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Transportation Disparities Impacting Health Needs in the Redwood Coast Region

CCRP
California Center for Rural Policy

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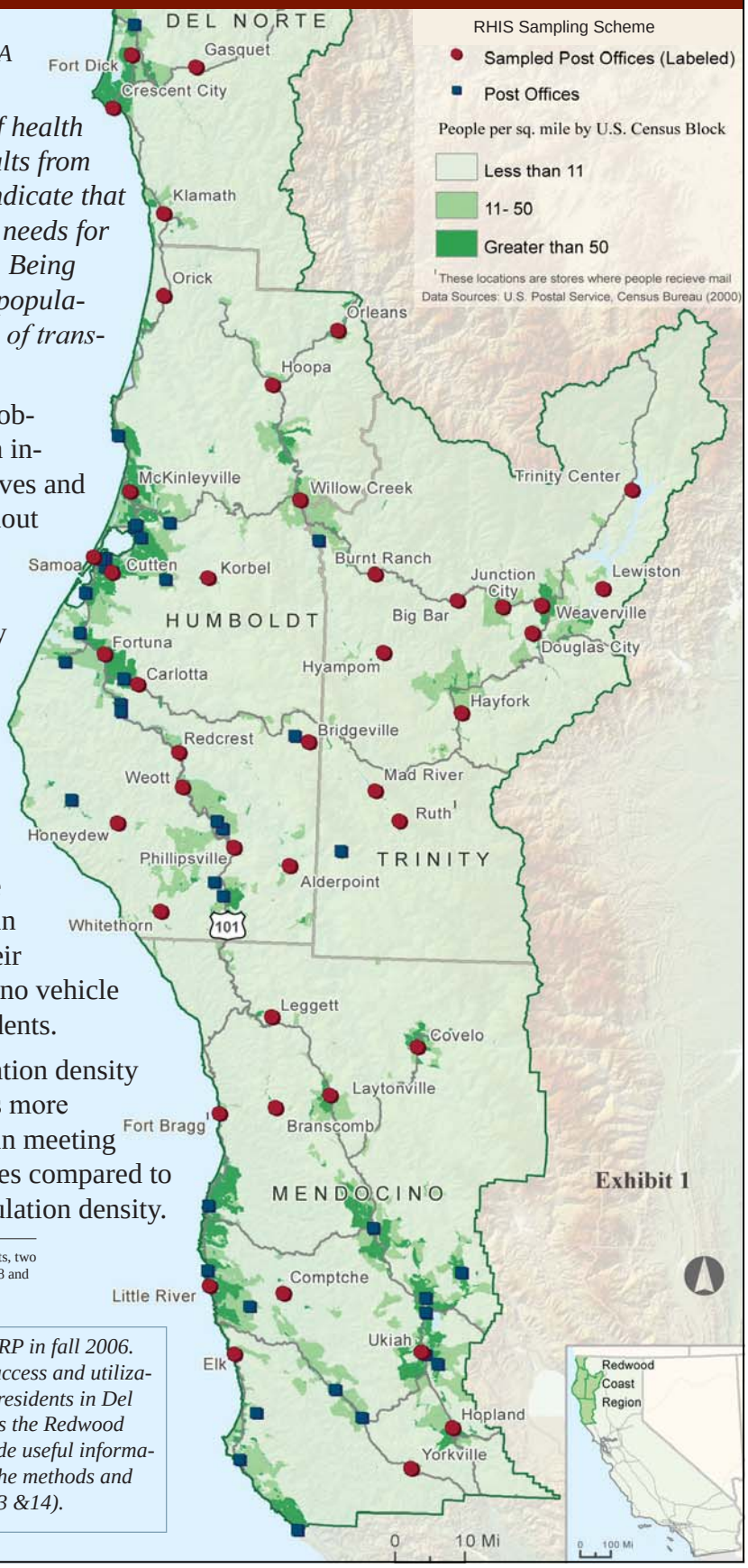
Transportation is an important determinant of health affecting all spheres of community life.[1,2] Results from the Rural Health Information Survey, 2006, indicate that transportation is a problem in meeting health needs for many residents in the Redwood Coast Region. Being poor, non-white or living in an area with low population density significantly increases the chance of transportation problems.

- Respondents who reported transportation problems were 2.6 times more likely to report an inability to get needed health care for themselves and their children compared to respondents without transportation problems.
- Respondents living below the federal poverty level (FPL)* were 5.2 times more likely to report transportation as a problem in meeting health needs for themselves and their families and 11 times more likely to report no vehicle in the household compared to respondents living at or above 300% poverty.
- Non-white respondents were 1.7 times more likely to report transportation as a problem in meeting health needs for themselves and their families and 2.5 times more likely to report no vehicle in the household compared to white respondents.
- Respondents living in areas with low population density (≤50 people per square mile) were 1.6 times more likely to report transportation as a problem in meeting health needs for themselves and their families compared to respondents living in areas with higher population density.



* 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.

