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The Vermont-New Hampshire Alliance for Prevention of Carbon Monoxide Incidents

Carbon Monoxide Alliance

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Introduction

Carbon monoxide (CO) is a deadly byproduct of the fuel-burning process.^{1,2} In homes, many commonly used appliances such as gas furnaces, gas and propane heaters, clothes dryers, stoves, and gasoline-powered generators and even automobiles produce CO.³⁻⁵ Improper installation of heating systems, damage to appliances, or insufficient ventilation in a house are factors that can expose individuals to dangerous levels of CO.² Since CO is an odorless, tasteless, and colorless gas, human detection of CO is nearly impossible without a CO detector.^{1,5} Moreover, symptoms of CO poisoning include headache, dizziness, weakness, upset stomach, vomiting, chest pain, and confusion, and are symptoms that can easily be mistaken for the flu.^{1,5} If undetected, elevated levels of CO exposure can ultimately result in unconsciousness and even death.¹ In fact, annually in the United States, CO poisoning is responsible for approximately 500 unintentional non-fire-related deaths and 15,000-50,000 non-fatal emergency department visits.⁶ CO incidents are dangerous and potentially fatal situations, but they are also preventable.

Background

Due to a recent number of fatal CO incidents in the Vermont and New Hampshire bi-state region, *The Vermont-New Hampshire Alliance for Prevention of Carbon Monoxide Incidents* (CO Alliance) was developed in 2015. Specifically, a close-call CO incident on September 18, 2014, motivated Norwich, Vermont resident, Norman Miller, to plant the seed for what would eventually become the CO Alliance. Since the fall of 2015, Deb Samaha MPH, RN the director of the Injury Prevention Center at Dartmouth and Ardis Olson MD, Professor of Pediatrics and Professor of Community and Family Medicine at Geisel School of Medicine at Dartmouth, have led the early stages of the CO Alliance, co-convening the monthly meetings since January 2016. The dedicated stakeholders of the CO Alliance include CO victims and representatives from public health, medicine, state agencies (e.g. division of fire safety), and businesses (e.g. fuel dealers associations). Together, the mission of the CO Alliance is to understand the preventable structural and personal causes of CO in the bi-state region and take action to remedy them.

Although the scope for the CO Alliance focuses on CO incidents in Vermont and New Hampshire (VT/NH), CO safety is a national public health issue. However, there are regional differences in types of heating systems that can increase the likelihood of CO exposure in particular regions across the United States. For example, fuel-based heating systems (e.g. gas, oil, kerosene, propane, wood, or charcoal) are commonly used during the cold winters in the Northeast and Midwest regions, while electric heating systems (i.e. do not produce CO) are used primarily in the South.^{2,7} Still, as CO is responsible for more poisoning fatalities each year than all other toxic agents, any household with a fuel-burning source has the potential to become exposed to CO.⁸ Thus, the efforts of the CO Alliance have both a local and national public health impact.

Summary of Literature

One of the most important strategies for preventing future CO incidents involves increasing public education on CO safety. In particular, it is important for the public to be knowledgeable about the types of situations that commonly result in CO exposure. For example,

residents should recognize that it is not the presence of a fuel-burning source alone that exposes a household to CO; rather, it is if the fuel-burning source is not functioning properly (i.e. there is a leakage), is being used incorrectly, or if there is insufficient ventilation that exposes a household to dangerous levels of CO.² Thus, CO safety must reach beyond simply understanding what CO sources exist in a household to understanding safe maintenance of these CO sources. However, common behavior among residents is to neglect such maintenance of CO sources.⁸ Thus, some articles have recommended interventions that focus on service personnel from gas companies (e.g. certified technicians), to provide annual or frequent inspections of common household CO sources such as old furnaces and heating and cooking appliances.^{9,10}

Opportunities to increase routine inspection and maintenance of CO sources by certified technicians would certainly provide one layer of safety for households. Still, another layer of safety is needed in the event that CO exposure occurs, especially since CO is an odorless, colorless, and tasteless gas.¹¹ For instance, a broken furnace was found to be the source of CO exposure for a couple in Pembroke, New Hampshire in February 2016.¹² Reportedly, there had even been a recent visit by a repairman for the furnace, but the husband remarked, “It’s probably not his fault. Maybe if in the process they would all do a last-time check of the nozzle,” acknowledging that maintenance of the furnace was but one layer of prevention.¹² In fact, it was the CO detector that woke up the wife, while the husband was still fast asleep, allowing her to call emergency services while the couple evacuated the house.¹² Therefore, the CO detector served as another layer of CO safety.¹²

