

Impact of the Closure of a Large Urban Medical Center: A Quantitative Assessment (Part II)

Diana Romero · Amy Kwan · Sue Nestler · Neal Cohen

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Abstract This community health needs assessment—the second part of a mixed-methods project—sought to quantitatively determine the impact of the closure of St. Vincent’s Medical Center, a large not-for-profit hospital in NYC on individuals who used its services. Findings from a community survey disseminated to the broader community affected by the closure of this hospital are described. The questions covered topics including demographics, health status, experiences accessing health care pre- and post-hospital closure, access to medical records, prescriptions, etc. The majority of respondents are from the community immediately surrounding the hospital. Almost 50% report having a physical or mental health condition requiring regular care; roughly 64% had a doctor affiliated with St. Vincent’s and 68% currently see the same doctor as before the hospital closed. With regard to service utilization, 74% reported having sought services at St. Vincent’s in the past 5 years. Of these, the emergency department was the most commonly used service (75%), followed by specialty tests (32%), inpatient care (30%), and outpatient services (22%). The majority of ratings of services at St. Vincent’s were “excellent” or “very good.” Conversely, 65% of former St. Vincent’s users reported more difficulty obtaining health care post closure. Of the 11% who have tried to access their medical records, 30% have not been able to obtain their records and 42% report their attempt as being “somewhat difficult” or “very difficult.” Over 50% report spending more time traveling or traveling further to get to their healthcare provider; and over one third report waiting longer to get an appointment, or to be seen when at an

appointment. Bivariate analyses revealed that certain sub-groups of respondents had significantly worse negative experiences associated with the closure of the hospital. Specifically, individuals with a health condition were more likely to have visited an ER since St. Vincent’s closed, and now travel further and spend more time traveling to their health care provider, compared to those without a physical and/or mental health condition. Similarly, a greater proportion of respondents who had a doctor affiliated with St. Vincent’s reported greater challenges accessing care since the closing, compared to those who did not have a doctor affiliated with St. Vincent’s (e.g., waiting longer to get an appointment). Finally, the same health care challenges were being experienced by those who are not seeing the *same doctor* as prior to the closing.

Keywords Hospital closure · Community health · Access to care · Vulnerable groups · Web-based survey

Introduction

When St. Vincent’s Catholic Medical Center (St. Vincent’s) closed in April 2010 [1, 2], after 160 years of providing health care services to residents of Greenwich Village and the surrounding New York City (NYC) neighborhoods, a Community Health Needs Assessment Steering Committee (the “Steering Committee”) was organized by several Community Boards and involving various community-based organizations (CBOs) and elected official’s offices. We first collected qualitative data (i.e., key informant interviews, focus groups) to understand the impact of the closure of St. Vincent’s from the perspective of local service providers and area residents. (Findings from this study and additional background details

D. Romero (✉) · A. Kwan · S. Nestler · N. Cohen
CUNY School of Public Health at Hunter College, 2180 Third Avenue, Room 542, New York, NY 10035, USA
e-mail: diana.romero@hunter.cuny.edu

about this project can be found in the accompanying paper [3].) Subsequently, we assisted with development and fielding of a quantitative Community Health Survey (CHS), which is the focus of this paper. Our survey collected individual-level data from community residents and other users of services at St. Vincent's. These two complementary analyses provide a rich picture of health care utilization patterns and individual experiences when St. Vincent's was open as well as since its closure.

The idea for the CHS (the "survey") came out of a discussion by members of the Steering Committee who were concerned that there were members of the community who might not be represented through the key informant interviews and focus groups. As such, a community-based participatory approach was utilized to develop a survey instrument from the extensive collaboration of Steering Committee members, for dissemination to the broader community¹ affected by the closure of St. Vincent's. The survey was officially launched on April 5, 2011, and closed on May 16, 2011, thus collecting this data approximately 1 year after the hospital closed.

Methods

Survey Development and Dissemination

The CHS is an anonymous, web- and paper-based survey consisting of 39 questions and comprised predominantly of closed-ended questions, with seven open-ended questions. The questions covered the following domains: how and where respondents heard about the survey; demographic characteristics (e.g., zip code, length of residence, age, race/ethnicity, language); health status (e.g., health conditions, whether respondent has a doctor, insurance); experiences with St. Vincent's (e.g., services used and satisfaction/ratings); experiences at other emergency departments post closure; accessing health care post closure; medical records; prescriptions; traveling time and distance to appointments; scheduling and waiting for an appointment.

¹ The definition of "community" was informed both by the NLIJ analyses as described in their third report [4] (which specified zip codes surrounding St. Vincent's, referred to as the Primary Service Area [PSA], Secondary Service Area-I [SSA-I], and Secondary Service Area-II [SSA-II]), as well as by members of the Steering Committee who advocated for consideration of individuals and groups that might not live within these zip codes but used St. Vincent's services nonetheless. The zip codes in the PSA include 10001, 10011, 10012, 10014; the SSA-I zip codes include 10003 and 10013; and, the SSA-II zip codes include 10002, 10009, and 10038. In following suggestions from Steering Committee members, our data sources include individuals who reside both within and outside of the primary and secondary service areas.