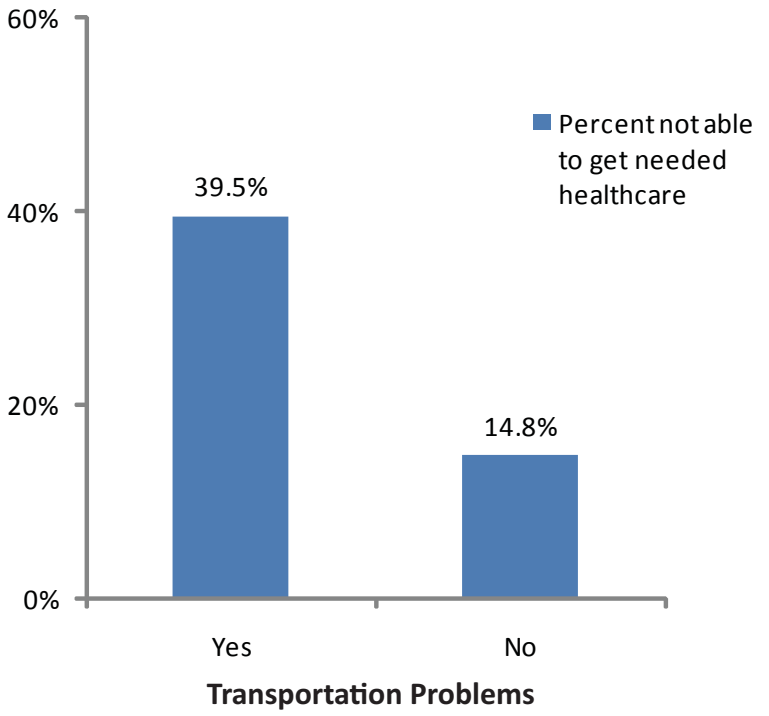
The Rural Health Information Survey was conducted by CCRP in fall 2006. The purpose of the survey was to assess health disparities, access and utilization of healthcare, and other determinants of health among residents in Del Norte, Humboldt, Trinity and Mendocino counties (known as the Redwood Coast 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 is at the end of this report (Exhibits 13 &14).

Transportation and Access to Health Care

Respondents who reported transportation problems were 2.6 times more likely to report an inability to get needed health care for themselves and their children compared to respondents without transportation problems.

Of the respondents who reported transportation problems, 39.5% stated they were unable to get needed health care for themselves in the year prior to the survey. This is significantly higher than the respondents who reported no transportation problems and an inability to get needed health care (14.8%) (Exhibit 2). Similarly, respondents with children in the household under the age of 18 who reported transportation problems were significantly more likely to report difficulties obtaining needed health care for their children (25.8%) compared to respondents without transportation problems (9.9%) (Exhibit 3). These finding suggests that transportation is a significant factor in accessing health care, but it is clearly not the only factor.

Exhibit 2: Transportation Problems and Ability to get Needed Health Care (*n* =2,502)



Transportation is a Problem in Meeting Health Needs		Not Able to Get Needed Health Care in Last 12 Months	
	Frequency	Frequency	%
Yes	435	172	39.5
No	2067	305	14.8
Total	2502	477	19.1

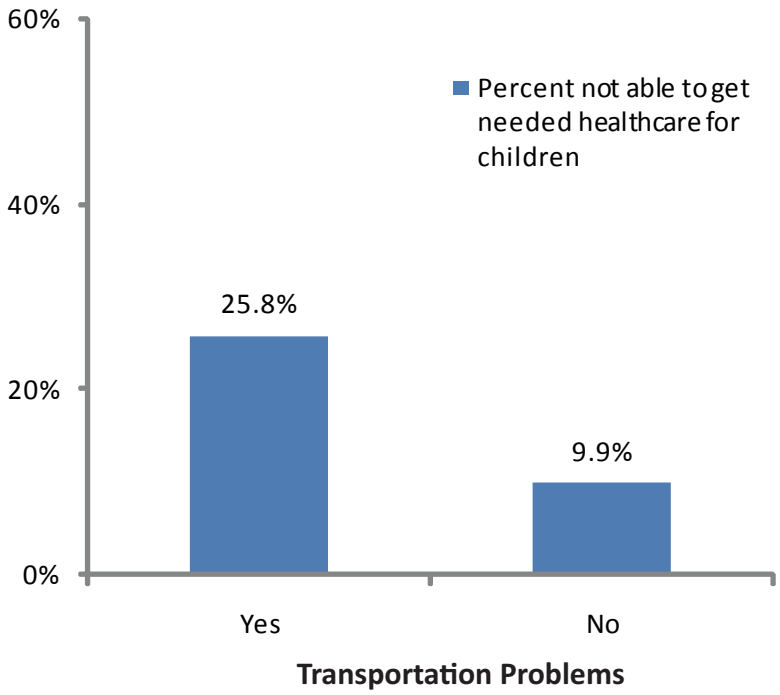
Source: Rural Health Information Survey, 2006, California Center for Rural Policy
This analysis was for the questions, "Within the past 12 months, were you able to get the healthcare (including mental healthcare) you needed?" and "Is transportation a problem in meeting the health needs of you or your family?". Analysis was restricted to respondents who answered both questions.

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.

Transportation and Access to Health Care *(continued)*

Exhibit 3: Transportation Problems and Ability to get Needed Health Care for Children (*n* =552)



Transportation is a Problem in Meeting Health Needs		Not Able to Get Needed Health Care for Children in Last 12 Months	
	Frequency	Frequency	%
Yes	89	23	25.8
No	463	46	9.9
Total	552	69	12.5

Source: Rural Health Information Survey, 2006, California Center for Rural Policy
This analysis was for the questions, "Within the past 12 months, were you able to get your child(ren) the healthcare (including mental healthcare) they needed?" and "Is transportation a problem in meeting the health needs of you or your family?" Analysis was restricted to respondents who answered both questions and indicated they had children under the age of 18 living in the household.

Why Study Transportation?

Transportation is an important determinant of health and rural areas are particularly challenged when it comes to transportation.[1,2] Research has shown that rural residents have greater transportation difficulties and have to travel longer distances to receive health care compared to urban residents.[3] Transportation is frequently reported as one of the major barriers to accessing health care and health programs among rural residents and this is particularly true among the elderly in rural communities.[4] Limited or no public transportation, needing to travel far distances for specialty care, inhospitable terrain and weather have all been identified as barriers to accessing health care among rural populations.[3]

The Rural Health Information Survey was designed to identify issues impacting health and access to health care in rural communities. Discussions with community leaders suggested that transportation was an issue, but there was a need to quantify the extent of the problem. Identifying populations and communities with transportation problems and measuring the extent and types of transportion problems will help inform planning and policy development aimed at addressing the problem. Assessing transportation issues over time can help determine if conditions are improving.