Multiple articles and the Center for Disease Control and Prevention (CDC) recommend the installation of CO detectors in households.^{5,8,13} However, one study found that only 29% of American households had CO detectors; in contrast, 97% of American households had at least one smoke detector.² Since the CO detector industry is relatively young, advocacy for CO detectors has not yet matched the prevalence of smoke detectors, but lessons learned from successful promotion of smoke detectors should also be applied to the promotion of CO detectors.^{2,10} Additionally, the public health campaign for CO safety could be partnered with that for fire safety if not only because both campaigns recommend installation of detectors but also because CO is in fact found in the smoke produced by all types of fires.¹⁰ Thus, many of the deaths that are associated with fires are suspected to be caused by CO poisoning.¹⁰ Moreover, calls to fire departments are common regarding CO incidents, so the opportunity for CO safety to be promoted alongside fire safety is promising.^{14,15}

Lastly, it is important to recognize that patterns of extreme weather such as severe snow storms, hurricanes, and floods also indirectly impact the incidence of CO.¹³ Articles have examined various cases in which an increased number of CO incidents are observed following extreme weather, and the explanation for this pattern is that resulting power outages increase the likelihood that residents utilize fuel-burning appliances (e.g. generators and space heaters) as a means to provide heat or electricity as necessary.^{13,16,17} Of particular concern, is the unsafe use of generators that causes CO incidents.¹⁸ Proper ventilation of fuel-burning appliances is critical to CO safety, especially when it comes to using a generator, which is recommended to be placed at a minimum of 20 feet outside the home.¹³ Even placing a generator outside in an attached garage,

near open doors or windows, or near the air conditioning vent puts residents at risk for CO poisoning because the exhaust from a typical portable generator (5.5 kW) is equal to that of 6 idling automobiles.¹³ Thus, the importance of CO safety cannot be stressed enough. Since CO incidents are observed to be most prevalent during the winter season and since severe snow storms also occur during the winter season, articles have suggested that public service announcements about CO safety and warnings about CO poisoning be included in a range of media coverage (e.g. television news, print news, and radio) to create a culture of CO safety.^{16,17}

Methodology

In contribution to the CO Alliance, the role of the Master of Public Health (MPH) intern was to conduct interviews with key stakeholders and to collect preliminary data on the epidemiology of CO incidents in VT/NH. Four interviews were conducted: 1) Norman Miller, CO victim and original instigator for the CO Alliance 2) William (Bill) Degnan, NH State Fire Marshal 3) Bruce Martin, Regional Manager of VT Division of Fire Safety and 4) Joseph (Joe) Rose, President of Propane Gas Association of New England (PGANE).

Two types of semi-structured interview guides were designed: one to capture the CO victim's story and the second to capture the stakeholder's contribution to the CO Alliance. Both interview guides were designed and revised by the intern and her two preceptors (**Appendix I**). Each interview was designed to last approximately one hour, scheduled at a time and place convenient to the interviewee, and audio-recorded with the interviewee's permission. Each interview was saved as an .MP3 file, analyzed into an individual summary, and also collated into one overall summary (**Appendix II**). An exception to the summaries was that a summary was not made of Norman Miller's story as a CO victim. Two interviews were done with Norman Miller since he was both a victim of CO and a key stakeholder of the CO Alliance. Since he had already personally drafted a detailed version of his CO story (for the Upper Valley News), the interview regarding his story as a victim was shortened and only conducted to educate the intern.

Although there are various data sources that potentially represent CO incidents (e.g. EMS calls, ED visits, Poison Center calls), it was decided to utilize fire department calls recorded in the National Fire Incident Reporting System (NFIRS). In order to represent even the CO incidents that did not require medical attention, it was agreed that NFIRS would capture most of the CO incidents that occurred. Further, since it is a mandatory reporting system for all fire departments in the United States, it would be possible to compare VT and NH data. NFIRS data for CO incidents was requested for both VT and NH for each year from 2010-2015 for every city/town.

