Epi Research Report

New York City Department of Health and Mental Hygiene May 2010

Including New Yorkers Who Can Be Reached Only by Cell Phone in the Community Health Survey: Results from the 2008 Cell Phone Pilot Survey

The Community Health Survey (CHS) is an annual telephone survey that is a primary source of data used by the Department of Health and Mental Hygiene (DOHMH) to monitor the health of New Yorkers, evaluate the outcomes of public health initiatives, and guide policy decisions. As part of the 2008 CHS, the DOHMH conducted a Cell Phone Pilot Survey to collect information from New Yorkers who could only be reached by cell phone, a population not captured by the landline telephone sample used by the CHS.

This *Epi Research Report* starts by comparing the demographic characteristics and health status of New Yorkers from the Cell Phone Pilot Survey ("cell-only" adults reachable only by cell phone) to New Yorkers from the 2008 CHS (adults with landline phones). Then citywide estimates from the combined cell-only and landline interviews are compared with estimates from the 2008 CHS landline interviews for key health measures. For most measures, there were limited differences between the two estimates. Starting in 2009, the Health Department began including cell-only New Yorkers as part of the CHS to ensure an inclusive and representative sample of adult New Yorkers.

Cell-only adults

The percentage of adults who can be reached only by calling a cell phone has been increasing steadily over the past several years. Since 2003 the proportion of US adults who are cell-only has increased from 2.9% (January-June 2003) to 18.4% (July-December 2008)

Key Points

- By 2008, nearly one in five New York City adults was reachable only by cell phone.
- In 2008, DOHMH conducted a Cell Phone Pilot Survey along with its annual, landline-based Community Health Survey (CHS).
- Cell-only New Yorkers were younger than those living in households with landlines, less likely to have health insurance and more likely to binge drink. Compared across key measures of New Yorkers' health, there were very few differences between results from the CHS landline and from combined CHS and Cell Phone Pilot Survey interviews.
- To maintain the representativeness of the CHS as the number of cell-only New Yorkers continues to grow, starting with the 2009 CHS, interviews include both landline and cell-only households.

NYC Health

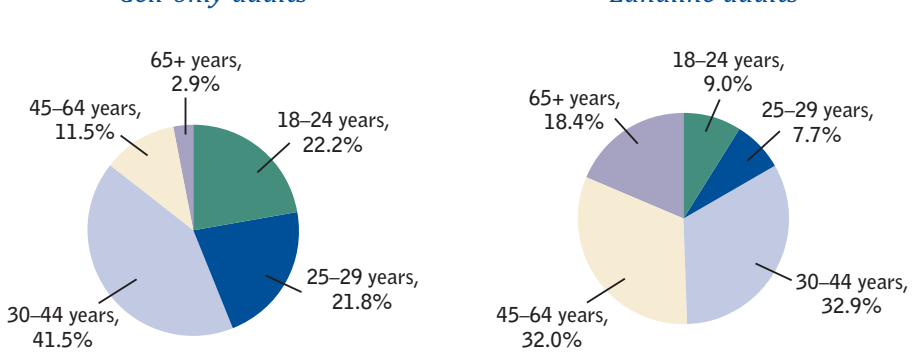
"Based upon data collected by the 2008 New York City Housing and Vacancy Survey, 18.4% of New York City adults are cell-only."

(Blumberg and Luke, 2007 and 2009a). In urban areas, growth in the cell-only population has been even greater.

National studies have found that cell-only adults are more likely to be Hispanic, to be younger, and to live near or below the federal poverty level than adults with a landline (Blumberg and Luke, 2009b). Cell-only adults are also more likely to smoke, to have had five or more drinks on at least one occasion in the past year, and to lack heath insurance, raising concerns about the accuracy of estimates from landline telephone surveys (Blumberg and Luke, 2009a).

