The Rutgers Omnibus Study: Protocol for a quarterly web-based survey to promote rapid tobacco research

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Abstract

Background: Rapid and flexible data collection efforts are necessary for effective monitoring and research on tobacco and nicotine product use in a constantly evolving marketplace.

Objective: To document the first two years of the Rutgers Omnibus Study.

Methods: Launched in February 2022 and fielded quarterly thereafter, we survey convenience samples of 2000 to 3000 US adults ages 18 to 45 years recruited through Amazon Mechanical Turk. The questionnaire includes core and rotating modules and is designed to take approximately 10 minutes to complete via Qualtrics. Fielding duration is approximately 10 days per wave. Each wave includes both unique and repeating participants, and responses can be linked across waves by an anonymous ID.

Results: Sample sizes range from 2,082 (Wave 8) to 2,989 (Wave 1), and the 8-wave longitudinal dataset includes 10,334 participants, of whom 2,477 have three or more data points. Key demographics are consistent across waves and similar to that of the general population, while tobacco product trial and past-30-day use is generally higher.

Conclusions: The Rutgers Omnibus Study is a quarterly survey that is effective for rapidly assessing the use of emerging tobacco and nicotine products and can also be leveraged to conduct survey experiments, generate pilot data, and address both cross-sectional and longitudinal research questions.

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Keywords: Survey; Tobacco; Nicotine; Young Adults; Adults; Protocol

Introduction

US tobacco companies have undergone dramatic changes in marketing and manufacturing of tobacco. Whereas tobacco control efforts have historically focused on cigarette smoking, the marketplace has evolved to include numerous products such as electronic nicotine vaping devices and “tobacco-free” nicotine pouches. Today, the tobacco marketplace is in constant flux, with the emergence of new products, flavors and packaging styles on a regular basis,[1,2] and tobacco use patterns are changing in turn.[3,4]
Traditional health behavior surveys, such as Behavioral Risk Factor Surveillance System (BRFSS), have been slow to respond to the changing marketplace. The most recent BRFSS survey (2022) does not include questions about the newest products, and the limited data about tobacco that are collected are typically not available for many months after data collection. Tobacco-centric surveys, such as the Population Assessment of Tobacco or Health Study (PATH), the National Youth Tobacco Survey (NYTS), and the Tobacco Use Supplement to the Current Population Survey (TUS) have improved our ability to monitor perceptions and use of a wider variety of products, but each wave of data takes months to collect and even longer to release for public analysis. While these studies are ideal for generating nationally representative, generalizable estimates of tobacco use, they are not well-suited for rapid and flexible data collection to capture changes in tobacco products, tobacco marketing, and tobacco use in the U.S.
With the growing variety of tobacco and nicotine products, there is a critical need to develop and test valid and precise measures for assessing use patterns and perceptions. For example, an investigation into measures of modern oral nicotine product use found substantial variation

in phrasing of questions about these products, calling for development of common and validated measures.[5] However, large national survey systems are not suited for this purpose. Instead, smaller studies that employ convenience samples are sufficient for conducting survey methods experiments.[6] Similarly, academic researchers can also use convenience samples to generate pilot data in support of a funding proposal. However, developing and fielding a separate study for each measurement question or pilot inquiry is both time and cost prohibitive.

In response to these methodological challenges, we designed the Rutgers Omnibus Survey, a serial web-based survey of adults ages 18 to 45 years designed to capture awareness and use of new and emerging tobacco products. The Rutgers Omnibus Survey serves three major functions. First, it provides timely data on awareness and use of new and emerging tobacco products among adults in a rapid manner. Second, it provides a platform for measurement experiments to help develop and refine measures of tobacco use that reflect the current marketplace. Lastly, it generates data to serve as pilot data for grant applications and timely scientific manuscripts among investigators at the Rutgers Institute for Nicotine and Tobacco Studies. With this paper, we document the first eight waves of the Rutgers Omnibus Survey protocol and describe characteristics of the study sample.

Methods

Overview

The Rutgers Omnibus is fielded quarterly; although there are minor differences across waves, the primary aspects of survey development and administration are consistent. Each wave's survey is programmed in Qualtrics, a secure web-based survey program, and extensively tested by research staff. All waves recruit a convenience sample of individuals ages 18 to 45 years from Amazon Mechanical Turk, an online crowdsourcing platform that has been used successfully in a number of prior studies related to tobacco use and perceptions.[6-10] We target this age range to increase the probability of capturing individuals who use a variety of tobacco and nicotine products, given that prevalence tends to be higher among younger adults, particularly for emerging products.[11,12] Recruitment, informed consent, data collection, and remuneration take place entirely online following the same procedures. We will describe the general protocol and address key differences across waves as necessary. The Omnibus protocol was reviewed by the Rutgers Institutional Review Board and approved as Exempt.