The survey was created in SurveyMonkey[®] in English, and then translated into Spanish and Chinese. A paper version was created and modified to account for skip patterns, allowing for non-electronic self-administration. Large-print versions were also produced for respondents with visual impairments. The survey was disseminated by organizations by emailing the survey link to their constituencies, posting it on their websites, and/or handing out paper copies to their memberships at their respective locations. A small number of organizational email lists were provided to us so that we could email the survey directly from SurveyMonkey[®].

Extensive efforts were made to broaden dissemination in order to reach as many constituents and former users of St. Vincent's as possible (i.e., through multiple languages and formats). While the original intention was to also reach low-income, racial/ethnic minority residents from the community with this survey, a decision was subsequently made by the Steering Committee to distribute a different survey to a housing community with large numbers of these groups via in-person, door-to-door administration by adolescent members of the community. Because these different datasets could not be merged, one limitation of this study may be the underrepresentation of this segment of the community.

Analysis

The data from the survey were downloaded from SurveyMonkey[®] directly into PASW Statistics 18 (formerly SPSS). After the data were cleaned and several variables recoded, frequencies or means were run on all variables. Bivariate analyses were also conducted to identify differences in outcomes (e.g., continuity of care, services no longer available) by select sub-groups (e.g., those with physical or mental health conditions, fewer resources). Finally, extensive responses to several open-ended questions were analyzed through standard qualitative data analysis procedures to identify salient themes.

Results

This paper provides (1) descriptive findings of the survey; (2) bivariate analysis of subgroups of the sample (e.g., those with chronic health problems); and (3) analyses of respondents' answers to open-ended responses. The sample size is specified for each question as it varies depending on the question, due to skip patterns and different rates of typically negligible item non-response. Thus, a total of 1,609 people started the survey, but approximately 180 of them did not continue beyond the third question. As such,

the relevant total sample size starts at approximately 1,438, and varies depending on the specific question.

Modes of Dissemination

With regard to the mode of dissemination, 1,609 respondents answered the English survey, 8 the Spanish survey, and 1 the Chinese survey. Approximately 96% of respondents completed the survey online (vs. by paper). The majority (84%) were reached directly by organizations (e.g., through emails, Facebook postings) or found out about the survey through a friend, family member or colleague.

About one quarter of the total sample heard about the survey from Manhattan Community Board 2 (22%), followed by Speaker Quinn’s office (12%), the McBurney YMCA (which included a memo from Senator Duane) (7%), the Actors Fund (4%), directly from Senator Duane’s office (3%), and Manhattan Community Board 4 (3%). The remaining half was widely dispersed over more than 70 other sources each accounting for 2% or less of the sample.

Sample Description

Characteristics of the sample ($n = 1,438$), including demographic and health status variables, are summarized in Table 1. The mean age of the respondents was 58 years old. The majority were White (85%), followed by Hispanic/Latino (7%), Asian/Pacific Islander (3%), African-American/African (2%), more than one race (2%) and other (2%). English was the primary language for 96% of respondents. Sixty-three percent of respondents identified as female and 37% identified as male. With regard to sexual orientation/identity, 76% identified as heterosexual and 14% as gay. The majority (75%) live in the Primary Service Area (PSA); on average, residents have lived in their zip code for 24 years.

A variety of health-related questions were asked of respondents, including health conditions, insurance status, and doctor affiliations. Regarding health status, 37% reported having a physical health condition that requires regular treatment or care, and 11% had a mental health condition also in need of regular care. When examining these two variables together, 40% reported having a physical and/or mental health condition; 6% reported having a visual and/or hearing impairment. Over 500 respondents specified their physical health condition. The majority (23%) were cardiac-related conditions (e.g., hypertension, high cholesterol, atherosclerosis, heart attack), followed by diabetes (8%), musculoskeletal (e.g., amputation, arthritis, osteoporosis) (8%), respiratory illnesses (e.g., asthma, allergies) (7%), infectious diseases (e.g., HIV/AIDS, hepatitis) (7%), and cancer (e.g., breast,

prostate, skin) (6%). Regarding mental health conditions, over 150 specified their condition, the majority being depression/dysphoria (41%), followed by anxiety (10%),