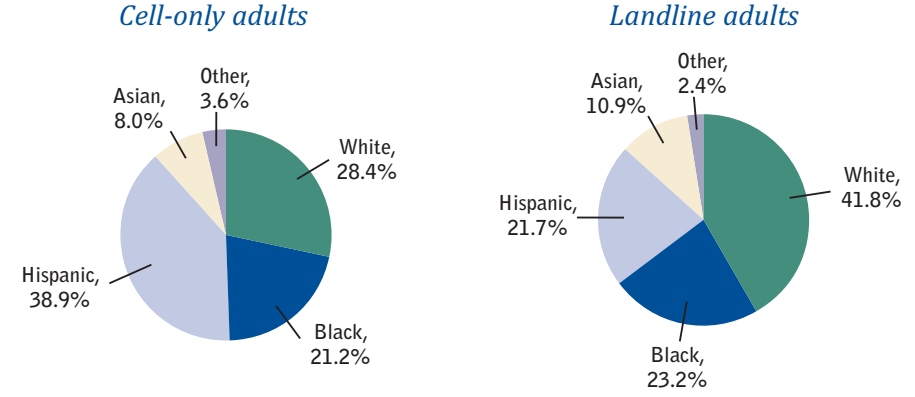
Based upon data collected by the 2008 New York City Housing and Vacancy Survey (NYC HVS), 18.4% of New York City adults are cell-only, similar to the 2008 National Health Interview Survey's national findings.

Figure 1 Age distribution of cell-only and landline New Yorkers



Sources: Community Health Survey and Cell Phone Pilot Survey (2008)

Figure 2 Race/ethnicity of cell-only and landline New Yorkers



Data are not age-adjusted.
Sources: Community Health Survey and Cell Phone Pilot Survey (2008)

The 2008 CHS and Cell Phone Pilot Survey

Since its start in 2002, the CHS has used landline telephone samples to randomly contact households with one or more adults ages 18 and older. The 2008 CHS was conducted from September 2008 to February 2009, and consisted of 7,554 interviews with adults in households with a landline [*see 2008 CHS Sample Design on page 4*].

A Cell Phone Pilot Survey was conducted in 2008 along with the CHS. It consisted of 590 interviews with adults contacted at random from a list of cell phone exchanges in New York City. These adults were asked questions related to the key health measures from the 2008 CHS.

Cell-only New Yorkers

The Cell Phone Pilot Survey and 2008 CHS landline interviews were weighted together to the 2008 NYC HVS on household phone status, and then used separately to provide estimates of cell-only and landline

New Yorkers (Figures 1-3). The landline estimates produced by this weighting process may differ slightly from the previously reported 2008 CHS estimates based on the landline sample. Cell-only New Yorkers, compared with those with a landline, were more likely to:

- be under 30 (44.0% vs. 16.7%).
- live in a household with an income below the federal poverty level (28.7% vs. 19.3%).
- be male (56.5% vs. 43.9%).
- be Hispanic (38.9% vs. 21.7%) and less likely to be white, non-Hispanic (28.4% vs. 41.8%).
- be employed (69.8% vs. 61.9%).
- have a high school degree or less education (44.3% vs. 37.9%).

Where do cell-only New Yorkers live?

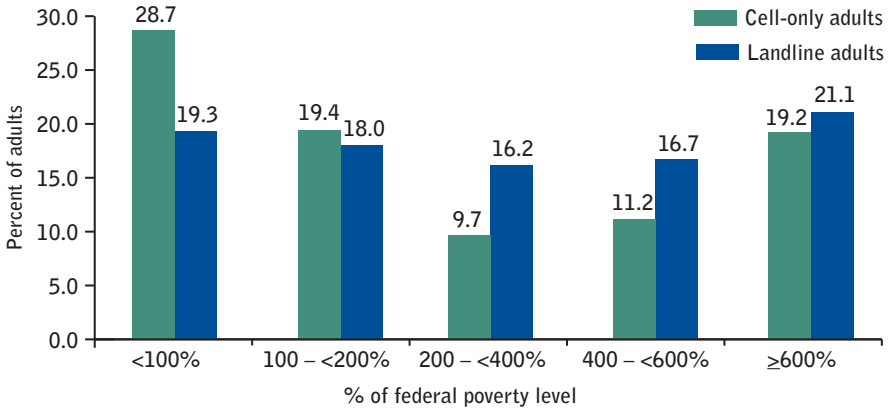
More than one in four Manhattanites (26.8%) were reachable only by cell phone, the highest prevalence among the boroughs in New York City. The prevalence was lowest in Staten Island, where one in ten adults (10.3%) were cell-only. There was a great deal of variation in cell-only levels within boroughs as well (Figure 4).

