**Supplemental Materials**

**Table S1. Knowledge, attitudes and practices household survey administered by mail in Sumter County, South Carolina – May, 2012**

\* Order of presentation of answer choices reversed on “B” version of the survey for questions 19 and 20.

|  |
| --- |
| **Sumter County Knowledge Attitude and Practices Survey**  If possible, please return your survey by July 15.  Please answer all questions based on what you knew before receiving this survey.  One adult (aged 18 years or older) per household should complete the survey. The survey should take 5 to 10 minutes to complete. Place an “X” in the box next to your answer choice for each question. Answer all questions as completely as you can. We will use this information to understand rabies and wildlife education needs in your community  1. Before receiving this mailing, had you heard about a disease called rabies? (please mark ONE answer)  [ ] Yes [ ] No  If “Yes”, please continue to Question 2. If “No”, please skip to Question 8.  2. What happens to MOST people who become ill with rabies? (please mark ONE answer)  [ ] Death  [ ] Recovery after a hospital stay  [ ] No hospital stay, but need a doctor visit  [ ] Resolves without doctor visit  [ ] Don’t know  3. Which of the following animals could give you rabies? (Please mark ALL that apply)x=1  [ ] Cow [ ] Bat [ ] Raccoon [ ] Possum [ ] Turtle [ ] Bird [ ] Horse  [ ] Dog [ ] Fox [ ] Skunk [ ] Deer [ ] Squirrel [ ] Snake [ ] Cat  4. If you were to encounter a rabid animal, which of the following types of contact with the animal could give you rabies?  (please mark ONE answer in EACH ROW)  a. Being bitten by the animal?…………………………….………................... [ } Yes [ ] No [ ] Don’t know  b. Contact with the animal’s feces or urine on unbroken skin?...... [ } Yes [ ] No [ ] Don’t know  c. Contact with the animal’s feces or urine on an open wound?.... [ } Yes [ ] No [ ] Don’t know  d. Contact with the animal’s blood on unbroken skin?……….………. [ } Yes [ ] No [ ] Don’t know  e. Contact with the animal’s blood on an open wound?……….…….. [ } Yes [ ] No [ ] Don’t know  f. Contact with the animal’s saliva on unbroken skin?…………………. [ } Yes [ ] No [ ] Don’t know  g. Contact with the animal’s saliva on an open wound?………………. [ } Yes [ ] No [ ] Don’t know  h. Contact with skunk spray?............................................................ [ } Yes [ ] No [ ] Don’t know  5. If you were exposed to a rabid animal, please describe three things you would do (for example, how you would treat the wound or who you might contact). Describe these actions in the order you would perform them.  a.  b.  c.  6. If you are exposed to a rabid animal, approximately how many vaccine injections would your doctor give you to prevent you from getting rabies? (please mark ONE answer)  [ ] 1-3 [ ] 4-5 [ ] 6-9 [ ] 10-15 [ ] >15 [ ] Don’t Know  7. If you are exposed to a rabid animal, where on your body are vaccinations given? (please mark ALL that apply)  [ ] Stomach [ ] Upper Arm [ ] Leg [ ] Buttocks [ ] Don’t know  Questions 8-12 concern one or more bats LIVING (visiting repeatedly and spending time inside the structure during the daytime) in an area of your home such as the attic, gables or eaves  8. Have you had one or more bats LIVING in your home any time between January, 2010 and today (the day you  are completing this survey)? (please mark ONE answer) [ ] Yes [ ] No [ ] Don’t know  If “Yes”, please continue to Question 9. If “No”, then please skip to Question 11 .  9. Please place an “X” next to the approximate seasons during which you had one or more bats LIVING in your home.  (please indicate BOTH the year(s) and season(s) of each year, if known)  [ ] 2010: [ ] Winter (Dec, Jan, Feb) [ ] Spring (Mar, Apr, May) [ ] Summer (Jun, July, Aug) [ ] Fall (Sept, Oct, Nov)  [ ] 2011: [ ] Winter (Dec, Jan, Feb) [ ] Spring (Mar, Apr, May) [ ] Summer (Jun, July, Aug) [ ] Fall (Sept, Oct, Nov)  [ ] 2012: [ ] Winter (Dec, Jan, Feb) [ ] Spring (Mar, Apr, May) [ ] Summer (Jun, July, Aug) [ ] Fall (Sept, Oct, Nov)  10. Have you attempted to remove the bats LIVING in your home? (please mark ONE answer)  [ ] Yes, I/we successfully removed the bats. [ ] Yes, but I/we did not succeed in removing the bats  [ ] No [ ] Other (please describe below)  If removal was attempted, accomplished or you answered “Other”, please describe:      11. Do you know how to prevent bats from LIVING in your home or attic? (please mark ONE answer)  [ ] Yes [ ] No  12. Does South Carolina have laws about how or when bats LIVING in your home can be removed?  (Please mark ONE answer) [ ] Yes [ ] No [ ] Don’t know  Questions 13-18 concern a bat entering an area of your home that people occupy, such as bedroom, living room, kitchen, bathroom etc., rather than one or more bats LIVING in your home  13. Have you/your family found a bat inside your home any time between January, 2010 and today (the day you are completing this survey)? (please mark ONE answer) [ ] Yes [ ] No [ ] Don’t know  If “Yes”, please continue to Question 14. If “No”, please skip to Question 19.  14. Did anyone have direct physical contact with the bat (ex. touch or hold the bat)? (please mark ONE answer)  [ ] Yes [ ] No [ ] Don’t know  If “Yes”, please describe what happened:    15. Was anyone bitten or scratched by the bat? (please mark ONE answer)  [ ] Yes [ ] No [ ] Don’t know  If “Yes”, please describe what happened:    16. Was anyone asleep in the room where the bat was found while the bat was present? (please mark ONE answer)  [ ] Yes [ ] No [ ] Don’t know  If “Yes”, please describe what happened:    17. Did you capture the bat that was in your home and/or submit it for rabies testing? (please mark ONE answer)  [ ] Yes, I/we captured the bat and released it outside  [ ] Yes, I/we captured the bat and submitted it to the health department for rabies testing  [ ] No, the bat escaped/left on its own  [ ] Other (please describe):  18. Did you/your family seek any additional assistance after finding the bat in your home? (please mark ONE answer)  If “Yes”, please describe who you contacted for assistance:    **\*If someone in your household had direct physical contact with a bat or was asleep in a room with a bat AND has NOT yet been evaluated by a medical professional, please contact your personal physician and call CDC information at 1.800.232.4636 for assistance.\***  \*19. Where would you seek assistance with removing bats from your home or preventing bats from entering your home?  (please mark ALL that apply)  [ ] Animal control [ ] Internet [ ] US Fish and Wildlife Service  [ ] Book or the library [ ] Police or sheriff [ ] Veterinarian  [ ] Department of Natural Resources [ ] Private pest removal service [ ] Wildlife charity or organization  [ ] Friends or family members [ ] State or local public health office [ ] Would not seek assistance  [ ] Hospital, clinic or doctor [ ] US Centers for Disease Control [ ] Other:  \*20. Where would you seek assistance if a bat bit you/someone in your family? (please mark ALL that apply)  [ ] Animal control [ ] Internet [ ] US Fish and Wildlife Service  [ ] Book or the library [ ] Police or sheriff [ ] Veterinarian  [ ] Department of Natural Resources [ ] Private pest removal service [ ] Wildlife charity or organization  [ ] Friends or family members [ ] State or local public health office [ ] Would not seek assistance  [ ] Hospital, clinic or doctor [ ] US Centers for Disease Control [ ] Other:  21. During what time or times of year do bats give birth to young in South Carolina? (please mark ALL that apply)  [ ] Winter (Dec, Jan, Feb) [ ] Spring (Mar, Apr, May) [ ] Summer (Jun, July, Aug) [ ] Fall (Sept, Oct, Nov) [ ] Don’t know  Questions 25-30 refer to yourself (the one adult who is filling out this survey).  23. What is your sex? (please mark ONE answer) [ ] Male [ ] Female  24. How old are you? (please mark ONE answer) [ ] 18-25 [ ] 26-45 [ ] 46-65 [ ] ≥66  25. How many years have you lived in South Carolina? (please mark ONE answer)  [ ] 2 years or less [ ] 3-9 years [ ] ≥10 years  26. How many people live in your household (including yourself)? \_\_\_\_\_\_  27. What is the highest level of education you completed: (please mark ONE answer)  [ ] Graduate school or professional degree [ ] College degree [ ] Some college  [ ] High school graduate or equivalent [ ] Less than high school  28. What is your zip code? (Please provide your 5 digit zip code): \_\_ \_\_ \_\_ \_\_ \_\_ |