Summary of Results

The summary contains the perspectives and opinions of four key stakeholders regarding nine domains: 1) CO Alliance Governance Structure 2) Funding Streams 3) Top 3 Priorities for CO Alliance 4) CO Legislation in VT/NH 5) Additional Stakeholders to Involve 6) CO Incidents Data 7) Intervention Ideas 8) Summit Meeting in November 2016 and 9) Feedback on CO Alliance.

CO Alliance Governance Structure

The CO Alliance seeks to avoid creating hierarchical structures so as to view all stakeholders as equal partners. The current governance structure will remain, in which there are two co-conveners, and the potential for a director of the CO Alliance is not preferred but remains as an option. The exact stakeholder composition of the CO Alliance is still in flux, and the creation of a “briefing book” that would provide background information to new members is suggested. A task-oriented strategy of operations, in which tasks are developed and assigned to smaller groups within the CO Alliance, is agreed by all interviewees as an effective strategy for the CO Alliance.

Funding Streams

Currently, the funds to initiate the CO Alliance have been provided by pilot funding from Norman Miller and family that is set to last for one year (ending in fall of 2016). The need to find additional funding streams was deemed important by all interviewees. One possible funding stream mentioned was to inquire of victims of CO incidents (e.g. the Lieb-Lapen family), who may have a desire to fund initiatives toward the prevention of CO incidents. Another possible funding stream is through a portion of the PGANE budget that Joe Rose has authority over; however, he clarified that this funding stream is best utilized for short-term, direct investments such as the purchasing of carbon monoxide detectors rather than long-term investments. A third possible funding stream is public health sources at the state and federal level. Lastly, a possible funding stream is possible the Poisoning Protection Act that Bill Degnan is working on approving in D.C.

Top 3 Priorities for CO Alliance

Among the four interviewees, the following three priorities were described:

1) Education

It was unanimously agreed that increased education regarding CO safety was a top priority. However, the interviewees had different target audiences in mind. Different audiences included: the general public, school-aged children, and technicians. A strong desire among the interviewees was for educational material to be made available, whether newly created or already existing, so that the CO Alliance could disseminate the material accordingly. Joe Rose was particularly interested in educational material that could be provided for technicians so that they could either spend a moment sharing CO safety suggestions with the residents of the household or at least leave such materials behind in the house.

2) Media

A second priority of the CO Alliance would be to have a robust media campaign regarding CO safety. It was expressed that creative outlets should be considered to communicate CO safety to the public- outlets ranging from print and online media, press, a series of articles, television, case studies, YouTube videos, photography, and film. It was highly suggested that the media strategies that were successful for other public health issues like tobacco prevention be utilized for CO prevention.

3) Policy

The third priority of the CO alliance involves comparing the policies around the nation that have already been implemented to prevent CO incidents in order to implement the most effective policies in VT and NH without “reinventing the wheel”. In particular, both Bill Degnan and Bruce Martin voiced that better enforcement of safety codes is an area where policy improvements could be made. It was also hoped that legislation around CO safety, especially focused on installation of CO detectors, be strengthened in both VT and NH.

CO Legislation in VT/NH

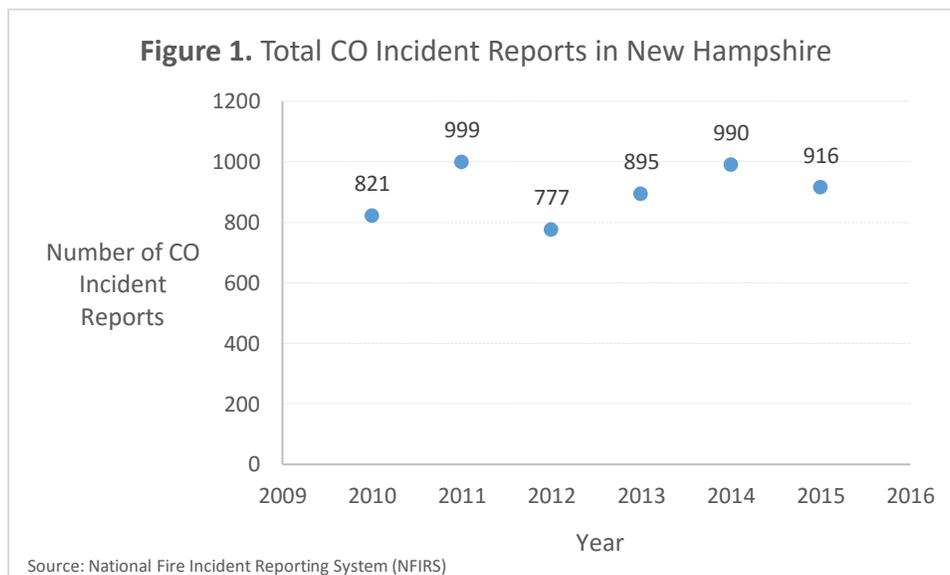
Currently, legislation in both VT and NH requires that all new construction and existing rental properties, apartments, hotels, and dorms have CO detectors installed. Further, in VT, the legislation also mandates that CO detectors must be installed upon sale or transfer of property. NH does not have such a clause yet in place, and Bill Degnan hopes that NH can add a “sale/transfer” clause as VT has. However, in both states, assurance of compliance with existing CO safety legislation cannot be determined since state agencies are not allowed to inspect single-family homes.

