Using Partnerships to Embed Community Perspectives and Equity into Surveillance Systems: Lessons from Bexar County, Texas for Improving Measurement of Social Determinants of Health

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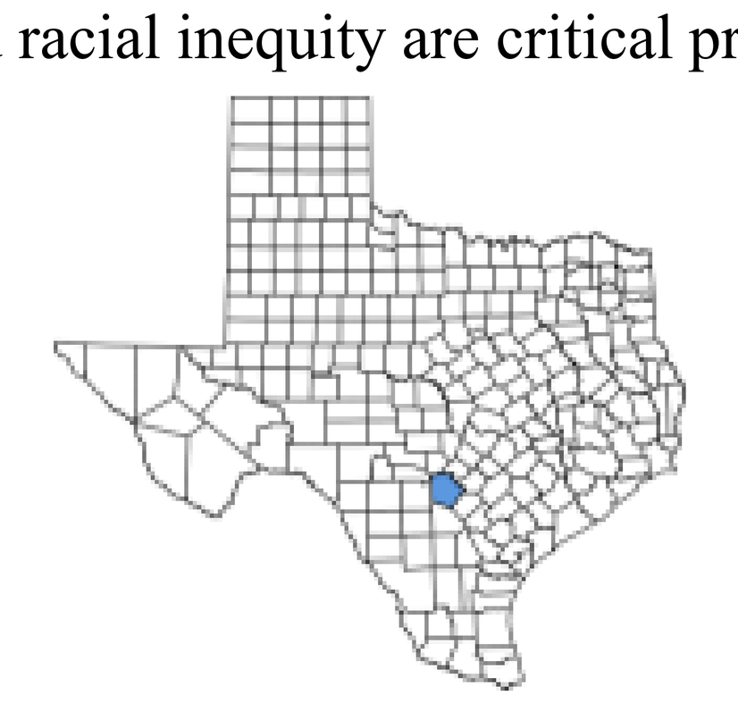
Introduction

For pursuing health equity, data accurately representing local experiences related to the social determinants of health (SDOH) is critical for progress. Five data intermediaries and a research partner, all local organizations collaborating with communities to improve access and use of public health data, conducted coordinated and tailored research investigating opportunities for surveillance systems to better respond to local data priorities related to SDOH, including the experiences and impacts of systematic injustices.

Project partners sought to understand community and local public health SDOH data needs and priorities, the benefits and shortcomings of existing SDOH survey tools; and promising approaches for increasing access and use of public health data. Activities included community survey validation interviews, focus groups, testing approaches to increase survey participation, piloting SDOH survey modules and facilitating community and researcher discussions. Partners engaged 1,252 public health professionals, community leaders and members of historically marginalized groups.

Local Context

Bexar County (San Antonio), Texas is home to nearly 2.1M people, of whom 61% are Hispanic, 26% white, 7% Black or African American, and 3% Asian. Of those 25 years and older, 85% have at least a high school diploma or GED. One in five children lives in poverty, and one in five people under age 65 lacks health insurance. Social/non-medical drivers of health and racial inequity are critical priorities.



Community Information Now (CINow) is a nonprofit local data intermediary based in San Antonio, Texas, with a vision of *improved lives and decreased disparities through democratized data*. CINow sought to understand how alternative approaches to administration of a subset of BRFSS survey modules compared to each other and to the Texas BRFSS household telephone survey in terms of both response rates and respondent demographic characteristics. The two BRFSS modules fielded, 2022 Social Determinants of Health (SDOH) and 2014 Reactions to Race (RR), were selected because the topics are key to health in Bexar County, but the community lacks local data for many of the issues (e.g., social support, racial bias in health care).

Methods

- CINow fielded two modules and a set of demographic questions in English and Spanish by
  - SMS text to two third-party probability panels
  - Mail to a stratified random sample of 2,500 Bexar County households
  - Social media and email to a convenience sample of CINow contacts and partners
- Responses were collected digitally for all methods using a Qualtrics URL and/or QR code and a pre-paid postage
- BRFSS survey questions were unaltered and additional questions were included to capture important demographic characteristics (e.g., disability, veteran status)
- Both probability panels incentivized responses; no incentives were offered for the mail or convenience surveys
- Final survey samples were merged and iterative proportional fitting algorithm (raking) was used to design weights and analyze the combined sample
  - Weighted variables: sex, age group, education, race/ethnicity, and employment
  - Cases with missing data were removed for weighted variables only
  - Population totals vary by question since all available data was used
- R statistical software was used to conduct a sentiment analysis of text responses as they seemed to indicate strong emotions and opinions among respondents

