

# Emergency Preparedness Skills: Human & Social Capital in the Redwood Coast Region

by Jessica Van Arsdale, MD, MPH & Melissa Jones, Esq.

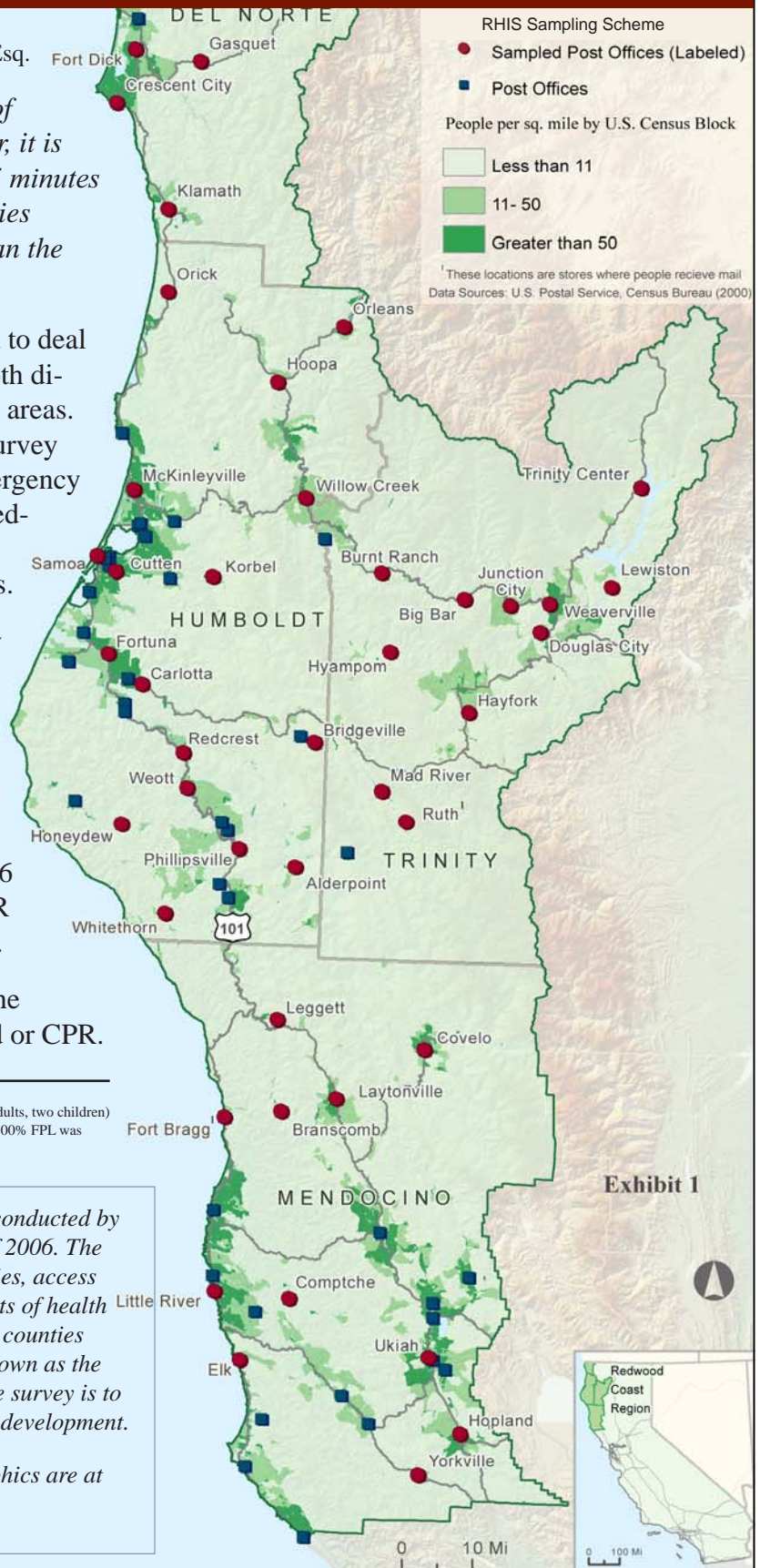
*CPR can double or triple a person's chance of survival from sudden cardiac arrest. However, it is most successful if performed within the first 5 minutes after the collapse.<sup>1</sup> In remote rural communities having a neighbor with these skills could mean the difference between life and death.*

Having community members who are trained to deal with medical emergencies is important for both disaster preparedness and everyday life in rural areas. Results from the Rural Health Information Survey 2006 indicate that there are disparities in emergency preparedness skills among residents of the Redwood Coast Region with vulnerable populations being the least likely to have these skills.

Respondents living below the federal poverty level (FPL)\* were approximately 1.3 times more likely to report no training in First Aid or CPR compared to respondents living at or above 300% FPL.

Elderly respondents were 1.4 times more likely to report no training in First Aid and 1.6 times more likely to report no training in CPR compared to respondents under the age of 65.

In some remote communities, up to 70% of the respondents did not have training in First Aid or CPR.



\* The Federal Poverty Level (FPL) varies by household size. For a family of four (two adults, two children) the 2006 Federal Poverty Level (100% FPL) was \$20,444, 200% FPL was \$40,888 and 300% FPL was \$61,332.

