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February 9, 2015

By Electronic Mail

Mary Bassett, MD, MPH
Commissioner
New York City Department of Health and Mental Hygiene
42-09 28th Street-8th Floor
Long Island City, NY 11101

Re: Letter Report on the Reliability and Accuracy of the Community Health Survey Administered by the New York City Department of Health and Mental Hygiene (Audit Number 7I14-061AL)

Dear Commissioner Bassett:

This Letter Report contains the findings of our audit of the Reliability and Accuracy of the Community Health Survey (CHS) administered by the New York City Department of Health and Mental Hygiene (DoHMH). The objectives of this audit were to determine: 1) whether DoHMH ensures that the CHS contract deliverables have been achieved; 2) CHS data exists in a secure environment; and 3) CHS data contains accurate information and was sufficiently reliable for health program decisions.

Background

On July 1, 2008, DoHMH entered a six year contract with Abt-SRBI to conduct the CHS to provide information on health risk factors in the City. The cost of the initial contract was \$8.3 million. Later DoHMH extended the contract to December 31, 2014, with an increase in total value to approximately \$10.7 million. DoHMH uses the CHS data to assess the population's health status, track prevalence of diseases, and monitor health trends.

Abt-SRBI uses a computer-assisted telephone interviewing (CATI) system to collect survey data. Surveys are recorded and monitored by Abt-SRBI. CHS is a multiple-choice survey that is conducted in English, Spanish, Russian, and Chinese. Survey questions are translated and reviewed for language accuracy by native speaker employees. Native speaker interviewers use the translated materials to conduct the surveys; the interviewees' answers are input by the interviewer into CATI. Abt-SRBI supervisors monitor approximately 15 percent of the live phone interviews and oversee the data entries to ensure that the answers have been input correctly into CATI. Feedback to interviewers is provided on a continual basis to improve performance.

In 2008, Abt-SRBI conducted the CHS with 7,560 landline respondents and obtained a response rate of 33.3 percent. In 2009, DoHMH began including cell phone respondents in the survey in response to the increasing number of people using only cell phones. In 2013, the CHS survey identified 3,920 cell phone respondents and 4,580 landline respondents. The number of questions for the CHS varies each year. The questions cover a range of topics that include general health and mental health status; diabetes; asthma; smoking; sexual behavior; alcohol consumption; cancer screening; and other health topics.

In order to group and better represent survey results, DoHMH assigned neighborhoods for the CHS based on the zip codes and boroughs provided by respondents.¹ DoHMH breaks down data by these neighborhoods to provide CHS statistical information and graphics on its website. On the DoHMH website, for instance, CHS data appears in bar charts and neighborhood maps.

Findings and Recommendations

We found that contract deliverables for CHS data were achieved. Our review verified that the vendor Abt-SRBI conducted the required surveys and performed the necessary purification on the CHS data. In addition, we reviewed the system security plans and found that the CHS data exists in a secure environment. We also tested the password management controls and reviewed the information system contingency plan. DoHMH has adequate access controls and contingency planning policy over its CHS data.

We tested the 2010, 2011 and 2012 CHS data files as well for blank and invalid data to ascertain whether critical data elements were missing. We also reviewed the data cleaning and analytic reports to ensure DoHMH performs data cleaning and checks for duplicates. Based on our tests, the CHS data is generally accurate and sufficiently reliable for DoHMH to support its health program decisions. However, we found that DoHMH did not always use the proper neighborhood codes in the CHS. We found that when respondents' neighborhoods are missing, DoHMH assigns neighborhood codes. Although the small percent of missing neighborhoods did not significantly affect the data analysis, greater accuracy in the CHS data will help better track public health throughout the City.

We recommend that DoHMH reviews the assignment of neighborhood codes to determine whether CHS data with missing UHFs can be assigned more accurately to increase reliability of CHS analysis.

Scope and Methodology

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. This audit was conducted in accordance with the

¹ DoHMH follows the United Hospital Fund (UHF) neighborhood system which was created by grouping adjoining zip codes together to create 42 distinct areas within the city limits.

audit responsibilities of the City Comptroller as set forth in Chapter 5, §93, of the New York City Charter.

The scope of this audit was from 2010 to 2013. We conducted fieldwork from September 2013 to August 2014. We took the following steps to achieve our audit objectives:

- Interviewed various DoHMH officials, including those from the Division of Informatics and Information Technology (DIIT) and the Bureau of Epidemiology Services;
- Conducted system walk-throughs of Abt-SRBI's CATI system and DoHMH's data center to gain an understanding of the administration and security of the CHS data;
- Reviewed Abt-SRBI's *Code of Standards and Ethics for Survey Research and Training Materials for the CHS 2013* to determine whether CHS interviewers were trained to conduct interviews in accordance with appropriate protocols; and
- Reviewed the CHS contract and amendment scope to ensure that the contract deliverables for the CHS data were achieved.

