## SUPPLEMENTAL MATERIALS

## Supplemental Figure 1: Diagram of Sample Selection Process

Records queried from NPDS during 2014-2016 related to unintentional residential CO exposure: N=788

Records with medical outcomes ‘Confirmed non-exposure’ and ‘Unrelated effect’ were removed (n=38)

Records with case notes suggesting exposure did not occur were removed (n=22)

Records where exposure was not residential (e.g., outside or while driving a car) were removed (n=18)

Records deemed irrelevant (e.g., occupational exposure, non-CO exposures, duplicate records) were removed (n=7)

Records with no mention of the presence or absence of a CO detector in case notes were removed (n=295)

Final sample: n=408

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Supplemental Table 1a. Individual demographic and outcome characteristics by CO detector status (Mention vs non-mention) | | | | | | | |
|  | CO Detectors NOT Mentioned | | CO Detector Mentioned (Presence/Absence) | | Total | |  |
|  |  |
|  |  |
|  | N | %a | N | %a | N | %b | P-Valuec |
| TOTAL | 295 | 42.0 | 408 | 58.0 | 703 | 100.0 | - |
| Year |  |  |  |  |  |  |  |
| 2014 | 97 | 42.4 | 132 | 57.6 | 229 | 32.6 | 0.9853 |
| 2015 | 119 | 41.6 | 167 | 58.4 | 286 | 40.7 |
| 2016 | 79 | 42.0 | 109 | 58.0 | 188 | 26.7 |
| Gender |  |  |  |  |  |  |  |
| Male | 139 | 46.5 | 160 | 53.5 | 299 | 42.8 | 0.043 |
| Female | 155 | 38.9 | 244 | 61.2 | 399 | 57.2 |
| Age Category |  |  |  |  |  |  |  |
| <=5 | 42 | 37.8 | 69 | 62.2 | 111 | 17.9 | 0.0433 |
| 6-19 | 68 | 47.9 | 74 | 52.1 | 142 | 22.9 |
| 20-59 | 138 | 42.7 | 185 | 57.3 | 323 | 52.1 |
| 60+ | 27 | 61.4 | 17 | 38.6 | 44 | 7.1 |
| Poisoning Status |  |  |  |  |  |  |  |
| Poisoned | 194 | 53.7 | 167 | 46.3 | 361 | 51.4 | <.0001 |
| Not poisoned | 68 | 35.4 | 124 | 64.6 | 192 | 27.3 |
| Unknown (Lost to follow-up) | 33 | 22.0 | 117 | 78.0 | 150 | 21.3 |
| Medical Outcome |  |  |  |  |  |  |  |
| Major effect and Death | 6 | 100.0 | 0 | 0.0 | 6 | 0.9 | - |
| Moderate effect | 46 | 79.3 | 12 | 20.7 | 58 | 8.3 |
| Minor effect | 142 | 47.8 | 155 | 52.2 | 297 | 42.3 |
| No effect | 68 | 35.4 | 124 | 64.6 | 192 | 27.3 |
| Unknown (Lost to follow-up) | 33 | 22.0 | 117 | 78.0 | 150 | 21.3 |
| a Calculated as a row percent | | | | | | | |
| b Calculated as a column percent | | | | | | | |
| c Chi-square test statistic, chi-square not calculated on certain categories due to low cell counts | | | | | | | |

