FOLLOW-UP ON SPRING VALLEY HEALTH STUDY

COMMUNITY OUTREACH SURVEY TECHNICAL REPORT

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A summary report can be found at: www.jhsph.edu/springvalley
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Introduction and Background

A community survey (Supplement A) was conducted in follow-up to the Johns Hopkins 2007 Public Health Scoping Study (or Scoping Study) to further inform current study findings about overall community health status as well as community health concerns. The survey allowed for community input from the 20016 ZIP Code area (from both Inside and Outside the Formerly Used Defense Site (FUDS) area in 20016) and the 20015 ZIP Code area as a comparison. Additionally, the survey allowed for self-reporting of health conditions from the three geographic areas.

The survey was available for response from current and former residents, workers and students in ZIP Code 20016 (proxy for Spring Valley, D.C. neighborhood) and ZIP Code 20015 (proxy for Chevy Chase, D.C. neighborhood).

Given the inherent limitations of online survey research (such as the inability to determine the response rate due to lack of a denominator and self-reported, unverified information), this survey aims to provide a general depiction of respondents' perceptions of their health status and public health concerns to further inform overall study findings and is not representative of the population of interest as a whole.

The survey analysis explored the following two questions:

1. How does self-reported health status compare across the 20016 (both inside and outside the FUDS) and 20015 ZIP Codes?
2. How do public health and community concerns compare across the 20016 (inside and outside the FUDS) and 20015 ZIP Codes?

Survey Outreach

In an effort to gather input from as many 20016 and 20015 current and former residents, workers and students as possible, the survey was available online for nine weeks in Fall 2012. For those who preferred to complete a paper version of the survey, hard copies were provided at the Tenley-Friendship Library (a Washington, D.C. public library) and available to print from a Johns Hopkins University website created for the project (www.jhsph.edu/springvalley). Respondents had the option to mail in the completed paper surveys or return them to the library for pickup by study investigators.

The survey was publicized through a variety of communication methods including press releases, newspaper coverage, community listserves, local neighborhood organizations and social media postings. Additionally, flyers were distributed to some residences, election sites, and at a limited number of community meetings during the open survey period. Additionally, people were encouraged to forward the survey link to any potential respondents, including not only current residents, workers or students, but also those that may have formerly lived, worked or studied in either of the ZIP Codes.

Independent from the Johns Hopkins outreach efforts, some community members publicized the survey and distributed their own flyers within the 20016 ZIP Code.

Survey Methods

The survey was developed and online submissions completed in the Qualtrics online survey system.[1] Paper copies were available at the Tenley-Friendship Library. Additionally a Microsoft Word version of the survey was posted on the Johns Hopkins Bloomberg School of Public Health web page for viewing, printing, and completing by hand. All current and/or former residents, workers and students in the 20016 and 20015 ZIP code areas were eligible to complete the survey. Participants could also respond for members of their household, including children and former household members who may currently live in another location or are now deceased.

Due to the similar demographic characteristics of Chevy Chase and Spring Valley as outlined in the Community Health Assessment Technical Report, Chevy Chase was used as the comparison group. The survey also sought to differentiate between respondents inside and outside the FUDS area, which is contained within ZIP Code 20016.

Respondents were asked to report their residence, employment, and schooling history inside and outside the FUDS and the 20015 ZIP Code area. For each household member, the survey asked for health status and diagnosed conditions. Respondents were asked to indicate their top five public health and community issues of concern; additionally respondents were able to offer any general comments, questions and concerns.

Health status and residence, work, and study history questions were repeated for each household member reported. The online version of the survey employed a "skip" function so questions not applicable to the respondent were omitted. For example, if a respondent indicated they lived in the 20015 ZIP Code only, questions specific to the other geographic areas were omitted.

Survey participation was voluntary and respondents could refrain from answering any question(s) or stop completing the survey at any time. Completion of the survey was estimated to take approximately five to ten minutes per household member. The survey was open for nine weeks from Friday, September 14, 2012 to Friday November 23, 2012. Respondents who began the survey and for any reason were unable to complete it (loss of internet connection, time, etc.) were able to return to their survey in progress from the same computer.

The survey was reviewed and approved by both the Johns Hopkins Bloomberg School of Public Health Institutional Review Board (IRB) and the DC Department of Health Institutional Review Board-Public Health (IRBPH). In accordance with IRB guidelines, only study investigators have access to the survey response database, and responses are reported in a manner to assure the confidentiality of all individual respondents. No identifying information (including names, addresses, places of work, computer IP address, etc.) was collected during the course of this survey.

[1] Qualtrics – *Sophisticated Research Made Simple.* <www.qualtrics.com>

Data Management and Analytical Approach

The study team manually entered the paper submissions into the Qualtrics online survey system and the database of survey responses was downloaded from the system for analysis. Data analysis was conducted using STATA 12.1 statistical software[2] and SAS statistical software, Version 9.3.[3] Analysis of the open-ended text comments, questions and concerns was conducted by exporting the responses from Qualtrics into a Microsoft Excel workbook. Themes were then identified, categorized and coded in Excel, and calculations were completed using SAS.

Reporting of survey findings included total response numbers as well as percentages/proportions as relevant. As denominators were indeterminable for the populations of interest (current and former residents, workers and students in each geographic area), statistical significance of and confidence intervals on findings were not able to be calculated. When possible, previous anecdotal reporting from the 2007 Scoping Study and U.S. health and census data are presented for comparison and context.

Survey responses were analyzed across the three geographic areas (20015, 20016 inside the FUDS and 20016 outside the FUDS) as well as by length of time in residence. Given that some survey categories were not mutually exclusive, a respondent could indicate that they lived and worked or studied in one or more of the three geographic areas. Only 26 respondents reported *only* working or studying in one of the areas. Thus, data analysis focused on residents (both current and former), many who also worked or studied in the survey area at some point in time.

Length of time residing in 20016 inside the FUDS was analyzed as a means to represent potential exposure to FUDS-related contaminants and compared to residence time in the other geographic areas (20016 outside the FUDS and 20015). Length of time in residence was calculated for each respondent by adding all years reported (years currently and formerly resided). A full distribution of length of time in residence was compiled for all respondents and divided into three segments to examine whether reported health status and conditions differed over residence times of 0 to 5 years (short-term), 6 to 17 years (medium-term) or 18 or more years (long-term). Reported average age of respondents increased as years of residence in each of the geographic areas increased (i.e. long-term residents were older than short-term residents). Therefore, categorizing by residence time improved the comparability of the data with regards to age distribution across the three areas.