Table 1 Sample description: demographics and health status

	% (n)
Age (mean years)	58.3 (SD = 13.9) Range: 18–98
Gender	
Female	62.7 (850)
Male	36.7 (498)
Transgender (identify as female, identify as male)	0.4 (6)
Other	0.1 (2)
Race/ethnicity	
White	84.8 (1,196)
Hispanic	6.7 (94)
Asian/Pacific Islander	3.1 (44)
African-American/African	2.1 (29)
More than one race	1.8 (25)
Other (including Caribbean/ West Indian/American Indian/Alaska Native)	1.6 (23)
Primary language	
English	95.8 (1,355)
Spanish	2.3 (32)
Chinese (Cantonese/Mandarin)	0.3 (4)
Other	1.4 (20)
Sexual orientation	
Heterosexual	75.8 (990)
Gay	13.9 (182)
Lesbian	4.6 (60)
Bisexual	2.3 (30)
Queer	0.6 (8)
More than one	0.5 (7)
Other	2.2 (29)
Zip code	
10014 ^a	31.9 (456)
10011 ^a	30.3 (433)
10012 ^a	6.9 (98)
10001 ^a	5.7 (81)
10003 ^b	4.8 (69)
10036	4.0 (57)
10013 ^b	1.9 (27)
Other	14.5 (217)
Length of residence in this zip code (mean years)	23.7 (SD = 15.0)
Deaf, or have serious difficulty hearing? ($n = 1,422$)	4.2 (60)
Blind, or have serious difficulty seeing even when wearing glasses? ($n = 1,422$)	1.9 (27)
Physical health condition? ($n = 1,422$)	37.1 (527)
Mental health condition? ($n = 1,422$)	10.9 (155)

Table 1 continued

	% (n)
Health insurance (yes) (n = 1,432)	94.3 (1,350)
Private through employment	47.8 (637)
Private, self-pay	12.8 (171)
Medicare (mixed)	29.6 (395)
Medicaid	3.1 (41)
Family Health Plus	0.7 (10)
Combined public sources	2.2 (30)
Combined private and public sources	1.3 (17)
Other (unspecified)	2.5 (33)

^a Primary Service Area (PSA)

^b Secondary Service Area-I (SSA-I)

bipolar disorder (6%) and other mental health conditions (e.g., cognitive impairment, insomnia) (6%). Approximately 28% said they had a mental health condition but did not specify.

With respect to health insurance status, almost all (94%) reported having some form of insurance. The majority (62%) had private insurance (self- or employer-paid), followed by Medicare (30%), Medicaid and Family Health Plus (4%) and mixed sources of insurance (4%).

Utilization of and Experiences with Services at St. Vincent's

Among the respondents who needed to go to a health care facility in the past 5 years ($n = 1,215$), 74% ($n = 898$) sought some form of services at St. Vincent's during this time period. The remaining questions (with the exception of the last, open-ended question) were asked specifically of this group.

First, we asked the respondents who had used services at St. Vincent's in the past 5 years about the specific services they utilized. The most commonly sought services were the emergency room (75%), specialty tests (32%), inpatient care (30%), outpatient services (22%), which include mental health, surgery and the HIV/AIDS center, and other outpatient clinics (14%). Among those that used *other outpatient services*, respondents specified cancer-related clinics (12%), orthopedic services (9%), gynecology/maternity/childbirth services (9%), general primary care services (9%), dermatology (7%), physical therapy (6%), cardiology (6%), mammography (5%), and emergency services (3%). We also asked whether there were additional services respondents used at St. Vincent's that were *not already listed*. There was some overlap with the responses given in the previous question, as the most frequent responses to this open-ended question were primary care services, including pediatric and faculty practice (12%), emergency room (11%), inpatient care (9%), gynecological



Fig. 1 Rating of services utilized at St. Vincent's ($n = 898$)

services (8%), specialty tests (8%), and other services (8%). When asked to rate a range of services accessed at the hospital, the majority consistently rated their experience as being "excellent" or "very good" for each of the services listed (range: 68–87%) (Fig. 1).

Continuity of Care

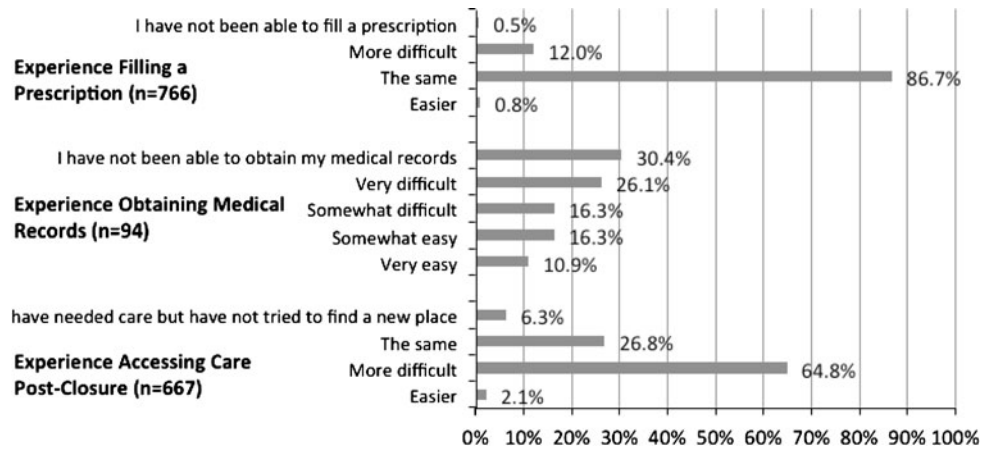
We asked whether in the past 5 years, respondents had a doctor affiliated with St. Vincent's. Among these respondents, 64% ($n = 843$) had a doctor affiliated with the hospital, and 36% ($n = 474$) did not. In a separate question, 68% ($n = 921$) reported they were seeing the same doctor for their medical care, as they did prior to the closing of St. Vincent's. A Chi-square analysis was conducted to see if there was a relationship between having a doctor affiliated with St. Vincent's and seeing the same doctor since the hospital closed. Indeed, respondents whose doctor was affiliated with the hospital were significantly *less likely* to currently see the same doctor compared to respondents whose doctor was not affiliated with the hospital (59.7 vs. 81.3%) ($p < 0.001$).