The health status and risk behaviors of cell-only New Yorkers

Despite the demographic differences between cell-only and landline New Yorkers, their health status and risk behaviors were very

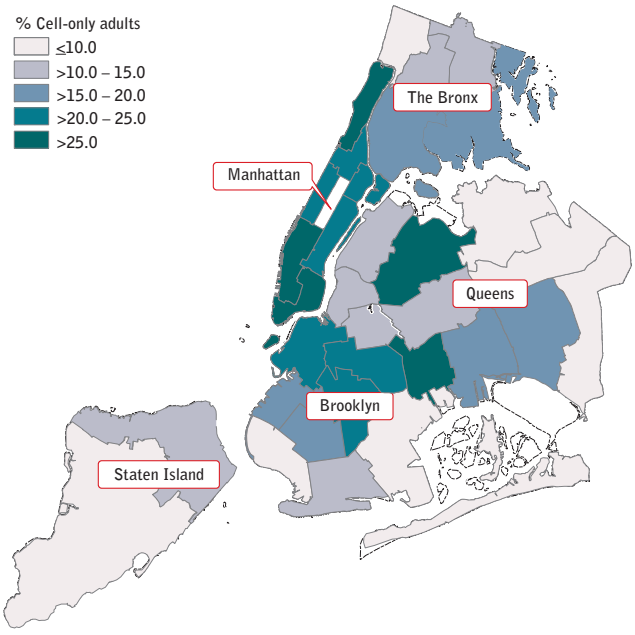
"There was a great deal of variation in cell-only levels within boroughs."

Figure 3 Poverty status of cell-only and landline New Yorkers



Data are not age-adjusted.
Sources: Community Health Survey and Cell Phone Pilot Survey (2008)

Figure 4 Prevalence of cell-only adults in New York City



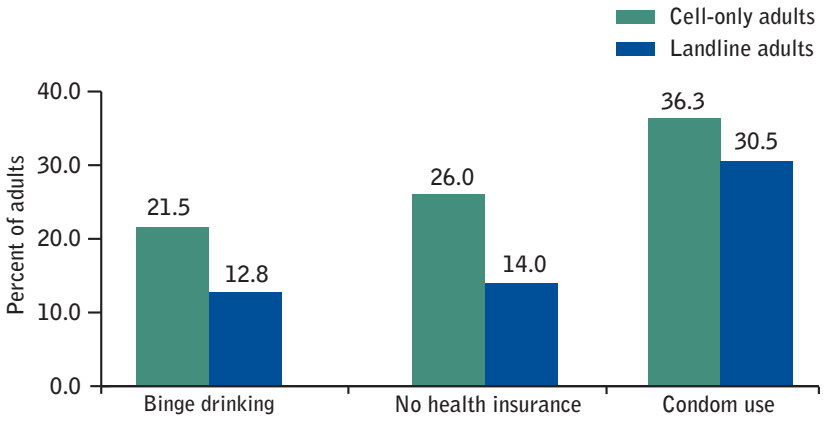
Data are not age-adjusted.
Sources: Community Health Survey and Cell Phone Pilot Survey (2008)

similar. Compared across key health measures [*see list of health measures on the last page*], only three measures showed a statistically significant difference (Figure 5). Cell-only New Yorkers were more likely than those with a landline to:

- binge drink — consume five or more drinks on at least one occasion in the past 30 days (21.5% vs. 12.8%).
- have no health insurance (26.0% vs. 14.0%).
- use a condom the last time he or she had sex, among those with at least one sex partner in the past 12 months (36.3% vs. 30.5%).

