

Progress Report to the Department of Justice
November 22, 2019

INTRODUCTION

The Tonawanda Coke Corporation was convicted of illegally releasing coke oven emissions, a hazardous air pollutant and known human carcinogen, into the environment. In response to concerns about potential adverse health effects due to these coke oven emissions, we proposed a large epidemiologic project to assist the community in understanding the health risks posed by exposures. Our overarching hypothesis is that exposure to polycyclic aromatic hydrocarbons, present in coke oven emissions and other sources, will increase the incidence of select cancers and non-cancer chronic diseases. We anticipate that the results of the epidemiologic studies will provide the residents of Tonawanda and Grand Island with the necessary information about the current burden of disease crucial for making rational decisions about initiatives to prevent these diseases in the future. Moreover, the Environmental Health Education Center will assist the community to translate these findings into action to reduce the disease burden going forward.

At the direction of the US Probation and Pretrial Services, we prepared four six-month progress reports. These progress reports were submitted via email on April 15, 2017, October 15, 2017, April 15, 2018, and October 15, 2018. As the probation period for Tonawanda Coke Corporation ceased on March 18, 2019, we were instructed not to send any additional progress reports to the US Probation and Pretrial Services. In addition, we were asked by the US Probation and Pretrial Services to submit all expenses associated with the project on November 19, 2018. UB responded on November 20, 2018 with a complete accounting of all expenses.

The current progress report covers the period between the last progress report submitted to the US Probation and Pretrial Services and November 1, 2019.

ACCOMPLISHMENTS (October 2018-October 2019)

1. Environmental Health Study for Western New York

Research activities for this funding period have focused on recruitment to enumerate the prospective cohort of residents from Town and City of Tonawanda and Grand Island. To date, we have recruited 13,167 adult participants. To accommodate this response, we set up a relational database for keyed double entry of the full and short baseline questionnaires, and hired and trained additional research staff in data entry. Other activities during this time period included developing, piloting and launching full implementation of protocols to collect blood and urine, both at UB, and in collaboration with Kaleida Health, a local health care network. We also piloted home collection methodology, logistics, and equipment among research staff and evaluated our bioassay analytical methods. Additionally, we developed protocols, trained staff, and obtained

IRB approval for a pilot study on adolescent neurobehavioral deficits. Further, we continued the development of our exposure assessment metrics. Finally, we obtained IRB continuing review approval for the study in October 2019.

Full Mailing:

We initiated full active recruitment by mailing a pre-notification postcard, introductory letter and questionnaire to approximately 103,544 adult residents from the City and Town of Tonawanda and Grand Island. The pre-notification postcards were mailed on September 18, 2018. The introductory letters and self-administered questionnaires were mailed starting on September 26, 2018. The third mailing began October 16, 2018, and the final mailings of the short questionnaires to non-respondents were mailed in early November, 2018. Table 1 depicts the proportion of responses for the online and printed mailed versions of the questionnaires as of October 28, 2019. Most participants completed one printed questionnaire (78.3%). For the online version, a small number of participants broke off before completing the questionnaire (4.4%). We also had a small number of participants that completed multiple questionnaires (< 5%). We plan to compare the duplicate questionnaires and the two methods of administering the questionnaire (online vs. print) to assess the reliability of the questions.

We offered each participant who returned either a completed online or paper questionnaire a \$10 check to compensate them for their time and effort. All participant incentive checks have been mailed.

Table 1. Number of Baseline Questionnaire Respondents by mode of administration

| Questionnaire Response Mode | n (% of Grand Total) |
|--|-----------------------------|
| Online (full questionnaire) | |
| Completed (only once, with and without contact info) | 1,669 (12.7) |
| Partial completion (only once) | 579 (4.4) |
| <i>Subtotal online</i> | <i>2,248 (17.1)</i> |
| | |
| Print (Mailed) | |
| Completed (full questionnaire) | 9,107 (69.2) |
| Completed (short questionnaire) | 1,206 (9.2) |
| <i>Subtotal Print</i> | <i>10,313 (78.3)</i> |
| | |
| Repeated Completion (online and/or print) | |
| Multiple responses online only | 85 (0.6) |
| Multiple responses print only | 431 (3.3) |
| Multiple responses print and online | 90 (0.7) |
| <i>Subtotal</i> | <i>606 (4.6)</i> |
| Grand Total | 13,167 |

We also evaluated low-resolution spatial distributions of respondents' current address zip codes and compared them with the current address zip codes of all who were mailed a questionnaire (Table 2). At the zip code level, there were no meaningful differences in the current residence zip codes between respondents' current zip code and all who were invited to participate (sampling frame). As we begin geocoding these current residential addresses, we may find discordance at a higher level of resolution, such as at the census tract level. Nonetheless, these preliminary zip code level data do not show

marked spatial differences between those participating and those eligible, and self-selection forces may not be related to proximity to Tonawanda Coke Corporation.

