

Using the American Community Survey Public Use Microdata Sample with GIS to Target Health Services for Children

Thomas F. Reynolds, PhD
 Institute for Health Policy
 University of Texas School of Public Health
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Thomas F. Reynolds, PhD

The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

No relationships to disclose.

Presentation Objectives

- Identify and discuss data that are available in the American Community Survey (ACS) Public Use Microdata Sample (PUMS), which can be used to target health services for children with greatest risk of not receiving needed services.
- Show how these data were analyzed within a GIS environment, so that interventions could be planned at sub-county and neighborhood levels of geography.
- Describe how a plan of action, based on the results of these analyses, has been (and continues to be) developed to provide these needed services.

Background

- Work commissioned by Memorial Hermann Community Benefit Corporation (MHCBC), a 501(c)(3) non-profit, health foundation in Houston, Texas, whose primary focus is children's health.
<http://www.mhcommunitybenefit.org/>
- Major funder and staffer for school-based clinics.
- Wanted data that would help them make informative strategic decisions about new funding and positioning of clinics.
- Work began well before the ACA was passed.

Background

- Two key pieces of health service planning data were lacking for sub-county levels of geography:
 - Reasonably good estimates of the number of children (ages 0-18) who are **eligible, but not enrolled** for public insurance programs (Medicaid + CHIP); and,
 - Reasonably good estimates of the number of children who are **not insured and likely not eligible** for public insurance due to citizenship status.

Background

- These eligibility and citizenship data had never been analyzed or estimated for the Houston/Harris area.
- MHCBC inquiry and request was made about two months after the 2008 ACS PUMS data were made public, which was the first year a health insurance status question was asked.
- Census data related to public insurance eligibility were now available, but not yet at geographic levels with which people were familiar – enter GIS technology and cartography.

ACS PUMS Data

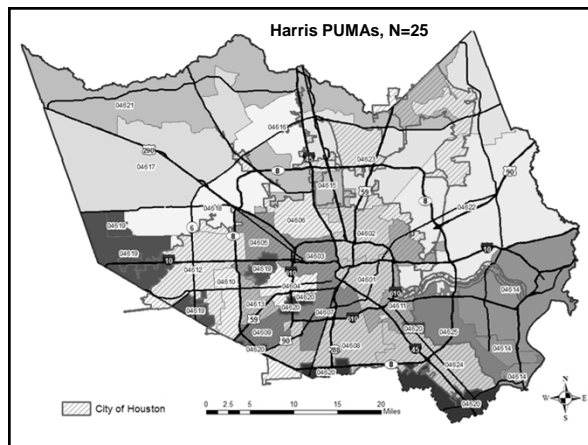
- PUMS are a sample of the actual responses to the American Community Survey and include most population and housing characteristics – e.g., age, income, poverty status, education, health insurance, citizenship, race, ethnicity, disability, etc.
- These are essentially case-level files – not pre-tabulated – that provide the flexibility to prepare customized tabulations and that can be used for detailed research and analysis – e.g., regression, correlation, nested tabulations and crosstabs, etc.
- Currently one-year and three-year PUMS data files are available – soon, the first five-year data file will be available.
- There are two data files, which can be merged – one contains household data, the other is person-level.
http://www.census.gov/acs/www/data_documentation/public_use_microdata_sample/

PUMS Data Set Example

RT	SERIALNO	SPODER	PUMAST	PWGTP	AGEP	CIT	HINS1	HINS2	HINS3	HINS4	HINS5	HINS6	HINS7
P	5	102506	48	100	69	1	1	2	1	2	2	2	2
P	5	202506	48	93	69	1	1	1	1	2	2	2	2
P	37	104622	48	117	22	1	2	2	2	2	2	2	2
P	37	204622	48	258	28	1	2	2	2	2	2	2	2
P	37	304622	48	160	17	1	2	2	2	2	2	2	2
P	37	404622	48	181	18	1	2	2	2	2	2	2	2
P	52	102101	48	94	77	1	1	2	2	2	2	2	2
P	52	202101	48	94	72	1	1	2	2	2	2	2	2
P	98	105500	48	211	62	1	2	2	2	1	2	2	2
P	105	104620	48	112	51	1	1	2	2	2	2	2	2
P	124	106702	48	145	43	1	1	2	2	2	2	2	2
P	124	206702	48	133	40	1	1	2	2	2	2	2	2
P	124	306702	48	142	10	1	1	2	2	2	2	2	2
P	124	406702	48	150	7	1	1	2	2	2	2	2	2
P	136	101400	48	80	81	1	2	2	1	2	1	1	2
P	142	102201	48	20	49	1	1	2	2	2	2	2	2
P	142	202201	48	20	48	1	1	2	2	2	2	2	2
P	142	302201	48	20	11	1	1	2	2	2	2	2	2