Results

Response rate, response totals, and external cost per response shown in Table 1
- Mail survey response rate was the lowest, only 1.0% (n=24)
- Both panels together generated a 60% response rate, higher than expected
- Snowball convenience sample yielded 237 responses (response rate cannot be calculated)
- Digital convenience sample survey produced the most responses but the panel surveys produced the most complete responses
- External costs include probability panel fees, printing/mailing services, and postage

None of the four samples closely matched Bexar County adult population (Table 2)
- Age and race/ethnicity breakdown for the mail and convenience samples are estimates, as the response options did not mirror those of the probability panels
- Both probability panels combined were more representative of the county population in terms of race and ethnicity than the unweighted BRFSS response set and other methods
- Respondents were disproportionately female for all methods tested

All four samples were combined using hybrid weights to yield a robust dataset (n=576) representative of Bexar County's adult population

Table 3 compares key demographic characteristics for the Bexar County population, the unweighted combined sample, and the final weighted combined sample

Table 1. Survey Distribution Methods, Response Totals, and External Cost per Response

	Panel A	Panel B	Mail	Convenience
Weeks open	2	2	5	7
Response rate	58%	61%	1%	-
Valid responses	120	195	24	237
External cost per response	$112	$110	$161	$0

Table 2. Bexar County Adult Population (18 years and older) and Respondent Characteristics

	Bexar County Percent	BRFSS Percent*	Panel A&B Percent	Mail Percent**	Convenience Percent**
Age					
18-29	16.6	16.4	13.1	14.3	7.8
30-44	22.3	22.4	26.1	42.9	32.6
45-64	22.2	30.1	39.2	28.6	43.1
65+	12.8	31.1	21.7	14.3	16.5
Race/Ethnicity					
Black, non-Hispanic	6.8	8.7	6.5	13.6	11.2
Hispanic	61.3	39.5	61.8	50.0	46.7
Other/multiracial, non-Hispanic	6.3	6.6	2.3	4.5	5.6
White, non-Hispanic	25.6	45.2	29.4	31.8	36.4
Sex					
Female	50.7	54.0	59.7	60.0	78.4
Male	49.3	46.0	40.3	40.0	21.6

* Unweighted ** Percentages estimated for age and race/ethnicity due to varying response options across methods

Table 3. Comparison of County, Unweighted Sample, and Weighted Sample Demographic Characteristics

	Bexar County Adult Population Percent*	Combined Unweighted		Combined Weighted	
		Number	Percent	Number	Percent
Age					
18-29	22.5%	58	10.8%	129.2	24.1%
30-39	20.8%	102	19.0%	109.3	20.4%
40-49	17.5%	111	20.7%	91.7	17.1%
50-59	14.5%	115	21.5%	76.6	14.3%
60-69	13.1%	88	16.4%	68.6	12.8%
70+	11.6%	62	11.6%	60.6	11.3%
Race/Ethnicity					
Black, non-Hispanic	6.8%	47	8.8%	38.6	7.2%
Hispanic	61.3%	297	55.4%	316.8	59.1%
Other/multiracial, non-Hispanic	6.3%	23	4.3%	33.8	6.3%
White, non-Hispanic	25.6%	169	31.5%	146.9	27.4%
Sex					
Female	50.7%	360	67.2%	271.8	50.7%
Male	49.3%	176	32.8%	264.2	49.3%
Other					
Military veteran	9.9%	62	11.7%	58.0	10.9%
Has one or more disabilities	15.1%	101	19.1%	109.0	20.6%
High school diploma or less	38.5%	97	18.1%	206.4	38.5%
Graduate or professional degree	10.8%	167	31.2%	57.9	10.8%

* Source: U.S. Census Bureau American Community Survey 2022 1-Year Estimates (multiple tables)