Survey Responses

Demographics

A total of 865 individual respondents were included in the analysis. The vast majority of surveys (> 98%) were received via online submission. Eight hundred and sixty-five individual persons (96% alive, 4% deceased) and 380 households were represented. Given that the aim of the survey was to gather responses and input from as many respondents as possible, all partially completed surveys (24 households) were included in the analysis.

[2] STATA Statistics and Data Analysis. Version 12.1 College Station, Texas. <www.stata.com>
[3] SAS software,Version 9.3. SAS Institute Inc., Cary, NC. <www.sas.com>

As noted previously, due to the inherent nature of online survey research, it is not possible to identify a denominator or determine the total number of persons eligible for the survey. Thus, it is standard practice to determine if the respondents are representative of the overall population of the area.[4] With this in mind, Table S-1 presents demographic information for survey respondents in comparison to the 2010 U.S. Census Data for the 20015 and 20016 ZIP code areas combined.

Respondents were 46% male, and 54% female, which closely mirrors the general population (45% and 55% respectively). The vast majority (92%) of respondents were White, which is higher than the general population (83%). In contrast, black (2%) and Hispanic (2%) respondent representation was lower than the general population (7% for each). The age distributions of survey respondents were older than the general population with lower representation in the under 20 (24% vs. 27%) and 20-39 (17% vs. 27%) age categories and conversely higher representation in the 40-59 (31% vs. 28%) and 60 -79 (23% vs. 15%) age categories.

Table S-1: Respondent Demographics

	All Survey Respondents (N=865)	**U.S. 2010 Census Data combined for 20015 and 20016**
Gender*		
Male	393 (46%)	45%
Female	467 (54%)	55%
Ethnicity**		
White/Caucasian	800 (92%)	83%
Black/African-American	18 (2%)	7%
Hispanic/Latino	18 (2%)	7%
Asian	41 (5%)	5%
Native American/Alaska Native	1 (0%)	0.2%
Choose not to respond	5 (1%)	NA
Other	10 (1%)	2%
Age**		
Under 20	179 (24%)	27%
20-39	129 (17%)	27%
40-59	234 (31%)	28%
60-79	172 (23%)	15%
80 and older	32 (4%)	4%

**Total unreported was 5. Unreported counts were not included in the calculated percentages.*
***Respondents could report race as more than one category. Total responses to this question (893) totaled more than the number of individuals (865).*
****Total unreported was 119. Unreported counts were not included in the calculated percentages.*

[4] Cook C., Heath F., Thompson R. A Meta-Analysis of Response Rates in Web- or Internet-Based Surveys. Educational and Psychological Measurement. Vol. 60, No. 6, 821-836 (2000)

Respondent Demographics – Findings

- Survey respondents were on average older and more likely to be White/Caucasian than the general population of the 20015 and 20016 ZIP code areas.

Geographic Areas

Respondents were characterized as to whether they currently or formerly lived, worked or studied in each of the three geographic areas, as shown in Table S-2. The categories are not mutually exclusive, as respondents were able to report more than one category. The majority of respondents were residents, with the largest number living in 20016 inside the FUDS area, and the fewest living in the 20015 area.

Table S-2: Live, Work and Study Status

Geographic Area	Currently Live	Currently Work	Currently Study
Inside FUDS	327 (38%)	32 (4%)	19 (2%)
Outside FUDS	232 (27%)	22 (3%)	66 (8%)
20015	118 (14%)	14 (2%)	8 (1%)
Geographic Area	**Formerly Lived**	**Formerly Worked**	**Formerly Studied**
Inside FUDS	120 (14%)	23 (3%)	58 (7%)
Outside FUDS	56 (6%)	16 (2%)	54 (6%)
20015	38 (4%)	15 (2%)	20 (2%)
Categories are not mutually exclusive, as respondents may be in more than one category. Percentages are calculated with the denominator as the total number of respondents (865).			

An analysis of residency in each geographic area and by length of time (0-5 years, 6-17 years or 18 or more years) is presented in Table S-3. The largest number of respondents (403) reported living in 20016 inside the FUDS, with (41%) for 18 years or more. For those living in 20016 outside the FUDS (259), the largest proportion (40%) reported residing there between 6-17 years. In 20015, 126 reported living in the area, with the largest proportion (37%) between 6-17 years.

Table S-3: Length of Residence

Time Resided	Inside FUDS	Outside FUDS	20015
	n=403	n=259	n=126
0 to 5 years	96 (24%)	67 (26%)	40 (32%)
6 to 17 years	143 (35%)	103 (40%)	47(37%)
18 or more years	164 (41%)	89 (34%)	39(31%)

The age distribution (mean age and age range) in each of the three geographic areas is presented in Table S-4. Of all respondents, 20016 inside the FUDS residents were the oldest (mean age of 44.3) and 20015 respondents were the youngest (mean age of 36.7). Across all three geographic areas there was a consistent relationship between age and length of residence, with short-term residents being the youngest and long-term residents the oldest. Thus, analyzing reported health

status and outcomes responses by time of residence improved the comparability of the data across the three geographic areas.

Table S-4: Age Distribution

Time Resided	0 to 5		6 to 17		18+	
	n=203		n=293		n=292	
Geographic Category (Lived)	**Mean Age**	**Age Range**	**Mean Age**	**Age Range**	**Mean Age**	**Age Range**
Inside FUDS	27.7	1-81	39.5	6-92	58.4	17-95
Outside FUDS	23.0	1-60	35.5	6-81	59.2	18-92
20015	23.2	1-52	32.5	6-89	59.5	22-86

Overall Health Status

Reported overall health status is presented in Table S-5. As a comparison, responses from the 2011 U.S. National Health Interview Survey (NHIS) are displayed. The NHIS survey presents health statistics from the civilian non-institutionalized adult population, aged 18 and older.[5]

As there was an observed decrease in reported health status of excellent or very good with increasing age, the mean age for each geographic area and length of residence is presented. The majority of respondents in all three geographic areas and for all lengths of residence reported excellent or very good health status at either above, or nearly equal to the U.S. average (60%). Similarly, all respondent groups indicated a lower fair or poor health than the national average of 13% except for respondents living in 20016 inside the FUDS for 18 or more years, with17% reporting fair or poor health.

[5] Centers for Disease Control and Prevention 2012. Summary Health Statistics for U.S. Adults: National Health Interview Survey, 2011. Available: http://www.cdc.gov/nchs/data/series/sr_10/sr10_256.pdf [accessed May 13, 2013].