Public Use Microdata Areas (PUMA)

- A Public Use Microdata Area (PUMA) is the smallest census area for which the Census Bureau provides the specially selected extracts of PUMS data, from a sample of (ACS) census records that are screened to protect confidentiality.
- Current PUMAs were developed for the 2000 Census:
 - Identified by 5% (PUMA) and 1% (SuperPUMA) sample; ACS sample percentage is considerably smaller.
 - In most cases, PUMA was drawn by state data centers.
 - Uniquely identified within the state.
- In urban areas, provide sub-county data – in Harris County, we have 25 PUMAs.



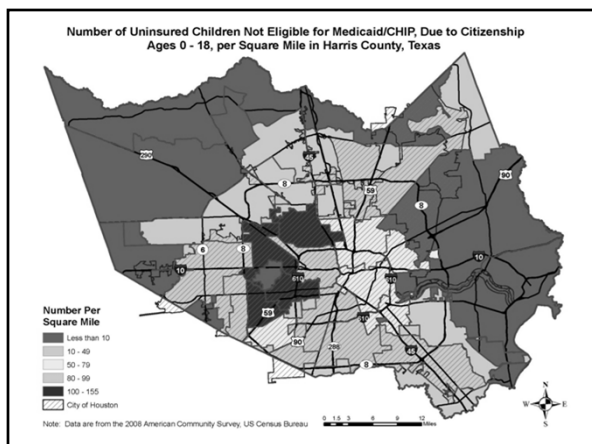
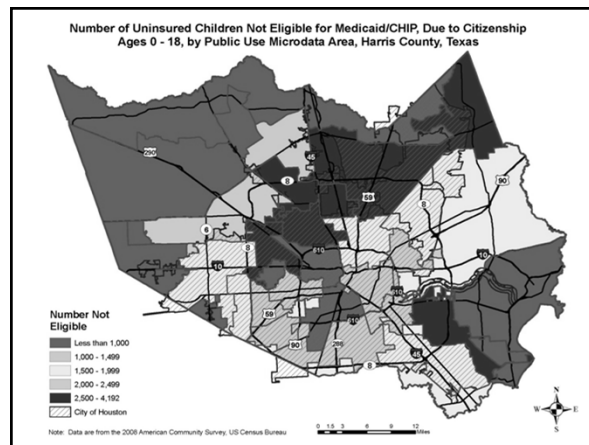
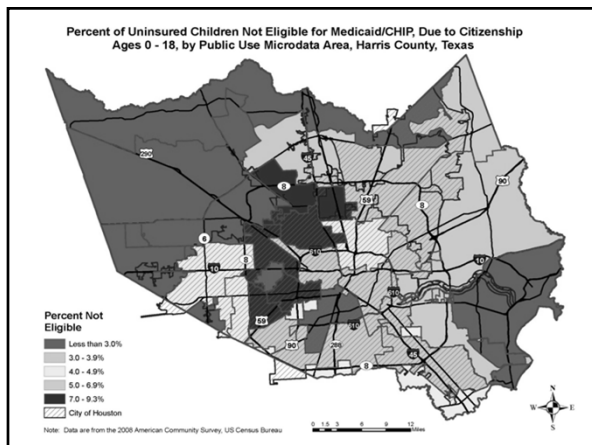
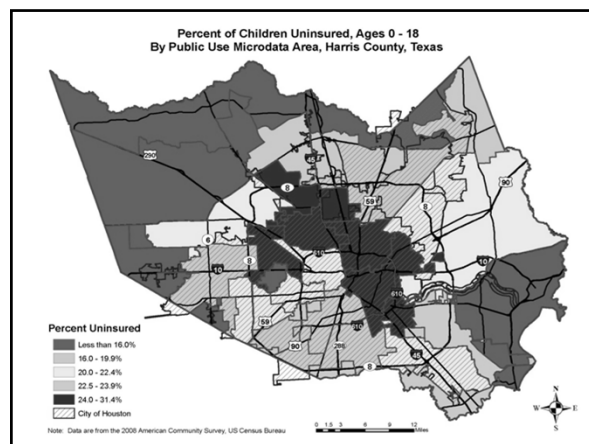
Proposal and Startup

- Use of PUMS data was proposed and accepted.
- Since MHCBC representatives would be presenting these data before their Board, community advocates, and school board officials, among others, a period of learning began.
- They studied the ACS survey instrument, as well as the PUMS dataset. For perspective with known areas, maps were drawn showing how the PUMAs related to ZIP Codes and other county features.
- MHCBC then developed a worksheet with data outline.

