

**The differences in characteristics between health-care users and non-users ---- Implication for introducing community-based health insurance in Burkina Faso**

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# **Introduction (1)**

- **The process of making decision for choosing health care is complicated**
- **One of the purposes of health-care demand analysis is to determine the factors influencing the choice**
- **The economic factors contributing to the demand for medical services are income, prices and the value of the patient's time**

## **Introduction (2)**

- **Many studies have found that health service prices are important for the use of care**
- **Reducing price of health care can increase the demand and the use of health care**
- **Health insurance is seen to have the function of ‘reducing the price’ because insured people can get free care or pay only portion of the real price**
- **Community-based health insurance has similar function as other types of health insurance so that it can increase the use of health care**

# Objectives

- **To describe the characteristics of different health-care user groups**
- **To explain their characteristics using health care demand model -- price-income ratio model (Multinomial Logistic Regression)**
- **To estimate price elasticity for different types of health care**
- **To assess the changes in health-care seeking behaviours among CBI members**
- **To provide some policy suggestions**

# **Study site**

- **The study was carried out in the Nouna demographic surveillance area that covers about 60,000 population, 7340 households**
- **The Nouna demographic surveillance is located at Nouna Health District in Burkina Faso**

# Burkina Faso



Author: NHRCDMOGIS  
Source: Map of West Africa (1/2000000)

## **Location:**

West Africa and sharing a borderline with Mali, Niger, Cote d'Ivoire, Ghana, Togo, and Benin.