To determine whether the CHS data was accurate and reliable for health program decisions, we asked that DoHMH provide the data files for testing. DoHMH informed us in a December 2013 meeting that the 2013 data had not been finalized. On March 6, 2014, we received the 2010 and 2011 CHS data files. In addition, we received the 2012 CHS data files in August, 2014. We took the following steps to determine the accuracy of the CHS data and satisfy our audit objectives:

- Tested for blank, invalid, or inappropriate data to ascertain whether critical data elements were missing;
- Analyzed the *Data Cleaning and Analytic Data Creation* reports for three years to ensure DoHMH performs data cleaning, checks for duplicates, and assigns UHF values for surveys with missing UHF neighborhoods;
- Reviewed and tested program codes for the 2010, 2011, and 2012 CHS surveys to determine how DoHMH analyzed its CHS data;
- Reviewed the CHS flowchart to determine the CHS process for the creation of questions, collection of data, and data analysis;
- Reviewed Epi Data Brief and Epi Research Report on CHS changes in methodology and trends over time to determine how DoHMH reported conclusions based on its analysis of the CHS data;
- Reviewed the *Survey Protocol and Sampling Plan* and production reports from July 2013 to October 2013 to determine the CHS sample design and the selection process for CHS surveys;
- Reviewed the *Community Health Survey Overview of Data Cleaning Process* to determine how the CHS data was cleaned for analysis;
- Reviewed the respondent selection for the CHS, CHS questionnaire process, CHS data entry and verification procedures, and data security at Abt-SRBI to determine if the CHS data was accurately recorded and controls were in place for data entry into the CATI system;
- Reviewed the pretesting notes for 2012 and 2013 to determine whether DoHMH staff performed testing of its CHS questions prior to conducting actual CHS interviews;

- Reviewed the 2013 *CHS User Access List & Summary* of users who have access to the CHS CATI program files and the type of access to determine whether DoHMH had adequate access controls for its CHS data;
- Reviewed Abt-SRBI's manuals, guides, and monitoring reports to determine whether CHS interviewers were being monitored;
- Reviewed and analyzed DoHMH's password management policy to determine how its employees were expected to manage passwords and personal identification numbers used to protect DoHMH systems and information; and
- Reviewed and tested Abt-SRBI's access controls to determine how Abt-SRBI prevented unauthorized access to CHS data.

We also determined whether the CHS data existed in a secure environment with tests that:

- Reviewed the DoHMH back-up data retention policy and *Backup Operations Guide* to determine DoHMH's back-up procedures used to protect its data;
- Reviewed DoHMH's *Information System Contingency Plan* to determine what information was considered mission critical and the recovery plan for the data;
- Reviewed DoHMH's *Business Impact Analysis Questionnaires* and *Business Impact Analysis Summaries* to understand the business impact and risks associated with each physical location, business function, and IT application;
- Reviewed DoHMH's report *Data Center Pull the Plug Test Version 1* to determine whether DoHMH tested its disaster recovery plan in case of an emergency or disaster;
- Reviewed Abt-SRBI's *Information Technology System Security Plan* to determine Abt-SRBI's system security process to protect DoHMH data;
- Reviewed Abt-SRBI's incident identification and response policy to determine how Abt-SRBI responded to information security-related incidents; and
- Reviewed Abt-SRBI's contingency planning policy to determine whether Abt-SRBI responded to information system emergencies to protect information required for mission-critical and critical business operations.

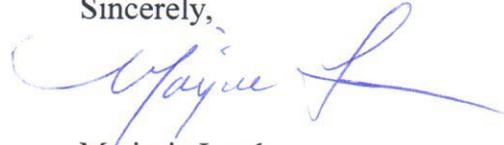
The issues covered in this report were discussed with DoHMH officials during and at the conclusion of this audit. The preliminary letter report was sent to DoHMH officials and was discussed at an exit conference held on November 17, 2014. We submitted a draft letter report to DoHMH for review and requested written comments within ten working days. We received a written response from DoHMH on February 2, 2015. In their written response, DoHMH officials disagreed with our recommendation and stated "DoHMH staff already regularly reviews the assignment of neighborhood codes and continue to work closely with the vendor to identify and develop new methods for assigning neighborhood, particularly for cell phone users who do not provide a valid New York City Zip." DoHMH also stated that "DoHMH uses sophisticated and scientifically sound methods to impute location for these respondents and we have also added questions to the survey to better understand the population using cell phones."