Other differences in prevalence estimates between cell-only and landline New Yorkers were not statistically significant. However, for several measures New York City results followed national patterns (Blumberg and Luke, 2009a). For example, data suggest that cell-only adults, compared with landline adults, had a slightly higher prevalence of smoking (18.1% vs. 15.7%) and ever having had an HIV test (61.1% vs. 56.5%), and had a slightly lower prevalence of having

Figure 5 Binge drinking, no health insurance and condom use were higher among cell-only New Yorkers



Data are age-adjusted to the US 2000 Standard Population.
Sources: Community Health Survey and Cell Phone Pilot Survey (2008)

2008 CHS Landline and Cell Phone Pilot Survey Sample Design

The 2008 Community Health Survey (CHS) sampled adults living in households with one or more landlines. The landline sample consisted of randomly generated telephone numbers drawn from New York City's residential telephone exchanges (first three digits following the area code) and blocks (the next two digits following the exchange). The Cell Phone Pilot Survey sampled adults who could only be contacted via cell phone. A listing of cell phone exchanges in New York was used to generate the cell phone sample. Genesys Sampling Systems provided both the landline and cell phone samples.

CHS participants must be at least 18 years old, live in a private household (no dorm rooms or other institutional housing) and live in one of the five NYC boroughs. Once an eligible household for the landline sample was reached, one adult residing in the household was randomly selected.

The cell-only sample was screened to identify adults residing in households without landline telephone service. Cell phone respondents were reimbursed $10 for the cost of participating on their cell phones.

The final combined cell and landline sample frame consisted of 7,554 adults interviewed by telephone in landline households and 590 telephone interviews with cell-only adults for a total of 8,144 interviews.

AAPOR Standard Definitions for Response Rate 3 and Cooperation Rate 3 were applied to each survey. The 2008 CHS landline response and cooperation rates were 33% and 81%, respectively. The Cell Phone Pilot Survey response and cooperation rates were 39% and 46%, respectively. (For AAPOR calculated rates, see American Association for Public Opinion Research. 2008. Standard definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys. 5th edition. Lenexa, Kansas: AAPOR.)

a flu shot in the past 12 months (26.9% vs. 30.9%).

Cell-only and landline comparisons of health measures were also made by key demographic groups, including age, gender, race/ethnicity, borough, poverty, education, and employment status, and for most measures, few differences were found. For example, cell-only 18- to 24-year-olds were as likely as those with a landline to drink two or more sodas per day (21.7% vs. 25.5%). Only the three health measures with significant differences in citywide estimates had large differences between cell-only and landline adults across most demographic groups. For example, cell-only 18- to 24-year-olds were more likely to binge drink than 18- to 24-year-olds with a landline (30.3% vs. 17.8%).

Estimates from combined Cell Phone Pilot and 2008 CHS landline interviews

Comparing health estimates between landline adults and cell-only adults provides a first look at the potential for differences in citywide estimates when including cell-only adults in health surveys. A more accurate estimate of the health of New Yorkers includes both landline and cell-only adults. To get this overall estimate, the interviews from the Cell Phone Pilot Survey and the 2008 CHS landline were weighted to their respective shares of the citywide population before additional weighting of the combined sample took place [*see 2008 CHS Weighting Procedure on page 7*].

Estimates produced from the combined cell-only plus 2008 CHS landline interviews were then compared with the 2008 CHS landline estimates across the same key health measures [*see list of health measures on the last page*].

Only two measures showed "meaningful difference" at the citywide level (Figure 6) [*see What is "meaningful difference"*]. The combined cell-only plus 2008 CHS landline interviews, compared with the 2008 CHS landline produced higher estimates of:

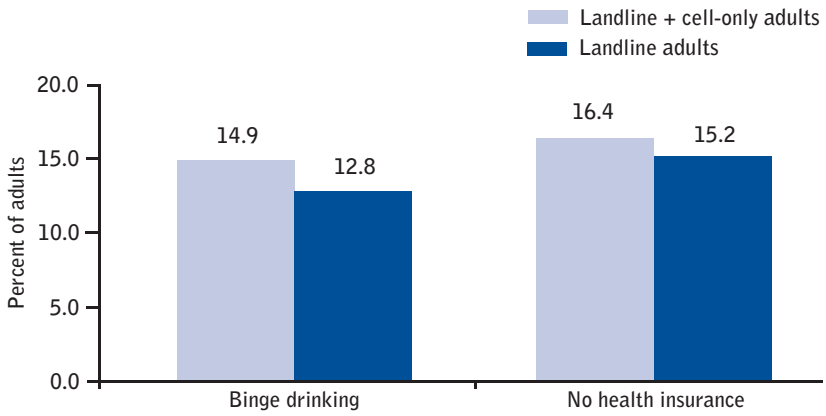
- binge drinking (14.9% vs. 12.8%).
- no health insurance (16.4% vs. 15.2%).

Estimates for other critical measures of New Yorkers' health and related behaviors, including smoking,

What is "meaningful difference"?

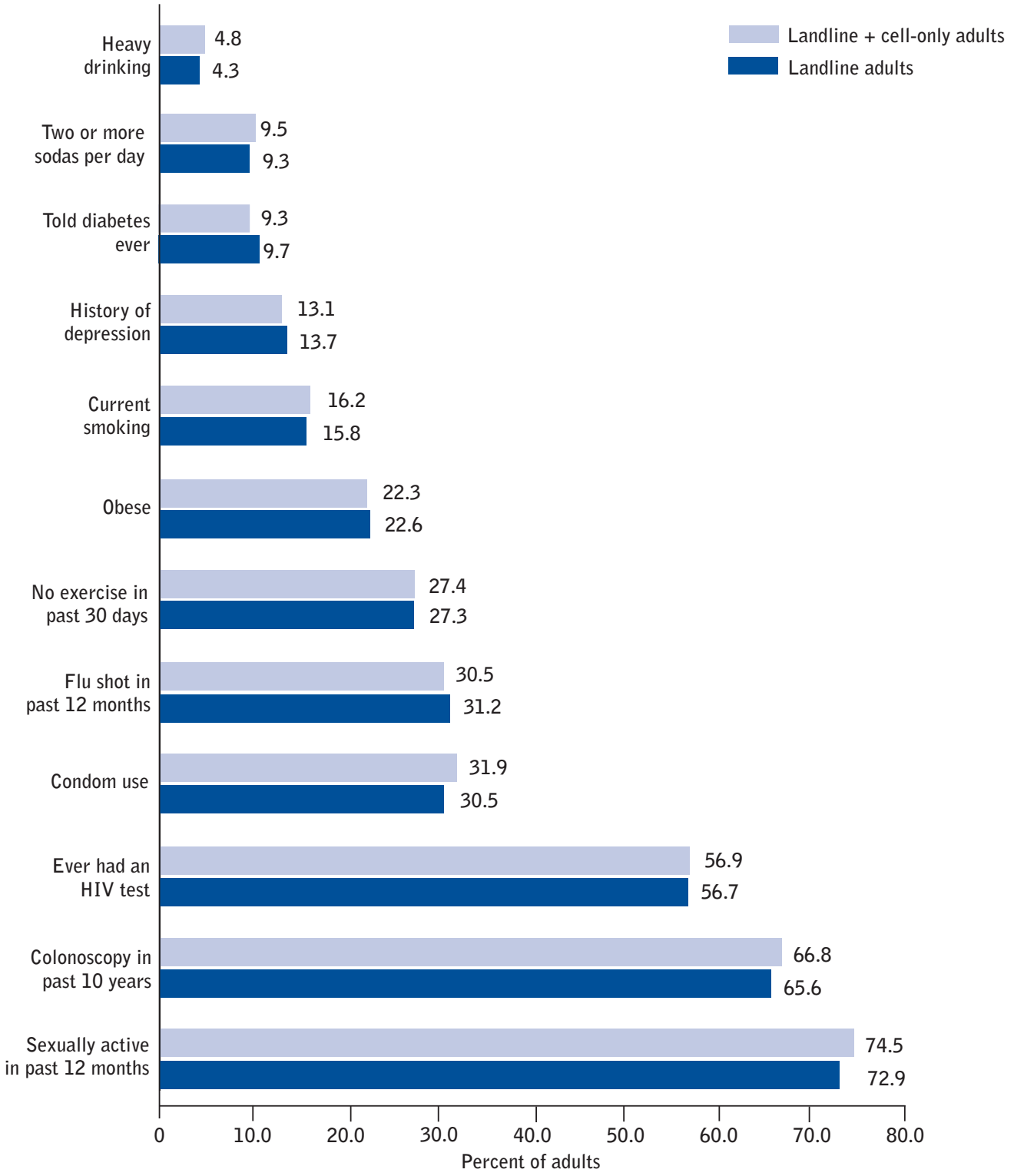
Because the same landline interviews are in both the CHS 2008 landline and combined cell-only plus landline estimates, statistical tests of difference were not possible. Instead, a threshold of "meaningful difference" was adopted, defined as a percent change between estimates of plus or minus five percent and an absolute difference of one percentage point or greater. The latter criterion was applied because percent change measures can be influenced by the prevalence of the health measure (if prevalence is low, percent changes will appear more extreme).