Table S-5: Reported Current Overall Health Status

	Inside FUDS			Outside FUDS			20015			Average U.S. Response NHIS Survey
	n=403, mean age = 44.3			N=259, mean age = 39.4			n=126, mean age = 36.7			
	0 to 5	6 to 17	18+	0 to 5	6 to17	18+	0 to 5	6 to 17	18+	
Reported Current Overall Health Status	**n=96, mean age =27.7**	**n=143, mean age = 39.5**	**n=164 mean age = 58.4**	**N=67, mean age = 23.0**	**n=103, mean age = 35.5**	**n=89, mean age = 59.2**	**n=40, mean age = 23.2**	**n=47, mean age = 32.5**	**n=39, mean age = 59.5**	
Excellent or Very Good	84%	76%	58%	91%	78%	64%	90%	74%	59%	60%
Good	11%	13%	17%	9%	10%	16%	3%	17%	31%	26%
Fair or Poor	2%	6%	17%	0%	10%	9%	8%	6%	5%	13%
Missing	2%	5%	8%	0%	3%	10%	0%	2%	5%	0%

Overall Health Status – Findings

- Respondents for the most part report better health status than the US average.
- Long-term (18 of more years) residents of 20016 Inside FUDS reported slightly more fair or poor health status than the US average.

Reported Diagnosed Health Conditions

In the survey, respondents were asked to report diagnosed health conditions. Of the total respondents (865) nearly half (398) reported no health conditions. About 50 percent of current residents in all three geographic areas (*20016 Inside FUDS, 20016 Outside FUDS* and *20015*) reported no health conditions/diseases (51%, 50% and 48%, respectively). Among former residents, who were older, 27% of those 20016 Inside the FUDS, 18% of those 20016 Outside the FUDS, and 39% in 20015 reported no health conditions/diseases.

Among the respondents that reported any diagnosed condition, living respondents (n=418) had an average of 1.8 conditions reported per person compared to 2.2 conditions reported per person for deceased (n=34). Reports for former 20016 Inside the FUDS residents (n=120) had the highest average count of conditions per person (2.5). According to a recent publication on the prevalence of multiple chronic conditions in the U.S., 26 percent of adults have more than one chronic condition, defined as hypertension, coronary heart disease, stroke, diabetes, cancer, arthritis, hepatitis, weak or failing kidneys, chronic obstructive pulmonary disease or current asthma.[6]

Top Five Reported Health Conditions

The top five health conditions reported in each geographic area are presented in Table S-6, along with the number of respondents and mean age for each category. Cancer, hypertension, skin disease, thyroid disease, and respiratory disease are the most frequently reported conditions for all three geographic areas, although the order varies slightly.

Table S-6: Top Five Reported Health Conditions Among Current and Former Residents

Inside FUDS	**Outside FUDS**	**20015**
n=403	**n=259**	**n=126**
mean age = 44.3	**mean age = 39.4**	**mean age = 36.7**
1. Cancer	1. Cancer	1. Hypertension
2. Hypertension	2. Skin Disease	2. Skin Disease
3. Skin Disease	3. Hypertension	3. Cancer
4. Thyroid Disease	4. Thyroid Disease	4. Respiratory Disease
5. Respiratory Disease	5. Respiratory Disease	5. Thyroid Disease

[6] Ward BW, Schiller JS. 2013. Prevalence of Multiple Chronic Conditions Among US Adults: Estimates From the National Health Interview Survey, 2010. Preventing Chronic Disease 10:120203. DOI: http://dx.doi.org/10.5888/pcd10.120203. Also available at: http://www.cdc.gov/pcd/issues/2013/12_0203.htm [accessed May 6, 2013]

Top health conditions reported – Findings

- A common set of health conditions were frequently reported across the survey areas: cancer, hypertension, respiratory disease, skin disease and thyroid disease.

Reported Health Conditions by Area and Length of Residence

Table S-7 shows reporting of health conditions by area and length of residence. US data presented in Table S-7 come from a variety of sources (see Supplement B). The prevalence statistics reflect the percentage of the US population with a condition; lifetime risk reflects the probability of developing a condition over the lifespan. Most health conditions reported by ZIP Code 20016 Inside or Outside FUDS respondents were reported with less frequency than general US population statistics.

20016 Inside FUDS

As summarized in Table S-7, there were consistent increases in reported frequency of most conditions by 20016 inside FUDS respondents over time, except for mental illness which remained at 3% over residence time and diabetes which was reported most frequently (7% of respondents) for the 6 – 17 year residence time. As noted previously, differences in reported frequencies of health conditions were based on percentages of respondents in each category and were not tested for statistical significance.

Conditions reported more frequently by 20016 inside FUDS respondents included cancer and diabetes (0-5 years residence); cancer, thyroid disease, heart disease, learning disability, peripheral neuropathy and diabetes (6-17 years residence); and learning disability (18+ years residence). 20016 Inside FUDS respondents reported learning disability more frequently than general US population statistics (in those with 6 to 17 year and 18 or more year residence times).

20016 Outside FUDS

There were consistent increases in reported frequency of most conditions by 20016 outside FUDS respondents over time, except for skin disease which declined slightly from 18% to 11% to 13% for the short, medium and long residence times, respectively; and for mental illness which dipped from 7% to 1% and returned to 7% across the residence times.

Conditions reported more frequently by 20016 outside FUDS respondents included skin disease and mental illness (0-5 years residence); cancer, thyroid disease, heart disease, peripheral neuropathy, diabetes and kidney disease (6-17 years residence); and learning disability (18+ years residence). 20016 Outside FUDS respondents with 18 or more years of residence reported thyroid disease, learning disability and peripheral neuropathy more frequently than general US population statistics.

20015

Similarly, there were consistent increases in reported frequency of most conditions by 20015 respondents over time, with the exception of learning disability, which remained stable at 2-3% over the residence time periods.

Conditions reported more frequently by 20015 respondents included: hypertension, respiratory disease, thyroid disease and learning disability (0-5 years residence); hypertension, skin disease, respiratory disease, and mental illness (6-17 years residence); and cancer, hypertension, skin disease, respiratory disease, thyroid disease, heart disease, mental illness, peripheral neuropathy, diabetes, and kidney disease (18+ years residence). In 20015 respondents who have lived 18 or more years in the area, heart disease, hypertension, respiratory disease, thyroid disease and peripheral neuropathy were reported with more frequency than general US population statistics.