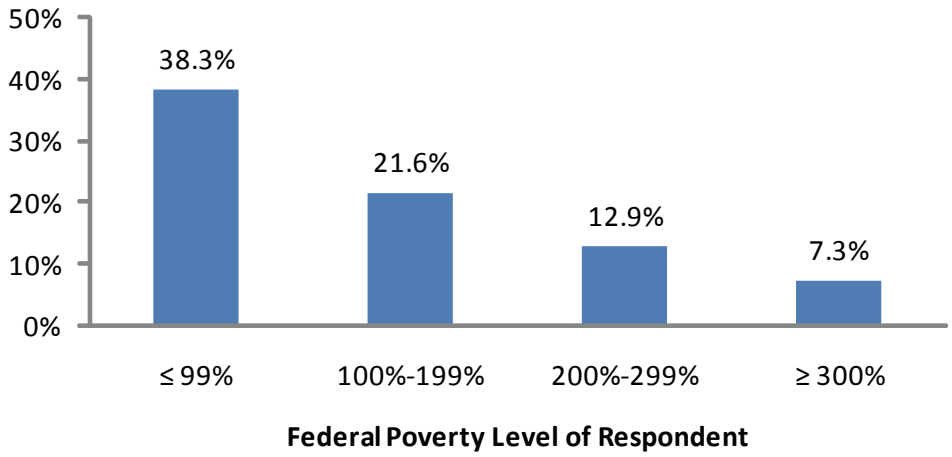
Transportation Problems: The Impact of Poverty

Respondents living below 100% poverty were 5.2 times more likely to report transportation as a problem in meeting their health needs compared to respondents living at or above 300% poverty.

Similarly, respondents living below 100% poverty were 11 times more likely to report no vehicle in the household compared to respondents living at or above 300% poverty.

Transportation was reported as a problem in meeting health needs for 17% of all respondents, however this increased to 38.3% for respondents living in the poorest households. There was a significant difference between each poverty level with respect to percentage of respondents reporting transportation as a problem in meeting their health needs or those of their family (Exhibit 4). This finding suggests that as individuals move away from poverty their chance of having transportation problems deceases, which in turn improves their ability to get needed health care.

Exhibit 4: Transportation Reported as a Problem Meeting Health Needs by Federal Poverty Level of Respondents (*n* =2,541)



"It is difficult to get someone to take me to appointments. Usually I don't have enough money for gas. The bus service takes nine hours from home and back…" ≤99% FPL

Federal Poverty Level		Transportation is a Problem in Meeting Health Needs	
	Frequency	Frequency	%
≤ 99%	410	157	38.3
100%-199%	638	138	21.6
200%-299%	488	63	12.9
≥ 300%	1005	73	7.3
Total	2541	431	17.0

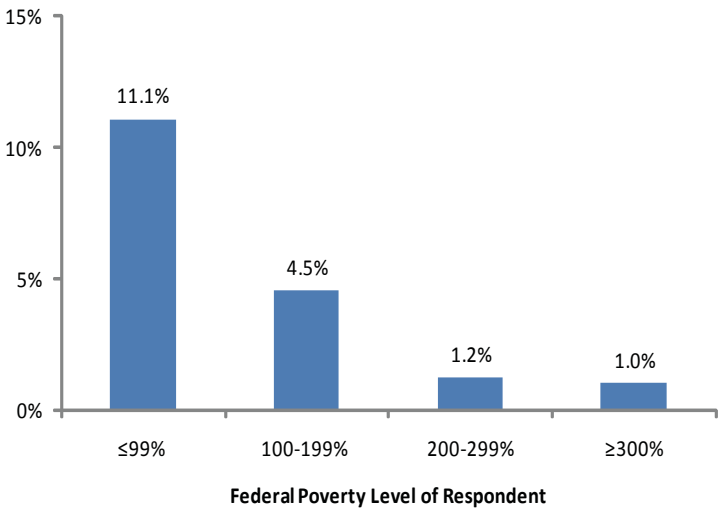
Source: Rural Health Information Survey, 2006, California Center for Rural Policy
This analysis was for the question, "Is transportation a problem in meeting the health needs of you or your family?" Analysis was restricted to respondents who answered the question and provided information necessary for determining poverty level.

Transportation Problems: The Impact of Poverty *(continued)*

No Vehicle in the Household

Not having a vehicle in the household was reported by 3.5% of all respondents, however this increased to 11.1% for respondents living in the poorest households. Not having a vehicle in the household differed significantly between every poverty level except between the two highest levels (200%-299% FPL and ≥300% FPL) (Exhibit 5).

Exhibit 5: No Vehicle in the Household by Federal Poverty Level of Respondents (*n* =2,536)



Federal Poverty Level		No Vehicle in Household	
	Frequency	Frequency	%
≤ 99%	406	45	11.1
100%-199%	639	29	4.5
200%-299%	488	6	1.2
≥ 300%	1003	10	1.0
Total	2536	90	3.5

Source: Rural Health Information Survey, 2006, California Center for Rural Policy
This analysis was for the question, "Do you or someone in your household have a vehicle?" Analysis was restricted to respondents who answered the question and provided information necessary for determining poverty level.

Types of Transportation Problems

Respondents who reported transportation problems were asked to explain why. The most commonly reported reasons were expense, distance and unreliable vehicle. Medical reasons and weather/road conditions were also frequently mentioned by respondents living at or above 200% FPL.