Table 2. Respondents and Sampling Frame by Zip Code of Current Residence (as of 11/20/2019).

| Zip Code | City/Town | Respondents N (%) | Sampling Frame N (%) |
|----------|-----------------|----------------------|-------------------------|
| 14072 | Grand Island | 2,179 (17.0) | 18,887 (19.3) |
| 14150 | Tonawanda | 4,651 (36.3) | 35,940 (36.7) |
| 14151 | Tonawanda | 0 (--) | 12 (--) |
| 14207 | Old Town | 84 (0.6) | 739 (0.8) |
| 14217 | Kenmore | 2,436 (19.0) | 19,513 (20.0) |
| 14223 | West of Kenmore | 2,709 (21.1) | 19,902 (20.3) |

3rd and 4th Round of Mailing:

Once all the compensation checks were mailed, we initiated a new round of recruitment by mailing a revised letter of invitation, information sheet, and another questionnaire addressed to one resident of every non-responding household. We selected only one resident per household to prevent multiple packets from being delivered to one house. The study team revised the letter and information sheet and received feedback and recommendations from Dr. Thomas Feeley, Professor, UB Department of Communications. In addition, we modified the compensation strategy to a raffle of ten \$100 checks for every 500 questionnaires returned.

After receiving IRB approval, we contracted with ARG Survey Services to mail the 3rd wave of 10,000 revised introductory letters, fact sheets, and questionnaires on May 8th, 2019. The 4th wave of just over 20,000 questionnaire packets was mailed on June 10, 2019.

Supplemental Recruitment Strategies:

We are planning several additional recruitment approaches to increase our overall sample size. Three approaches have been identified and include, 1) placing advertisements in the local newspapers; 2) conducting an invite-a-friend email campaign among currently enrolled participants; and 3) piloting community presentations to recruit new cohort members.

We obtained IRB approval to deploy the invite-a-friend email campaign to currently enrolled participants, and post the newspaper advertisements in local papers such as the Ken-Ton Bee and Grand Island Independent Dispatch and Penny Saver newspapers.

Dr. Tumiel Berhalter is taking the lead on developing a community presentation strategy to recruit study participants. We are currently revising a community focused recruitment PowerPoint presentation.

Baseline Questionnaire Data Entry:

We have completed the data entry for the short questionnaire. In total 1,487 were entered.

Our data entry platform for the long questionnaire is in modular form.

Data have been entered into the following sections as of October 30th:

- Contact information (N= 7,800 completed)
- Residential history (N= 5,932 completed)
- Demographics/Household Characteristics/sample donation (N=9,262 completed)
- Personal medical history (N=6,709 completed)
- Neighborhood environment, thoughts and feelings, depression, family medical history, and occupational exposures (N=9,232 completed)
- Lifestyle/personal characteristics (N=973 completed)
- Women's health (N=559 completed)

Data Entry Metrics:

Our baseline questionnaire has 10 sections (or modules). We developed a relational database in Access to facilitate keyed double entry of the 9,000+ completed paper questionnaires. This database was assembled with a modular approach to mirror the questionnaire's sections so that we could prioritize data entry for the subsequent phase of the study. For instance, participant residential histories are needed to reconstruct recent and historical exposure metrics that will be used in our epidemiologic analyses and biospecimen donation preferences were needed to recruit participant to donate blood and urine samples.

To estimate the time to complete data entry, we based our rates of module entry based on 9/16 through 9/19 for each of our data entry personnel. For all modules combined, we estimate it will take an additional 1,339 hours to complete data entry. With our current staffing level, we estimate it will take about six months to complete data entry. We have hired additional students to conduct data entry and with these additional hires, we estimate that the first round of data entry will be completed in February of 2020. We are using a double entry protocol to ensure accuracy of keyed responses in the baseline questionnaires.

Biospecimen Collection:

We received IRB approval on February 4th,2019 for the biospecimen collection protocol with Kaleida Health. We conducted a pilot with eight study participants who provided oral and written informed consent and scheduled visits to Kaleida Health. Overall, the pilot was successful at obtaining written consent, scheduling visits, collecting blood and urine, shipping specimens to the University at Buffalo Biorepository (Biobank), and processing and storing samples at the Biobank. In July, we started collecting biospecimens at UB South Campus on Wednesday evenings and Thursday mornings to expedite collection.