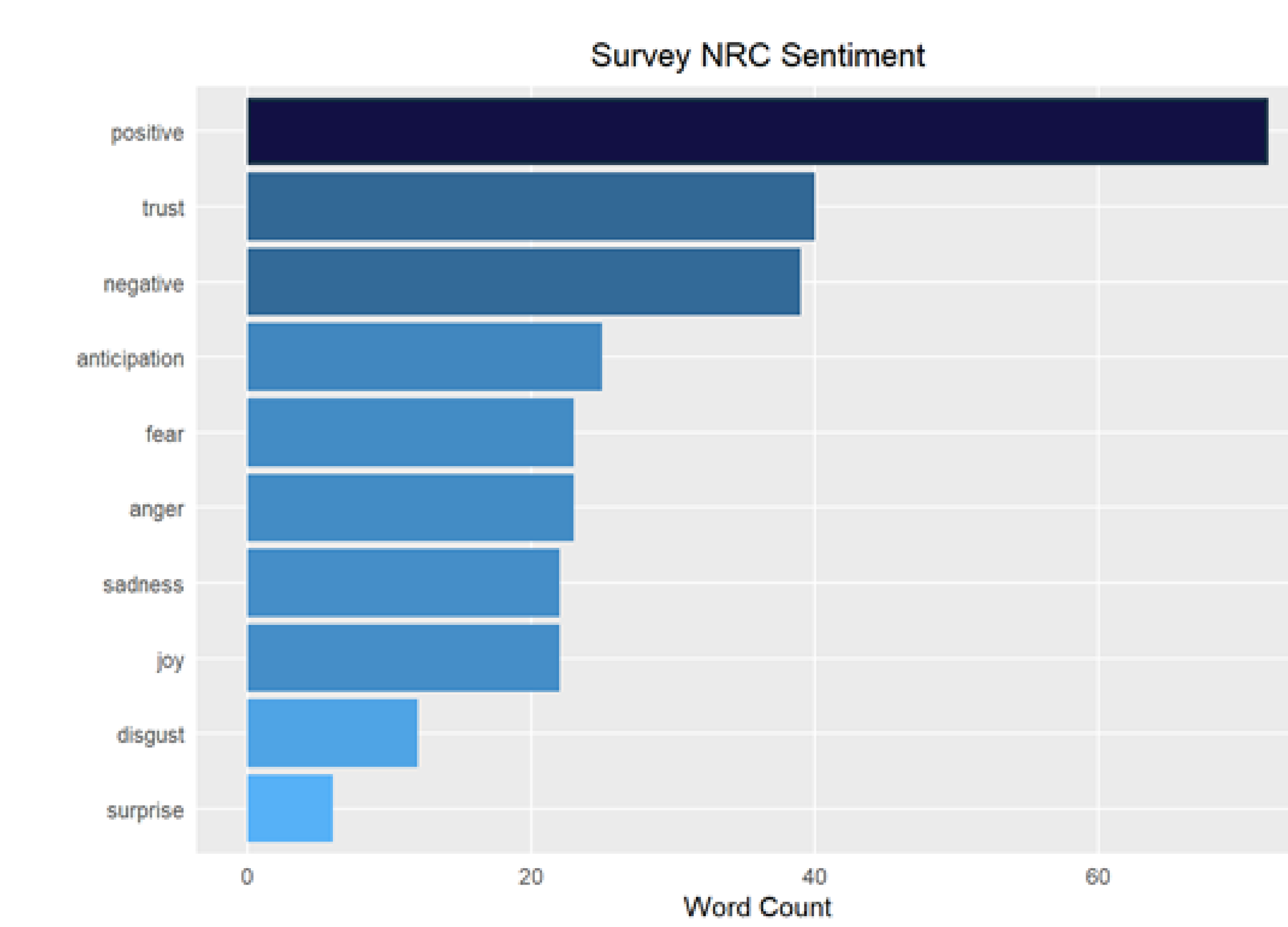
Results (Cont.)