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| **Supplemental Table 1b. Event level demographic, exposure, and outcome characteristics by CO detector status (Mention vs non-mention)** | | | | | | | | | |
|  | CO Detectors NOT Mentioned | | | | CO Detector Mentioned | | Total | |  |
|  |  |
|  |  |
|  | N | | %a | | N | %a | N | %b | P-Valuec |
| TOTAL | 169 | | 45.4 | | 203 | 54.6 | 372 | 100.0 | - |
| Year |  | |  | |  |  |  |  |  |
| 2014 | 54 | | 44.6 | | 67 | 55.4 | 121 | 32.5 | 0.9585 |
| 2015 | 62 | | 45.3 | | 75 | 54.7 | 137 | 36.8 |
| 2016 | 53 | | 46.5 | | 61 | 53.5 | 114 | 30.7 |
| Persons Exposed per Event |  | |  | |  |  |  |  |  |
| 1 | 112 | | 50.2 | | 111 | 49.8 | 223 | 60.0 | 0.0283 |
| 2 | 25 | | 43.1 | | 33 | 56.9 | 58 | 15.6 |
| 3 | 9 | | 22.5 | | 31 | 77.5 | 40 | 10.8 |
| 4 | 11 | | 42.3 | | 15 | 57.7 | 26 | 7.0 |
| 5+ | 12 | | 48.0 | | 13 | 52.0 | 25 | 6.7 |
| Poisoning Event |  | |  | |  |  |  |  |  |
| 1+ | 131 | | 54.1 | | 111 | 45.9 | 242 | 65.1 | <.0001 |
| 0 | 21 | | 30.0 | | 49 | 70.0 | 70 | 18.8 |
| Unknown (Lost to follow-up) | 17 | | 28.3 | | 43 | 71.7 | 60 | 16.1 |
| Caller Site |  | |  | |  |  |  |  |  |
| Health Care Facility | 73 | | 70.9 | | 30 | 29.1 | 103 | 27.7 | - |
| Residence | 78 | | 35.3 | | 143 | 64.7 | 221 | 59.4 |
| Other | 18 | | 37.5 | | 30 | 62.5 | 48 | 12.9 |
| Poisoning Event |  | |  | |  |  |  |  |  |
| 1+ | 131 | | 54.1 | | 111 | 45.9 | 242 | 65.1 | <.0001 |
| 0 | 21 | | 30.0 | | 49 | 70.0 | 70 | 18.8 |
| Unknown (Lost to follow-up) | 17 | | 28.3 | | 43 | 71.7 | 60 | 16.1 |
| Most Severe Medical Outcome |  | |  | |  |  |  |  |  |
| Major effect and Death | 6 | | 100.0 | | 0 | 0.0 | 6 | 1.6 | - |
| Moderate effect | 30 | | 79.0 | | 8 | 21.1 | 38 | 10.2 |
| Minor effect | 95 | | 48.0 | | 103 | 52.0 | 198 | 53.2 |
| No effect | 21 | | 30.0 | | 49 | 70.0 | 70 | 18.8 |
| Unknown (Lost to follow-up) | 17 | | 28.3 | | 43 | 71.7 | 60 | 16.1 |
| Exposure Area |  | |  | |  |  |  |  |  |
| Camper/RV | 1 | | 25.0 | | 3 | 75.0 | 4 | 1.1 | - |
| Garage | 33 | | 75.0 | | 11 | 25.0 | 44 | 11.8 |
| Home | 128 | | 40.5 | | 188 | 59.5 | 316 | 85.0 |
| Other enclosed area (e.g. shed) | 7 | | 87.5 | | 1 | 12.5 | 8 | 2.2 |
| CO Source |  | |  | |  |  |  |  |  |
| Cigarette/hookah | 0 | | 0.0 | | 3 | 100.0 | 3 | 0.8 | - |
| Fire or smoke from something burning | 63 | | 87.5 | | 9 | 12.5 | 72 | 19.4 |
| Furnace or water heater | 26 | | 33.8 | | 51 | 66.2 | 77 | 20.7 |
| Gas ovens/stoves/burners | 6 | | 25.0 | | 18 | 75.0 | 24 | 6.5 |
| Not mentioned or unknown | 31 | | 24.8 | | 94 | 75.2 | 125 | 33.6 |
| Other gas powered equipment (e.g. fireplace, generator, grill) | 21 | | 72.4 | | 8 | 27.6 | 29 | 7.8 |
| Vehicle exhaust (e.g. cars, farm equipment) | 22 | | 66.7 | | 11 | 33.3 | 33 | 8.9 |
| Wood burning fireplace or wood burning stove | 0 | | 0.0 | | 9 | 100.0 | 9 | 2.4 |
| a Calculated as a row percent | | | | | | | | | |
| b Calculated as a column percent | | | | | | | | | |
| c Chi-square test statistic | | | | | | | | | |