"Car often breaks down and don't always have money for repairs." ≤99% FPL

"I have no insurance and the only clinic I can afford to go to is 2 hours and 15 minutes [away]." ≤99% FPL

"Old vehicle, can't afford new one, too much debt." 100-199% FPL

"We have had to borrow vehicles to go to Willits or Ukiah as our vehicle is not always running." 100-199% FPL

"Distance would be problem in an emergency." 100-199% FPL

"Sometimes we don't have gas money or sometimes the car needs repairs." 200-299% FPL

"Kaiser is too far and I have trouble driving in cars." 200-299% FPL

"Long drive for major health care; my son has frequent appointments and I don't know how much longer I can drive him. He cannot drive himself." ≥300% FPL

"High gas prices, road construction, and occasional bad weather on windy, wet roads make getting to larger city difficult." ≥300% FPL

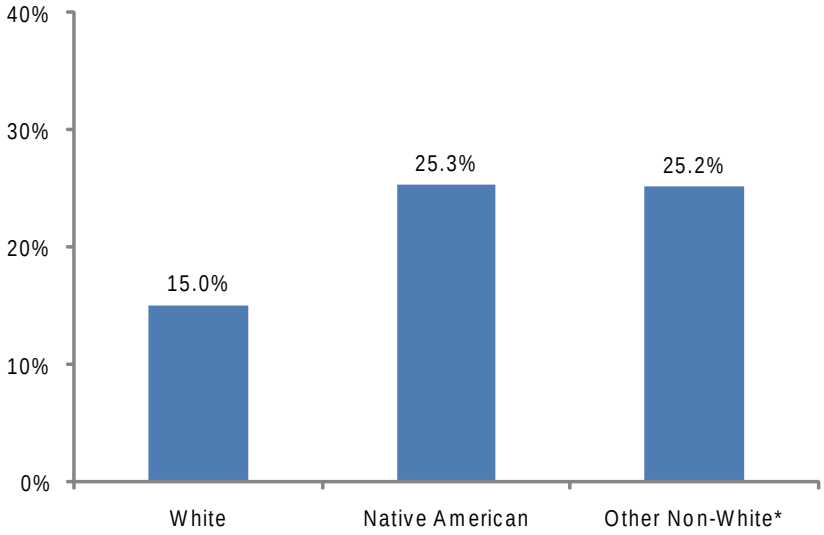
Transportation Problems: The Impact of Race/Ethnicity

Native American and other non-white respondents were 1.7 times more likely to report transportation as a problem in meeting their health needs or those of their family compared to white respondents. Similarly, Native American and other non-white respondents were 2.5 times more likely to report no vehicle in the household compared to white respondents.

Of the Native American respondents, 25.3% reported transportation problems, which is similar to the other non-white respondents (25.2%), but significantly higher than the white respondents who reported transportation problems (15%) (Exhibit 6).

The types of transportation problems reported were similar for each race/ethnicity and included expense, distance, lack of/unreliable vehicle, lack of public transportation, medical problems, weather/road conditions, and lack of a driver's license or phone.

Exhibit 6: Transportation Reported as a Problem Meeting Health Needs within each Race/Ethnicity* (*n* =2,893)



"Health care provider 3 hrs away: to be covered by insurance." White

"In winter roads may be closed due to slides." White

"Sometimes when I have low funds. I cannot drive to the store." Other Non-White

"Gas prices high, doctor far." Other Non-White

"Gas is too expensive." Native American

"Bad eye sight - don't drive." White

"Financial difficulties, unreliable vehicle." Native American

Race/Ethnicity*		Transportation is a Problem in Meeting Health Needs	
	Frequency	Frequency	%
White	2441	367	15.0
Native American	146	37	25.3
Other Non-White	306	77	25.2
Total	2893	481	16.6

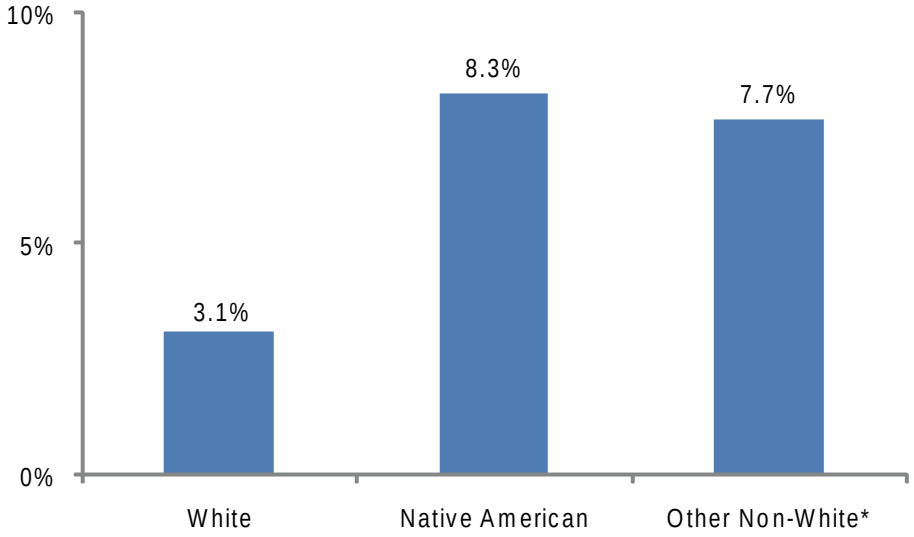
Source: Rural Health Information Survey, 2006, California Center for Rural Policy
*Respondents were able to classify their ethnicity as White, African American, Latino/a, Asian, Native American, Multi-racial, or Other. Due to a small number of respondents in several of the categories, comparisons were made between White, Native American, and Other Non-White respondents (includes African American, Latino/a, Asian, Multi-racial and other).

Transportation Problems: The Impact of Race/Ethnicity *(continued)*

No Vehicle in the Household

No vehicle in the household was reported more frequently among Native American and other non-white respondents compared to white respondents. The difference between the Native Americans and other non-white respondents was not significant, however the difference between the white respondents and the Native American and other non-white respondents was significant (Exhibit 7). Thus, being white significantly increases the chance of having a vehicle in the household and decreases the chance that transportation will be a problem in meeting health needs for individuals and their families.

Exhibit 7: No Vehicle in the Household within each Race/Ethnicity* (*n* =2,893)



Race/Ethnicity*		No Vehicle in the Household	
	Frequency	Frequency	%
White	2437	76	3.1
Native American	145	12	8.3
Other Non-White	311	24	7.7
Total	2893	112	3.9

Source: Rural Health Information Survey, 2006, California Center for Rural Policy
*Respondents were able to classify their ethnicity as White, African American, Latino/a, Asian, Native American, Multi-racial, or Other. Due to a small number of respondents in several of the categories, comparisons were made between White, Native American, and Other Non-White respondents (includes African American, Latino/a, Asian, Multi-racial and other).