**Capital:** Ouagadougou

**Area:** 274 000 km<sup>2</sup>

**National language:** French

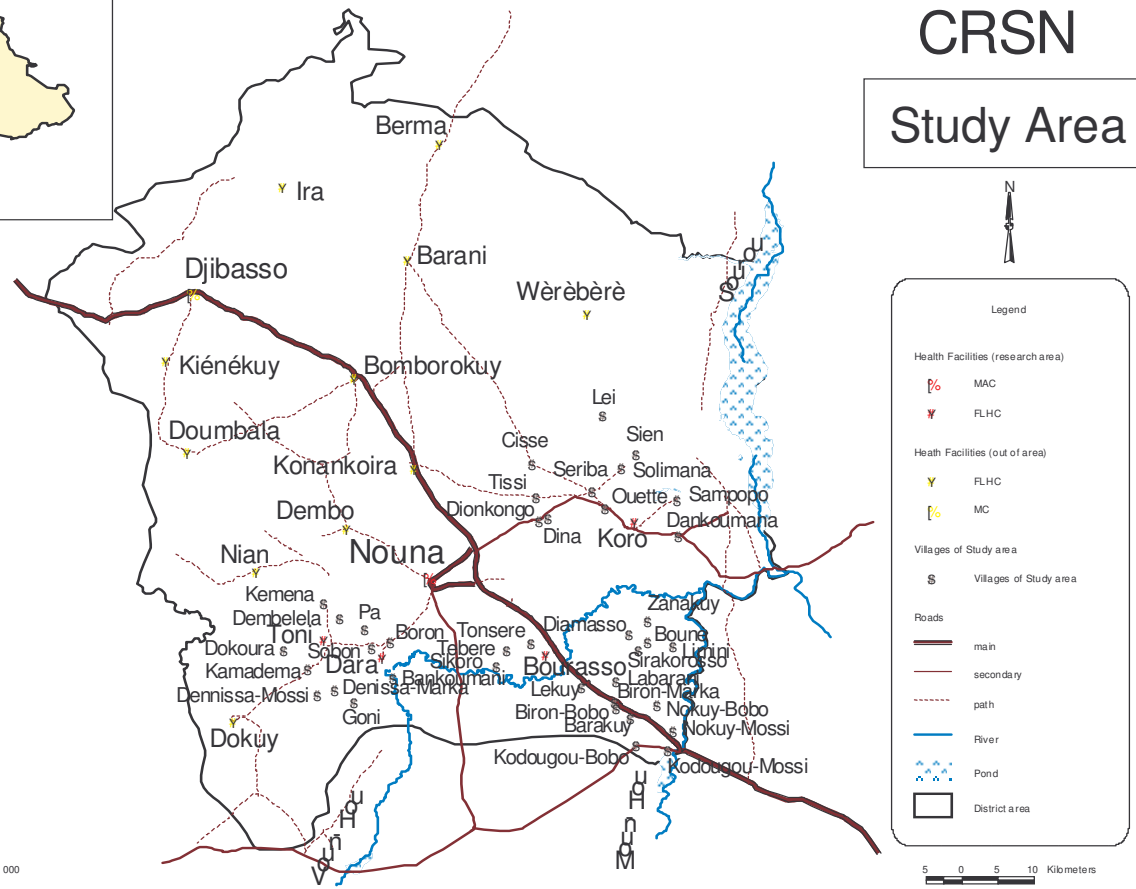