Experience with Other ERs Post-closure

Among those who have used St. Vincent's in the past 5 years, 26% have gone to an emergency room for care since St. Vincent's closed. We asked how they would rate their overall experience at the emergency room. Fifty-one percent rated their experience at this other ER as being "excellent" or "very good," compared to 68% who rated their ER experience at St. Vincent's similarly.

Approximately 90 respondents described their experiences at these other ERs in their own words. Among these, the large majority (44%) noted long waits, overcrowded settings, or long distances traveled. For example, one respondent commented that a local ER was "more crowded and hectic than St. Vincent's." Almost one quarter (23%) described a positive experience at the other ER, while 15% simply described their reason for visiting an ER. Ten percent

Fig. 2 Accessing care, medical records, prescriptions



described good or excellent care at the ER, but also noted crowdedness. For example, one respondent wrote: “I went in an ambulance to [a local hospital]; had to wait 3 h for treatment. However, the treatment was excellent and the staff was very caring.” Meanwhile, 6% described a negative experience, other than the wait time or distance traveled.

Experience Accessing Care Post-closure, Obtaining Medical Records, and Filling a Prescription

When asked how it has been finding a new place to get care since St. Vincent’s closed, approximately two-thirds (65%) reported that it was more difficult to obtain care while about one-quarter (27%) said it was the same as when St. Vincent’s was open (Fig. 2). Just over 6% stated that they needed care but have not tried to find a new provider. When combined, accessing care was more difficult or had been put off by about three quarters (71%) of respondents, while the remainder (29%) found it easier or the same to obtain health care as when the hospital was open.

Respondents were also asked whether there were health care services that are no longer available to them since the closing of St. Vincent’s, in addition to whether they have now been able to access services that were previously *not* available. Forty-four percent reported a loss of services since the hospital closed and 11% stated that they are able to access services that were previously *not* available to them.

We then asked individuals who had used St. Vincent’s in the past 5 years about their experiences with their medical records and recent prescriptions (Fig. 2). Of these, 11% ($n = 94$) have tried to access their medical records since the hospital closed. Among these, over 30% have not been able to obtain their records, and 42% report their experience as being “somewhat difficult” or “very difficult.” With regard to prescriptions, among the 95% who received a prescription since the hospital closed ($n = 834$), 12% ($n = 91$) have had a more difficult time filling their prescriptions since the closure of the hospital.

Travel Time, Distance, and Appointments

A series of questions were asked about travel *time* and *distance* to get to a new health care provider, compared to when St. Vincent’s was open. Just under half reported they travel the same amount of time (47%) and distance (46%), respectively, to get to their current health care provider. Yet, just over half are spending more time traveling (51%) and traveling further (52%), as compared to when St. Vincent’s was open (Fig. 3). We also asked what their experiences are like *getting* an appointment and *waiting to be seen* at an appointment, before and after the hospital closed. Approximately 62% said they wait the same amount of time to get an appointment, as well as to be seen when at an appointment, while slightly more than one third have to wait a longer amount of time for both (Fig. 4).

Access to and Continuity of Care by Demographics, Doctor, and Health Status

For the bivariate analyses, we examined associations between demographic characteristics, including age, gender, race/ethnicity, health insurance status, and length of residence, and variables related to health status, continuity of care, and access to care (before and after the closing of

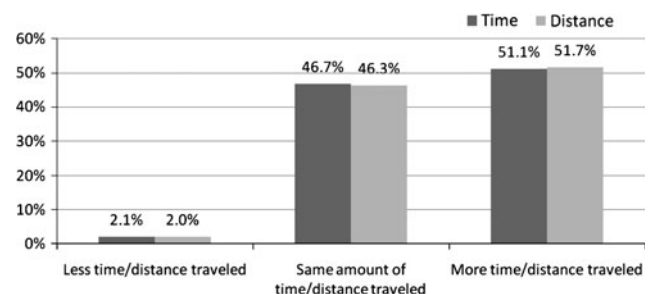


Fig. 3 Distance ($n = 795$) and time ($n = 792$) spent traveling to health care provider