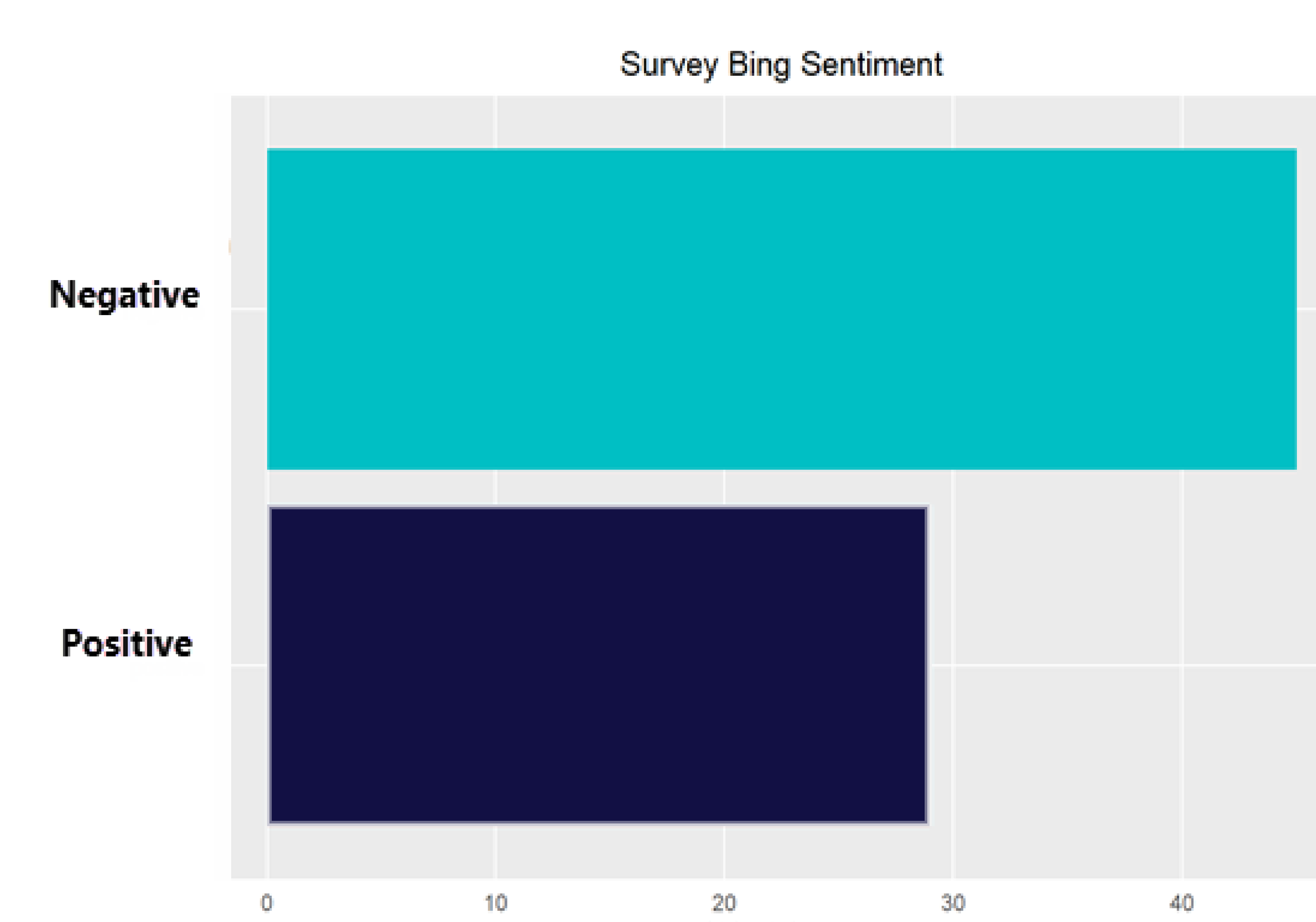
Figure 1 visualizes the frequency with which various words appeared in the text entered by the 39 respondents who answered the question "Are there any other comments you would like to share?" Larger font indicate words that appeared more times in the combined text.

Figure 1. Word Cloud of Free-Text Responses (n=39) to General Open-Ended Question

Bing (Liu) and NRC lexicons were used to categorize words by sentiment (Figure 2). NRC maps words to a number of different categories, while the Bing lexicon is binary – each word is categorized as either positive or negative. While the analysis using the NRC lexicon identified more words as positive than negative, the reverse was true using the Bing lexicon.

Figure 2. Sentiment Analysis of Free-Text Responses (n=39) using NRC and Bing Lexicons





Conclusions

Lessons Learned

- A clear understanding of the logistics of various survey administration methods and any implications for data collection is necessary, particularly when integrating with third-party probability panels
- National survey demographic categories need to be disaggregated to respond to changes in how people self-identify
- Survey module questions should be assessed for culturally relevant language and clarification
- The best audience for reviewing national survey modules and questions may be those close to home
- Consideration should be given to having surveys available in several languages and having language localized
- Building trust and gathering community support is imperative to high quality research and data collection
- Government and system transparency is crucial for successful grantees and for the greatest impact in communities

Key Takeaways and Insights

For other local data intermediaries:

- Using datasets like BRFSS and PLACES in data platforms and reports, while also explaining its limitations, will raise awareness of the data and help people use it responsibly
- Increasing local awareness of both the value of the data *and* its limitations can also build local support to, for example, fund a larger sample size that would make greater demographic disaggregation possible and make estimates less uncertain
- If using a local geography constructed of census tracts or ZCTAs, aggregate PLACES data to that geography to increase its utility

For public health professionals working within large scale surveillance systems:

- Consider translating the surveys into common languages beyond English and Spanish
- Consider whether a panel model would be a better fit for BRFSS or PRAMS, and whether PRAMS participation could be increased by partnering with hospital systems to give mothers information about it at the time of delivery
- For BRFSS, the best people to hold a focus group with are those who do phone interviews, as they are most likely to know whether questions are confusing, the response options are inadequate, and so forth
- Consider opportunities to expand the PLACES modeling approach in ways that enable trending over time and demographic disaggregation, and consider partnering with local data intermediaries, universities, and larger health departments to demonstrate that the modeling approach and Small Area Estimate code can be built upon

Future Work

- Deeper analyses are continuing outside of this project
- CINow will try to develop a web interface to allow public query of the data
- Separate analyses will investigate how respondents self-report race/ethnicity when given detailed and write-in responses options, and identify key themes emerging from narrative responses, particularly age- and sex-based bias in health care
- CINow plans to present results and findings through a community report and an online website where participants and partners can view key findings

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