**Table S2. Analysis of survey delivery and response rates by zip code of household**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Zip Code (City)** | **N Total in Sample** | **Col % of N Total** |  | **N Return-to-Sender** | **Col % Return-to-Sender** |  | **N Surveys Delivered** | **Col % of Surveys Received** |  | **N Surveys Completed** | **Col % Surveys Completed a** |  | **Response Rate by Zip Code (row %)** |
| 29150 (Sumter)\* | 2179 | 36.12% |  | 615 | 32.96% |  | 1564 | 37.54% |  | 214 | 35.85% |  | 13.67% |
| 29154 (Sumter)\* | 1427 | 23.65% |  | 284 | 15.22% |  | 1143 | 27.42% |  | 181 | 30.32% |  | 15.84% |
| 29153 (Sumter) | 920 | 15.25% |  | 278 | 14.90% |  | 642 | 15.40% |  | 70 | 11.73% |  | 10.90% |
| 29040 (Dalzell)\* | 498 | 8.25% |  | 173 | 9.27% |  | 325 | 7.80% |  | 59 | 9.88% |  | 18.15% |
| 29128 (Rembert) | 338 | 5.60% |  | 171 | 9.16% |  | 167 | 4.01% |  | 16 | 2.68% |  | 9.58% |
| 29168 (Wedgefield) | 239 | 3.96% |  | 127 | 6.81% |  | 112 | 2.69% |  | 14 | 2.35% |  | 12.50% |
| 29080 (Lynchburg) | 132 | 2.19% |  | 53 | 2.84% |  | 79 | 1.89% |  | 10 | 1.68% |  | 12.66% |
| 29125 (Pinewood) | 130 | 2.15% |  | 71 | 3.80% |  | 59 | 1.42% |  | 5 | 0.84% |  | 8.47% |
| 29104 (Maysville) | 92 | 1.52% |  | 61 | 3.27% |  | 31 | 0.74% |  | 2 | 0.34% |  | 6.45% |
| 29114 (Olanta) | 35 | 0.58% |  | 15 | 0.80% |  | 20 | 0.48% |  | 2 | 0.34% |  | 10.00% |
| 29152 (Shaw AFB) | 22 | 0.36% |  | 8 | 0.43% |  | 14 | 0.34% |  | 0 | 0.00% |  | 0.00% |
| 29051 (Gable) | 19 | 0.31% |  | 9 | 0.48% |  | 10 | 0.24% |  | 1 | 0.17% |  | 10.00% |
| 29162 (Turbeville) | 3 | 0.05% |  | 1 | 0.05% |  | 2 | 0.05% |  | 1 | 0.17% |  | 50.00% |
| 29151 (P.O. Box) | - | - |  | - |  |  | - | 0.00% |  | 4 | 0.67% |  | - |
| Zip Code Not Provided | - | - |  | - |  |  | - | - |  | 17 | 2.85% |  | - |
| TOTAL | 6033 | 100.00% |  | 1866 | 100.00% |  | 4167 | 100.00% |  | 597 | 100.00% |  | 14.33% |