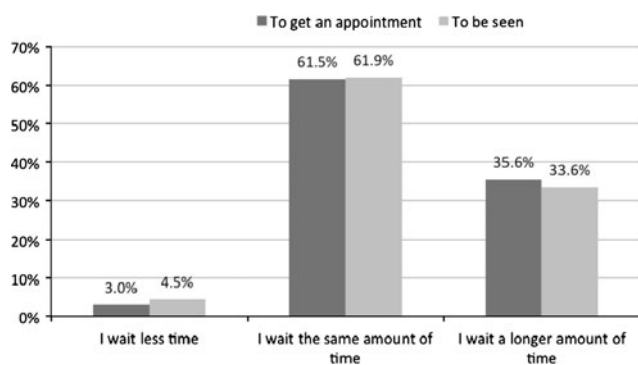


Fig. 4 Time to get appointment ($n = 779$) and be seen ($n = 776$)

St. Vincent’s). Table 2 summarizes the specific variables we used and how each variable was measured. For these analyses, some variables were combined (e.g., type of health insurance, racial/ethnic group) either due to small numbers in certain categories or to facilitate interpretation of findings.

With regard to demographic characteristics, individuals reporting visual and/or hearing impairments were significantly older (69 vs. 58 years), more likely to be male, Hispanic, and have a combination of sources of health insurance (e.g., Medicaid and Medicare). A similar picture emerged among those who reported having a physical or mental health condition requiring regular care, although the larger proportion of Hispanics with a health condition (48 vs. 40% White and 38% Other) was not statistically significant (Table 3). In addition, individuals who had a health condition had lived in their current residence for a longer period of time.

A greater proportion of respondents who had a doctor affiliated with St. Vincent’s is having a more difficult time accessing care (or have needed, but haven’t tried to access care) since the closing, compared to those who did not have a doctor affiliated with St. Vincent’s (Table 4). Moreover, a significantly greater proportion of respondents who had a doctor affiliated with St. Vincent’s are traveling further and spending more time traveling to get to their health care provider now, in addition to waiting longer to get an appointment and be seen at an appointment, compared to when St. Vincent’s was open. Those who are *not seeing the same doctor* as prior to the closing are also experiencing greater challenges in accessing care. Specifically, a larger proportion is experiencing increased travel times and greater distances, and longer wait times to get and be seen at an appointment.

There were no significant differences between those with and without a visual and/or hearing impairment on access to care variables. However, a greater proportion of those with a physical and/or mental health condition have visited an ER since St. Vincent’s closed, and now travel

Table 2 Variables for bivariate analyses

	Operationalization
Descriptive variables	
Age	Years
Gender	Female, male
Race/ethnicity	White, Hispanic, other
Health insurance status	Private, Medicaid, Medicare, combined
Length of residence	Years at residence
Key variables	
Health status	
Hearing and/or visual impairment	Yes, no
Physical and/or mental health condition	Yes, no
Continuity of care	
Had doctor affiliated with St. Vincent’s	Yes, no
Seeing same doctor now	Yes, no
Experience accessing new place for care	Easier/same, more difficult/needed care but haven’t found new place
Gone to ER since hospital closed	Yes, no
Access to care (pre/post)	
Distance spent traveling to new provider	Less/same, more
Time spent traveling to new provider	Less/same, more
Wait time to get an appointment	Less/same, more
Wait time to be seen at an appointment	Less/same, more
Services no longer available	Yes, no
New services available	Yes, no

further and spend more time traveling to their health care provider, compared to those without a health condition (Table 4).

Overall Health Care Experience Pre and Post Hospital Closure

The final open-ended question was asked of all respondents, regardless of past utilization of services at St. Vincent’s. Respondents were asked if there was “anything else that you want to tell us comparing your *current* experience with health care services to your experiences prior to the closing of St. Vincent’s Medical Center?” Over 630 people responded to this question, from which we initially created 37 codes and further reduced to 13 after combining similar themes (e.g., fear/anxiety expressed, loss of “security” after closing). On average, respondents provided between 1 and 5 comments, of which the three most frequently