"Yes [transportation is a problem], because I have no phone." Native American

"No car or license." Other Non-White

"There is no public transit in our town." White

"Summer 2 hr Drive, Winter 5 mile snow shoe, then hitch hike 90 miles." White

"No public transportation and gas/ insurance is very expensive/up keep." Other Non-White

"No bus/50 miles to all but basic services, cost." Other Non-White

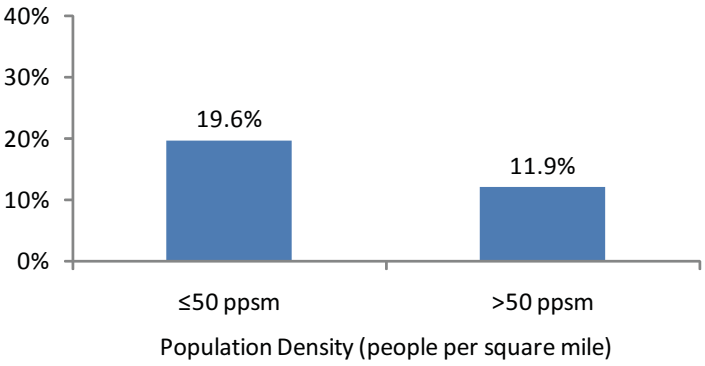
Transportation Problems: The Impact of Place

Population Density

Respondents residing in areas with low population density (≤50 people per square mile) reported transportation as a problem in meeting health needs significantly more than respondents living in more populated areas (>50 people per square mile).

Of the respondents who live in a low population density area (≤50 people per square mile), 19.6% reported transportation as a problem in meeting their health needs, compared to 11.9 % of respondents living in higher population density areas (statistically significant) (Exhibit 8). There was no difference between respondents living in different population densities with respect to not having a vehicle in the household.

Exhibit 8:Transportation Reported as a Problem Meeting Health Needs by Population Density* (*n* =2,911)



Population Density		Transportation is a problem in meeting health needs	
	Frequency	Frequency	%
≤50 people per square mile	1782	350	19.6
>50 people per square mile	1129	134	11.9
Total	2911	484	16.6

Source: Rural Health Information Survey, 2006, California Center for Rural Policy
* This analysis was for the questions, "Is transportation a problem in meeting the health needs of you or your family?" and "How far do you live from the post office where you get your mail?" Analysis was restricted to respondents who answered both questions. Population density was calculated based on GIS analysis using 2000 Census block population density estimates and distance in which 95% of the respondents live from the Post Office within its given ZIP Code.

Types of Transportation Problems

The types of transportation problems reported were similar for respondents living in low population density areas (≤50 people per square mile) and those living in more populated areas (>50 people per square mile). The most commonly reported reasons were expense, distance, no transportation, and unreliable vehicle.

≤50 people per square mile:

"Can't afford the gas, road trips are very rough on me and [the] baby at times, there is no public transportation and no baby sitter."

"Long distance to doctors, opt not to go sometimes."

"There is no public transportation here. I do not own a car at present."

"No way to get to store or clinic except once in a while [when] someone takes me… or brings me food."

>50 people per square mile:

"[I] can't afford to see doctors outside of town."

"[I have to] travel to Santa Rosa (2 tough hours) to get good quality specialty care."

"When I have doctor appointments in Medford I have to rent a car as mine is old with high mileage."

"Have to rely on 'Dial a Ride' or bus service."

"Harder to get to Dr. I trust. I used to have a car."

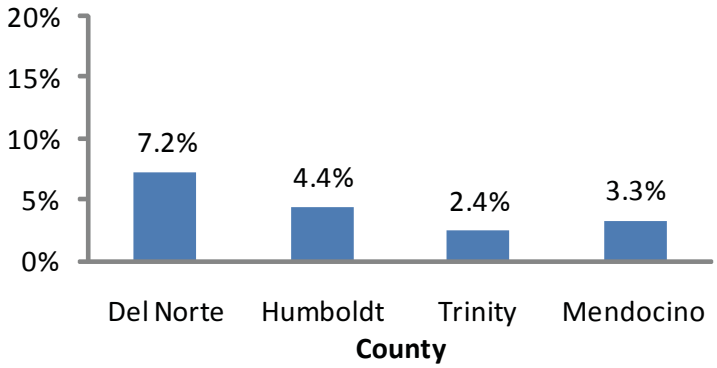
Transportation Problems: The Impact of Place *(continued)*

County of Residence

When comparing counties there was no statistically significant difference found between counties with respect to respondents reporting transportation as a problem in meeting health needs (Del Norte 17.7%, Humboldt 17.1%, Trinity 17.0% and Mendocino 14.8%). Analysis on a sub-county level revealed that transportation problems ranged from 6% to 45% depending on the location. The sampled communities with the highest percentage of respondents reporting transportation problems within each county were Klamath, Weott, Phillipsville, Hyampom and Covelo (Exhibit 10).

Not having a vehicle in the household differed between some counties. Del Norte had the highest percentage of respondents without a vehicle in the household (7.2%), which was significantly higher than respondents from Trinity (2.4%) and Mendocino (3.3%). Respondents from Humboldt County (4.4%) did not differ significantly from the other counties (Exhibit 9).