Exhibit 1

*The Rural Health Information Survey (RHIS) was conducted by the California Center for Rural Policy in the fall of 2006. The purpose of the survey was to assess health disparities, access and utilization of healthcare, and other determinants of health among residents in California's four most northern counties – Del Norte, Humboldt, Trinity and Mendocino (known as the Redwood Coast Region - Exhibit 1). The goal of the survey is to provide useful information for planning and policy development.*

*A description of the methods and sample demographics are at the end of this report (Exhibits 11 & 12).*

## Human and Social Capital and Emergency Preparedness

The Rural Health Information Survey asked respondents if they had training in any of the following: First Aid, Cardiopulmonary Resuscitation (CPR), First Responder, Emergency Medical Technician (EMT) or other health related training. Respondents were also asked if anyone else in their community had these types of training.

Sudden cardiac arrest is a leading cause of death in adults in the United States.<sup>2,3</sup> A nationwide study found a decline in the proportion of cardiac deaths occurring in the hospital or in the emergency room between 1989 and 1998, which may reflect improvements in emergency services. This same study also found a concerning trend- an increase in sudden cardiac death occurring outside of the hospital and an increase in sudden cardiac death occurring in women aged 35 to 44 years.<sup>3</sup>

Resuscitation from sudden cardiac arrest is most successful if performed in the first 5 minutes after a collapse. Achieving high survival rates depends on increasing the number of bystanders who are trained and willing to initiate the “chain of survival,” which includes dialing 911, initiating CPR and using automated external defibrillators when available until emergency personnel arrive.<sup>4</sup> CPR can double or triple a person’s chance of survival from sudden cardiac arrest.<sup>1</sup>

In addition to cardiac arrest, there are a myriad of other medical emergencies in which EMT, First Responder or First Aid training can be invaluable in rural areas. Rural roads are vulnerable to closure due to winter flooding, landslides, and harsh weather. Rural life can make it difficult for EMS to arrive on the scene within the necessary response time, thus the need for rural residents to rely on their neighbors and family for help. Community members who are trained to deal with medical emergencies can save lives and are valuable contributors to the human and social capital of the community.

One of the objectives of *Healthy People 2010*\* is to increase the proportion of persons who have access to rapidly responding pre-hospital emergency medical services. In rural areas, this is defined as an interval of less than 10 minutes for at least 80% of EMS responses.<sup>4</sup> In the Redwood Coast Region, the longest response times are 4 hours for Trinity and Mendocino, 3.5 hours for Humboldt, and 1 hour for Del Norte (L. Ward, Office of Emergency Services, Trinity County; C. Frances, Office of Emergency Services, Mendocino County; J. Chand, Eureka Ambulance; J. Smith, Crescent City Fire Department, personal communications April 3, 2008).

### Definitions of Terms

**Human Capital:** *Skills and knowledge acquired by individuals.*<sup>5</sup>

**Social Capital:** *Any aspect of social structure that creates value and facilitates the actions of the individuals within that social structure.*<sup>5</sup>

**First Aid:** *The provision of limited care for an illness or injury.*

**CPR:** *The provision of chest compressions and lung ventilation for a victim of cardiac arrest.*

**Certified First Responder:** *A person who has completed 40-60 hours of training in providing care for basic medical emergencies. They have more skills than someone trained in first aid, but less skills than an EMT.*<sup>6</sup>

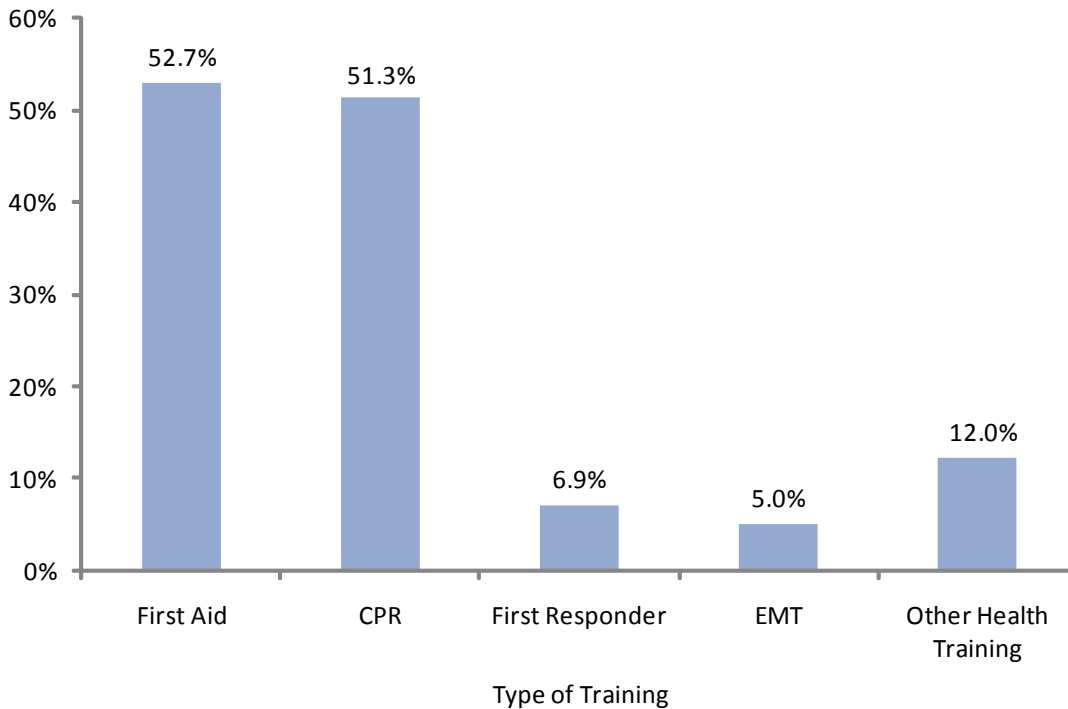
**Emergency Medical Technician (EMT):** *A person who is trained to provide emergency pre-hospital care. There are 4 levels of EMTs ranging from EMT-B (Basic) with at least 128 hours of training to EMT-P (Paramedic) with at least 1,100 hours of training.*<sup>7</sup>

\* *Healthy People 2010* provides a framework for prevention for the Nation. It is a statement of national health objectives designed to identify the most significant preventable threats to health and to establish national goals to reduce these threats.<sup>4</sup> *Healthy People 2020* objectives are currently under development.