Table 3 Demographic variables by health status

	Total % (n)	Visual/hearing impairment (%)			Physical/mental health condition (%)		
		Yes	No	p value	Yes	No	p value
Age (mean years)	58.3 (SD = 13.9)	69.1	57.8	***	61.7	56.2	***
Length of residence in zip code (mean years)	23.7 (SD = 15.0)	25.6	23.5		25.8	22.2	***
Gender							
Female	63.1 (850)	4.5	95.5	**	36.8	63.2	**
Male	36.9 (498)	8.0	92.0		46.4	53.6	
Race/ethnicity							
White	84.8 (1,196)	5.2	94.8	*	39.9	60.1	
Hispanic	6.7 (94)	12.0	88.0		47.8	52.2	
Other	8.6 (121)	5.9	94.1		37.8	62.2	
Health insurance status							
Private insurance	62.1 (808)	2.9	97.1	***	32.5	67.5	***
Medicare	30.4 (395)	8.9	91.1		50.0	50.0	
Medicaid/Family Health Plus	3.9 (51)	5.9	94.1		74.5	25.5	
Combined sources (e.g., Medicaid+)	3.6 (47)	23.4	76.6		74.5	25.5	
Visual and/or hearing impairment	5.8 (82)	–	–		–	–	
Physical and/or mental health condition	40.4 (575)	–	–		–	–	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 4 Association between doctor affiliation, continuity, and respondent’s health status with different aspects of accessing care post hospital closure

	Experience accessing care since closing		Have gone to an ER since hospital closed		Distance traveled		Time spent traveling		Time to get appointment		Time to be seen	
	Easier/same	More difficult/have not tried	Yes	No	Less/same	Further	Less/same	More	Less/same	More	Less/same	More
Had a doctor affiliated with St. Vincent’s												
Yes	25.3***	74.7	24.9	75.1	43.6***	56.4	44.1***	55.9	62.4***	37.6	64.6**	35.4
No	46.3	53.7	29.1	70.9	72.4	27.6	71.8	28.2	80.2	19.8	80.2	19.8
Seeing same doctor as prior to closing												
Yes	31.3	68.8	25.6	74.4	58.1***	41.9	57.7***	42.3	71.1***	28.9	71.7***	28.3
No	26.2	73.8	27.0	73.0	32.8	67.2	34.8	65.2	54.7	45.3	58.3	41.7
Visual and/or hearing impairment												
Yes	30.4	69.6	31.0	69.0	38.5	61.5	38.0	62.0	53.1	46.9	63.3	36.7
No	28.8	71.2	25.7	74.3	49.0	51.0	49.6	50.4	65.2	34.8	66.6	33.4
Physical and/or mental health condition												
Yes	27.1	72.9	32.0***	68.0	42.7**	57.3	44.4*	55.6	62.1	37.9	63.2	36.8
No	30.9	69.1	21.1	78.9	53.3	46.7	52.9	47.1	66.6	33.4	69.2	30.8

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

mentioned were: (1) a negative anecdote about a post-closure experience, or about another hospital (e.g., distance, crowdedness, cost) (19%); (2) feelings of insecurity, fear, anxiety, sadness, or unhappiness (17%); and (3) that there is no nearby ER/trauma center now, uncertainty of where to go for ER, health care, or specialty care (16%).

These sentiments accounted for over half of the responses, while just over 13% also spoke about a positive aspect of St. Vincent’s, such as its charitable approach, “one-stop shop” and the high quality of care received there.

The following series of quotes were selected from among the comments provided by respondents as

illustrative of the sentiments of many. One person expressed the feeling of loss of a nearby ER:

What I miss very much is the knowledge that there is a qualified emergency facility close at hand. My children and grandchildren, as well as myself, have all had recourse to the St. Vincent's ER. I am also very saddened that the community health services provided by St. Vincent's are no longer there.

Related to this sense of loss is an associated feeling of anxiety or fear, around having to travel further in case of an emergency, as well as anger at the closing of the hospital:

My experience living in a neighborhood that once had a first-rate emergency room that closed because of managerial incompetence is currently terrifying. I'm 54 with Parkinson's. Any number of things may occur—taking a bad fall, hitting my head, fumbling with a knife and cutting myself badly—that would force me to travel longer distances to get to an emergency room...This whole thing is a complete outrage, inexcusable, and thoroughly immoral.

Many also spoke about the challenges faced with accessing care at other health care facilities post closing of the hospital:

I pass the site of St. Vincent's every day. It is depressing and frightening to think that this facility was closed down so abruptly with no explanation to the public...I hope we can all get to another area hospital alive. Unfortunately my neighbor on the first floor (age 83) did not make it two weeks ago. After the EMS workers told us that she would be all right, she died in the ambulance going across town. This is a true story, and this is what the closing of St. Vincent's is about.

These quotations are illustrative of the several hundred comments that pertained to concern with loss of a local hospital and emergency room, ensuing anxiety with the uncertainty associated with a future medical emergency, and negativity regarding accessing care at other, more distant facilities. They also overlap with the findings of the qualitative research we conducted (see accompanying paper [3]).