Additional Stakeholders to Involve

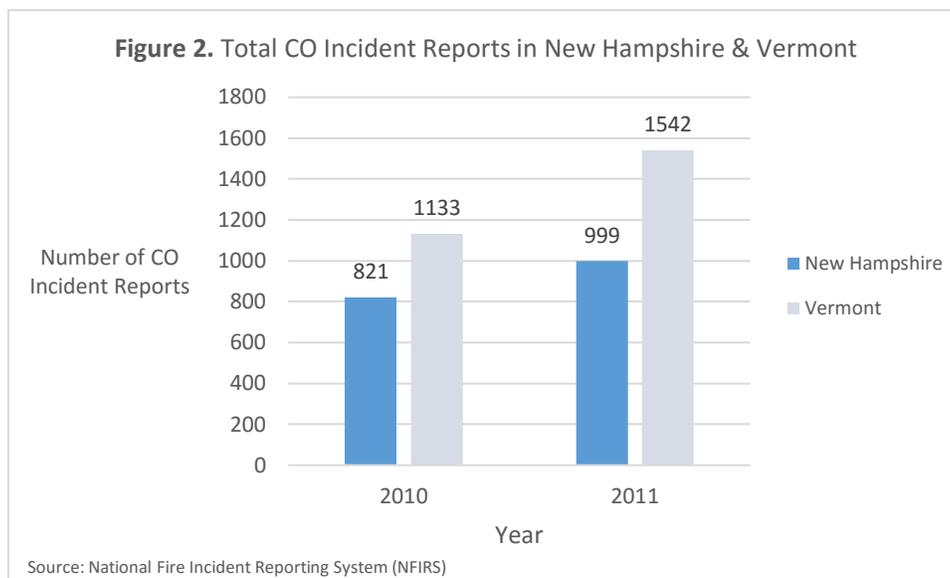
Interviewees were asked to think of any other stakeholders who are not yet included in the CO Alliance. The additional stakeholders to involve included: primary care providers, VT/NH Fire Chief Associations, fire department representatives, state building officials, technical training school representatives (for heating systems of fuel industry), fuel company representatives, and Vermont Leagues of Cities and Towns.

CO Incidents Data

Bill Degnan was able to provide NFIRS data for each city/town in NH for each year from 2010-2015 from which the total for each year was calculated. **Figure 1.** below represents the total CO incident reports in New Hampshire from 2010-2015.



However, comparable data for VT was not yet obtainable. Instead, VT NFIRS data up to 2011 was available, so state-level total CO incidents could be compared between VT and NH was from 2010-2011 (**Figure 2.**).



Intervention Ideas

Innovative ideas were drawn from the interviewees. One example was based on the “Midas Courtesy Check” that is performed by the auto-repair shop, Midas, to check that basic components of your vehicle were safe. Similarly, a “courtesy check” could be designed for technicians to check that basic components of a household were CO-safe. Another idea was to work with local schools to insert short-film (3-4 min) projects into the curriculum regarding CO safety. Yet another idea was to collaborate with fire safety educators on an annual CO safety poster contest and calendar, modeled after the existing poster contest and calendar that is done on fire safety. Lastly, other partnerships and venues to consider included: Health Occupations Students of America (HOSA), Eagle Scouts, American Red Cross (New Hampshire and Vermont Region), undergraduate and graduate students, Tunbridge World’s Fair (September), Gas Exhibition (August), Dartmouth Home Show (March), and the Home Show in Champlain Valley Fair.