# Human and Social Capital and Emergency Preparedness, *cont.*

Results from the Rural Health Information Survey show that within the Redwood Coast Region approximately half of the respondents have training in First Aid (52.7%) or CPR (51.3%). Training as a First Responder or EMT were reported less frequently (6.9% and 5.0% respectively) and other health related training was reported by 12% of respondents (Exhibits 2 & 3).

**Exhibit 2: Emergency Preparedness Skills in the Redwood Coast Region (n=2,947)**



Source: Rural Health Information Survey, 2006, California Center for Rural Policy

**Exhibit 3: Number of Respondents with Emergency Preparedness Skills in the Redwood Coast Region**

All Respondents	Training in First Aid		Training in CPR		First Responder		EMT		Other Health Training	
Frequency	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
2947	1554	52.7	1512	51.3	204	6.9	146	5.0	356	12.0

Source: Rural Health Information Survey, 2006, California Center for Rural Policy

## What does it mean to be statistically significant?

Whenever comparisons are made between groups there is always the possibility of finding a difference simply by chance. In research we like to find “true” differences and not differences that have occurred by chance. By convention, most researchers use a *P*-value of <.05 to determine if a difference is significant. This means there is less than a 5% probability that the difference observed has occurred by chance alone.

# Emergency Preparedness: The Impact of Poverty and Place

*Respondents living at or above 300% poverty were 1.2 times more likely to report having training in First Aid or CPR compared to respondents living below 100% poverty.*

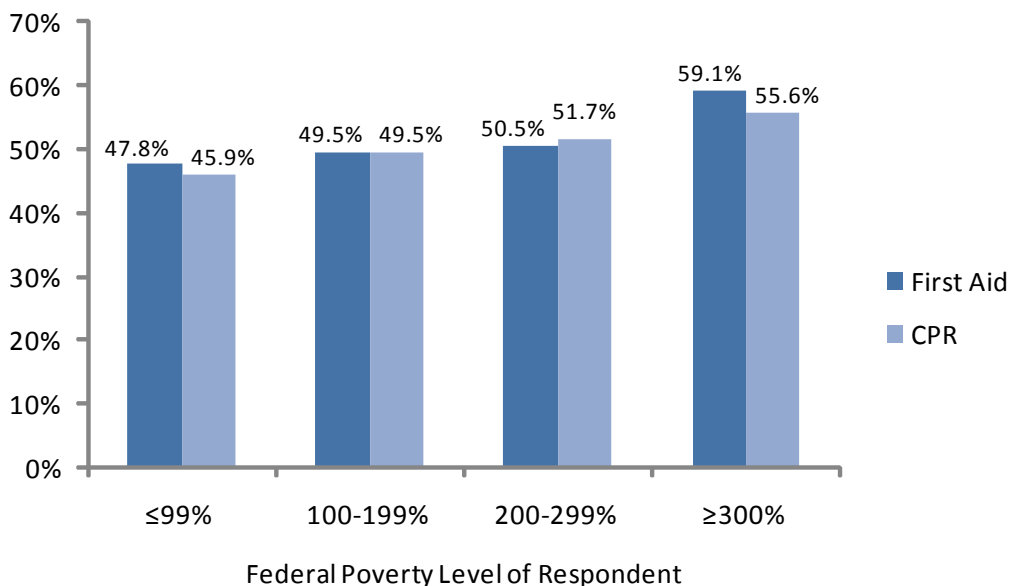
Respondents living below the FPL were the least likely to have training in first aid (47.8%), while those living at above 300% FPL were the most likely to have training in first aid (59.1%). The difference between the first three levels of poverty ( $\leq 99\%$  FPL, 100-199% FPL and 200-299% FPL) is not statistically significant. There is a statistically significant difference between respondents living at or above 300% FPL and the other poverty levels (Exhibits 4 & 5).

Training in CPR followed a similar pattern. Respondents living below the FPL were the least likely to have training in CPR (45.9%), while those living at or above 300% FPL were the most likely to have training in CPR (55.6%). A trend was observed where the likelihood of having training in CPR increased as the poverty level improved. A significant difference was only detected when comparing respondents living below the FPL and those living at or above 300% FPL (Exhibits 4 & 5).

Respondents living below the FPL were the least likely to report first responder or EMT training, however the differences between the poverty levels were not statistically significant (Exhibit 5).

Since the total number of people with first responder or EMT training is small there may not have been a large enough sample size to detect significant differences between the poverty levels.

**Exhibit 4: Training in First Aid or CPR by Federal Poverty Level of Respondents (n= 2,560)**



Source: Rural Health Information Survey, 2006, California Center for Rural Policy  
 \* The lowest % of FPL is the poorest household.