As of October 30th, we have sent 1,182 letters inviting participants to donate a specimen. We have verbally consented 550 participants and obtained written consent from 430. Of these, 398 participants have been scheduled for a visit and of those, 367 have completed donations. We began evening collections on Tuesdays, starting November 12, 2019.

We submitted an IRB modification for recruitment and protocol materials, inviting cohort members who have already donated biological specimens to come back and donate a second set.

As of November 18th, 2019, there are 9,901 aliquots of urine and 6,862 aliquots of serum, plasma, and buffy coat frozen and in storage at the UB Biobank.

Measurement of Urinary Benzene and PAH Metabolites by GC-MS:

We piloted mailed home urine collection to compare the stability of benzene and PAH urinary metabolites in samples shipped to the lab. After reviewing the protocol and completing the written informed consent process, two kits were supplied to each volunteer and taken home. At home one clean catch urine sample was collected and divided into two samples. One was immediately frozen and the other refrigerated. The frozen sample was brought directly to Dr. Olson’s lab and the refrigerated sample was mailed back to UB via the US Postal Service. Dr. Olson’s lab compared the stability of benzene and PAH urinary metabolites between the shipped and frozen samples.

Our preliminary results from the home urine collection pilot are depicted below, with “F” indicating a frozen sample and “R” indicating a refrigerated sample.

Result of Urinary Benzene Metabolites in Urine samples of Mailing Pilot Study

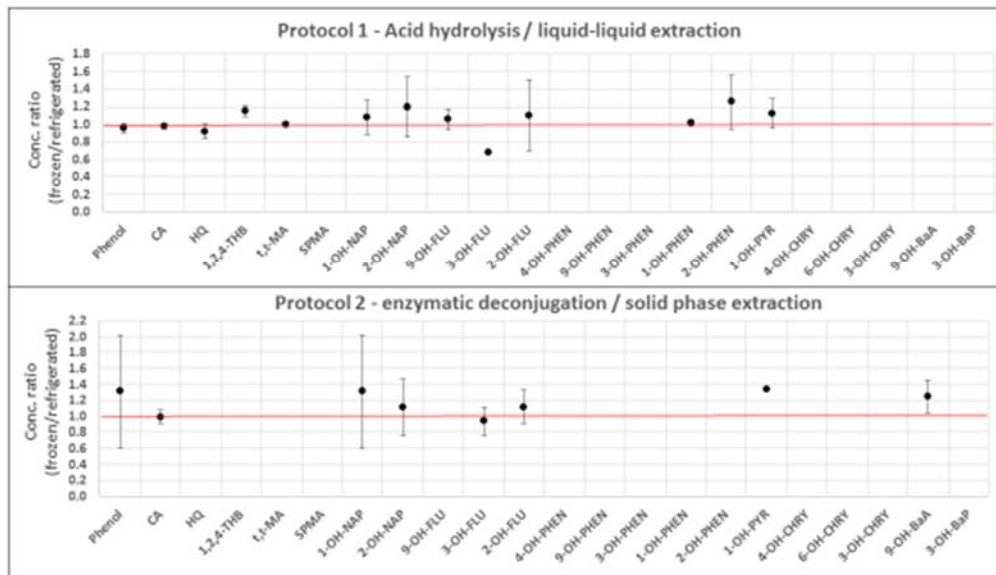
Conc. (ug/ml urine)