Summit Meeting in November 2016

There was a lot of confusion among the interviewees regarding what the summit meeting in November of 2016 was, so it was clear that further discussion regarding this summit meeting needed to become an item at the CO Alliance’s monthly meetings. Clarity was needed on the vision, feasibility, and responsibility of the summit meeting.

Feedback on CO Alliance

The two areas of improvement that were suggested were to send out the meeting minutes sooner for more immediate reflection and to begin focusing on specific tasks that can become actionable. Regarding the creation of tasks, it was understood that the CO Alliance was still in an early stage, but a desire to progress towards actionable tasks was expressed: “*There have been a*

lot of ideas all over the place, so now it's time to focus down into what it is we're actually going to do."

Lastly, it was unanimously agreed that the efforts of the CO Alliance thus far were productive and laudable, especially given that the creation of a new workgroup is inherently complex. The energy and willingness of individuals to show up and contribute to the meetings was appreciated by all the interviewees: *"Everyone seems to respect each other, despite different disciplines and backgrounds."* It was recognized by all the interviewees that each stakeholder believed in the mission of the CO Alliance and thus valued the potential of the CO Alliance.

Recommendations and Next Steps

Based on the summary of literature and the summary of interviews, there are three recommendations that the CO Alliance should consider pursuing. First, there is an opportunity to explore a collaborative intervention with the American Red Cross that serves the bi-state region. Currently, the American Red Cross has a campaign targeting fire safety by providing free smoke detectors and installation in homes (Red Cross Home Fire Preparedness Campaign). It would be worthwhile to connect with individuals from the American Red Cross to see if such an intervention could be expanded or additionally designed similarly for targeting CO safety, providing free CO detectors and installation in homes. Additionally, if, through donations and funding, free CO detectors were available to be distributed, other collaborators to include could be the local fire departments to serve as volunteers to provide the installations. Even if a campaign for CO safety cannot be fulfilled, inquiring of a partnership with the American Red Cross still seems like a worthwhile venture with the possibility for even more ideas.

Second, the technicians who come to service and repair heating systems, furnaces, and other appliances in households are in a unique position to spread CO safety education and prevention. In other words, although state agencies cannot inspect homes to ensure that a household is compliant with CO safety measures such as proper ventilation and CO detectors that are installed and operational, technicians do have the opportunity to scan a house for CO safety measures during their visit. Since the CO Alliance has key stakeholders from the fuel industry realm, it is possible to design a new workflow for technicians by which the technicians could bring with them CO safety educational materials to every house either to leave in the house if no one is home or if someone is home, to guide them through CO safety suggestions (i.e. the idea of doing a "CO Safety Courtesy Check"). Better yet would be if CO detectors could be provided (through donations or funding) and given for free when a technician finds a household without a CO detector. Joe Rose mentioned that the idea of the technicians actually installing the CO detector may receive pushback since CO detector installation is an additional activity that the technician is not paid to do, but he thought the idea of technicians supporting an educational role in CO safety was feasible.

Third, seeing that the historic success of public health initiatives relies heavily on communication and media coverage, the CO Alliance should strive to develop a professional CO safety media campaign. In order to accomplish such a media campaign, it would be strategic for the CO Alliance to seek out talent in the field of communication studies, advertisement, and/or

marketing. Undergraduate and graduate students at surrounding universities in the bi-state region would be a great resource to recruit talent. The media campaign could take form in many ways: through short film clips, case write-ups, articles in the Upper Valley News, flyers, and public service announcements on television and radio to name a few.

These three recommendations are but three potential next steps that the CO Alliance could take. As the CO Alliance continues to meet each month, it will become clearer as to which recommendations are most feasible and supported by the group. The important reminder will be to determine a mechanism by which each implemented intervention will be measured for impact.

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Appendix

Appendix I. Interview Guides

Interview Guide: CO Victim's Story

Interviewed by: Joelle Jung **Interviewee:** _____ **Interviewed on:** _____

Opening Statement for Interview: [5min]

Hi. I'm Joelle Jung, and I am a student at The Dartmouth Institute getting my Masters in Public Health (my MPH). I am working as an intern with the Carbon Monoxide (CO) Alliance, and one of my roles is to conduct interviews with stakeholders, like yourself, regarding carbon monoxide.