Questionnaire

The Rutgers Omnibus consists of a core set of items that appear in all waves as well as rotating and one-time supplemental question modules. The core items that appear in every iteration of the study include batteries on ever and current (daily, some days, rarely, past 30 days) use of cigarettes, electronic nicotine delivery systems, cigars (including traditional and premium, cigarillo, filtered), smokeless tobacco (i.e., moist snuff, chew, and snus), and modern nicotine products (e.g., nicotine pouches). Each survey also contains items about product brands and flavors and exposure to tobacco advertising, an item capturing whether respondents have purchased tobacco or nicotine products that are different from their usual products in the past 30 days, and standard demographic questions. Rotating modules that are included periodically include question sets about cessation from tobacco use, product risk perceptions and social norms surrounding tobacco use, use of heated tobacco products, alcohol, and marijuana, use of coupons to purchase tobacco products, and mental health status.

One-time batteries may be added to a wave on an ad hoc basis for the purposes of generating pilot data or testing survey questions. Examples of such modules include split sample

experiments testing the impact of question wording, randomized experiments exploring variations in warning labels and ad features, and items that expand upon the core batteries by examining them in greater depth.
At all waves, the questionnaire is designed to take approximately 10 minutes to complete, depending on the number of products a respondent reports using.

Recruitment, Data Collection, and Data Quality

Omnibus participants are recruited from among eligible workers on Amazon's Mechanical Turk (MTurk) using the MTurk Toolkit by CloudResearch (formerly known as TurkPrime), in order to enhance control over data quality.[7] CloudResearch regularly monitors MTurk worker demographics and engagement in order to identify individuals who are most likely to provide high-quality data. For all waves, we specify the following eligibility parameters: age range (18 to 45 years), located in the United States, and identified as high-quality by CloudResearch approved participant status. We further specify that CloudResearch should block workers coming from suspicious geocodes and duplicate IP addresses, as well as verify workers' country location. Finally, CloudReseach ID numbers are assigned in place of participants' Amazon ID numbers to ensure anonymous participation.
Individuals who meet all eligibility criteria receive an invitation in the form of a MTurk Human Intelligence Task (HIT). The HIT briefly describes our survey, and interested workers can choose to participate by clicking on a link to the survey, which is programmed in Qualtrics. Before beginning the survey, respondents must provide informed consent and verify their age.

Compensation

Upon completing the survey, respondents are assigned a randomly generated redemption code, which they then submit to the CloudResearch platform in order to claim payment. Redemption codes entered on the platform are compared to the list of codes that were generated by Qualtrics to verify participation before payment is issued. Verified respondents in Waves 1 through 6 were paid $1.50 for completing the survey, which is consistent with similar MTurk tasks; compensation was increased to $2.00 beginning in Wave 7 to combat slowed recruitment.

Sample Size and Composition

At each wave, our primary goal is to collect high-quality data rapidly, to facilitate efficient monitoring of tobacco and nicotine product features and use. For this reason, we have no prespecified target sample sizes and instead target a fielding period of approximately 10 days. However, in waves that include a supplemental split-sample experiment, we have extended the fielding period in order to recruit enough participants to yield adequate statistical power, approximately 2,500 participants. We decide to exit the field based on a combination of fielding duration, reaching a target sample size, and daily yield.
A secondary goal at each wave is to maximize participation among eligible workers that have not taken part in previous waves of the study. CloudResearch enables exclusion of individuals who have completed previous study waves. We have used this feature iteratively, whereby excluding some or all prior participants at a survey's launch and slowly increasing the pool of prior participants, starting with the oldest iteration of the study (e.g., allow those who had participated in wave 1 but no subsequent waves), as the rate of daily participation declines.

Statistical Analysis

Although data collection is anonymous, we are able to identify unique (participated in one

wave only) and repeated respondents (participated in multiple waves) according to participants' anonymized CloudResearch ID numbers. Therefore, we are able to maintain single wave, serial cross-sectional (all waves, unique individuals only), and longitudinal (all waves, linked by anonymous ID) datasets, enabling a variety of analyses including cross-sectional and longitudinal studies.