**Exhibit 5: Number of Respondents with Emergency Preparedness Skills by Federal Poverty Level**

Federal Poverty Level	Training in First Aid		Training in CPR		First Responder		EMT	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
≤99%	416	47.8	191	45.9	23	5.5	16	3.8
100%-199%	644	49.5	319	49.5	45	7.0	31	4.8
200%-299%	491	50.5	254	51.7	31	6.3	24	4.9
≥300%	1009	59.1	561	55.6	78	7.7	53	5.3

Source: Rural Health Information Survey, 2006, California Center for Rural Policy



## Emergency Preparedness: The Impact of Poverty and Place *cont.*

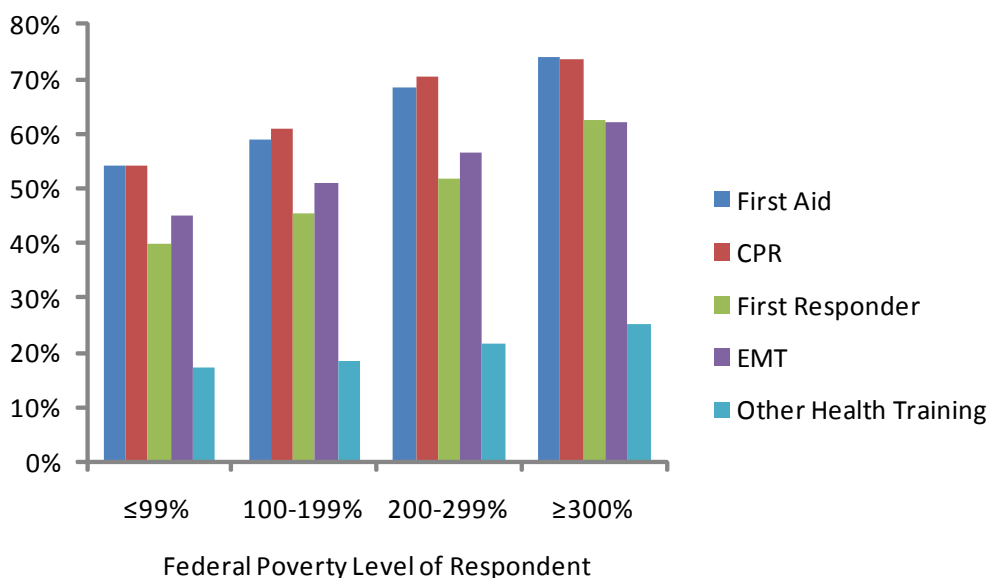
Respondents were asked if anyone in their community (aside from themselves) had training in any of the following: First Aid, CPR, First Responder, EMT or other health related training.

The results show a trend of increased training among community members in all of these areas as the federal poverty level improves.

This suggests that the poorer a community is the less likely it is that the community members will have training in these emergency preparedness skills (Exhibit 6).

This data raises several questions. Do poorer communities have less social capital (i.e. networks) so they are less likely to know their neighbors, or know if their neighbors have training? Or, is training less accessible to poorer communities because of cost, transportation, or other factors?

**Exhibit 6: Emergency Preparedness Skills in the Community**



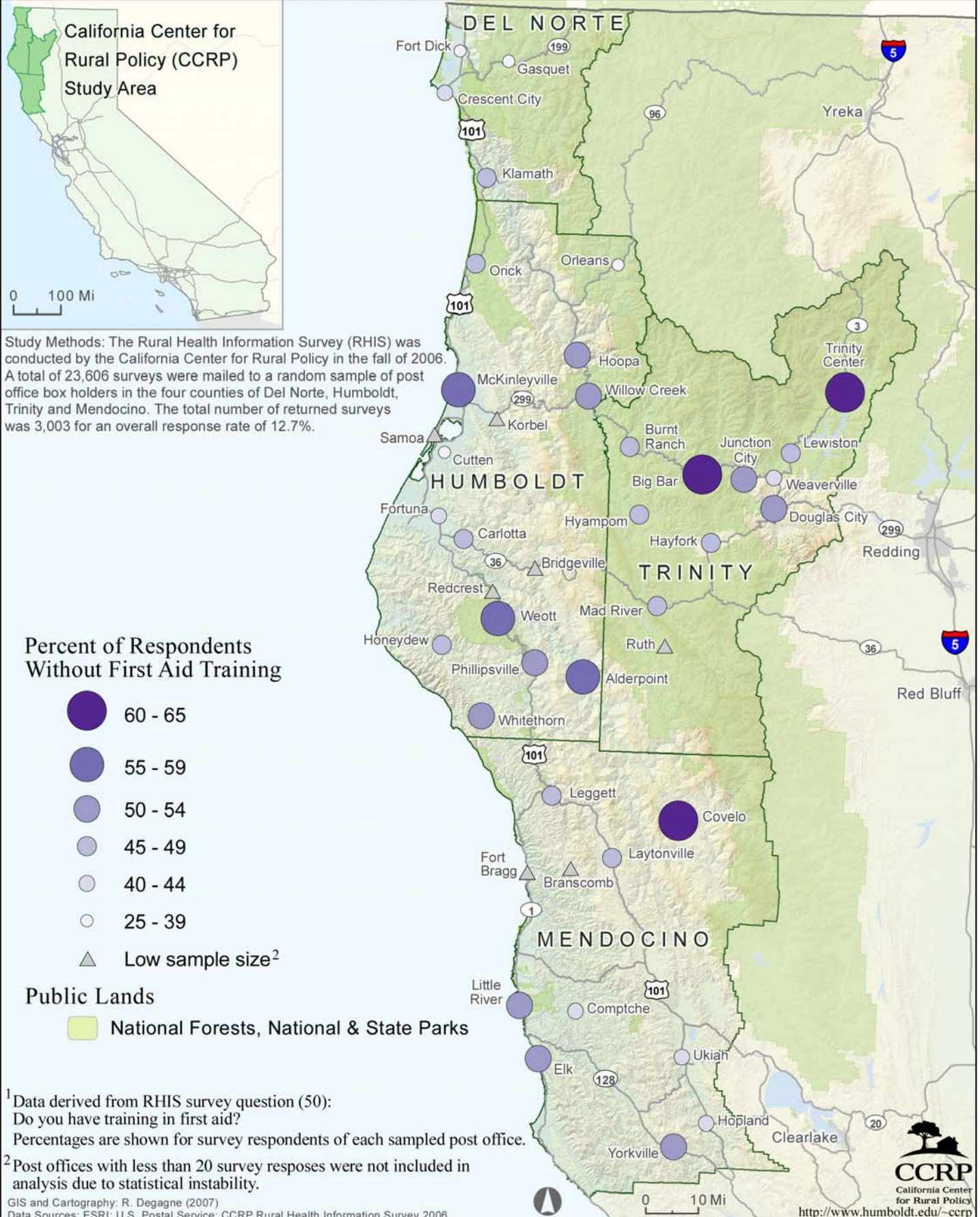
Source: Rural Health Information Survey, 2006, California Center for Rural Policy