| Sample ID | Phenol | Catechol | Hydroquinone | 1,2,4-THB | t,t-MA | SPMA |
|---------------------|--------|----------|--------------|-----------|--------|------|
| 1-F | 6.910 | 5.172 | 1.085 | 0.087 | 0.136 | n.d. |
| 1-R | 8.165 | 5.559 | 1.523 | 0.073 | 0.132 | n.d. |
| 2-F | 3.675 | 1.953 | 0.683 | n.d. | n.d. | n.d. |
| 2-R | 3.845 | 1.963 | 0.701 | n.d. | n.d. | n.d. |
| 3-F | 1.512 | 1.162 | 0.585 | n.d. | n.d. | n.d. |
| 3-R | 1.599 | 1.214 | 0.625 | n.d. | n.d. | n.d. |
| 4-F | 3.856 | 0.491 | 0.315 | n.d. | 0.056 | n.d. |
| 4-R | 3.989 | 0.493 | 0.322 | n.d. | 0.059 | n.d. |
| 6-F | 1.250 | 2.556 | 0.153 | n.d. | n.d. | n.d. |
| 6-R | 1.365 | 2.634 | 0.171 | n.d. | n.d. | n.d. |
| 7-F | 7.974 | 3.287 | 1.121 | n.d. | 0.060 | n.d. |
| 7-R | 7.872 | 3.410 | 1.193 | n.d. | 0.060 | n.d. |
| 7R- dup* | 7.733 | 4.572 | 1.144 | n.d. | 0.053 | n.d. |
| 8-F | 5.610 | 12.130 | 0.917 | 0.091 | 0.073 | n.d. |
| 8-R | 5.645 | 12.536 | 1.023 | 0.082 | 0.074 | n.d. |
| 9-F | 16.134 | 1.204 | 0.672 | n.d. | 0.066 | n.d. |
| 9-R | 16.287 | 1.211 | 0.681 | n.d. | 0.066 | n.d. |
| 9 (F & R mix)- dup* | 17.007 | 1.210 | 0.636 | n.d. | 0.065 | n.d. |
| 10-F | 1.333 | 1.069 | 0.738 | n.d. | 0.134 | n.d. |
| 10-R | 1.339 | 1.042 | 0.764 | n.d. | 0.128 | n.d. |

Abbr: Catechol = 1,2-dihydroxybenzene
 Hydroquinone = 1,4-dihydroxybenzene
 1,2,4-THB = 1,2,4-trihydroxybenzene
 t,t-MA = trans,trans-muconic acid
 SPMA = S-phenylmercapturic acid
 dup* = duplicate sample analyzed

Nine research staff volunteered to provide one fresh frozen “F” and one mailed urine sample that was placed on a cold pack “R”. Some delays were found in the receipt of the mailed specimens that took from 1.5 to 5 days to be received at UB. The figure below illustrates a comparison of the mean ratios of metabolite levels in frozen vs. mailed urine samples from the same participant. The results suggest that the metabolite levels were similar in urine samples that were frozen immediately and in samples maintained for up to 5 days at room temperature during the mailing process. Thus, the home mailing method for urine specimen collection from the study participants may represent a valid method for sample collection.

Comparison of Conc. ratio (Frozen/Refrigerated) of Urinary Metabolites – Protocol 1 vs 2



New Analytical Method:

A new GC-MS method was developed to measure both benzene and PAH metabolites in the same run. This method was able to measure benzene metabolites, including: phenol, catechol, hydroquinone, 1,2,4-trihydroxyphenol, trans,trans-muconic acid, and S-phenylmercapturic acid. The same chromatographic run also measures the following monohydroxy PAH metabolites: 1-hydroxynaphthalene, 2-hydroxynaphthalene, 9-hydroxyfluorene, 3-hydroxyfluorene, 2-hydroxyfluorene, 4-hydroxyphenanthrene, 9-hydroxyphenanthrene, 3-hydroxyphenanthrene, 1-hydroxyphenanthrene, 2-hydroxyphenanthrene, 1-hydroxypyrene, 4-hydroxychrysene, 6-hydroxychrysene, 3-hydroxychrysene, 9-hydroxybenz[a]anthracene and 3-hydroxybenzo[a]pyrene. Urine sample volume for analysis was increased from 1 ml to 2 ml to increase detection sensitivity of low abundance metabolites.

In brief, the method starts with incubation of two ml urine overnight in sodium acetate buffer and β-glucuronidase/ arylsulfatase for deconjugation. The sample mixture is then passed through a solid phase extraction (SPE) cartridge (Focus, from Agilent) and rinsed with 0.1% acetic acid followed by water. The sample load and rinsed fractions are collected and extracted with ethyl acetate. The Focus SPE cartridge is dried, and the analytes remaining in the cartridge are eluted with acetonitrile and methylene chloride. The eluates are pooled with ethyl acetate extracts and dried under nitrogen. The dried extract is reconstituted with hexane and derivatized with MSTFA, and then analyzed by GC-MS.

Method validation includes the determination of the detection limit, intra- and inter-day precision, percent recovery and analyte spike levels for quality controls for each batch analysis.

The research team is working on method validation and quality control (QC) for GC-MS analysis of benzene and PAH metabolites. The method was found to be suitable for accurate, low level detection of urinary metabolites of benzene and PAHs.