a There was no significant difference between the distribution of surveys delivered and the distribution of surveys completed by zip-code (Fisher’s exact test, p=0.116). There was a significant difference in the zip-code distribution of surveys in the original sample of 6033 surveys compared to the zip-code distribution of surveys completed and returned by respondants (Fisher’s exact test, p<0.001), suggesting that the survey data are not entirely geographically representative due to differential return-to-sender rates. Survey results may have a geographic bias that cannot be controlled for in these analyses.

\* Dalzell (29040) and Sumter (29150 and 29154) were the two cities in which bats were reported in homes in this survey. These three zip codes also represent the areas with the largest number of households that received a larger proportion of the surveys. There is insufficient sample size in this study to explore spatial patterns in bat colonization rates due to the low prevalence of this event and the possible sampling effort bias by zip code.

**Table S3. Comparison of survey respondents to Sumter County and South Carolina populations a**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Sumter County**  **(%)** | **South Carolina**  **(%)** |  |  | **Survey Population**  **(%)** |
| *Sex* |  |  |  | *Sex* |  |
| Female | 51.9% | 51.4% |  | Female | 64.2% |
| Male | 48.1% | 48.6% |  | Male | 34.2% |
|  |  |  |  |  |  |
| *Age* |  |  |  | *Age* |  |
| 15-24 | 19.1% | 17.7% |  | 18-25 | 2.0% |
| 25-44 | 32.1% | 32.0% |  | 26-45 | 22.3% |
| 45-64 | 32.0% | 33.0% |  | 46-65 | 47.1% |
| ≥ 65 | 16.5% | 16.9% |  | ≥ 66 | 27.0% |
|  |  |  |  |  |  |
| *Education (25 and older only)* |  |  |  | *Education (25 and older only)* |  |
| Less than high school | 18.2% | 17.0% |  | Less than high school | 21.1% |
| High school graduate or equivalent | 33.4% | 31.2% |  | High school graduate or equivalent | 27.3% |
| Some college | 21.5% | 19.5% |  | Some college | 26.2% |
| College degree | 20.6% | 23.8% |  | College degree | 21.1% |
| Graduate school or professional degree | 6.2% | 8.4% |  | Graduate school or professional degree | 4.23% |
|  |  |  |  |  |  |
| *Total number of people in household* |  |  |  | *Total number of people in household* |  |
| Average household size | 2.67 | 2.51 |  | Average household size | 2.45 |
| Margin of error | 0.04 | 0.01 |  | Margin of error (SEM) | 0.05 |

a Sumter County demographics obtained from the US Census 2010 (demographics) and the American Community Survey (housing, economic and social factors): <http://quickfacts.census.gov/>

**Table S4. Summary of actions that respondents indicated they would take if exposed to a rabid animal a**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Category** | **All responses**  **N (%)** | **Ranked 1st**  **N (%)** | **Ranked 2nd**  **N (%)** | **Ranked 3rd**  **N (%)** |
| a. | Performing wound care (Table S3a) | 321 (59.8%) | 243 (45.2%) | 123 (22.9%) | 25 (4.7%) |
| b. | Seeking medical attention (Table S3b) | 509 (94.8%) | 212 (39.4%) | 222 (41.3%) | 177 (33.0%) |
| c. | Actions concerning the rabid animal (Table S3c) | 110 (20.5%) | 50 (9.3%) | 34 (6.3%) | 37 (6.9%) |
| d. | Who to call for help (non-medical) (Table S3d) | 207 (38.5%) | 40 (7.4%) | 87 (16.2%) | 115 (21.4%) |

a N=537 for denominator in all percentages and percentages will not necessarily sum to 100% across a column. For all responses, the numerator counts any mentions of activities in each category by each respondent across all three fields. For Ranked columns, column percentages may not add to 100% because not all respondents provided three ranked responses and some provided more than one activity per response field.