### The Impact of Place

While there were not major differences between counties, analysis on a sub-county level revealed drastic differences between communities with respect to emergency preparedness training.

Depending on the location, respondents without training in First Aid or CPR ranged from 25% to 70% (Exhibits 7 & 8). Respondents living in areas with low population density ( $\leq 50$  people per square mile) were significantly less likely to have training in First Aid or CPR compared to respondents living in areas with higher population density ( $> 50$  people per square mile).

# CCRP Rural Health Information Survey: Percent of Respondents Without First Aid Training,<sup>1</sup> 2006





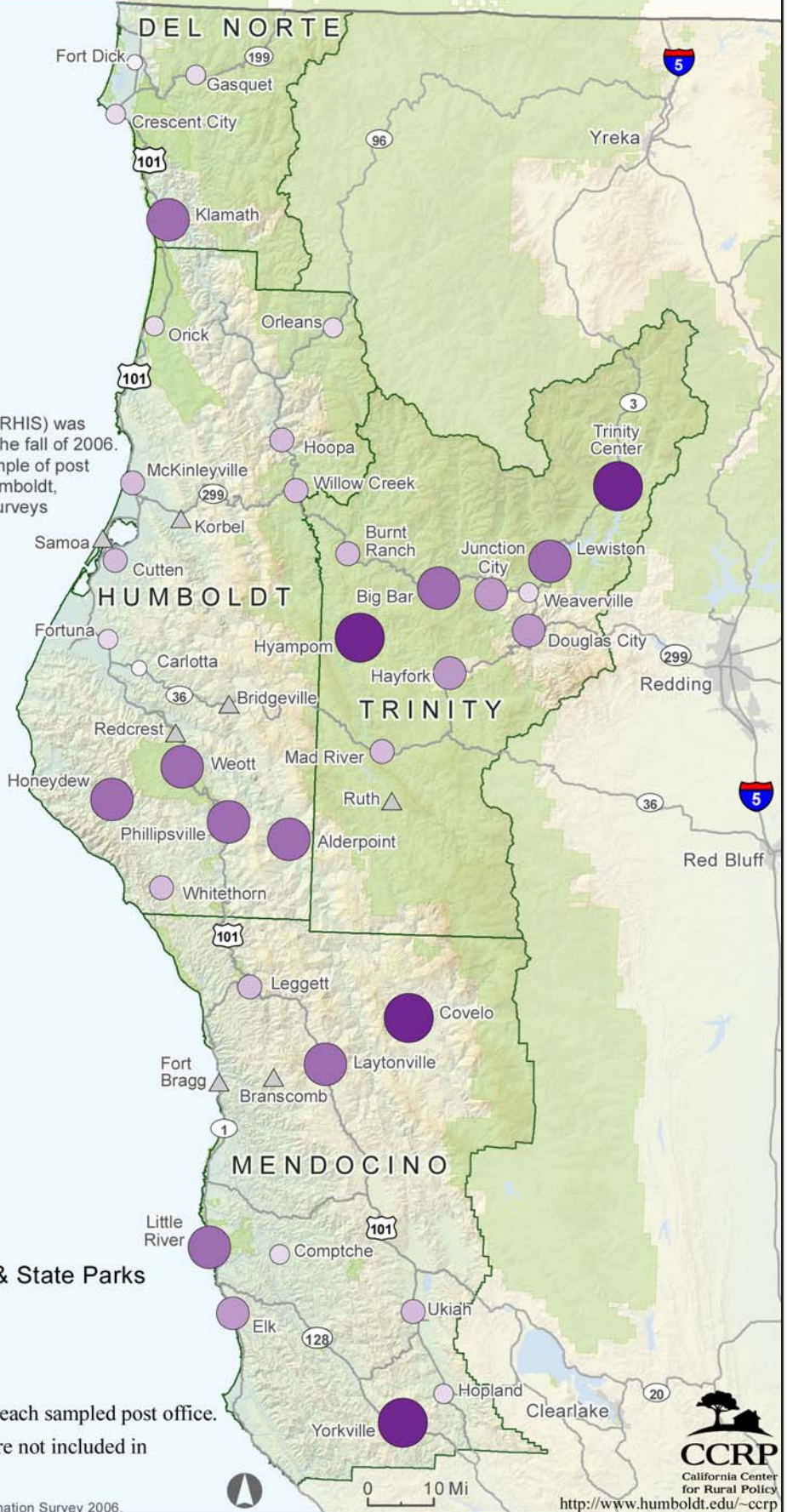


Study Methods: The Rural Health Information Survey (RHIS) was conducted by the California Center for Rural Policy in the fall of 2006. A total of 23,606 surveys were mailed to a random sample of post office box holders in the four counties of Del Norte, Humboldt, Trinity and Mendocino. The total number of returned surveys was 3,003 for an overall response rate of 12.7%.