There will be two parts to our interview session today- Part I will focus on your story with carbon monoxide and Part II will focus on your contribution to the CO Alliance. Each part will take one hour (45 minutes using questions from my interview guide, and 15 minutes for information aside from the guide). So, in total after both parts, the interview session will last two hours.

The mission of the CO Alliance is to better understand the preventable structural and personal causes of carbon monoxide incidents in the VT/NH region and to take action to remedy them, in hopes of reducing carbon monoxide incidents. Thus, your perspective will be very valuable! Thank you again for participating.

With your permission, I will be recording our conversation today with this recorder so that I can get your experiences in your own words. Recording also helps me to be able to focus on our conversation rather than take lots of notes. The recordings will be saved and maintained securely, and once the recordings have been transcribed, the recordings will be deleted. The information you provide may be used in the future by the CO Alliance, and if you would like further clarification for how and when the information would be used, you may contact, Debra Samaha or Dr. Ardis Olson. So does this all sound alright to you?

Great, and I want to remind you that your participation in the interview is completely voluntary, so you may ask to stop the interview at any time and choose not to answer questions. So all that being said, do you have any questions for me before we begin?

Alright, so I'll keep my eye on the time since we have a lot to cover- I'll make sure we stay on track and end in two hours. Once I turn on the recorder, I'm going to state a few facts including both of our names and the date. Here we go.

Interview Guide:

Main question: Share your story with carbon monoxide.

Background [5min]

Start recording.

Joelle Jung here who has the privilege of interviewing Norman Miller on Monday, April 4th.

1. So Norman, before I ask you to share your carbon monoxide story, can you please tell me a little about yourself? What do you like to do? (*after ~2min, shift to next question- these are meant to be warm up questions*)
2. How long have you lived in Norwich (and the Upper Valley)? How long have you lived in this house?
 - a. **Transition:** Great, thanks for sharing all of that. Now that I know a little bit about you, I want you to walk me through your carbon monoxide story.

Personal Story [30min]

3. First, if we can just start with the context. When did your story take place- date and time, if you remember? Location?
4. Now, can you please share what your carbon monoxide story was from your perspective. I have specific questions regarding why and such for after, but to start, I'd like to hear the story from your perspective. What happened?
 - a. **Probe:** *probe as necessary about "what happened"; if possible try not to stray too much into other perspectives (like the furnace techs) yet or the "what should have been done" or the "blame game of root cause"*
 - b. **Probe:** So to clarify, [] was concluded as the source of carbon monoxide exposure. And to make sure I understood your story, [recap the story in one sentence].
5. What were you feeling when [] was happening?
6. What actions (legal or advocacy) did you take after your exposure with carbon monoxide?
 - a. **Transition:** Thank you so much for sharing your carbon monoxide story.

Carbon Monoxide Message [10min]

7. Was this your first encounter with a carbon monoxide issue? In this house? In your lifetime?
8. Were you aware of the potential health dangers of carbon monoxide before this incident?
 - a. **Probe:** How aware do you think your neighbors are? Those in VT/NH? The public?
9. What message would you like to convey to others regarding your story with carbon monoxide?

Wrap-Up [15min]

10. Alright, we're just about reaching time, so before we close, is there anything else you wanted to tell me about your carbon monoxide story?

Thank you so much for sharing your story! Before we move onto Part II of our interview session, would you like to take a quick five minute stretch or bathroom break?

End recording.

Interview Guide: CO Alliance Stakeholder Contribution

Interviewed by: Joelle Jung **Interviewee:** _____ **Interviewed on:** _____

Opening Statement for Interview: [5min]

Hi. I'm Joelle Jung, and I am a student at The Dartmouth Institute getting my Masters in Public Health (my MPH). I am working as an intern with the Carbon Monoxide (CO) Alliance, and one of my roles is to conduct interviews with stakeholders, like yourself, regarding carbon monoxide.

The focus of our conversation today will be on how you personally and as a representative can contribute to the CO Alliance. The interview will take one hour (50 minutes using questions from my interview guide, and 10 minutes for information aside from the guide).

The mission of the CO Alliance is to better understand the preventable structural and personal causes of carbon monoxide incidents in the VT/NH region and to take action to remedy them, in hopes of reducing carbon monoxide incidents. Thus, your perspective will be very valuable! Thank you again for participating.