Table S-7: Proportion of Reported Health Conditions by Area and Length of Residence

Disease/Condition	0 to 5	6 to 17	18+	US*		0 to 5	6 to 17	18+	US*
Cancer	%	%	%		**Learning Disability**				
Inside FUDS	6%	13%	23%	Risk: 41%	*Inside FUDS*	2%	6%	9%	Prevalence: 2%
Outside FUDS	0%	16%	22%		*Outside FUDS*	0%	2%	4%	
20015	5%	2%	36%		*20015*	3%	2%	3%	
Hypertension					**Mental Illness**				
Inside FUDS	1%	10%	23%	Prevalence: 31%	*Inside FUDS*	3%	3%	3%	Prevalence: 25%
Outside FUDS	3%	9%	19%		*Outside FUDS*	7%	1%	7%	Risk: 50%
20015	3%	11%	36%		*20015*	0%	4%	8%	
Skin Disease					**Peripheral Neuropathy**				
Inside FUDS	8%	8%	15%	Prevalence: 30%	*Inside FUDS*	1%	3%	5%	Prevalence: 6%
Outside FUDS	18%	11%	13%		*Outside FUDS*	0%	1%	7%	
20015	8%	11%	26%		*20015*	0%	0%	10%	
Respiratory Disease					**Diabetes**				
Inside FUDS	4%	5%	10%	Prevalence: 15%	*Inside FUDS*	2%	7%	2%	Prevalence: 8%
Outside FUDS	3%	5%	13%		*Outside FUDS*	0%	2%	3%	
20015	8%	11%	23%		*20015*	0%	0%	8%	
Thyroid Disease					**Kidney Disease**				
Inside FUDS	2%	8%	10%	Prevalence: 6%	*Inside FUDS*	0%	1%	3%	Prevalence: 10%
Outside FUDS	4%	5%	13%	Risk: 12%	*Outside FUDS*	0%	1%	4%	
20015	5%	2%	21%		*20015*	0%	0%	8%	
Heart Disease									
Inside FUDS	0%	6%	8%	Prevalence: 12%					
Outside FUDS	0%	4%	10%						
20015	0%	2%	15%						

*Statistics for the US population were gathered from a variety of sources. See Supplement B for a list of sources and references.

Reported health conditions by area and length of residence – Findings

- In all areas reporting of most conditions increased with time (and age).
- Most health conditions reported by ZIP Code 20016 Inside or Outside FUDS respondents were reported with less frequency than general US population statistics.
- 20016 Inside FUDS respondents had a pattern of higher reporting of learning disability (medium and long-term), peripheral neuropathy (short and medium-term) and diabetes (short and medium-term) than respondents Outside the FUDS and in ZIP Code 20015. These conditions have been associated with arsenic exposure, however arsenic exposure assessment was beyond the scope of this study and no determination can be made about causes of conditions reported. [7,8] 20016 Inside FUDS respondents reported learning disability more frequently than general US population statistics (in those with 6 to 17 year and 18 or more year residence times).
- There was no consistent pattern of higher reporting of conditions in 20016 Outside FUDS compared to 20016 Inside FUDS or 20015 respondents. 20016 Outside FUDS respondents with 18 or more years of residence reported thyroid disease, learning disability and peripheral neuropathy more frequently than general US population statistics.
- 20015 respondents had a pattern of higher reporting of hypertension (medium and long-term), respiratory disease (all three time periods, mental illness (medium and long-term) and thyroid disease (short and long-term) than respondents in 20016 Inside or Outside the FUDS. In 20015 respondents who have lived 18 or more years in the area, heart disease, hypertension, respiratory disease, thyroid disease and peripheral neuropathy were reported with more frequency than general US population statistics.

Types of Cancer Reported

A total of 133 cancers were reported by survey respondents: 108 living respondents and 25 deceased respondents. The most commonly reported cancer type was skin, with 40 reported cases (36 living). Thirty-one cases of breast cancer were reported (28 living), and 13 cases of prostate cancer (11 living) were reported. While other types of cancer were reported, including bladder, colon, endometrial, lung, lymphoma, thyroid, and uterine, four or fewer cases of each were reported. In the 2007 Scoping Study, anecdotal reports of cancer in the 20016 ZIP code area indicated about 100 reports of cancer with brain, breast, leukemia and lymphoma the most commonly reported. Further information on confirmed cancer cases and deaths for selected cancers is available in the community health assessment.

Types of cancer reported- Finding

- A total of 133 cancers were reported by survey respondents, the most common types reported were skin, breast and prostate.

Community Concerns

Respondents were asked to indicate their top five most important concerns for their household from a list of 19 public health and community issues, as well as given an option of "other" where they could write in additional issue(s) not included in the list (See Supplement C). Table S-8 lists the most common concerns reported by respondents from each geographic area. The concerns are presented in order of the

[7] Wasserman et al. 2004. Water Arsenic Exposure and Children's Intellectual Function in Araihazar, Bangladesh. Environmental Health Perspectives 112(13): 1329-1333.
[8] Agency for Toxic Substances and Disease Registry (ATSDR) 2007. Toxicological Profile for Arsenic. Available: http://www.atsdr.cdc.gov/ToxProfiles/tp.asp?id=22&tid=3

frequency they were chosen as one of the top five concerns (i.e. the issue listed first, for instance, drinking water quality was the issue most often chosen by 20016 inside FUDS and 20015 respondents.

Respondents across all geographic areas reported drinking water quality, chronic conditions, and access to health care as issues of public health concern. 20016 Inside FUDS residents expressed concerns about the exposure to hazardous materials and/or toxic substances from Spring Valley FUDS. Residents 20016 outside the FUDS or in 20015 did not report these issues as top concerns.

Table S-8: Top Five Public Health and Community Concerns

Inside FUDS	Outside FUDS	20015
Drinking water quality	Access to health care	Drinking water quality
Exposure to hazardous materials and/or toxic substances from Spring Valley Formerly Used Defense Site (FUDS)	Drinking water quality	Chronic conditions
Chronic conditions	Chronic conditions	Distracted driving/ drunk driving
Nutrition/ availability of nutritious foods	Outdoor air quality	Nutrition/ availability of nutritious foods
Outdoor air quality	Obesity/healthy lifestyle	Access to health care

General Comments

At the conclusion of the survey, each household was given the opportunity to provide open-ended text responses to elaborate on their most important public health and community concerns, to identify any other specific health or community concerns, as well as share any additional thoughts or comments. A little over one-quarter of households (104/380) provided responses to at least one of these questions with over 80% of these comments from 20016 inside or outside the FUDS respondents.

About 14 percent of all households (52) provided additional comments on their reported top five public health and community concerns listed in Supplement C. For 20016 Inside and Outside the FUDS respondents the comments were about the number and cause of cancers and other health problems of their family members and people from their neighborhoods as well as exposure to toxins and pollutants, with the Spring Valley area specifically mentioned. For the 20015 respondents, comments concerned water quality and its potential association with health problems.

