September 14, 2020.

B. Community Resilience Estimates

In June 2020, the Census Bureau released a new experimental tract-level and county-level data product, Community Resilience Estimates (CRE). The CRE provides a measure of an area's ability to withstand the health, social, and economic impacts of a disaster such as a hurricane or pandemic.

Underlying the CRE is the understanding that heterogenous outcomes following a disaster, such as a pandemic, can depend critically on individual and household characteristics. Accounting for these differences in characteristics concerning the capacity and resources to overcome challenges is thus

[3] The Social Security Administration and the Bureau of Transportation Statistics joined as new partners for Phase 2.

critical. The CRE's granular data captures the differential abilities of these communities.

Thus the CRE provides a critical tool for disaster preparedness enabling policymakers (such as public health officials) to effectively deploy resources as needed in response to a disaster and to plan for future disasters.

As with the weekly BFS, the CRE represents a new product created from existing data holdings at the Census Bureau. In this case, the CRE relies upon individual and household characteristics from the 2018 American Community Survey (ACS) and publicly available data from the 2018 National Health Interview Survey (NHIS). These data products were combined in a model that allows the Census Bureau to provide tract and county-level estimates of resilience without imposing additional respondent burden.

C. Existing Surveys

Collection of household surveys was significantly impacted by the COVID-19 pandemic since surveys that relied upon in-person visits from field staff shifted to telephone contact, with field staff trying to reach respondents from home. This change was required for Census Bureau sponsored surveys as well as surveys conducted by the Census Bureau for other agencies.

American Community Survey. — The American Community Survey (ACS) provides detailed population and housing information. The ACS program revised messaging, altered the mailout strategy, and made sampling adjustments to accommodate the National Processing Center's staffing limitations. The Computer Assisted Personal Interview operation was limited to conducting only telephone interviews for a few months. The decision to conduct telephone only interviews impacted the Group Quarters operation which relies on personal visits to collect data.

Current Population Survey. — The Current Population Survey (CPS), sponsored jointly by the Census Bureau and the Bureau of Labor Statistics (BLS), serves as the primary source of labor force statistics for the U.S. population and provides information on other important topics such as education.

At the request of NCES, one of the co-sponsors of the School Enrollment Supplement, the Census Bureau added seven questions in order to provide information on how the coronavirus pandemic impacts schooling at an individual child level (for example, the availability of computers or other digital devices for educational purposes). In addition, concerns about the coronavirus were added as an answer category for two questions in the November Voting Supplement.

Survey of Income and Program Participation. — The Survey of Income and Program Participation (SIPP) is a household survey that provides longitudinal monthly data. Data collection for the SIPP was severely affected by the pandemic; the SIPP shifted from personal-visit data collection mode to decentralized telephone collection. SIPP also developed new content related to the pandemic including the receipt and use of economic stimulus payments, unemployment compensation due to COVID-19, school meal changes due to COVID-19, retirement planning and changes, and missed or deferred rent/mortgage payment due to COVID-19.

Answer lists and help text were modified in the program receipt, labor force, assets, and health and disability sections to specify how COVID-19 reasons should be handled. Data collected from the 2021 SIPP will provide monthly information on the intersection between employment, program use, health, and family dynamics for the full 2020 calendar year.

III. Looking Forward

The Census Bureau's rapid response to the pandemic has highlighted a capability for flexible production that can be applied to other emergency situations and has demonstrated an agile accommodation for the suspension of in-person interviewing from March - July 2020. Many of these innovations will be useful as the Census Bureau navigates its way to a new normal. There remain important data gaps that research and development activities at the Census Bureau are addressing. These include more timely measures of business deaths, enhanced collections on business expectations, and increasing our use of administrative or even blended third party data to produce high frequency statistics.

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