Exhibit 9: No Vehicle in the Household by County of Residence (*n* =2,915)

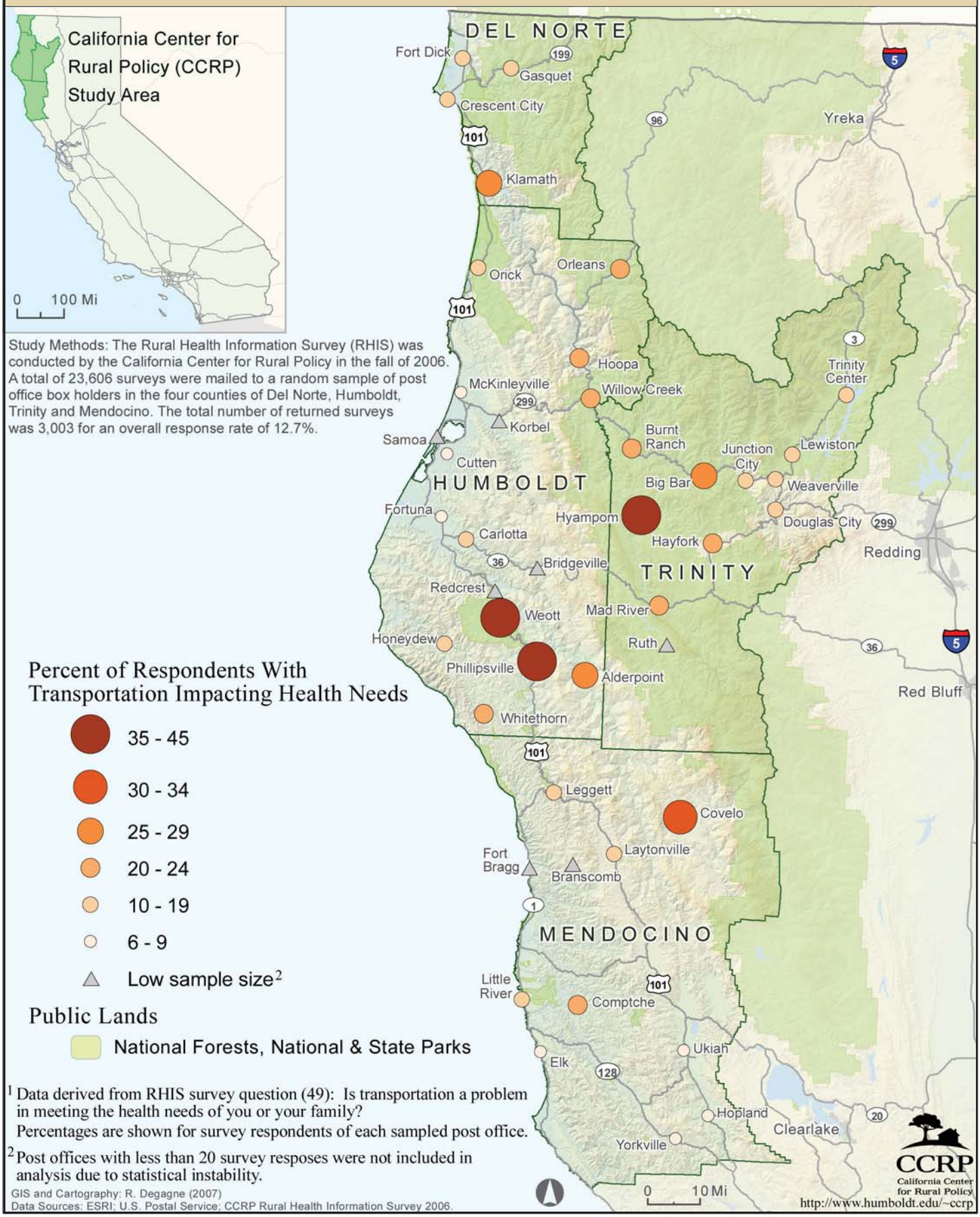


County		No Vehicle in Household	
	Frequency	Frequency	%
Del Norte	417	30	7.2
Humboldt	864	38	4.4
Trinity	931	22	2.4
Mendocino	703	23	3.3
Total	2915	113	3.9

Source: Rural Health Information Survey, 2006, California Center for Rural Policy
This analysis was for the question, "Do you or someone in your household have a vehicle?" and "What county do you live in?" Analysis was restricted to respondents who answered both questions.

Exhibit 10

CCRP Rural Health Information Survey: Percent of Respondents With Transportation Impacting Health Needs[1], 2006



[1] Data derived from RHIS survey question (49): Is transportation a problem in meeting the health needs of you or your family? Percentages are shown for survey respondents of each sampled post office.

[2] Post offices with less than 20 survey resposes were not included in analysis due to statistical instability.

GIS and Cartography: R. Degagne (2007)
Data Sources: ESRI; U.S. Postal Service; CCRP Rural Health Information Survey 2006.

Transportation Problems: The Impact of Place *(continued)*

The county of residence affected the transportation problems reported by respondents.

Del Norte County

For respondents living in Del Norte County, the most commonly reported reasons were expense, leaving local area, no transportation, medical reasons, and public transportation problems.
These respondents explained:

"Car is 1989 - 200,000 + miles and needs work that I can't afford. [I] drive as little as possible"
"Nothing available locally in Klamath."
"[I] don't have a vehicle."
"Due to Parkinson's disease I am unwilling to drive any distance all. [I] stay in local area; drive no more than 10 miles from home."
"It is necessary for my wife to drive due to the disability to my hands."
"…when I'm sick or injured there is no public transport so I have to call on friends to drive me."

Humboldt County

For respondents living in Humboldt County, the most commonly reported reasons were expense, distance, public transportation problems, and unreliable vehicle.
These respondents explained:

"Gas price [and] reliability of transportation."
"The ER is too far for a real emergency. Good Doctors are also far and it is hard when I'm sick to drive."
"19 year old son uses bus. [It is] 3 hours both directions. 3 different bus schedules."
"Neither vehicle is reliable to make the drive to the hospital."

Trinity County

For respondents living in Trinity County, the most commonly reported reasons were expense, distance, no transportation , medical reasons, and unreliable vehicle.
These respondents explained:

"Can't afford to keep up on registration insurance and gas."
"Good healthcare is so far away."
"Neither my wife nor I can safely drive at night or in heavy traffic. [There is] no public transportation to Redding."
"No car and not adequate public transportation."
"Car breaks down and distance to health care."