Slightly over 10 percent of all households (43) provided responses to the question: “Are there any other specific health or community concerns you would like to mention?” Respondents from all geographic areas addressed both health and community concerns, such as safety. Respondents from 20016 Inside the FUDS expressed more health-related concerns than community concerns particularly about cancer for family members and neighbors. Additionally responses from 20016 Inside the FUDS reflected concern about contamination of soil.

Just under 10 percent of households (36) had any further general comments to share. The large majority of responses were from 20016 inside or outside the FUDS, with the majority commenting on the survey

itself (structure, questions, etc.). Additionally, some respondents requested additional information on the issues addressed in the survey.

Discussion

In summary, of the 865 individuals represented in the survey, the largest proportion is made up of current or former residents of 20016 inside the FUDS boundary (Table 2). In comparison to the general population of the study area, survey respondents were on average older and more likely to be White/Caucasian (Table 1). Former residents were older than current residents on average, and longtime residents were older on average than more recent residents.

Survey respondents reported equal or better overall health status than the general U.S. population (Table 5), except in the case of residents living in 20016 Inside the FUDS for 18 or more years where the proportion of those reporting fair/poor health was higher than the national average. In interpreting this information, it is important to be mindful of the fact that it was not possible to age adjust these findings. That is, the findings do not account for the greater average age of survey respondents to the general population or the greater average age of long-term resident survey respondents to medium or short-term resident respondents.

Reported Health Conditions

In all areas, reporting of conditions increased with age and correspondingly length of residence, as long-term residents on average were older. Most health conditions reported by ZIP Code 20016 Inside or Outside FUDS respondents were reported with less frequency than general US population statistics. 20016 Inside FUDS residents had higher reporting than 20016 Outside FUDS and 20015 in at least two of the three residence time periods for learning disability (medium and long-term), peripheral neuropathy (short and medium-term), and diabetes (short and medium-term) – conditions that have been linked to arsenic exposure (exposure assessment was beyond the scope of this study and no determination can be made about causes of conditions reported).

Reported Health and Community Concerns

In all three geographic areas, the top reported public health and community concern was drinking water quality. Other commonly reported concerns include chronic conditions, nutrition, and outdoor air quality. Residents from 20016 inside the FUDS noted concerns about hazardous materials and toxic substances from the Spring Valley FUDS, as well as causes of cancer and soil contamination.

Limitations

The online survey format, chosen for its ease of use and broad reach to potential eligible participants, also has inherent limitations. Survey respondents were anonymous and self-reported health conditions for themselves and in many cases also for family members. Therefore reported health conditions cannot be independently verified. Further, as mentioned previously the data were not age-adjusted or tested for statistical significance—only raw numbers and percentages were reported. As such, the analysis was solely descriptive in nature.

Another source of uncertainty in the survey findings is potential for bias that may have resulted from several factors. First, there is media and public attention and awareness of the FUDS site in general as

well as increased knowledge and interest in the online survey in the 20016 ZIP Code area. Further, independent of study investigators, flyers were distributed in the 20016 ZIP Code area that contained a historical photo along with descriptions of potentially harmful activities at the American University Experiment Station. Text accompanying the photo on the altered flyer reads:

> *"The 1918 'Sgt. Maurer photograph' depicts disposal in a pit area of bottle and carboys, presumably containing mustard gas. The inscription on the back of the photograph says: This pit, the most feared and respected place on the grounds. The bottles are full of Mustard to be destroyed here in Death Valley in the hole called 'Hades'."*

While we cannot estimate or be certain of additional bias associated with these conditions (media and public interest and altered flyer), we acknowledge this as a limitation.

Despite the limitations, the online community survey provided a forum for current and former residents, workers and students in the study areas to submit comments, concerns and experiences to researchers for consideration along with the other components of this report (community health and environment assessments).

Conclusions and Recommendations

The survey responses provide helpful insight with regards to residents' self-reported health outcomes, as well as public health concerns.

Personal health status and most health conditions reported were better than or equal to the national average (similar to findings of the community health assessment that indicate that the 20016 and 20015 ZIP Code areas are "healthy" communities compared to the nation).

There was consistency in concerns across all respondent groups on drinking water, chronic conditions, outdoor air quality and obesity. Inside FUDS area respondents expressed additional concerns regarding causes of cancer and possible environmental contamination.

Building on these findings the following actions are recommended:

- Monitor and report environment and health status and trends in the 20016 and 20015 ZIP code areas, as well as specifically for the 20016 inside the FUDS area. Findings should be publicly available and disseminated on a regular basis in user-friendly formats, such as neighborhood profile reports or interactive websites.

- Maintain transparency and engagement with the community regarding on-going Spring Valley FUDS remediation activities and potential health risks, as well as FUDS related health concerns.

- Engage with the study area communities to identify opportunities for communication, education and evaluation of reported topics of concern (drinking water quality, chronic conditions, outdoor air quality and nutrition/obesity).

Overarching recommendations include continued monitoring of health trends by government agencies and engagement and communication with the community on health status indicators. Neighborhood profile reports could be prepared and updated regularly to assess disease rates and environmental concerns. This format, used by Baltimore City (http://www.baltimorehealth.org/neighborhood.html) could be a useful model for communicating key information to neighborhood residents and other

stakeholders. Such a profile for the FUDS area would also be informative but likely challenging to develop because the FUDS boundary does not correspond directly to ZIP Codes or census tracts.

Responsible agencies should maintain transparency with regards to the ongoing Spring Valley FUDS remediation activities. Further, it is important to engage the community on how best to address identified areas of public health and community concern including drinking water quality, chronic conditions, outdoor air quality and nutrition/obesity.

Supplement A. Full paper version of the survey

*Note: The online version of the survey is formatted differently and questions may appear in a different order than in the paper version below. Also, the online version was designed to skip questions not relevant to the respondent based on their survey responses.

Zip Codes 20015 and 20016 Community Health Survey

You are invited to participate in this community health survey. This survey focuses on two communities: the 20016 and 20015 zip codes **only**. This survey asks a series of questions about your health status and health concerns.

If you like, you may complete a survey on behalf of members of your household as well. **Please submit one survey per person.** For example, if you are completing the survey for yourself, your spouse, and your child, please send us three copies of this survey. It should take no longer than 5 to 10 minutes to respond per person.

Survey Eligibility
This survey is intended for current or former residents, workers or students in **zip codes 20015 and 20016**.

Survey Background
This survey is part of a Johns Hopkins Bloomberg School of Public Health study to assess the health and environment of Spring Valley related to historical activities (World War I chemical munitions development, testing and related waste disposal) and ongoing remediation of buried munitions and contaminated soil. The purpose is to characterize the current community health and environment status of both the 20015 and 20016 zip codes in Washington, D.C. This study is a follow-up to a 2007 Spring Valley public health scoping study conducted by the Johns Hopkins Bloomberg School of Public Health, which is available at **www.jhsph.edu/SpringValley**. The D.C. City Council funded the 2007 and current studies.