During our audit, we found that five percent of the cell phone survey had missing neighborhood codes. In those instances, either the respondent's zip code was not a valid residential zip code, the respondent's zip code was outside of New York City, or the respondents refused to provide their zip codes. Although DoHMH regularly reviews and develops methods for assigning

neighborhood codes, DoHMH still could not ensure that the neighborhood codes assigned to those five percent are accurate. Greater accuracy in the CHS data will help better track public health throughout the City.

The full text of DoHMH's comments is included as an addendum to this report.

Sincerely,



Marjorie Landa

- c: Sara Packman, Assistant Commissioner of Audit Services
- Mindy Tarlow, Director, Mayor's Office of Operations
- George Davis III, Deputy Director, Mayor's Office of Operations



NEW YORK CITY DEPARTMENT OF
HEALTH AND MENTAL HYGIENE
Mary T. Bassett, MD, MPH
Commissioner

ADDENDUM
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January 29, 2015

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Re: Draft Letter Report on the Reliability and
Accuracy of the Community Health Survey (CHS)
administered by the New York City Department of Health and Mental
Hygiene
Audit Number 7114-061AL

Dear Deputy Comptroller Landa:

We reviewed your draft letter report on the Reliability and Accuracy of the Community Health Survey (CHS) administered by the New York City Department of Health and Mental Hygiene (DOHMH) and thank the auditors for the opportunity to respond.

The auditors found that 1) CHS contract deliverables were achieved; 2) CHS data exists in a secure environment; and 3) DOHMH has adequate access controls and contingency planning policy over its CHS data. The auditors acknowledge that CHS data is generally accurate and sufficiently reliable for DOHMH to support its health program decisions. The auditors made one recommendation with regard to DOHMH's assignment of neighborhood codes when respondents' neighborhood codes are missing. DOHMH disagrees with the auditors' recommendation and the attached response details DOHMH's position.

We appreciate the efforts and professionalism of your staff in the performance of this audit. If you have any questions or need further information, please contact Sara Packman Assistant Commissioner for Audit Services, at (347) 396-6679.

Sincerely,

Oxiris Barbot, MD

cc: Mary T. Bassett, MD, MPH, Commissioner, DOHMH
Charon Gwynn, PhD., Deputy Commissioner, Epidemiology
Cindy Driver, Acting Commissioner, PhD, Acting Assistant Commissioner,
Epidemiology
George Davis, Director, Mayor's Office of Operations

**RESPONSE TO THE NEW YORK CITY COMPTROLLER'S AUDIT ON THE RELIABILITY
AND ACCURACY OF THE COMMUNITY HEALTH SURVEY ADMINISTERED BY
THE NEW YORK CITY DEPARTMENT OF HEALTH AND MENTAL HYGIENCE
Audit Number 7114-061AL**

The Department of Health and Mental Hygiene ("DOHMH" or "Department") reviewed the draft letter report on the Reliability and Accuracy of the Community Health Survey (CHS) administered by the NYC DOHMH and thanks the auditors for the opportunity to respond. The objectives of this audit were to determine: 1) whether DOHMH ensures that CHS contract deliverables were achieved; 2) CHS data exists in a secure environment; and 3) CHS data contains accurate information and was sufficiently reliable for health program decisions.

The auditors found that 1) CHS contract deliverables were achieved; 2) CHS data exists in a secure environment; and 3) DOHMH has adequate access controls and contingency planning policy over its CHS data. The auditors acknowledge that CHS data is generally accurate and sufficiently reliable for DOHMH to support its health program decisions. The auditors made one recommendation with regard to the assignment of neighborhood codes, when respondents' neighborhood codes are missing and DOHMH assigns neighborhood codes. The auditors recognized that the small percent of missing neighborhoods did not significantly affect the data analysis. DOHMH disagrees with the Comptroller's recommendations for the reasons cited below.

Auditor's Recommendation:

DOHMH should review the assignment of neighborhood codes to determine whether CHS data with missing UHFs can be assigned more accurately to increase reliability of CHS analysis.

DOHMH Response

DOHMH disagrees with the auditors' recommendations for the following reasons: 1) DOHMH staff already regularly reviews the assignment of neighborhood codes and continue to work closely with the vendor to identify and develop new methods for assigning neighborhood, particularly for cell phone users who do not provide a valid New York City ZIP (for whom auxiliary location information is not generally available), and 2) DOHMH uses sophisticated and scientifically sound methods to impute location for these respondents and we have also added questions to the survey to better understand the population using cell phones.