With your permission, I will be recording our conversation today with this recorder so that I can get your experiences in your own words. Recording also helps me to be able to focus on our conversation rather than take lots of notes. The recordings will be saved and maintained securely, and once the recordings have been transcribed, the recordings will be deleted. The information you provide may be used in the future by the CO Alliance, and if you would like further clarification for how and when the information would be used, you may contact, Debra Samaha or Dr. Ardis Olson. So does this all sound alright to you?

Great, and I want to remind you that your participation in the interview is completely voluntary, so you may ask to stop the interview at any time and choose not to answer questions. So all that being said, do you have any questions for me before we begin?

Alright, so I'll keep my eye on the time since we have a lot to cover- I'll make sure we stay on track and end in an hour. Once I turn on the recorder, I'm going to state a few facts including both of our names and the date. Here we go.

Interview Guide:

Main question: Share how you will contribute to the CO Alliance.

Contact Information [5min]

Ask them to fill out a sheet of the following contact information

- Name:
- Title:
- Organization:
- Mailing address:
- Phone:
- Email:

Context & Contribution [20min]

1. What sector or discipline do you represent on the CO Alliance?
2. How did you first become involved in the CO Alliance?
3. What role do you see yourself playing in the CO Alliance? How do you think you can best contribute within the CO Alliance?
4. What informational items can you or have you already shared with the CO Alliance? (e.g. data, printed materials, stories)

- a. *We need a robust inventory of items- name + purpose*
 - b. Wanting data from 2010-present (2016)
5. What additional resources can you bring to this alliance? (e.g. funding, grant writing skills, personnel, volunteers, products such as CO monitors, access to other groups to deliver education/interventions, training materials)
 6. Can you tell me about specific CO issues you have seen at the front-line?

Expectations & Future [25min]

7. What are the top three priorities that you want the CO Alliance to focus on?
8. Can you tell me about the legislation regarding CO in VT/NH?
9. Now, regarding CO policy in VT/NH, what do you see as strengths and weaknesses in VT/NH?
10. What policy recommendations would you like to see moving forward?
 - a. **Examples:** codes, industry, educational materials
 - b. **Probe:** How do you see [] happening? What is your role? Would you participate in making [] happen?
11. What other community organizations do you know of that the CO Alliance should work with to increase awareness in the region about the risks of carbon monoxide?
 - a. **Probe:** Are there other stakeholders that still need to become involved? If so will you take responsibility for contacting them?
12. Would you be interested in piloting a community intervention in the summer or fall, for example?
 - a. **Probe:** Who would be some personal contacts that would help execute this intervention?
 - b. **Example:** Piloting interventions in the areas on the map that were “poor performers”
13. Would you be interested in providing the fire departments with an educational opportunity regarding CO?
14. The group has talked about a Summit Meeting in November 2016. What do you envision as the goals and structure of that summit meeting?
 - a. **Probe:** What role can you play in the summit meeting? What resources can you offer to support the summit meeting? (e.g. site location, food, speaker support, materials)

Feedback & Wrap-Up [10min]

15. How do you think the CO Alliance has performed thus far?
 - a. **Probe:** List positives and negatives.
16. Moving forward, what should the CO Alliance do differently to be more productive?
 - a. **Probe:** What role are you willing to play to help [] happen?
17. Alright, we’re just about reaching time, so before we close, is there anything else I should know?

Thank you so much for sharing with me. If I have any questions for clarification in the future, do you mind if I get in contact with you again? Wonderful, thank you again for your time- these interviews will be valuable to the CO Alliance!

End recording.

Appendix II. Interview Summaries

Stakeholder Summary

Based on four interviews: Norman Miller, Bill Degnan, Bruce Martin, and Joe Rose

CO Alliance Structure

- Mission: The CO Alliance seeks to understand the preventable structural and personal causes of carbon monoxide incidents in our region and take action to remedy them.
- Vision: *Model of education dissemination that is scalable*
 - Improved education for public and heating technicians
- Without hierarchy; with consensus
 - Where all stakeholders viewed as equal as partners hence an Alliance
 - Membership structure is still under consideration
- WHO model
 - Briefing book: all the available materials for background, key issues on the topic
 - Library of case studies (2-4pg)
 - Interviews (i.e. summaries, notes, transcripts)
 - Articles (i.e. form journals, press)
 - Data
- Task-Oriented: need to develop tasks
 - Potential Tasks
 - Menu of CO Messages
 - Vision 2020
 - Red Cross
 - Case Studies
 - Prepared Comments for Press
 - Fundraising
- Sustainability