Survey Responses
Responding to this survey is strictly voluntary. There are no monetary or other direct benefits if you participate in this survey. Some of the questions address personal health topics. All responses are anonymous. You will not be asked any identifying information such as your name, address or phone number. All individual responses will only be accessible to the Johns Hopkins investigators. Study findings will be reported in such a way as to maintain confidentiality (e.g., 52% of respondents were female). Survey findings will be included in the final study report, which will be publicly available upon study completion at **www.jhsph.edu/SpringValley.**

More Information
For more information on the survey or the overall study, please visit www.jhsph.edu/SpringValley. If you have any questions or concerns about the survey, please feel free to contact the study faculty listed below or the Johns Hopkins Institutional Review Board 410-955-3193 or irboffice@jhsph.edu.

We encourage you to complete the online version of this survey if possible, which can be found on our website listed above. Additionally, we encourage you to forward the survey to anyone who currently or previously lived, worked or studied in the 20015 or 20016 zip codes.

For individuals who prefer to complete the survey using this hard copy version, surveys can be printed from our website or picked up and turned in at the Tenley-Friendship Neighborhood Library. The completed survey can also be mailed to Mary Fox at the address on the next page. If you have any questions or concerns about the survey, please feel free to contact us.

Thank you,

Mary Fox, PhD, MPH
Principal Investigator
Johns Hopkins Bloomberg School of Public Health
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443-287-0778

Beth Resnick, MPH
Outreach Coordinator
Johns Hopkins Bloomberg School of Public Health
bresnick@jhsph.edu
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Instructions

Please complete one survey per household member. It should take no more than 5 to 10 minutes per person to complete.

Please check or write in the answer as requested.

The survey is voluntary and you may skip any question you do not wish to answer.

Please help us avoid double counting by ensuring that each person is only counted one time.

Surveys can be picked up and turned in at the Tenley-Friendship Neighborhood Library (4450 Wisconsin Ave. NW) or returned by mail to the address below:

Mary Fox
Johns Hopkins Bloomberg School of Public Health
624 N. Broadway, Room 455
Baltimore, MD 21205

1. Are you answering the questions in this survey about yourself or a member of your household? (For the rest of this survey, this person will be referred to in questions as the respondent.)

☐ Self
☐ Member of my household

If you are answering the following questions about a household member, what is that person's relationship to you (child, parent, sibling, spouse, etc.)?

_____

2. Has the respondent ever lived, worked or attended school in either the 20015 or 20016 zip codes?

☐ Yes, the respondent has lived, worked or attended school in zip codes 20015 or 20016.

☐ No, the respondent has not ever lived, worked or attended school in zip codes 20015 or 20016.

**If you answered No, this respondent is not eligible for the survey. Please do not submit surveys for respondents who have not lived, worked or attended school in zip code 20015 or 20016.*

3. If you are completing this survey for someone else, is this person alive or deceased?

☐ Alive

☐ Deceased

***If this person is alive, please skip to question 6.**

4. What was his/her age of death in years?

_____

5. What was his/her cause of death? Feel free to indicate multiple causes or additional explanation if you desire. If you aren't sure, you can write "I don't know."

---

6. What is the respondent's gender?

☐ Male

☐ Female

7. What is the respondent's race/ethnicity? You may select multiple boxes if applicable.

☐ African-American/Black

☐ Asian

☐ Caucasian/White

☐ Hispanic/Latino

☐ Native American/Alaska Native

☐ Native Hawaiian /Pacific Islander

☐ Other: _____

☐ Choose not to respond

8. Did the respondent ever live, work or attend school in the 20016 zip code? Please check all that apply.

☐ Currently lives in 20016 ☐ Formerly lived in 20016

☐ Currently works in 20016 ☐ Formerly worked in 20016

☐ Currently attends school in 20016 ☐ Formerly attended school in 20016

☐ None of the above ☐ Not sure

8. If applicable, what years did the respondent:

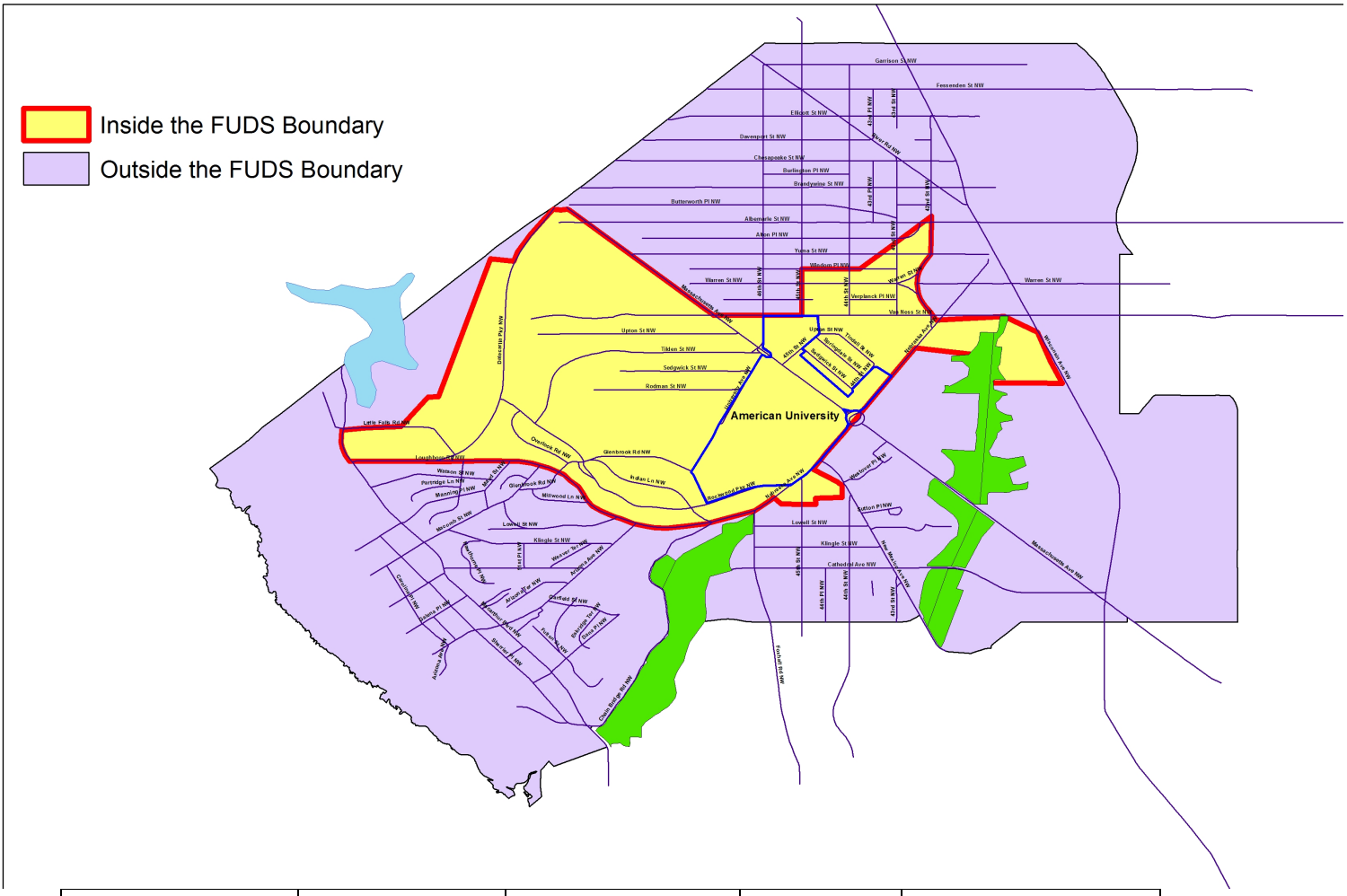
Live in zip code 20016: _____ **to** _____