Briefly, our method validation approach is as follows:

1. Authentic standards were used to establish individual calibration curves
2. Precision of the assay includes:
 - a. Intra-assay precision (%CV):
 - i. Run the lowest and 2nd lowest calibration standard 10 times.
 - ii. Run the lowest spike QC 10 times.
 - b. intra-individual precision:
 - i. Analyze 7 replicates on one urine sample with no spike.
 - ii. Analyze 7 replicates on the same urine sample as above with lowest QC spike (this is also for verification of method detection limit).
 - c. inter-assay precision:
 - i. Batch to batch runs include Ref spike runs and all QCs.
3. Recovery of metabolites from extraction of urine samples includes assessment of 3 levels of spiked QC urine samples. 1st batch include 3 replicates of each level.
4. QC samples are added to each batch of 20 urine samples that are analyzed. QC samples in each batch of analyses will include: 1 water blank, 1 solvent blank, 3 matrix blanks, and 4 urine QC samples (2 low, 1 medium and 1 high spiked QC urine).
5. LOD (level of detection) and LOQ (level of quantification) for each benzene and PAH metabolite have been established.

The GC/MS runs on the first batch of 71 urine samples for benzene and PAH metabolites have been finished and are in the process of data analysis.

Exposure Assessment Metrics:

We have begun compiling the necessary external data to begin GIS-based exposure assessment. This includes the ambient air monitor data from the New York State Department of Environmental Conservation. We are starting to pull together the necessary ancillary data for reconstructing recent and historical exposure to air pollution, which contains many of the same chemicals present in coke oven emissions. We have previously reconstructed historical exposure to total suspended particulates for Erie and Niagara Counties for the years 1959 to 1997 using inverse distance squared interpolation for a previous study. The next step is to update this exposure reconstruction for the years 1998 to 2019. In addition, we will be reconstructing historical exposure to other criteria pollutants that are routinely measured by the NYSDEC (i.e., Particulate Matter (PM₁₀ and PM_{2.5}), Lead, Nitrogen Dioxide, Ozone, Sulfur Dioxide).

Dr. Meng Wang has proposed an exposure assessment strategy for the EHS4ENY (see appendix A)

Child and Adolescent Questionnaires:

We are developing the materials (e.g., questionnaires and introductory letter) and the protocol for recruiting children into the study. Our primary sampling frame for enrolling children and adolescents into the study is based on the adults who are participating in the study and who reported having children and adolescents on the baseline questionnaire. We plan a mailing to recruit these children and adolescents of the adults. The questionnaire will assess a number of items including, attention deficit/hyperactivity disorder symptoms, demographics, household characteristics, diet, mother's occupation during pregnancy and nursing, and parental smoking habits.

Outcomes Assessment:

One important aspect of our overall goals is to investigate emerging outcomes not currently known to be associated with coke oven emissions and its chemical constituents. We identified a published paper that reported on an association between traffic pollution exposure and neurobehavioral deficits among adolescents in Ecuador (Neurotoxicology. 2019 Jul;73:31-39). Because traffic pollution has many of the same chemical constituents as coke oven emissions (e.g., benzene and polycyclic aromatic hydrocarbons), we discussed developing a pilot study to assess neurobehavioral deficits among adolescents exposed to pollutants present in coke oven emissions and ambient air pollution with our Scientific and Community Advisory Committees, and both were in favor of us pursuing this pilot study.

Our protocols were approved by the IRB (July 17, 2019) for the neurobehavioral pilot study. We completed initial training of research staff on July 25 and 26th. It has been our observation that recruitment of participants is most successful in the Winter/Spring seasons. Consequently, we will begin recruiting participants for the NB pilot in late January/early February, 2020.

We obtained approval from the New York State Department of Health to obtain access to Statewide Planning and Research Cooperative System (SPARCS) data to explore the relation between ambient pollution and residential proximity to TCC (estimated by zip code) and in-patient and out-patient outcomes. The SPARCS data request was approved. However, we were notified on September 13th, that due to ongoing data processing remediation, delivery of data has been delayed until December 2019.

Scientific Advisory Committee (SAC minutes appendix B):

We held a conference call with the Scientific Advisory Committee on April 8th. We discussed various topics, including the reduction in funding due to TCC bankruptcy, additional participant recruitment efforts, biospecimen collection and the reporting of results to participants, our proposed exposure metrics, the pilot study of neurobehavioral deficits among adolescents, and non-response and potential activities to obtain data on non-respondents to help assess potential response bias.

The Scientific Advisory Committee meeting is scheduled for December 4th, 2019.