Discussion

The data from the St. Vincent's Community Health Survey have provided community-level insight into the nature of service utilization at St. Vincent's, as well as respondents' health-related experiences since it closed. Given that three quarters of the total survey sample reported residing predominantly in the zip codes that comprise the PSA (i.e.,

10001, 10011, 10012, 10014), the majority of respondents are from the community immediately surrounding the hospital. Almost two thirds of respondents had a doctor who was affiliated with the hospital and three quarters had used the hospital in the past 5 years, suggesting that respondents had a close relationship, or contact, with the hospital. As such, we believe the sample surveyed was appropriate for providing information regarding the *community's* utilization of the hospital's services when it was open, as well as an informed perspective of changes since the hospital closed in April 2010. In addition, the sample had a good distribution of those reporting a health condition "requiring regular treatment or care" (37% physical; 11% mental) and those not reporting a health condition (i.e., presumably in relatively good or better health), which likely provides a more complete picture of the ways in which community members with different health care needs utilized, or engaged with, the hospital.

Although survey respondents specified a wide range of physical and mental health conditions, there were several categories that accounted for a large proportion of the health conditions. The top five health conditions included cardiac, diabetes, musculoskeletal, respiratory, and infectious disease. The top three mental health conditions were depression/dysphoria, anxiety, and bipolar disease. These complaints comprised over half of the physical and mental health problems, respectively, reported by survey respondents. They align closely with the types of health concerns highlighted by participants in the focus groups of the qualitative component of this community health needs assessment (accompanying paper [3]). Difficulties in maintaining preventive health practices related to high blood pressure, diabetes, HIV/AIDS, and depression were stated by many, as were concerns regarding access to emergency services for conditions such as asthma and anxiety disorders.

Clearly, respondents reported using the hospital's emergency (ER) services substantially more (74%) than any other aspect of the hospital (specialty tests, 32%; inpatient care, 30%; specific outpatient services, 22%). The very high "excellent" and "very good" ratings—ranging from 68 to 87%—across the range of hospital services utilized is noteworthy. Further, despite the fact that the ratings for ER services were on the lower end (68% rated it "excellent-very good"), this was substantially *higher* than the 51% "excellent-very good" rating of other hospital ER services since St. Vincent's closed. These findings appear to validate favorable statements made by individuals who participated in the key informant interviews and focus groups of the qualitative study, which highlighted the importance of and high regard for the hospital's emergency services (accompanying paper [3]).

Among key concerns when a hospital or other health care provider is no longer serving a community is whether or not

individuals' health care needs will be met by other providers and if health outcomes will worsen [5, 6]. This concern was clearly articulated in the key informant interviews and focus groups that we conducted, as many participants described having postponed or gone without care in the year since the hospital closed (accompanying paper [3]). This experience was further confirmed in the larger sample that participated in the survey, with two thirds of previous hospital users stating that it has been more difficult to obtain health care since the hospital closed. In addition, the reports of between one third and one half of the sample regarding lack of services that were previously available, and additional travel and wait times associated with accessing care elsewhere, are all in line with concerns about the potential negative consequences of the hospital closure. Indeed, we consider increased difficulty in accessing care among a substantial portion of survey respondents to be a negative effect of the hospital closure.

Although only a minority (11%) of respondents had tried to access their medical record, it is concerning that more than half of them had encountered much difficulty in obtaining them, or were not successful. Not surprisingly, lack of information about individual's medical records emerged as a key theme in the findings from the key informant interviews and focus groups in the qualitative study (accompanying paper [3]). As such, it is plausible that some portion of the 89% who had not tried to access their medical records may not have done so due to the confusion and resulting inertia from not knowing where to get the information.

While the survey has provided us with information describing the health and hospital-related experiences of the larger community, we were also able to obtain a more detailed picture of the experiences of specific *sub-groups* within the population. That those with health conditions requiring regular care reported worse health care experiences, such as having to travel further or longer to get to their provider, in addition to waiting longer to get and be seen at an appointment, points to a differential impact of the hospital closure on those in greater need of health care. Our findings also show that those who had a doctor who was *not* affiliated with St. Vincent's were faring better in terms of access to care. Thus, these data suggest that not only did community members lose a health care facility, but they have subsequently experienced reduced access to health care if their doctor was affiliated with the hospital. The finding that people with health conditions (i.e., visual/hearing, physical/mental) are older is not surprising, although the higher proportion of Hispanics with a visual and/or hearing impairment is noteworthy, particularly given that there is an underrepresentation of Hispanics in the sample overall.

There are some limitations associated with the study design and sample that should be taken into account when

considering the results. The study design incorporated a collaborative approach reflected in the involvement of many community-based organizations in the sampling and distribution of the survey. Specifically, organizations primarily involved in the delivery of health and social services to the community, as well as civic (i.e., community board members) and elected officials, assisted in the dissemination of the survey to their clients and constituents. As such, it was clear from the outset that individuals most likely to complete the survey would be those who are connected to community organizations, as well as those with a particular interest in the closure of St. Vincent's Hospital. If the sample had an underrepresentation of residents who are less connected to community-based organizations (e.g., marginalized or vulnerable groups, such as the homeless, home-bound, undocumented immigrants, etc.), that might be associated with an under-report of the negative consequences associated with closure of the hospital (e.g., if they were not able to find alternative health care services since the hospital closed but did not complete the survey to report that). Conversely, individuals who were motivated to complete the survey due to strong feelings about the hospital may have been inclined to over-report the negative consequences associated with its closure. Thus, to some extent, these two biasing influences may have "cancelled" each other, resulting in a fairly accurate representation of the experiences of community members since the hospital closed.