Work in zip code 20016: _____ **to** _____

Attend school in zip code 20016: _____ **to** _____

9. Please refer to the map on the next page and write a check mark on the table identifying what area(s) of the map the respondent currently or formerly lived, worked or attended school.
The yellow/lighter colored central of the map represents the area defined as the Spring Valley Formerly Used Defense Site (FUDS). The purple/shaded area of the map represents parts of Spring Valley that are outside the defined FUDS boundaries. The map focuses on the area closely surrounding the FUDS and all of zip code 20016 is not viewable. **A larger version of this map is available on our website** www.jhsph.edu/SpringValley **for your reference.**

The Spring Valley FUDS comprises about 660 acres (approximately one square mile) in the northwest quadrant of Washington, D.C. Although the borders extend beyond these streets at some points, the cleanup site is roughly bordered on the west by the Dalecarlia Woods and the federal property that belongs to the Washington Aqueduct, on the south by Loughboro Road, on the east by Nebraska Avenue and on the north by Massachusetts Avenue and Van Ness Street.



	Inside FUDS	Outside FUDS	Not sure	Not applicable
Currently lives				
Currently works				
Currently attends school				
Formerly lived				
Formerly worked				
Formerly attended school				

Please provide any relevant details about the respondent's residential, work and school history in zip code 20016. For example, if the respondent has lived, worked or attended school BOTH inside and outside the FUDS boundary in zip code 20016 at different points in time, please explain what years were spent at each location. If this question is not applicable, please leave it blank.

10. Did the respondent ever live, work or attend school in the zip code 20015? Please check all that apply.

☐ Currently lives in 20015 ☐ Formerly lived in 20015

☐ Currently works in 20015 ☐ Formerly worked in 20015

☐ Currently attends school in 20015 ☐ Formerly attended school in 20015

☐ None of the above ☐ Not sure

11. If applicable, what years did the respondent:

Live in zip code 20015: _____ **to** _____

Work in zip code 20015: _____ **to** _____

Attend school in zip code 20015: _____ **to** _____

12. How would you rate the respondent's overall health?

☐ Excellent

☐ Very Good

☐ Good

☐ Fair

☐ Poor

☐ Unsure

13. Has the respondent ever been diagnosed by a doctor or health professional with any of the following conditions? Select all that apply.

☐ Cancer (Please specify type: _____)

☐ Parkinson's Disease

☐ Alzheimer's Disease

☐ Heart Disease

☐ Hypertension

☐ Skin Disease (e.g. dermatitis, eczema, rashes)

☐ Thyroid Disease

☐ Diabetes

☐ Autism

☐ Respiratory Disease (e.g. asthma, COPD, emphysema)

☐ Mental Illness

☐ Peripheral Neuropathy

☐ Liver Disease

☐ Kidney Disease

☐ Blood Disorder

☐ Learning Disability

☐ Other, please specify: _____

☐ None of the above

14. If applicable, please indicate the approximate age(s) the respondent was diagnosed with each of the conditions indicated above:

15. Is the respondent currently under a doctor or other health professional's care for the medical condition(s) in question?

☐ Yes

☐ No

☐ Unsure

☐ Not Applicable

16a. The list below describes many different kinds of public health and community issues that may be of concern. Please check **up to 5** issues that are of most concern to you and your household.

____ Access to health care

____ Access to mental health care

____ Chronic conditions (e.g., cancer, respiratory diseases, diabetes)

____ Distracted driving/ drunk driving

____ Drinking water quality

____ Emergency Preparedness

____ Excessive noise (e.g., dog barking, parties, traffic, industrial activity)

____ Exposure to hazardous materials and/or toxic substances from Spring Valley Formerly Used Defense Site (FUDS)

____ Exposure to hazardous materials and/or toxic substances from non-FUDS sources

____ Food safety

____ Housing conditions (e.g., lead paint, insects/pests/rodents, inadequate heating/cooling)

____ Indoor air quality

____ Neighborhood nuisances (e.g., garbage, unkempt lawns, crowded or unkempt rental properties, parking)

____ Nutrition, availability of nutritious foods

____ Obesity/Healthy lifestyle

____ Outdoor air quality

____ Substance abuse

____ Violence/domestic abuse

____ Other, please describe:

16b. If you would like to elaborate on any of the concerns identified in 16a, please use the space below to describe specific issues and/or suggestions to address this concern in your community.

17. Are there any other specific health or community concerns you would like to mention? Please explain.

18. Do you have any other comments you would like to make?

Thank you for taking the time to complete this survey. We appreciate your input.