PUMA	Total Child Pop	Number Medicaid/CHIP	Number Uninsured			Other Insurance Private Only	
			Total Uninsured	Medicaid/CHIP Eligible	Medicaid/CHIP Ineligible		
				Due to Citizenship	Due to HHI		
04601	31,088	15,104	9,576	5,408	2,082	2,086	6,408
04602	41,760	24,288	11,879	7,389	1,855	2,635	5,593
04603	20,048	6,494	4,097	2,850	663	594	9,457
04604	25,662	8,615	5,163	2,282	2,396	485	11,894
04605	36,890	14,288	8,908	3,831	2,399	2,087	13,713
04606	36,162	14,163	10,944	7,165	3,002	777	11,055
04607	29,285	8,720	6,783	4,556	635	1,592	13,782
04608	42,312	17,259	9,947	5,836	2,131	1,980	15,106
04609	32,275	12,209	6,321	3,793	1,087	1,441	13,745
04610	38,133	10,717	8,091	5,253	1,836	1,002	19,326
04611	37,626	16,538	11,805	5,800	2,462	3,543	9,283
04612	39,421	12,195	6,489	2,822	1,819	1,848	20,737
04613	34,420	18,477	7,682	5,115	2,481	96	8,261
04614	53,691	13,989	8,582	3,472	260	4,850	31,120
04615	52,173	19,280	14,480	6,547	3,803	2,130	18,413
04616	43,293	10,623	8,022	3,728	1,450	2,844	24,648
04617	95,086	9,912	9,000	2,266	439	6,295	76,174
04618	74,032	16,751	16,577	8,933	2,059	5,585	40,704
04619	74,116	15,245	9,517	3,540	415	5,562	49,354
04620	41,508	7,055	8,191	3,318	1,991	2,882	26,262
04621	78,914	11,475	10,325	5,660	360	4,305	57,114
04622	61,728	24,465	12,853	5,065	1,864	5,924	24,410
04623	75,684	28,930	12,702	4,878	4,192	3,632	34,052
04624	50,468	14,453	11,210	5,578	1,838	3,794	24,808
04625	54,915	21,151	12,522	6,352	3,593	2,577	21,242

Data Tables

- Besides the previous slide's number example, virtually identical tables were developed showing percentages and "numbers per square mile."
- Spatial files used for PUMA boundaries included a field with area size.
- These three tables served to provide data for the maps (quintile classification) that became a major part of the analysis and presentation(s).
- Although in excess of 35 maps were developed and reviewed, 15 became the core of most presentations, based on data from five columns in the tables (5 X 3): Total uninsured, those with Medicaid/CHIP, uninsured but eligible, uninsured not eligible due to citizenship, and uninsured not eligible due to poverty status.
- Examples:



Results

- Data and maps became a major part of a strategic directions presentation before the MHCBC Board.
- Have been presented to and shared with members of a taskforce developed to expand public enrollment in the Houston Metro Area.
- Have been shared at Houston area school-based healthcare collaborative meetings in preparation for SBHC provisions in the ACA.
- They are being used to determine if school-based clinics funded and managed by MHCBC are positioned correctly based on need and in preparation for ACA provisions.

Additional Uses and Next Steps

- Being used with ISD, ZIP Code and census tract overlays - side effect, more organizations are using GIS (DIY).
- Mapped geocoded safety net clinics to gain perspective.
- Have begun analyzing other age groups, especially in light of the ACA.
- Augmented small area estimations of insurance status.
- Awaiting the release of the 2009 data – two years = larger sample.
- Are awaiting the release of the five-year ACS, which should expand our ability to provide small area estimates.
- Refine our estimation methods related to citizenship and eligibility (Pew Hispanic Center, SHADAC).

Caveats and Tips

- Read the documentation and literature thoroughly. Accuracy issues have occurred due to methods used to maintain confidentiality, primarily in the age 65 and over group.
- Understand the weighting method. There are several good Web sites that have information and tips about how to use the 80 replicate weights (each, household and person) provided in the PUMS.
- The PUMS, due to PUMA population restrictions, may not provide the detail needed for rural areas.
- Even when the five-year ACS tabular data are released in December, with detail at tract and block group levels of geography, the PUMS will still be invaluable as an analytical data set. In any case, the insurance data will not be a part of the five-year set until released in 2013 (2008-2012 data).

Acknowledgement and thanks to:

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References and Suggested Reading

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Contact Information

Thomas. F. Reynolds, PhD
 Institute for Health Policy
 UT-Houston School of Public Health
 1200 Pressler – RAS E929
 Houston, TX 77030

Thomas.f.reynolds@uth.tmc.edu

<http://www.sph.uth.tmc.edu/research/centers/ihp/>