**Table S5. Concept breakdown by categories of actions that respondents indicated they would take if exposed to a rabid animal**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **a. Performing wound care – Summary (all responses)**   |  |  | | --- | --- | | **Concepts/Keywords** | **Percent a** | | Wash/Clean, method unspecified | 34.0% | | Apply a bandage, wrap or covering | 16.6% | | Wash/Clean with soap and water | 16.6% | | Apply antiseptic/antibiotic/disinfect | 8.9% | | Wash/Clean with peroxide | 5.8% | | Wash/Clean with alcohol | 4.9% | | Wash/Clean with water or flush | 4.3% | | Apply a tourniquet | 2.9% | | Treat the wound, method unspecified | 2.5% | | “Bleed” wound | 1.1% | | Stop the bleeding | 0.7% | | Assess wound | 0.7% | | Apply compression | 0.4% | | Apply salt | 0.2% | | Wash/Clean with iodine | 0.2% | | Apply ice | 0.2% |   **b. Seeking medical attention – Summary (all responses)**   |  |  | | --- | --- | | **Concepts/Keywords** | **Percent** | | Call or go to the doctor or nurse | 29.1% | | Call or go to the Emergency Room | 26.1% | | Call or go to the hospital | 20.6% | | Call 911 | 11.1% | | Seek medical care (unspecified) | 9.2% | | Get shots or rabies shots | 3.5% | | Get a tetanus shot | 0.1% | | Take antibiotics | 0.1% | | Take Benadryl | 0.1% | |
| **c. Actions concerning the rabid animal – Summary (all responses)**   |  |  | | --- | --- | | **Concepts/Keywords** | **Percent** | | Report or describe the animal to authorities/neighbors | 30.9% | | Capture the animal | 27.5% | | Kill the animal | 26.2% | | Have the animal tested (method unspecified) | 12.1% | | Have the animal's blood tested | 0.7% | | Observe the animal | 0.7% | | Burn the carcass | 0.7% | | Submit the animal's head for testing | 0.7% | | Do not capture | 0.7% |   **d. Who to call for help (non-medical) – Summary (all responses)**   |  |  | | --- | --- | | **Concepts/Keywords** | **Percent** | | Animal control | 35.2% | | Local or state public health | 22.9% | | Police or sheriff | 13.8% | | Centers for Disease Control | 8.7% | | Authorities - unspecified | 7.5% | | Family/friends | 5.1% | | Department of Natural Resources | 2.4% | | Veterinarian | 2.0% | | Neighbors | 1.2% | | US Fish and Wildlife Service | 0.4% | | Poison control | 0.4% | | Animal's owner | 0.4% | |

a Percentages were calculated as the total number of times a key word or concept was mentioned across all free-text responses divided by the total number of distinct comments placed in the category. One individual can contribute more than one key word or concept in the same category. For example, if a person wrote: “Clean wound with soap and water and wrap with gauze”, the response would be categorized as “Wash/Clean with soap and water” and “Apply a bandage, wrap or covering”.