Another possible concern is the underrepresentation of racial/ethnic minorities in the sample compared to the larger population of the surrounding neighborhoods. Specifically, compared to the most recent CHS report from the NYC Department of Health and Mental Hygiene for the Chelsea/Clinton neighborhood [7], our sample had relatively fewer Hispanics, Asians, and African Americans. The sample, however, was not so different from the racial/ethnic composition of the Greenwich Village/Soho neighborhood [8], except for the relatively smaller proportion of Asian respondents (see Table 5). It is unclear to what extent this may affect the survey findings. That said, given the extensive national, state, and local data that have

Table 5 Racial/ethnic comparison: St. Vincent's closure survey versus area neighborhoods

Race/ethnicity	St. Vincent's closure survey (%) ^a	Chelsea-Clinton CHS (%)	GV-Soho CHS (%)
White	85	65	67
Hispanic/Latino	6.7	16	6
Asian	3.1	10	21
African American	2.1	6	3
Other	1.6	3	3

^a Percents do not sum to 100 because of other groups not shown here

documented health disparities among racial/ethnic minorities (particularly Latinos and African Americans) [9]—including health status, access to care, utilization, and outcomes—it is plausible that the findings from this survey may under-report the negative impact of the hospital closure. In other words, since Latinos and African Americans have a higher prevalence of certain health conditions (e.g., diabetes, asthma), closure of the hospital may have had a disproportionately negative impact on them compared to other previous St. Vincent’s users. As such, with relatively fewer individuals from these groups in the survey sample, we would suggest that the negative experiences that survey respondents reported (e.g., loss of health-related services, longer appointment wait and travel times, deferred health-care seeking, uncertainty about medical records) are likely *underestimates* of the actual experience.

From the outset it was clear that the composition of the survey sample would more closely represent previous users of St. Vincent’s Hospital and individuals interacting with community organizations that provide health-related services, given the broad community collaboration in dissemination of the survey. However, a subsequent decision was made by the Steering Committee to not disseminate the web-based survey in a portion of the community with substantial numbers of low-income and Latino residents, and to instead undertake a separate door-to-door data collection activity. As a result, the post-hospital closure experiences of members of this community were likely not captured by the survey data to the extent that was possible.

The findings from the community survey have provided us with much concrete and useful information concerning the health status and utilization of health care services of individuals who reside predominantly in the community surrounding St. Vincent’s Hospital. While approximately 50% of survey respondents had a physical and/or mental health problem, these individuals were more likely to be older, male, Latino, and receiving Medicaid, suggesting that this sub-group of individuals be given special attention with regard to outreach for health care services. The particularly negative health care experiences reported by individuals with health problems and those whose doctor was previously affiliated with St. Vincent’s also warrants extra consideration. To the extent that health-related outreach activities can be conducted in the community, a special effort to identify individuals who either (1) have a physical or mental health problem requiring regular care, (2) had a doctor affiliated with St. Vincent’s, and/or (3) are not seeing the same doctor as when the hospital was open, should be undertaken. That these groups reported greater difficulty accessing health care and longer travel and wait times points to the need for information about health care providers in the community *and* assistance in getting to them. This corresponds with one of the key suggestions

from the qualitative study that a comprehensive inventory be developed of health care providers in the community (accompanying paper [3]). Assuming that assistance accessing health care is provided, patients (and their new providers) would ideally have access to their medical records. This pertains to another concern raised from the qualitative study: the lack of information regarding medical records from St. Vincent’s caused much distress among focus group participants. And although relatively few survey respondents had tried to access their records, the majority of those who did found the process difficult or were not successful. As such, it seems that providing assistance to community members and other former users of the hospital with access to their medical records would be a valuable and timely service, particularly in light of recent news concerning the costs associated with continuing to store these documents [10].

The findings from this survey, taken together with the findings from the qualitative study, provide an informative depiction of health care utilization and experiences before and after St. Vincent’s closed, and the differential impact of the closure on specific, vulnerable sub-groups. We believe that the combination of individual- and organization-level perspectives that the quantitative survey and qualitative key informant interview and focus group data provide comprise rich insights that can be used to develop the best plan for addressing community health needs in the wake of the closure of St. Vincent’s. Further, we imagine that the “lessons learned” and evidence-based recommendations put forth from this major medical center closure (referred to in the disaster preparedness lexicon as a “no-notice, prolonged surge event,”) [11] will be applicable to other large urban health care facilities.

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