Percent of Respondents Without CPR Training



Public Lands



<sup>1</sup> Data derived from RHIS survey question (50): Do you have training in CPR? Percentages are shown for survey respondents of each sampled post office.

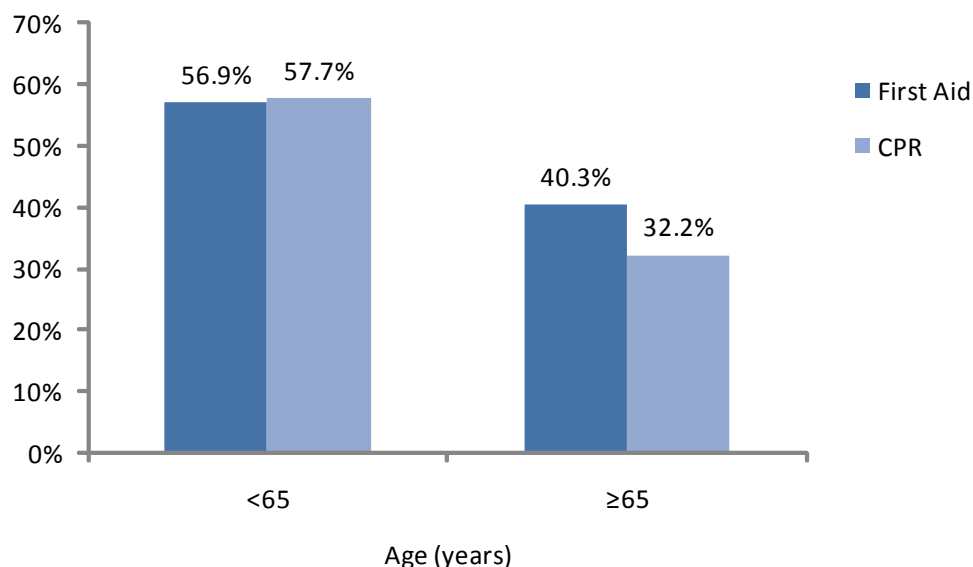
<sup>2</sup> Post offices with less than 20 survey responses were not included in analysis due to statistical instability.

## Emergency Preparedness: The Impact of Age

*Respondents under age 65 were 1.4 times more likely to have training in First Aid and 1.8 times more likely to have training in CPR compared to respondents 65 years or older.*

Training in First Aid was reported by 56.9% of respondents under the age of 65 and 40.3% of respondents 65 years or older. Similarly, training in CPR was reported by 57.7% of respondents under age 65 and 32.2% of respondents 65 years or older. These differences are statistically significant (Exhibits 9 & 10).

**Exhibit 9: Training in First Aid or CPR by Age of Respondents (n= 2,889)**



Source: Rural Health Information Survey, 2006, California Center for Rural Policy

**Exhibit 10: Number of Respondents with First Aid or CPR Training by Age**

Age	Training in First Aid		Training in CPR	
	Frequency	%	Frequency	%
<65 years	2185	56.9	1260	57.7
≥65 years	704	40.3	227	32.2
Total	2889	52.9	1487	51.5

Source: Rural Health Information Survey, 2006, California Center for Rural Policy

## Limitations

In an attempt to keep the survey a reasonable length and obtain information about a wide range of health related topics, the Rural Health Information Survey asked respondents if they had training in First Aid, CPR, First Responder or EMT, but did not ask when they had the training.

This study provides information about the respondents of the survey and does not necessarily describe the population in general. However, this is the largest study ever conducted in this rural region of California.



## Implications for Programs, Policy & Research

*The poor, the elderly, and people living in remote locations are the most likely to not have training in First Aid or CPR. Increasing the level of preparedness in rural communities is desirable and requires collaboration between public and private entities. The Redwood Coast Region has some good programs in place and expansion of these activities could greatly increase emergency preparedness in the region.*

### **Increase Funding for Emergency Training in Rural communities**

Rural communities rely significantly on volunteers to perform emergency services. For many communities, the training requirements and the re-certification of emergency personnel have become too costly. Some fire departments are losing willing volunteers because the volunteers can't afford to take time off work to travel to training and the fire districts cannot afford the re-certification classes.

Preparedness efforts greatly mitigate the negative economic and social effects of a disaster. *Dollars spent on disaster preparedness will decrease dollars spent on disaster recovery.* For every additional \$1.00 spent in preparedness spending, an extra \$7.37 is saved in disaster damage or recovery.<sup>12</sup>

The Federal Government should invest in long term and sustainable emergency training programs in rural communities. Much of the federal funding currently available focuses on equipment purchases, terrorist preparedness training, or urban preparedness. Funding for Community Emergency Response Teams should be increased or reinstated. Funding is needed for EMT re-certification training to volunteer fire departments.

### **Reduce Barriers for Emergency Medical Technicians**

California needs to develop a less expensive EMT exam that reflects the state's scope of practice laws. Currently California requires passage of the very pricey National Registry test in order to become a certified EMT. The test is far more in depth than the skills EMTs are permitted to use.