Scientific Communications:

Seeking independent peer review and feedback from our scientific colleagues is an important aspect to the scientific process. By presenting preliminary data at scientific meetings we receive feedback on the progress of our research efforts with the ultimate goal of improving the scientific rigor of the research. Therefore, we submitted an abstract to the annual meeting of the International Society of Environmental Epidemiology in Utrecht, The Netherlands on August 25th through the 28th. The abstract was accepted for a poster presentation titled "Recruitment After Environmental Exposure." The poster can be found at

https://ehstudy.buffalo.edu/app/site/media/images/ISEE%202019%20conference%20poster_FINAL.pdf. Dr. Denise Feda was the lead author on the poster and presented the poster during a poster session. Briefly, the poster describes the results of our ongoing recruitment strategies. The primary conclusions from the poster were: 1) participation in the online enrollment was not as high as anticipated and 2) the response rate we obtained is similar to other population-based epidemiological studies conducted recently.

2. Community Engagement and the Environmental Health Education Center
(CAC minutes appendix C)

The community engagement team has been working with the research team, contributing to discussions about design and recruitment. We are committed to building relationships and bringing health and environmental education into the community. Our goal is to listen to the needs and concerns of the community and be responsive to them. We also strive to serve as liaisons between the community and the research team to break down barriers and conduct research that is meaningful and useful to the community while providing resources through health education.

Our team includes: Laurene Tumiel Berhalter (10%), Laura Mangan (20%), Donna Wysokenski (100%), and Theresa Williams (20%). Laurene Tumiel Berhalter, PhD, is an epidemiologist by training who has conducted community based participatory research for over 20 years. She leads the community engagement team. Donna Wysokenski, MS, has a background in microbiology and public health education. She is a full-time health and environmental education specialist. Theresa Williams is currently a Master's of Public Health student. We are planning on adding a team of dietetic interns in partnership with UB's dietetic internship program. The dietetic interns will be MS students with four years of experience in nutrition sciences. As part of their capstone project, they will create curricula, workshops, literature, tabling events, etc. specifically designed to meet the needs and interest of our study population on nutrition and wellness topics. We hope to start this partnership in the Spring semester, 2020 and continue for the duration of the study.

Community Advisory Committee:

Our community Advisory committee started with a focus group of seven individuals that was held in March of 2017. This meeting focused on the needs of the community that should be addressed in the baseline questionnaire. Two items stood out, vaping and thyroid conditions, which were both added to the questionnaire.

In 2017, we began to formalize the committee. It has met quarterly. We are purposeful with respect to the location of the meetings, rotating the venue between the three communities. Catering options are always selected from the local community restaurants.

| Date | # of Community Attendees |
|----------|--------------------------|
| 3/23/17 | 7 |
| 9/9/18 | 6 |
| 12/12/18 | 5 |
| 3/27/19 | 6 |
| 6/12/19 | 8 |
| 9/11/19 | 10 |
| 12/11/19 | TBD |

Representation has changed over time and we are still growing our community advisory committee. We are cognizant of representation from each of the three communities on the committee and actively seek diversity of experience and expertise in committee members.

Table 4. Current Community Advisory Committee Members

| Name | Affiliation | Town |
|---------------------|--|-------------------|
| Karen Ammerman | Fletcher School | City of Tonawanda |
| Brittni P. Anderson | Sheridan Medical Group | Town of Tonawanda |
| Nicole Bermingham | Public Library (Kenmore & Kenilworth Branches) | Town of Tonawanda |

| | | |
|---------------------------|---|-------------------|
| Gary M. Bisone, RN | Tonawanda City School District | City of Tonawanda |
| Jennifer M. Carlson, LMSW | Sheridan Medical Group | Town of Tonawanda |
| Russ Certo, PT | Medical Oriented Gym | Grand Island |
| Ralph Critelli | Ken-Ton Union Free School District | Town of Tonawanda |
| Brian Edwards | Paramedic | Town of Tonawanda |
| Myra Kaiser | Massage therapist and yoga teacher | Grand Island |
| Christina Kasprzak | UB, resident | Town of Tonawanda |
| Jenna Koch | City Council | City of Tonawanda |
| Cathy Piciulo | Ken-ton Chamber of Commerce | Town of Tonawanda |
| Dan Rifkin, MD | Sleep Center of WNY | Town of Tonawanda |
| Shirley Samson | Retired Director of Public Health, resident | City of Tonawanda |

A formal charge has been produced and approved by the committee members. The committee is very interested in helping with recruitment. As such, we formed two subcommittees that are scheduled for their first meeting. One will focus on recruitment and the other on health and environmental education.