Funding Streams

- Current
 - Norman Miller & family – pilot funding for one year (currently at halfway)
- Potential
 - CO survivors
 - Public health sources at state and federal level
 - Fuel dealers association for educational training materials
 - Poisoning Protection Act

Top 3 Priorities for CO Alliance

1. Education
 - a. Have enough content (need to decide on which content and have it available) but need the right dissemination/distribution strategies
 - b. Design and implement a pilot test for educational materials in middle and high schools
 - c. Education of both the public and the technicians
 - d. Well-crafted public education materials to create public exposure around the need for CO detectors to protect your family: a safety issue
2. Media Campaigns
 - a. Print and online media, press, series of articles, TV, stories, YouTube, photography, film

- i. Look to tobacco prevention for ideas
- 3. Policy
 - a. Compare/contrast CO safety implementation in other states
 - b. Enforcement of the codes
 - c. Strengthening legislation

CO Legislation in VT/NH

- VT Title 20
 - If you build a new apartment building, you have to have CO alarms
 - If you have an existing building that you rent units in, you also have to have CO alarms
 - However, they can't go into and check single family homes so the statute for that says that if you build new after 2005 or sale/transfer after 2005 then have to have CO alarms
- NH RSA 153: 10A
 - Legislation passed few years ago requiring CO alarms in all new construction and in any existing rental properties or apartments or hotels or dorms
 - Can't inspect/go into single family dwellings while people are living in it, even though law says must have; they inspect the dwelling as newly constructed
 - Weakness: he thinks there should be inspection upon sale or transfer of the property for working CO alarms
 - Because that offers a time when you can get into these dwellings and check without being labeled as "intrusive"
 - This is a clause in the VT law
 - Q: What was that process like for VT to add in the "sale or transfer" bit?
- Similarity:
 - Cannot go into single family homes, so how can we use other avenues to inspect/install/maintain CO detectors
 - Aka what are other points of entry?

Current CO Alliance Stakeholders

- Fuel dealers' association
- Survivors group
- State fire marshals
- State health departments
- Medical profession
- Public health professor
- Injury prevention professional
- University of Vermont or University of New Hampshire

Other Stakeholders to Involve

- Fuel companies
- VT/NH Fire chief associations
- Fire departments
- NH Building Officials
- Technical training schools (of heating systems of fuel industry)
- Primary care providers
- Vermont Leagues of Cities and Towns

Data: CO Incidents in VT/NH from 2010-2015

- NFIRS
 - Have NH
 - Action Item: Get parallel VT data
- Add an economic component (i.e. the cost of not installing a CO alarm)

Ideas

- Midas Courtesy Check
- School children creating an educational 3-4 min video about CO issues
- HOSA
- Eagle Scouts
- Red Cross Campaign
- Undergraduate/graduate connections
- VT Annual Fire Safety Poster Contest & Calendar for CO
- Get towns involved by capitalizing on existing community events
 - Tunbridge World's Fair in September
 - Gas exhibition in August
 - Dartmouth Home Show in March
 - Home Show in Champlain Valley Fair in Essex

Summit Meeting in November 2016

- Need to clarify what it is (separate it from other conference-like gatherings) and the vision
- Discuss feasibility and commitment; project leads

Feedback on CO Alliance Thus Far

- Minutes could come out a little sooner after the meeting for more immediate reflection
 - There have been a lot of ideas all over the place, so now it's time to focus down into what it is we're actually going to do
 - Put the other ideas in a parking lot
 - Very impressed with energy and willingness of individuals to come to the meetings so far
 - Everyone seems to respect each other, despite different disciplines and backgrounds
-
- **Theme so far (being the third interview): Who is responsible for CO safety?**

Action Items

- What is the vision?
- What are the tasks?
 - Who owns which tasks- project leads?
- How will the CO Alliance be sustainable?
- Where will further funding come from?
- Consensus on the 3 priorities (*based on 3 interviews*)
- Consensus on stakeholder membership
- Consensus on absence of a sole director (i.e. leadership structure)
- Consensus on Summit Meeting in Nov 2016
- Get VT NFIRS data from 2010-2015 for each year for each town