Please return completed surveys to the Tenley-Friendship Neighborhood Library or mail to:

Mary Fox
Johns Hopkins Bloomberg School of Public Health
624 N. Broadway, Room 455
Baltimore, MD 21205

Supplement B. US statistics for reported conditions

Health Condition	US Statistic	Type of Statistic	Source (All links accessed May 6, 2013)
Cancer	41%	Lifetime Risk	Surveillance, Epidemiology and End Results (SEER) http://seer.cancer.gov/statfacts/html/all.html#prevalence
Hypertension	31%	Prevalence	Centers for Disease Control and Prevention http://www.cdc.gov/bloodpressure/facts.htm
Skin Disease	30%	Prevalence	Goodman et al. 2008 http://www.sidnet.org/pdfs/burden%20of%20skin%20diseases%202004.pdf
Respiratory Disease	15% Asthma and COPD	Prevalence	American Lung Association http://www.lung.org/finding-cures/our-research/trend-reports/estimated-prevalence.pdf
Thyroid Disease	6% 12%	Prevalence Lifetime Risk	American Thyroid Association http://www.thyroid.org/thyroid-events-education-media/about-hypothyroidism/
Heart Disease	12%	Prevalence	Centers for Disease Control and Prevention http://www.cdc.gov/nchs/fastats/heart.htm
Learning Disability	2%	Prevalence	National Center for Learning Disabilities http://www.ncld.org/types-learning-disabilities/what-is-ld/basic-facts/demystify-ld-18-facts
Mental Illness	25% 50%	Prevalence Lifetime Risk	Centers for Disease Control and Prevention http://www.cdc.gov/mentalhealthsurveillance/fact_sheet.html
Peripheral Neuropathy	6%	Prevalence	The Neuropathy Association http://www.neuropathy.org/site/PageServer?pagename=About_Facts
Diabetes	8%	Prevalence	American Diabetes Association http://www.diabetes.org/diabetes-basics/diabetes-statistics/
Kidney Disease	10%	Prevalence	Centers for Disease Control and Prevention http://www.cdc.gov/diabetes/pubs/factsheets/kidney.htm

Abbreviations: COPD, chronic obstructive pulmonary disease.

The prevalence statistics reflect the percentage of the US population with a condition; lifetime risk reflects the probability of developing a condition over the lifespan.

References for US statistics for reported conditions

American Diabetes Association. Diabetes Statistics. Data from the 2011 National Diabetes Fact Sheet. Available: http://www.diabetes.org/diabetes-basics/diabetes-statistics/ [accessed May 6, 2013].

American Lung Association 2013. Estimated Incidence and Prevalence of Lung Disease. Available: http://www.lung.org/finding-cures/our-research/trend-reports/estimated-prevalence.pdf [accessed May 6, 2013].

American Thyroid Association. General Information/Press Room. Prevalence and Impact of Thyroid Disease. Available: http://www.thyroid.org/thyroid-events-education-media/about-hypothyroidism/ [accessed May 6, 2013].

Centers for Disease Control and Prevention. High Blood Pressure Facts. Available: http://www.cdc.gov/bloodpressure/facts.htm [accessed May 6, 2013].

Centers for Disease Control and Prevention. Fast Stats, Heart Disease. Available: http://www.cdc.gov/nchs/fastats/heart.htm [accessed May 6, 2013].

Centers for Disease Control and Prevention. Fact Sheet. CDC Report: Mental Illness Surveillance Among Adults in the United States. Available: http://www.cdc.gov/mentalhealthsurveillance/fact_sheet.html[accessed May 6, 2013].

Goodman et al. 2006. The Burden of Skin Diseases 2004. Available: http://www.sidnet.org/pdfs/burden%20of%20skin%20diseases%202004.pdf [accessed May 6, 2013].

National Center for Learning Disabilities. Demystifying Learning Disabilities: 18 Facts You Need to Know. Available: http://www.ncld.org/types-learning-disabilities/what-is-ld/basic-facts/demystify-ld-18-facts [accessed May 6, 2013].

The Neuropathy Association. About Peripheral Neuropathy: Facts. Available: http://www.neuropathy.org/site/PageServer?pagename=About_Facts [accessed May 6, 2013].

Surveillance, Epidemiology and End Results (SEER) SEER Stat Fact Sheets: All Sites, Lifetime Risk. Available: http://seer.cancer.gov/statfacts/html/all.html#prevalence [accessed May 6, 2013].

Supplement C. Free Text Response Questions

	Percent indicated response from each locale (e.g. number of households from 20015 who indicated the comment / total number of households from 20015 who responded to this question)	
Questions 16b. If you would like to elaborate on any of the concerns identified in 16a, please use the space below to describe specific issues and/or suggestions to address this concern in your community.	**Currently or Formerly Live(d) in 20016**	**Currently or Formerly Live(d) in 20015**
Concern about the number and/or cause of cancers and other health problems of family members and/or neighbors, might have something to do with the surrounding environment	32%	11%
Concern about exposures to toxins and pollutants in Spring Valley (Spring Valley was specifically mentioned)	20%	11%
Referenced noise problems (e.g. airplane, leaf blowers, landscapers, AU students, local restaurants and bars)	17%	
Concern that water quality is connected to health problems	7%	22%
Concern about the needs of senior citizens (transportation, adult services for those living at home)	5%	
Request more information about the safety of the soils, what residents can do as precautionary measures, what is being done to address current situation, etc.	17%	

	Percent indicated response from each locale (e.g. number of households from 20015 who indicated the comment / total number of households from 20015 who responded to this question)	
Questions 17. Are there any other specific health or community concerns you would like to mention? Please explain.	**Currently or Formerly Live(d) in 20016**	**Currently or Formerly Live(d) in 20015**
Health concern (e.g. cancers, environmental exposures)	73%	40%
Non-health concern (community concerns)	27%	40%
Mention of family members and neighbors have cancer and/or other health problems	27%	
Requests and suggestions about dissemination and collection of information (how chemicals get in to system, request more soil and areas tested, suggest health conference at end of survey)	22%	
Concern about drinking water quality	8%	40%
Concern about contamination of soil and potential health effects	38%	
Concerns about safety (cars, traffic, motorcycles, armed robbery, trees threaten power supply)	11%	20%
Mental health (e.g. anorexia, eating disorders)	8%	
Concern about living and raising kids in Spring Valley/FUDs area with regards to potential health risks and pathways of exposure	8%	
Suggest to build the strength of the community (e.g. race/poverty issues)	5%	20%

	Percent indicated response from each locale (e.g. number of households from 20015 who indicated the comment / total number of households from 20015 who responded to this question)	
Question 18. Do you have any other comments you would like to make?	**Currently or Formerly Live(d) in 20016**	**Currently or Formerly Live(d) in 20015**
Suggestions, comments, questions about the survey itself	55%	20%
Positive comment about survey (e.g. thanks for doing survey, good job keep people informed)	31%	
Negative comment about survey (problems with survey methods)	31%	20%
Mention of family members and neighbors have cancer and/or other health problems	17%	
Positive comment about current living conditions	3%	60%
Request of more information on the issues (what can happen if contaminated soil blows into yard, did Army Corps and AU make public all known information, why the District is dragging this issue)	21%	