**Population:** 12 000 000 habitants

**Ethnic Groups:** about 60

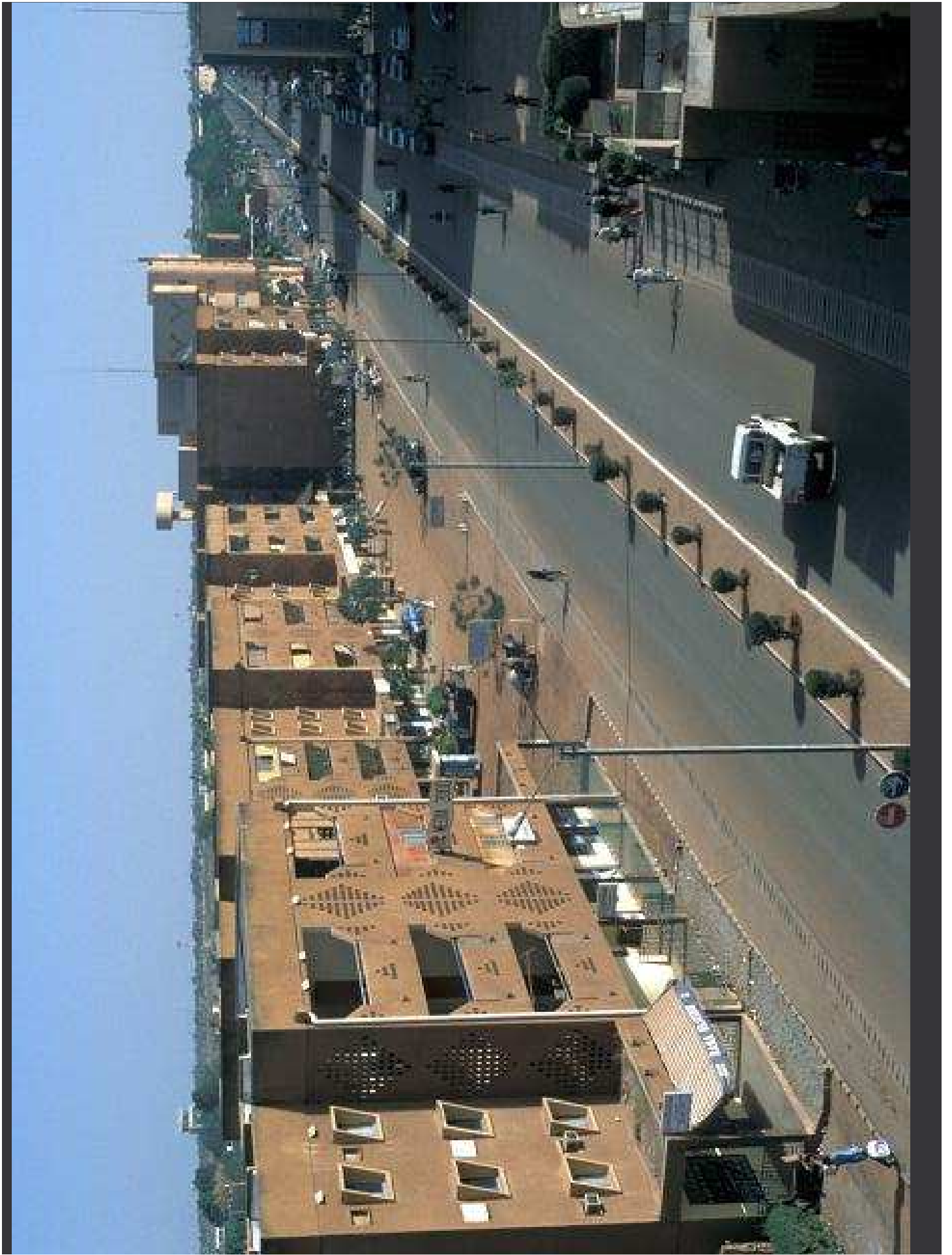




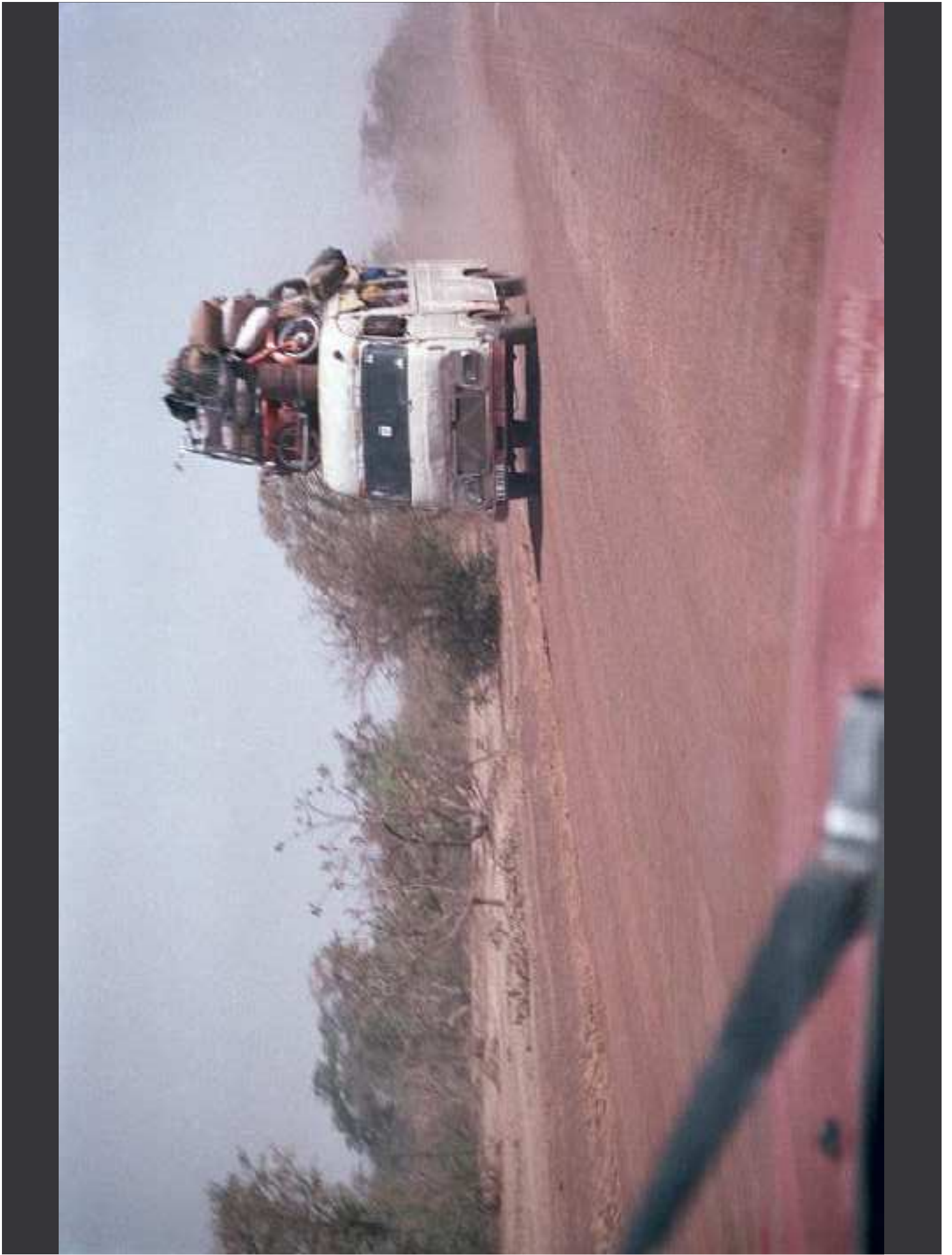