Engagement in the Community:

In addition to conducting the community advisory committee, the community engagement team has been attending meetings of different community groups and holding one-on-one meetings with the stakeholders, including the Grand Island Farmers Meeting, Ken-Ton Community Day, Zonta Club event, the Grand Island Garden Walk, and Canal Fest. The team has talked with local businesses such as Child Care Resource Network and Colvin Cleaners, as well as community residents.

The team participated at several community events to distribute health and environmental education and to get to know the community better.

These events include:

8/15/19: City of Tonawanda HUB; Sponsored by Rotary, Niagara River Greenway and Wellness Institute

Focus: Study newsletter, postcard, green cleaning flyer, and information about nutrition and the environment and children’s health

10/4/2019: Health Fair at Town of Tonawanda Senior Center

Focus: Healthy aging, nutrition, green cleaning, study materials

10/17/19: Town of Tonawanda Library – Kenmore Branch; Table set up to coincide with children’s story hour for 3-5 year of age

Focus: Children’s environmental health, nutrition, green cleaning, study materials

Educational and Informational Products Produced and Distributed:

The team has created and distributed several educational products in the communities. The purpose of these products is to educate about health and the environment, but also to keep people up to date about the progress of the study.

These products include:

1. **Seasonal Fun Fact Sheets** were created that integrate seasonal tips on health, the environment and environmental health awareness. Local resources are mentioned when possible. Fun Facts are distributed to study area libraries and have proved popular with residents.
Editions: Summer, Fall, Winter (produced but not printed yet)
Distribution: Mainly to study area libraries, at tabling events and other venues to be identified
Approximate Number Distributed:
 Summer: 200 (July)
 Fall: 200 (end of Aug-Oct 18)
2. **Green Cleaning Flyer** with recipes and information about indoor air quality and toxicants in cleaning products and their impact on health.
 Handed out at tabling events.
3. **Green Cleaning Workshop Materials**
 Materials includes: PowerPoint presentation, Pre and Post Surveys, Recipe Booklet, flyers for host libraries
 Planned Workshops:
 November 13 at Town of Tonawanda Library- Kenmore Branch
 December 9 at City of Tonawanda Library
4. **Infographic**
 Draft 1: sent August 9, 2019
 Revised infographic: sent 10/10/2019
Status: finalized, to be submitted for IRB review
5. **PowerPoint for Community Recruitment Presentations**
 Draft 1: September 3, 2019
 Revised PowerPoint: September 30, 2019
Status: Waiting for feedback and finalization

Tool Kit of Resources:

The team developed a tool kit of resources. There is a substantial body of quality health and environmental resources available that can be shared with people in the community based on their interests. This tool kit is constantly growing to be responsive to the community's needs and as new information is found.

The tool kit includes resources on:

Nutrition:

- Plan your portions – American Diabetes Association
- Foods Rich in Antioxidants

Healthy Aging from National Institute on Aging (NIH):

- Diet and Exercise
- Tips for better aging
- Overcoming Exercise Barriers

Children and the Environment:

- Healthy Home, Healthy Child Activity Book from Columbia Center for Children's Environmental Health
- Kitchen Activities for 2-5 years of age – USDA
- Crack the Secret Code – USDA

- Healthy Tips for Picky Eaters – USDA
- Phrases that Help and Hinder – USDA
- Resources from Clean and Healthy NY
 - Heavy Metals and Safer Child Care
 - Chemicals and You – What to do?
 - Healthy Toys for Safer Child Care
 - Eco- Healthy Child Care – Plastics and Plastic Toys
 - Healthy Kitchens for Safer Child Care
 - Getting Ready for Baby – Furnishings and Rugs
- Ten Tips to Create Healthier Environments for Children- Children’s Environmental Health Network