Mendocino County

For respondents living in Mendocino County, the most commonly reported reasons were expense, distance, and unreliable vehicle.
These respondents explained:

"[It is] very difficult with health disability to leave home. The money it costs to drive."
"[I] would like to consult UCSF regarding surgery on hands and feet but it's too far for me to drive."
"I cannot afford a reliable car."

Primary Mode of Transportation

The overwhelming majority of respondents (91.7%) reported a vehicle as their primary mode of transportation. This was followed by walking (3.2%) and multiple sources of transportation (2.5%), while less than 3% of respondents reported a bicycle, public transportation or some "other" source of transportation as their primary mode of transportation (Exhibit 11).

Exhibit 11: Respondents' Primary Mode of Transportation

Mode of Transportation	Frequency	%
Vehicle	2690	91.7
Walking	94	3.2
Multiple	74	2.5
Bicycle	30	1.0
Public Transportation	15	0.5
Other	32	1.1
Total	2935	100

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

Significant differences were found for respondents' primary mode of transportation across all levels of poverty. Respondents living below the FPL were more likely to report walking, bicycle, public transportation, multiple or other modes of transportation compared to the other poverty levels.

As the FPL improves the percentage of respondents reporting a vehicle as their primary mode of transportation also increases (Exhibit 12). There were no significant differences in the primary mode of transportation reported when comparing counties or population density.

Exhibit 12: Respondents' Primary Mode of Transportation by Federal Poverty Level

Federal Poverty Level	Frequency	Walking	Bicycle	Public Transportation	Vehicle	Multiple	Other
≤ 99%	414	9.2%	2.9%	1.2%	77.8%	6%	2.9%
100%-199%	643	3%	1.2%	0.9%	91.9%	1.9%	1.1%
200%-299%	489	1.2%	0.8%	0.4%	95.3%	2%	0.2%
≥ 300%	1006	1.5%	0.2%	0	97.1%	0.7%	0.5%

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

Implications for Programs, Policy & Research

The results from the Rural Health Information Survey clearly show that being poor, non-white or living in an area with low population density significantly increases the chance of transportation problems. Expense, distance, no transportation, unreliable vehicle, limited or no public transportation, needing to leave the local area for health care, medical conditions, and weather/road conditions were the primary types of transportation problems reported.

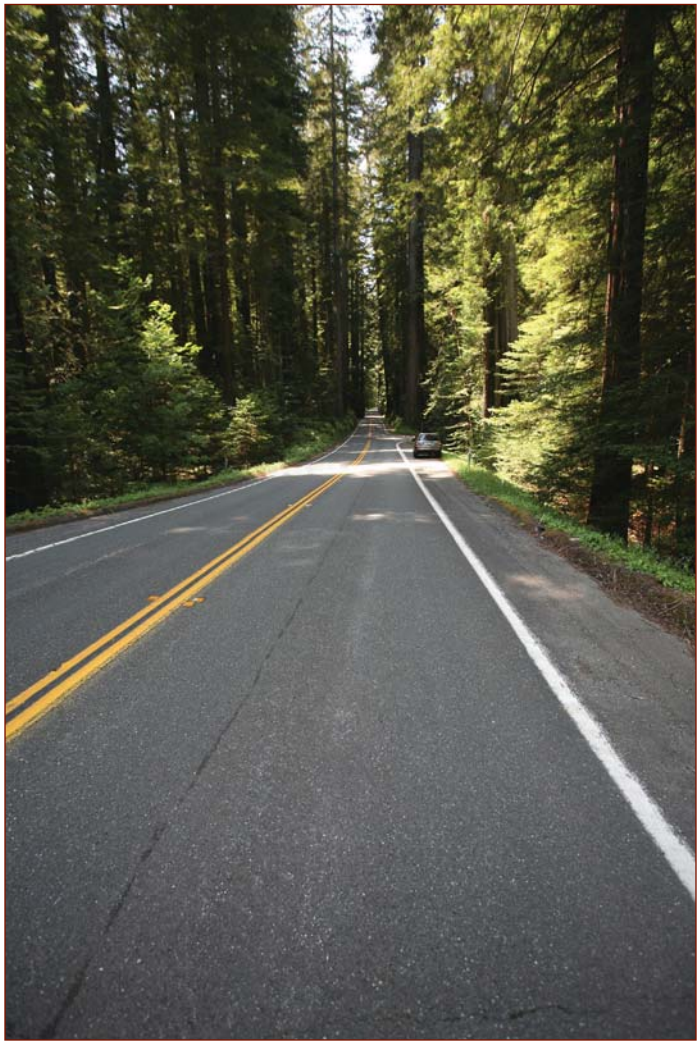
This study has some limitations. It provides information about the respondents of the survey and does not necessarily describe the population in general. However, this is the largest and most comprehensive study ever conducted in this rural region of California.

Transportation is an important determinant of health.[1] Transportation not only affects access to health care, it also affects access to employment, food, education and social activities. Transportation clearly affects one's ability to get needed health care, especially in rural communities. Additional analysis of RHIS data shows that individuals with transportation problems are also more likely to have other problems associated with poverty, such as lack of a phone in the home and difficulties affording enough food. Thus, transportation is one of many factors impacting health and access to health care in our rural communities.

As rural counties address unmet transit needs it will be important to consider the transportation-disadvantaged populations identified in this research. The GIS map can be used to help identify and address communities with unmet transit needs, keeping in mind that these maps only contain information for the surveyed communities.

Programs, policies and future research should consider both the positive and negative effects of transportation.

The positive effects include access to health care, services, goods, employment, education and other amenities, whereas the negative effects include vehicle accidents, air pollution, noise and insufficient physical activity.[5] Programs, policies and future research should focus on innovative ways to improve transportation and deliver services to remote rural communities, while minimizing the negative impacts of transportation. As the population ages, this will be especially important since the elderly have the greatest difficulty with personal transportation and have the greatest need for frequent health care visits.[4]



Policy Directions

Promote better coordination between health care facilities and transportation planners

It is challenging to design rural transportation systems around health care needs; however, there are some model projects in the region.