**Table S6. Analysis of survey version effects on selection of resources for assistance with issues related to bats or bat exposures**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Number** | **Percenta** | **Version Effect**  **(p-value) b** | **Version A**  **A🡪Z (%)** | **Version B**  **Z🡪A (%)** |
| *Would seek assistance with removing bats from his/her or preventing bats from entering the home (N=yes, would use)* |  |  |  |  |  |
| Animal control | 434 | 72.7% | <0.001\* | 80.4% | 63.9% |
| Private pest removal service | 321 | 53.8% | 0.573 | 53.7% | 55.7% |
| State or local public health office | 244 | 40.9% | 0.175 | 39.1% | 44.3% |
| US Centers for Disease Control | 194 | 32.5% | 0.292 | 31.1% | 35.2% |
| Internet | 162 | 27.1% | <0.001\* | 34.0% | 20.2% |
| Department of Natural Resources | 158 | 26.5% | 0.914 | 26.7% | 27.1% |
| Police or sheriff | 135 | 22.6% | 0.170 | 25.4% | 20.2% |
| Friends or family members | 105 | 17.6% | 0.665 | 18.7% | 16.9% |
| US Fish and Wildlife Service | 88 | 14.7% | 0.065\*\* | 12.4% | 18.0% |
| Veterinarian | 63 | 10.6% | 0.501 | 9.8% | 11.7% |
| Wildlife charity or organization | 62 | 10.4% | <0.001\* | 6.4% | 15.4% |
| Hospital, clinic or doctor | 41 | 6.9% | 0.192 | 5.7% | 8.4% |
| Book or the library | 34 | 5.7% | 0.381 | 6.7% | 4.8% |
| Would not seek assistance | 16 | 2.7% | 0.200 | 1.9% | 3.7% |
|  |  |  |  |  |  |
| *Would seek assistance if a bat bit him/her or someone in his/her family (N=yes, would use)* |  |  |  |  |  |
| Hospital, clinic or doctor | 547 | 91.6% | 1.000 | 92.7% | 90.4% |
| State or local public health office | 232 | 38.9% | 0.122 | 36.3% | 41.8% |
| US Centers for Disease Control | 216 | 36.2% | 1.000 | 36.6% | 35.7% |
| Animal control | 180 | 30.2% | <0.001\* | 36.9% | 22.5% |
| Police or sheriff | 95 | 15.9% | 0.653 | 16.7% | 15.0% |
| Department of Natural Resources | 52 | 8.7% | 0.887 | 8.5% | 8.9% |
| Private pest removal service | 48 | 8.0% | 0.132 | 9.8% | 6.1% |
| Internet | 47 | 7.9% | 0.050\*\* | 10.1% | 5.4% |
| Veterinarian | 34 | 5.7% | 0.600 | 6.3% | 5.0% |
| Friends or family members | 33 | 5.5% | 0.718 | 6.0% | 5.0% |
| US Fish and Wildlife Service | 22 | 3.7% | 0.506 | 3.2% | 4.3% |
| Wildlife charity or organization | 18 | 3.0% | 0.232 | 2.2% | 3.9% |
| Book or the library | 6 | 1.0% | 1.000 | 0.9% | 1.1% |
| Would not seek assistance | 1 | 0.2% | 0.462 | 0.0% | 0.4% |

a N=597 for all calculations, however, not all respondents completed all questions. Numbers and percentages represent the total number of respondents that selected each resource over the total number of surveys completed (i.e. 597). Respondents could mark more than one resource, so percentages do not sum to 100% down each column.

b Two survey versions were used for presenting the order of these resources to evaluate bias in selection due to encounter order. The two versions contained the same questions, but for these two items, reversed the order of presentation from alphabetical (Version A) to reverse alphabetical (Version B). Surveys were sent with a 1:1 ratio of survey versions, randomly assigned to recipient addresses and completed surveys were received with an approximately event distribution of survey versions (version A=317 surveys or 53.1% and version B= 280 or 46.9% of the total 597 surveys; Chi-squared test with 2000 simulations to test the actual distribution against a uniform 50% distribution, p=0.293). P-values presented are for Chi-squared test with 2000 simulations (using chisq.test in the base package of R) to compare the percent of persons selecting or not selecting each resource for survey versions A and B to test for bias in responses based on order of presentation of the resource list. A significant p-value indicates a difference in the percent of persons that selected the resource of interest on survey version A versus survey version B.

\* Statistically significant at p<0.05; \*\* Statistically significant at p<0.1.