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| **Supplemental table 2a. Logistic regression analyses showing the odds of CO poisoning by detector status and covariates.** | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|  | OR | 95% CI | | OR | 95% CI | | OR | 95% CI | | OR | 95% CI | |
| INDIVIDUAL LEVEL |  |  |  |  |  |  |  |  |  |  |  |  |
| CO detector alarm status |  |  |  |  |  |  |  |  |  |  |  |  |
| No CO detector present | **3.23** | **1.51** | **6.94** | **2.56** | **1.15** | **5.71** | **2.69** | **1.19** | **6.06** | **3.13** | **1.36** | **7.21** |
| CO detector did not alarm | **2.40** | **1.26** | **4.59** | **2.28** | **1.08** | **4.82** | **2.35** | **1.10** | **5.02** | **2.99** | **1.37** | **6.52** |
| CO detector alarmed (Reference) | - | - | - | - | - | - | - | - | - | - | - | - |
| Sex |  |  |  |  |  |  |  |  |  |  |  |  |
| Male | - | - | - | - | - | - | 0.64 | 0.36 | 1.13 | 0.67 | 0.38 | 1.20 |
| Female (Reference) | - | - | - | - | - | - | - | - | - | - | - | - |
| Age |  |  |  |  |  |  |  |  |  |  |  |  |
| <=5 (Reference) | - | - | - | - | - | - | - | - | - | - | - | - |
| age 6-19 | - | - | - | **2.87** | **1.23** | **6.71** | **3.14** | **1.31** | **7.51** | **3.11** | **1.26** | **7.64** |
| 20-59 | - | - | - | **4.07** | **1.96** | **8.48** | **4.01** | **1.91** | **8.41** | **4.54** | **2.10** | **9.82** |
| 60+ | - | - | - | **8.17** | **1.48** | **45.11** | **7.98** | **1.43** | **44.40** | **8.19** | **1.41** | **47.70** |
| Caller Site |  |  |  |  |  |  |  |  |  |  |  |  |
| Health care facility (Reference) | - | - | - | - | - | - | - | - | - | - | - | - |
| Other | - | - | - | - | - | - | - | - | - | **0.27** | **0.12** | **0.59** |
| EVENT LEVEL |  |  |  |  |  |  |  |  |  |  |  |  |
| CO detector alarm status |  |  |  |  |  |  |  |  |  |  |  |  |
| No CO detector present | **4.95** | **1.40** | **17.55** | **5.68** | **1.58** | **20.47** | - | - | - | - | - | - |
| CO detector did not alarm | 2.12 | 0.84 | 5.39 | 2.54 | 0.98 | 6.59 | - | - | - | - | - | - |
| CO detector alarmed (Reference) | - | - | - | - | - | - | - | - | - | - | - | - |
| Caller Site |  |  |  |  |  |  |  |  |  |  |  |  |
| Health care facility (Reference) | - | - | - | - | - | - | - | - | - | - | - | - |
| Other | - | - | - | **0.12** | **0.03** | **0.54** | - | - | - | - | - | - |
| **Bolded text** indicates statistically significant result | | | | | | | | | | | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Supplemental table 2b. Linear regression analyses showing the β estimates for outcome severity by detector status and covariates.** | | | | | | | | | | |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|  | β estimate | 95% CI | | β estimate | 95% CI | | β estimate | 95% CI | | β estimate | 95% CI | |
| INDIVIDUAL LEVEL |  |  |  |  |  |  |  |  |  |  |  |  |
| CO detector alarm status |  |  |  |  |  |  |  |  |  |  |  |  |
| No CO detector present | **0.353** | **0.168** | **0.538** | **0.353** | **0.167** | **0.538** | **0.291** | **0.099** | **0.483** | **0.325** | **0.141** | **0.510** |
| CO detector did not alarm | **0.194** | **0.027** | **0.361** | **0.205** | **0.036** | **0.374** | 0.158 | -0.023 | 0.340 | **0.229** | **0.053** | **0.405** |
| CO detector alarmed (Reference) | - | - | - | - | - | - | - | - | - | - | - | - |
| Sex |  |  |  |  |  |  |  |  |  |  |  |  |
| Male | - | - | - | - | - | - | 0.079 | -0.064 | 0.221 | 0.062 | -0.075 | 0.199 |
| Female (Reference) | - | - | - | - | - | - | - | - | - | - | - | - |
| Age |  |  |  |  |  |  |  |  |  |  |  |  |
| <=5 (Reference) | - | - | - | **-0.588** | **-0.978** | **-0.198** | **-0.581** | **-0.974** | **-0.189** | **-0.531** | **-0.908** | **-0.155** |
| age 6-19 | - | - | - | -0.288 | -0.674 | 0.099 | -0.263 | -0.652 | 0.126 | -0.235 | -0.608 | 0.137 |
| 20-59 | - | - | - | -0.213 | -0.581 | 0.156 | -0.211 | -0.581 | 0.158 | -0.151 | -0.506 | 0.204 |
| 60+ | - | - | - | - | - | - | - | - | - | - | - | - |
| Caller Site |  |  |  |  |  |  |  |  |  |  |  |  |
| Health care facility (Reference) | - | - | - | - | - | - | - | - | - | - | - | - |
| Other | - | - | - | - | - | - | - | - | - | **0.402** | **0.236** | **0.568** |
| EVENT LEVEL |  |  |  |  |  |  |  |  |  |  |  |  |
| CO detector alarm status |  |  |  |  |  |  |  |  |  |  |  |  |
| No CO detector present | **0.343** | **0.117** | **0.569** | **0.366** | **0.152** | **0.579** | - | - | - | - | - | - |
| CO detector did not alarm | 0.150 | -0.064 | 0.364 | 0.196 | -0.007 | 0.400 | - | - | - | - | - | - |
| CO detector alarmed (Reference) | - | - | - | - | - | - | - | - | - | - | - | - |
| Caller Site |  |  |  |  |  |  |  |  |  |  |  |  |
| Health care facility (Reference) | - | - | - | - | - | - | - | - | - | - | - | - |
| Other | - | - | - | **0.471** | **0.261** | **0.680** | - | - | - | - | - | - |
| **Bolded text** indicates statistically significant result | | | | | | | | | | | | |