Figure 6 Binge drinking and no health insurance were higher among combined cell-only and landline CHS than landline CHS based on meaningful differences



Data are age-adjusted to the US 2000 Standard Population.
Sources: Community Health Survey and Cell Phone Pilot Survey (2008)

Figure 7 **Most key CHS health measures were similar when combined cell-only and landline CHS estimates were compared with landline CHS**



For comparison of all key health measures, see the appendix tables.
Data are age-adjusted to the US 2000 Standard Population.
Sources: Community Health Survey and Cell Phone Pilot Survey (2008)

asthma, mental health, and cancer screening, showed little or no difference (Figure 7). This is due in part to similar prevalence estimates between cell-only and landline adults on many of these health measures. Furthermore, although the number of cell-only New Yorkers is increasing, the proportion of all adult New Yorkers who are cell-only is less than the proportion of landline adults, giving the cell-only population less impact on overall citywide estimates. Detailed results of the comparisons for the city overall and among demographic groups can be found in the appendix data tables, available online [*http://nyc.gov/html/doh/downloads/pdf/epi/ epiresearch-cellpilot-appendix.pdf*].

Summary and Conclusions

In 2008, cell-only New Yorkers accounted for 18.4% of the city's adults, and were demographically different from those living in households with a landline telephone. However, adding cell-only interviews to the 2008 CHS made little difference in the estimates for key measures of New Yorkers' health. This also suggests that the omission of cell-only New Yorkers has had little or no impact on estimates from prior years of the CHS.

As the percentage of cell-only New Yorkers increases, it may be more difficult to use only a landline sample to achieve a representative sample of the city's adults. Therefore, future CHS will include both landline and cell-only interviews.

Next Steps

- Starting with 2009, CHS estimates will be based upon landline and cell-only interviews.
- The share of cell-only New Yorkers is dynamic: consequently, the proportion of landline and cell-only interviews may need to be adjusted over time.

Sources

Blumberg, SJ, Luke JV. Wireless substitution: Early release of estimates from the National Health Interview Survey, July-December 2008. National Center for Health Statistics. May 2009a. Available from: http://www.cdc.gov/nchs/nhis.htm.

Blumberg, SJ, Luke JV. Reevaluating the Need for Concern Regarding Noncoverage Bias in Landline Surveys. American Journal of Public Health. 2009b; 99(10): 1806-1810.

Blumberg, SJ, Luke JV. Wireless substitution: Early release of estimates from the National Health Interview Survey, July-December 2006. National Center for Health Statistics. May 2007. Available from: http://www.cdc.gov/nchs/nhis.htm.

2008 CHS Landline and Cell Phone Pilot Survey Weighting Procedure

Survey weights were used to ensure that the sample was representative and to produce prevalence estimates from the 2008 Community Health Survey (CHS). A survey weight was calculated for each of the 8,144 adults interviewed. Weights were first calculated for the 7,554 landline adult interviews. These weights take into account the probability of selection of the landline household and the random selection of one adult from the household. Initial weights were then calculated for the 590 cell-only adult interviews. These weights take into account the probability of selection of the cell-only adults.