Throughout the region, Indian health service systems provide transportation for patients when necessary. One example is Mendocino County's Consolidated Tribal Health clinic. The clinic is administered by the Indian Health Consortium, an alliance of eight tribal governments. It uses general funds to provide trips to its clinic in Ukiah or to other specialized medical appointments at the University of California Medical Centers in San Francisco and Stanford Medical Center in Palo Alto.[6]

Trinity County's government provides direct funding to Southern Trinity Health Center to support its non-emergency patient transportation system. As one of the region's most remote health care facilities, the Center offers transportation for patients seeking primary care at its clinic and also offers transportation to Fortuna for patients that need specialty care.

Use existing programs to fund new public transportation routes

The Redwood Coast region received several grants in the 08-09 from the Federal Transit Administration (FTA) Non-Urbanized Area Formula Program, commonly known as the Section 5311 Programs. The funds, administered by the California Department of Transportation are intended to provide access to employment, education, health care, shopping and recreation.

Section 5311f provides funding for long-distance bus service for routes of 50 miles or more. The region received several grants from this fund in 08-09 for buses to expand services and to replace older equipment. The Karuk Tribe also received funding for a feasibility study to expand bus service along Hwy 96.

Section 5311f funds can also be used for operating expenses; however, the grants are very competitive and must be applied for every year.

In addition to writing competitive proposals again this year to keep existing section 5311f services, both Trinity County and Humboldt County are planning on applying for route expansion next year. If successful, the Trinity County proposal would create East-West service across the Hwy 299 corridor. Humboldt County would provide service to Southern Humboldt, linking up in Fortuna with already-existing county bus service.

More public transportation may help increase access to health care in the region, but for many places other options should also be pursued. Because of the geography and lower population density of some of the communities where higher numbers of respondents reported they were unable to get needed health care for themselves, such as Hyampom and Covelo, it is difficult to create financial sound public transportation systems.

Policy Directions *(continued)*

Create Affordable Vehicle Ownership Options

There are scores of programs nationwide, in both cities and rural communities, which help low-income families purchase affordable vehicles with low or no interest loans.

Wisconsin's JumpStart is a widely successful rural program that helps low-income working people to obtain a car to stabilize or improve employment. The program also provides financial education that helps families budget, avoid predatory lenders, save, and develop other assets that promote long-term economic self-sufficiency.[7]

Our region could work with existing banks and credit unions to look at creating a used car ownership program for the recipients of the Temporary Assistance for Needy Families program (TANF). One statewide impediment to the creation of an affordable vehicle program in California is the state's current asset limitation requirements. If TANF families own vehicles worth more than the state's allowable limit they will lose the state funding and benefits.

Assembly member Jim Beall has introduced AB 1058: the CA Workforce Mobility and Savings Initiative, which would repeal the state's current $4,650 vehicle limit. The bill is sponsored by the New America Foundation. If approved by the legislature and signed by the Government the measure would assure that affordable car programs do not penalize TANF applicants and recipients.[8]

Increase direct funding to needy individuals who need health care related transportation

There are several partnerships between safety net providers and government agencies throughout the region to give low-income, transportation-disadvantaged residents vouchers for health care related travel. Trinity County contracts with the Human Response Network to offer reimbursement vouchers of $.25 per mile for low-income residents seeking social and health care related services. In Del Norte County, Community Assistance League provides gas vouchers for out-of-town medical trips for low-income and people with disabilities.

In Mendocino County, the nonprofit Community Resources Connection (CRC) provides volunteer non-emergency demand-response medical transportation to transport residents between the communities of Timber Cove and Elk. Volunteers use their private automobile and may request reimbursement, which is $25 per 250 miles ($.125 per mile). CRC works closely with Redwood Coast Medical Service (RCMS), the Gualala-based nonprofit clinic.[6]

There are examples of non-governmental health related travel as well. The Union Labor Health Foundation's Angel Fund provides small one-time grants for healthcare needs in Humboldt County. Much of the foundation's funding is given for medically related travel.

Much is being done in the Redwood Coast Region to address the unique challenge of addressing transportation issues in low-income, low population density areas. All four counties recently completed Coordinated Public Transit Plans which outline existing available public transportation and identify potential strategies to improve service.[9]

By looking to innovations that succeeded in similar regions nationwide, legislators and other community leaders can leverage resources in the most effective manner possible, building on the already-existing success stories in the region. This will increase the likelihood of families leveraging their own resources to access needed health care services.

Methods & Demographics

Exhibit 13: 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)[10] 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 = 8,165). Post offices located in higher population density areas (≥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. When multiple comparisons were made adjustments were made to account for alpha inflation.

Sample Demographics are presented in Exhibit 14.

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

Exhibit 14: Sample Demographics

Characteristics	Frequency	Percent
Federal Poverty Level[11]		
≤99%	416	16.2
100%-199%	645	25.2
200%-299%	491	19.2
≥300%	1009	39.4
Total	2561	100
Ethnicity		
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	3.0
Total	2921	100
Gender		
Female	1882	64.1
Male	1053	35.9
Other	2	0.1
Total	2937	100
Age (mean = 55.3)		
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
≥ 80	126	4.4
Total	2890	100
County of Residence		
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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10. Generalized area representations of U.S. Postal Service (USPS) ZIP Code service areas. Simply put, each one is built by aggregating the Census 2000 blocks, whose addresses use a given ZIP Code, into a ZCTA which gets that ZIP Code assigned as its ZCTA code. Source: U.S. Census Bureau <http://www.census.gov/geo/ZCTA/zcta.html>.
11. Poverty Thresholds obtained from U.S. Census Bureau, "Poverty Thresholds 2006" <http://www.census.gov/hhes/www/poverty/threshld/thresh06.html> accessed May 2007.

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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

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