Results

The study launched in February of 2022 and proceeded approximately quarterly thereafter. As shown in Table 1, the total number of participants ranged from 2,082 (Wave 8) to 2,989 (Wave 1), and the percentage of respondents who were new to the Omnibus survey, after Wave 1, ranged from 71% (Wave 2) to 20% (Wave 6). The serial cross-sectional dataset for Waves 1–8 contains 5,822 participants, of whom all have participated in exactly one wave. The longitudinal dataset for Waves 1–8 includes 10,334 participants, of whom 2,477 have three or more data points.

Table 1. Fielding Summary, Rutgers Omnibus Study Waves 1–8 (February 2022 – December 2023)

Wave	Month, Year	Total N	New participants
1	Feb, 2022	2,989	2,989
2	May, 2022	2,964	2,091
3	Aug, 2022	2,526	1,679
4	Dec, 2022	2,307	1,243
5	Feb, 2023	2,530	877
6	May, 2023	2,518	501
7	Aug, 2023	2,174	443
8	Dec, 2023	2,082	503

Table 2 summarizes demographic and tobacco use characteristics of Omnibus participants by wave, which have been largely consistent throughout the study. The majority of participants in each wave were ages 25 to 45 years, non-Hispanic white, and college educated, and about 55% to 60% were female. Roughly three-quarters of participants in each wave had ever smoked cigarettes, and prevalence of past-30-day smoking ranged from 32.0% to 36.3%. Trial of e-cigarettes was reported by nearly half of each wave's participants (range: 45.3%–49.9%) with past-30-day prevalence ranging from 19% to 24.4%. Ever cigar smoking was reported by about 60% of each sample, with past-30-day prevalence ranging from 12% to 14.8%. Smokeless tobacco product use was less common, with trial and past-30-day use ranging from 14.8% to 17.7% and 3.3% to 5.6%, respectively. Finally, nicotine pouch trial ranged from 5.5% to 8.5% over the eight waves, while past-30-day use increased from 0.8% in wave 1 to 4.2% in wave 8.

Discussion

The Rutgers Omnibus is fielded quarterly, beginning in February 2022, among an online sample of US adults ages 18 to 45 years recruited from vetted MTurk workers via CloudResearch. Although a convenience sample, MTurk samples have fairly good geographic distribution, and the distribution of key demographic and socioeconomic characteristics are comparable to the US general population.[6-8] For the purposes of researching tobacco and nicotine product use, our MTurk samples have been particularly useful, with trial and past-30-day use prevalence exceeding those in national surveillance studies. For example, e-cigarette trial was reported by about 24% of the 2022 BRFSS sample, and current use by only 5%, as compared to nearly half and one-fourth of our samples, respectively.[13] Indeed, while Omnibus samples are not representative of all US adults, they are ideal for reaching individuals who use or are exposed to various emerging tobacco products. Moreover, we are able to recruit two to three thousand participants for each wave within ten days of fielding and process the data for analysis

immediately, making Omnibus especially useful for rapid monitoring and timely research of emerging products.

Table 2: Sample demographic and tobacco or nicotine product use characteristics at each wave, Rutgers Omnibus Study Waves 1–8 (February 2022 – December 2023)