Agencies should be able to share live scan fingerprinting information. July 1, 2010, EMT regulations are being changed to require live scan background checks. Agencies cannot share information because of a mandate from federal government. If live scan fingerprinting is done for one agency, it will not transfer and the EMT must get new fingerprinting.

### **Include Tribal Governments in State and County wide Emergency Planning**

There are 20 different Federally recognized tribes in our region. Tribal governments create their own preparedness plans, but there must be an open and equal dialogue between our Tribal leaders, the counties in which they reside, and the state.

The state should amend the California Emergency Services Act to include Tribal Governments in the mutual aid system. In our region, emergency and safety coordination with Tribal Governments is essential. California's disaster planning is based on a statewide system of mutual aid and should include Tribes.<sup>13</sup> The California Emergency Management Agency should also include guidance on coordination between counties and tribal governments in the State Emergency Plan.<sup>14</sup>

Arizona tribes successfully collaborated with the state of Arizona to formulate a statewide Tribal Strategic Plan for public health emergency preparedness. The Plan sets overall goals for tribal emergency preparedness, identifies and prioritizes tribal needs, identifies possible funding mechanisms for tribes, provides a plan for possible contract language, and provides for ongoing evaluation of the Plan's goals.<sup>15</sup>

New Mexico has a thriving tribal-state system of communication. The legislature enacted the State-Tribal Collaboration Act of 2009. This Act provides a set structure for government-to-government communication

## Implications for Programs, Policy & Research *cont.*

and collaboration between state and tribal governments. Annual tribal-state consultation summits are required, as are tribal liaisons for state agencies. Each year, all agencies must report to the governor and demonstrate compliance with the Act.<sup>16, 17</sup> This collaboration has diverse tribal specific programs and policies to address emergency preparedness and has received national recognition.

Encourage counties and tribes to open up communication and create formalized agreements or memorandums of understanding (MOUs) specific to tribal needs. Start with smaller, more localized needs if necessary, such as MOU's with police or fire departments, then move on to broader MOU's with the county.

### **Mobilize Preparedness Training**

Combine disaster preparedness and awareness with a Mobile Engagement Vehicle (MEV). The MEV provides access to social services staff for those that cannot travel into the city center. For the frontier areas of the region, transportation to trainings is often a hindrance. By bringing this knowledge to the communities in need, preparedness awareness and skills increase.

### **Make Access to Volunteers Easy**

Encourage local medically trained volunteers (such as actively licensed medical providers, public health professionals, or members of disaster response teams) to register with the Disaster Healthcare Volunteers. Once registered, authorized officials will be able to access the list in case of a disaster and identify who is available in specific areas. See the Disaster Healthcare Volunteers website for more information: <https://www.healthcarevolunteers.ca.gov/>.

### **Utilize and Promote Local Volunteer Organizations such as Community Emergency Response Teams (CERTs)**

There are many successful volunteer frameworks that encourage emergency preparedness skills. By expanding and supporting these programs, human and social capital can be further developed in our communities, resulting in life-saving efforts.

The Redwood Coast Region should invest in the creation of CERTs. CERT is a program through Citizen Corps that organizes and trains community members in various preparedness skills. When professional first responders are not immediately available, as may occur in remote rural areas, these volunteers can be the first contact after a disaster.<sup>10</sup>

Mendocino County provides a good example of a streamlined CERT network. The county has divided itself into four zones and within each zone is a CERT. The zones have leaders to organize all trainings and meet with a county-wide coordinator on a quarterly basis to plan future trainings and address any needs. Zone leaders are given a stipend for their time contributed to trainings. The coordinator also meets with the Mendocino County Office of Emergency Services.

Mendocino County offers incentives for their trained disaster preparedness volunteers. The volunteers can be covered through insurance from the North Coast Opportunities Volunteers Program and Retired and Senior Volunteer Program. When a disaster occurs, the volunteers are sworn in as disaster service workers. The county, and in some cases, the Federal Emergency Management Agency (FEMA) may cover liability costs that are incurred by workers. This reduces a possible barrier for trained volunteers and promotes additional community involvement.

## Implications for Programs, Policy & Research *cont.*

The Red Cross in Humboldt has trained CERTs in Eastern Humboldt, Briceland, Shelter Cove, Trinidad Rancheria, and Humboldt State University. Our research shows that there are additional communities that could benefit from these trainings. A training for 15 people costs roughly \$4,000 or more. For more information, contact American Red Cross, Humboldt County Chapter at (707) 443-4521.

### **Encourage Youth to Get Training in Basic Medical Emergencies**

To increase the human and social capital in communities and perhaps inspire youth to pursue medical careers, it is important to develop their interest early.

A model program exists in San Francisco where students at some San Francisco Unified School District High schools are able to earn college credits for completing training in EMT. For more information, visit: Galileo High School Health Academy at <http://galileoweb.org/healthacademy/>.

It is also important to promote youth volunteering in communities. CERT teams can be formed at high schools and junior highs to promote youth community organization, volunteerism, and safety skills.

### **Establish Neighborhood Organization and Assessment**

Although Community Emergency Response Teams provide valuable services at the broader city or county wide level, it is vital that local neighborhoods be organized. Establishing Neighborhood Emergency Service Teams (NEST) in rural neighborhoods would promote neighbors talking to neighbors and teach them basic skills such as how to shut off water and power if needed. Also, NEST prepares neighborhoods by informing people about what should be included in emergency kits and gives them opportunity to practice emergency response procedures.<sup>11</sup>

For some communities, it may be appropriate to utilize already established organizations such as granges, community centers, and neighborhood watches to disseminate information regarding organizing and training in communities. Such community organizations could supplement training with low cost options such as the American Heart Association's CPR Anytime.