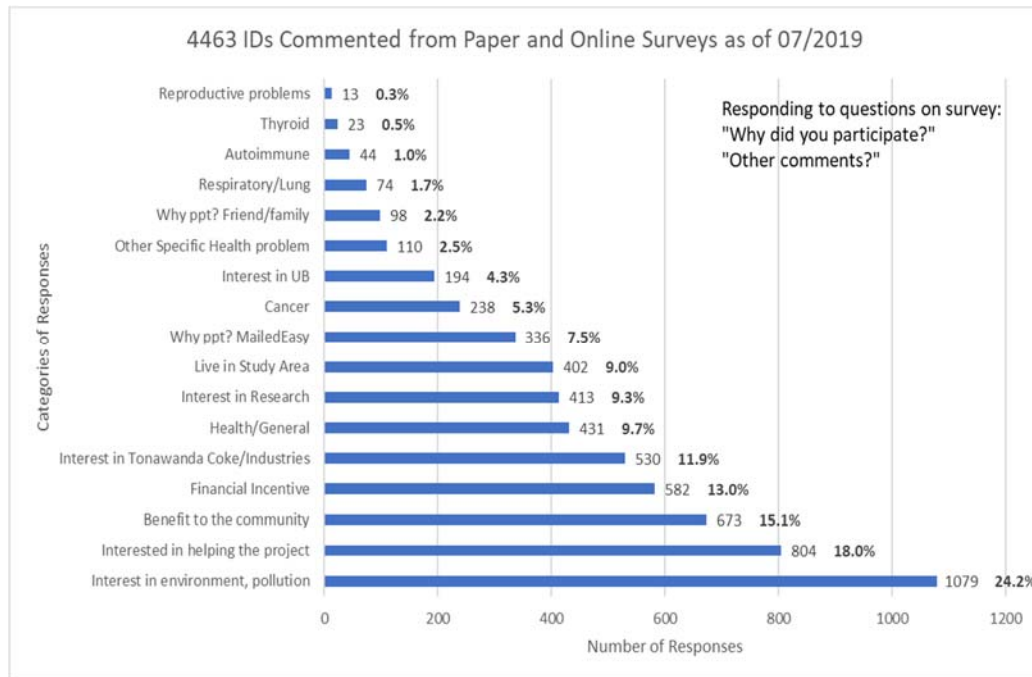
Women’s Health

- Women’s Health and the Environment – What We Know- Clean and Healthy NY

Baseline Questionnaire Comment Analysis:

We also wanted to learn from people who participated in the study. Two questions were included in the baseline questionnaire: *Why did you participate?* and *Other Comments*. Responses were open-ended in which people could write in whatever they wished. To date, 6,172 records were analyzed from both on-line responses and paper questionnaires. In total, 4,463 participants filled in one or both of these questions. These responses helped us to understand the motivation of why people participated. This information will help us focus our educational efforts as well as communicate to others in the community why it is important to participate.

These responses were coded and results are as follows:



Newsletters:

We contracted with ARG Survey Services, Inc. to print and mail newsletters to study participants' households in the Spring and Fall, 2019. In addition to our study participants, we also email the newsletters to the elected officials of the City and Town of Tonawanda and Grand Island. The newsletters are currently available on our website (<https://ehstudy.buffalo.edu/study-info/newsletters>). We plan to continue to release two newsletters per year.

Our fall newsletter was mailed on October 31st, 2019.

3. Retrospective Occupational Cohort Study

We learned in the Fall of 2018 that TCC would not be submitting its final payment to UB for this project. This represents nearly a 18% decrease in the budget. With this reduction in budget, we have been working to accomplish as much of the original project as possible, however, a reduction in the scope of our activities is inevitable. We have been discussing among the research team, community advisory committee and the scientific advisory committee about the impact of the reduction in funding and we will be developing our plans for any changes in the scope of activities. A likely candidate for scaling back activities is the retrospective occupational cohort aim of this project because TCC is closed and the existence of the employment records is suspect. In addition, in discussion with the Scientific Advisory Committee the scientific and community value for such a study was questioned because coke oven workers have been extensively studied and the limited resources might be better utilized in other aspects of the project.

New Key Personnel and Staff:

Dr. Meng Wang, Assistant Professor, Department of Epidemiology and Environmental Health joined the research team as a Co-Investigator on April 1st.

Donna Wysokenski started on January 7, 2019 as our Environment and Health Education Coordinator.

Rachael Gray started on March 18, 2019 as another research support specialist.

We have 13 graduate and undergraduate students on staff who focus on data entry and assist with educational outreach efforts.

Starting in Spring semester, 2020, we are planning on partnering with UB's dietetic internship program to have a team of interns develop, continuously evaluate and modify a nutrition and wellness curriculum designed specifically for our study population.

To further increase our accrument of biospecimens, we are posting for additional staff to conduct phone calls and assist with the logistics in scheduling appointments. We are also posting for an additional education/outreach position to bolster those activities as well.

Appendices:

- A. Dr. Meng Wang's exposure assessment approach
- B. SAC meeting minutes
- C. CAC meeting minutes
- D. 4/15/2017 Progress report submitted to the US Probation and Pre-trial Services
- E. 10/15/2017 Progress report submitted to the US Probation and Pre-trial Services
- F. 4/15/2018 Progress report submitted to the US Probation and Pre-trial Services
- G. 10/15/2018 Progress report submitted to the US Probation and Pre-trial Services