The two parts of the sample were then combined and the final weights were calculated. The completed adult interviews were grouped into the five boroughs. For each borough the population distribution of adults by United Hospital Fund (UHF) neighborhood, UHF by race/ethnicity, and UHF by age and gender was assembled from U.S. Census 2000. The completed interviews for each borough were also grouped into three telephone usage categories: only landline telephone service in the household, only cell phone service in the household, and landline and cell phone service in the household.

The 2008 New York City Housing and Vacancy Survey was used to estimate the distribution of the adult population in each borough for these three telephone usage categories. The final weights were then calculated in a manner that ensured that the weighted sample in each borough had the correct: 1) UHF distribution, 2) UHF by race/ethnicity distribution, and 3) UHF by age and gender distribution, and 4) telephone usage distribution.

Glossary of Terms

- *Sampling*: the process of selecting individual observations from a population in order to make inferences about that population.
- *Weight*: a value assigned to each observation in a sample to make the sample comparable to the population it is intended to represent. This value accounts for the probability of selection and corrects for known differences in sex, age, and race/ethnicity between the sample and the population.

Age Adjustment

Because many health conditions and behaviors vary by age, a method called 'age-adjustment' is used to account for differences in the age distributions between two or more groups being compared. For example, the NYC cell-only population is younger than the landline population. For health measures that are more common among younger adults, such as binge drinking, or less common among younger adults, such as high blood pressure, it is important to compare age-adjusted estimates — estimates that account for differences in the age distribution between the two groups. Unless otherwise noted, all estimates reported in this document and the appendix have been age-adjusted to the year 2000 US Standard Population.

Appendix tables are available online at ***http://nyc.gov/html/doh/downloads/pdf/epi/epibrief-cellpilot-appendix.pdf***

Prepared by NYC Department of Health and Mental Hygiene.

List of health measures evaluated for Cell Phone Pilot Survey and 2008 CHS

Smoking and Alcohol Use
- Current smoking
- Binge drinking (consuming five or more drinks on at least one occasion in the past 30 days)* †
- Heavy drinking (consuming two or more drinks per day for men; one or more drinks per day for women)

Physical Activity, Nutrition, and Weight Status
- No exercise in past 30 days
- Two or more sodas per day
- Obese (body mass index ≥30)

Health Care Access and Preventive Health Utilization
- No health insurance* †
- Flu shot in past 12 months
- Ever had an HIV test

Sexual Behavior
- Sexually active in past 12 months
- Condom use (last time he/she had sex among sexually active in past 12 months)*
- Men who had sex with men (in past 12 months)

Chronic Disease
- Told diabetes ever
- Told high blood pressure ever
- Current asthma

General Physical and Mental Health
- Self-reported health status
- History of depression

Cancer Screening
- Colonoscopy in the past 10 years (adults 50+ years)
- Mammography in the past 2 years (women 40+ years)
- Pap test in past 3 years (women 18+ years)

* *Health measure estimates were significantly different for cell-only versus landline adults*
† *Health measure estimates were meaningfully different for combined cell-only and landline versus landline adults*

New York City Department of Health and Mental Hygiene
125 Worth Street, CN-6, New York, NY 10013
May 2010

Suggested Citation: *Corey C, Eisenhower D, Immerwahr S, Konty K, Norton JM, Sanderson M. Including New Yorkers Who Can Only Be Reached by Cell Phones in the Community Health Survey: Results from the 2008 Cell Phone Pilot Survey. Epi Research Report 2010, May; 1-8.*

Acknowledgements: *Thank you to the following individuals who contributed to the Cell Phone Pilot and to this report: Adam Karpati, Executive Deputy Commissioner, Division of Mental Hygiene, NYC DOHMH. Thomas Matte, Director of Environmental Research, Division of Environmental Health, NYC DOHMH. Bonnie Kerker, John Jasek, and Leena Gupta, Bureau of Epidemiology Services, NYC DOHMH. Michael P. Battaglia, Vice President, Survey Sampling and Methodology Division, Abt Associates. Andy Weiss, Senior Vice President, Government Division, Abt SRBI Inc.*