	Wave 1		Wave 2		Wave 3		Wave 4		Wave 5		Wave 6		Wave 7		Wave 8	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Age																
18-24	323	10.8	308	10.4	283	11.2	239	10.4	230	9.1	210	8.3	176	8.1	144	6.9
25-34	1363	45.6	1360	45.9	1142	45.2	1023	44.3	1074	42.5	1118	44.4	940	43.2	870	41.8
35-45	1303	43.6	1296	43.7	1101	43.6	1045	45.3	1226	48.5	1190	47.3	1058	48.7	1068	51.3
Sex																
Male	1297	43.4	1325	44.7	979	38.8	927	40.2	1110	43.9	1030	40.9	886	40.8	807	38.8
Female	1691	56.6	1639	55.3	1546	61.2	1377	59.8	1419	56.1	1487	59.1	1288	59.2	1275	61.2
Race																
Non-Hispanic White	1527	68.2	2026	68.4	1722	68.2	1547	67.1	1699	67.2	1687	67.0	1444	66.4	1400	67.4
Hispanic	206	9.2	281	9.5	278	11.0	243	10.5	283	11.2	261	10.4	236	10.9	205	9.9
Non-Hispanic Black	231	10.3	310	10.5	259	10.3	236	10.2	256	10.1	272	10.8	227	10.4	228	11.0
Non-Hispanic Asian	161	7.2	209	7.1	146	5.8	152	6.6	174	6.9	168	6.7	143	6.6	126	6.1
Non-Hispanic Other	24	1.1	30	1.0	25	1.0	31	1.3	22	0.9	19	0.8	19	0.9	19	0.9
Non-Hispanic Multi- race	90	4.0	107	3.6	94	3.7	98	4.3	96	3.8	111	4.4	105	4.8	100	4.8
Education																
High school graduate or less	387	13.0	395	13.3	316	12.5	312	13.5	316	12.5	324	12.9	309	13.1	269	12.9
Associate/some college	947	31.7	979	33.0	916	36.3	811	35.2	813	32.1	816	32.4	719	33.3	697	33.5
Bachelor's degree	1185	39.7	1170	39.5	918	36.4	842	36.5	985	38.9	977	38.8	832	38.4	801	38.5
Master's degree +	469	15.7	420	14.2	375	14.9	341	14.8	415	16.4	401	15.9	314	15.2	315	15.1
Cigarettes																
Ever	2271	76.0	2242	75.6	1873	74.2	1694	73.4	1905	75.3	1888	75.0	1634	75.2	1554	74.6
Past 30 day	1086	36.3	992	33.5	834	32.0	787	34.1	903	35.7	898	35.7	765	35.2	691	33.2
E-cigarettes																
Ever	1453	48.6	1478	49.9	1280	50.7	1150	49.9	1205	47.7	1196	47.5	973	44.8	943	45.3
Past 30 day	707	23.7	707	23.9	615	24.4	561	24.3	599	23.7	573	22.8	468	21.5	396	19.0
Cigars																
Ever	1795	60.1	1782	60.1	1483	58.7	1380	59.8	1484	58.7	1493	59.3	1219	56.1	1194	57.3
Past 30 day	418	14.0	426	14.4	355	14.1	328	14.2	332	13.1	372	14.8	263	12.1	250	12.0
Smokeless tobacco																
Ever	493	16.6	522	17.7	442	17.5	429	18.6	444	17.6	371	14.8	323	14.9	332	16.0
Past 30 day	98	3.3	100	3.4	81	3.2	100	4.3	142	5.6	104	4.1	74	3.4	69	3.3
Nicotine pouches																
Ever	165	5.5	217	7.3	147	5.8	165	7.2	156	6.2	155	6.2	156	7.2	178	8.5
Past 30 day	25	0.8	79	2.7	53	2.1	64	2.8	86	3.4	78	3.1	68	3.1	87	4.2

A key feature of the Rutgers Omnibus is our ability to generate both cross-sectional and longitudinal datasets while still maintaining anonymity of participants. Although new workers join each month, the pool of eligible workers that have never participated in a Rutgers Omnibus survey shrinks with each iteration of the study. While including an increasing number of repeating participants requires vigilance for evidence of worker fatigue and panel conditioning, [14] it has the advantage of producing data that can be used for multiple types of analyses.

The frequency and rapidity of the Omnibus study also makes this a useful source of pilot data for project planning and grant proposals, as well as survey methods experiments. Requests to add supplemental measures to a specific wave of data collection, granted on an ad-hoc basis, have resulted in several scholarly works and support for numerous grant proposals since the study's inception.[9,10]

Limitations

This protocol is not without limitations. First, as a convenience sample of MTurk workers with unknown selection probability, results of Omnibus analyses cannot be considered representative of all US adults or of adults ages 18 to 45 years. However, it is worth noting that such inferences are not necessary in the context of rapid surveillance when the goal is to

identify signals rather than estimate population prevalence. Additionally, representative samples are not necessary for survey experiment studies, where the focus is on maximizing internal validity, or for generating pilot data.
A second limitation is the potential for panel conditioning, especially as the pool of unique MTurk workers becomes smaller over time. However, existing evidence indicates that panel conditioning is most likely when study waves take place one month apart or less, and the literature on panel conditioning across study waves that are less frequent, such as ours, is divided.[15] To combat this, we have begun applying strategies to reduce the impact of conditioning, including diversification of questions wave-to-wave and reduction in survey length, with a focus on fielding rapidity over target sample size. As well, we have the ability to exclude repeated participants for primary or sensitivity analyses.

Conclusions

The Rutgers Omnibus Study is a quarterly rapid survey that can also be leveraged to conduct survey experiments, generate pilot data, and address both cross-sectional and longitudinal research questions. Future waves of data collection will continue to follow this protocol.

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Conflicts of Interest

The authors declare that they have no conflicts of interest to disclose.

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