Providers, such as health care providers, social workers, and caregivers can assess the need for training among people they serve and make referrals to the local agency(s) that provide the training. This is particularly important for people who live with or care for the very young and the elderly.

### **Increase the Capacity for Communities to Communicate During Emergencies**

When all other forms of communication are down ham radio (amateur radio) operators are able to support their communities with emergency and disaster communication. Remote communities in Southern Humboldt are training residents to become ham radio operators. The long term goal is to get more community members as well as clinic, hospital, and emergency personnel trained to be ham radio operators. There are also efforts currently taking place to get ham radios in schools in Humboldt County. For more information about ham radio activities in Southern Humboldt, contact Jan Scheidt at [jangeosch@hotmail.com](mailto:jangeosch@hotmail.com).

### **Continue Monitoring Emergency Preparedness Skills in the Redwood Coast Region**

This research was intended to give a snapshot of the level of emergency preparedness skills in the region. It is important to note that the research did not assess how recent the training occurred or the level of competency with emergency skills. Future research should address these questions.



## Methods and Demographics

### Exhibit 11: Methods

The Rural Health Information Survey was conducted by the California Center for Rural Policy in the fall of 2006. The purpose of the survey was to assess health disparities, access and utilization of healthcare, and other determinants of health among residents in rural Northern California with the goal of providing useful information for planning and policy development.

A four-page self-administered survey was developed by project administrators at CCRP. The survey instrument was based on existing surveys (Behavioral Risk Factor Surveillance Survey, California Health Interview Survey, Canadian Community Health Survey and Mendocino Community Health Survey). New questions were developed as needed to inquire about areas of rural health not previously explored, such as access to transportation, phones, computers and Internet as well as skills for responding to emergency medical situations.

A total of 23,606 surveys were mailed to a random sample of adults residing in the four counties of Humboldt, Del Norte, Trinity and Mendocino. The sampling strategy employed the use of a Geographic Information System (GIS) to map the population density for Zip Code Tabulation Areas (ZCTA)<sup>8</sup> with an overlay of the locations of post offices. All of the post offices in low population density areas (<11 people per square mile) were selected (total post offices = 24; total post office boxes = 8165). Post offices located in higher population density areas ( $\geq 11$  people per square mile) were randomly selected (total post offices = 19; total post office boxes = 15,441) (Exhibit 1).

The total number of returned surveys was 3,003 for an overall response rate of 12.7%. A total of 2,950 surveys provided usable responses for analysis. Responses were analyzed with SPSS version 14.0. Chi Square was used to test for differences between groups with a *p*-value less than .05 considered statistically significant.

Sample Demographics are presented in Exhibit 12.

A total of 41.4% of the sample lives in a low-income household (<200% FPL).

### Exhibit 12: Sample Demographics

Characteristics	Frequency	Percent
<b>Federal Poverty Level<sup>9</sup></b>		
$\leq 99\%$ Poverty	416	16.2
100%-199%	645	25.2
200%-299%	491	19.2
$\geq 300\%$	1009	39.4
Total	2561	100.0
<b>Ethnicity</b>		
White	2459	84.2
African American	7	0.2
Latino/Latina	34	1.2
Asian	13	0.4
Native American	148	5.1
Multiracial	173	5.9
Other	87	3
Total	2921	100
<b>Gender</b>		
Female	1882	64.1
Male	1053	35.9
Other	2	0.1
Total	2937	100
<b>Age (mean = 55.3)</b>		
18-29	173	6.0
30-39	240	8.3
40-49	455	15.7
50-59	930	32.2
60-69	656	22.7
70-79	310	10.7
$\geq 80$	126	4.4
Total	2890	100
<b>County of Residence</b>		
Del Norte	421	14.3
Humboldt	880	29.8
Trinity	940	31.9
Mendocino	705	23.9
More than 1 of above	4	0.1
Total	2950	100

Source: Rural Health Information Survey, 2006, California Center for Rural Policy.

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### **Suggested Citation:**

Van Arsdale J, Jones M. *Emergency Preparedness Skills: Human & Social Capital in the Redwood Coast Region*. Humboldt State University: California Center for Rural Policy, March 2010.

## Acknowledgements

The California Center for Rural Policy would like to thank:

- The California Endowment and The California Wellness Foundation for supporting this work
- The rural residents who participated in the Rural Health Information Survey
- Connie Stewart, CCRP Executive Director
- Sheila L. Steinberg, PhD, Director of Community Research, CCRP
- Steven J. Steinberg, PhD, Director, Institute for Spatial Analysis, Humboldt State University
- Terry Uyeki, MSED, Director of Evaluation & Development, CCRP
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*This research and report were made possible by grants from The California Endowment, The California Wellness Foundation, and in-kind support from Humboldt State University.*



*Grantmaking for a Healthier California*

*The policy portion of this report is funded in part by a grant from The California Wellness Foundation (TCWF). Created in 1992 as an independent, private foundation, TCWF's mission is to improve the health of the people of California by making grants for health promotion, wellness education and disease prevention.*



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The California Center for Rural Policy will continue to share research results with the community through briefs, reports and meetings. We plan to engage the community in dialogue about potential solutions and policy recommendations to address identified problem areas. We hope you will join us as we work together to improve health in our region. If you would like to receive information from CCRP please contact us to get on our mailing list: (707) 826-3400 or [ccrp@humboldt.edu](mailto:ccrp@humboldt.edu)

### Join us in collaboration...

CCRP welcomes opportunities to collaborate with community partners for more in-depth research on this topic.





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