# CRSN Study Area

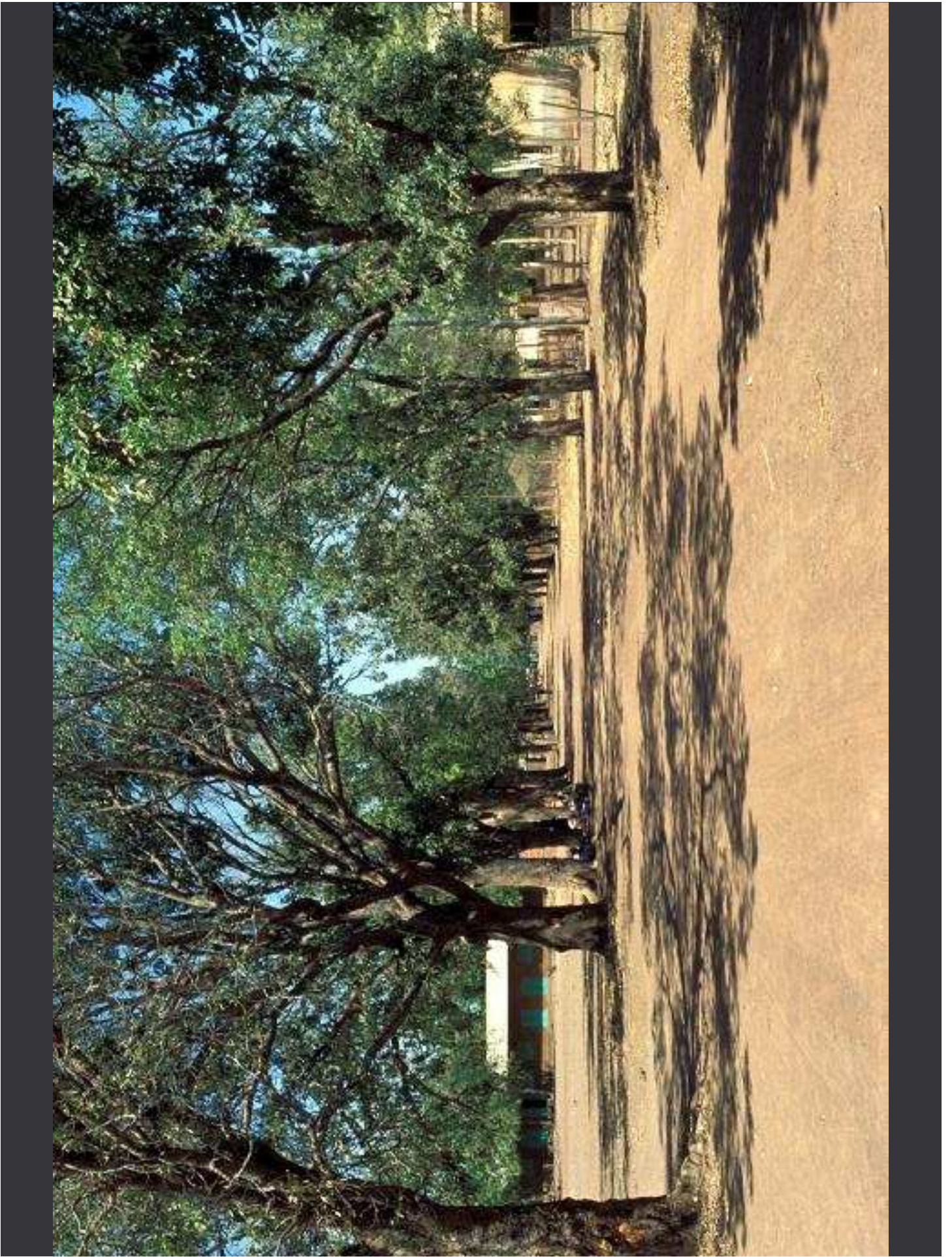


Auteur : CRSN/SGI/SIG  
Source : Carte de l'Afrique de l'Ouest au 1/200 000

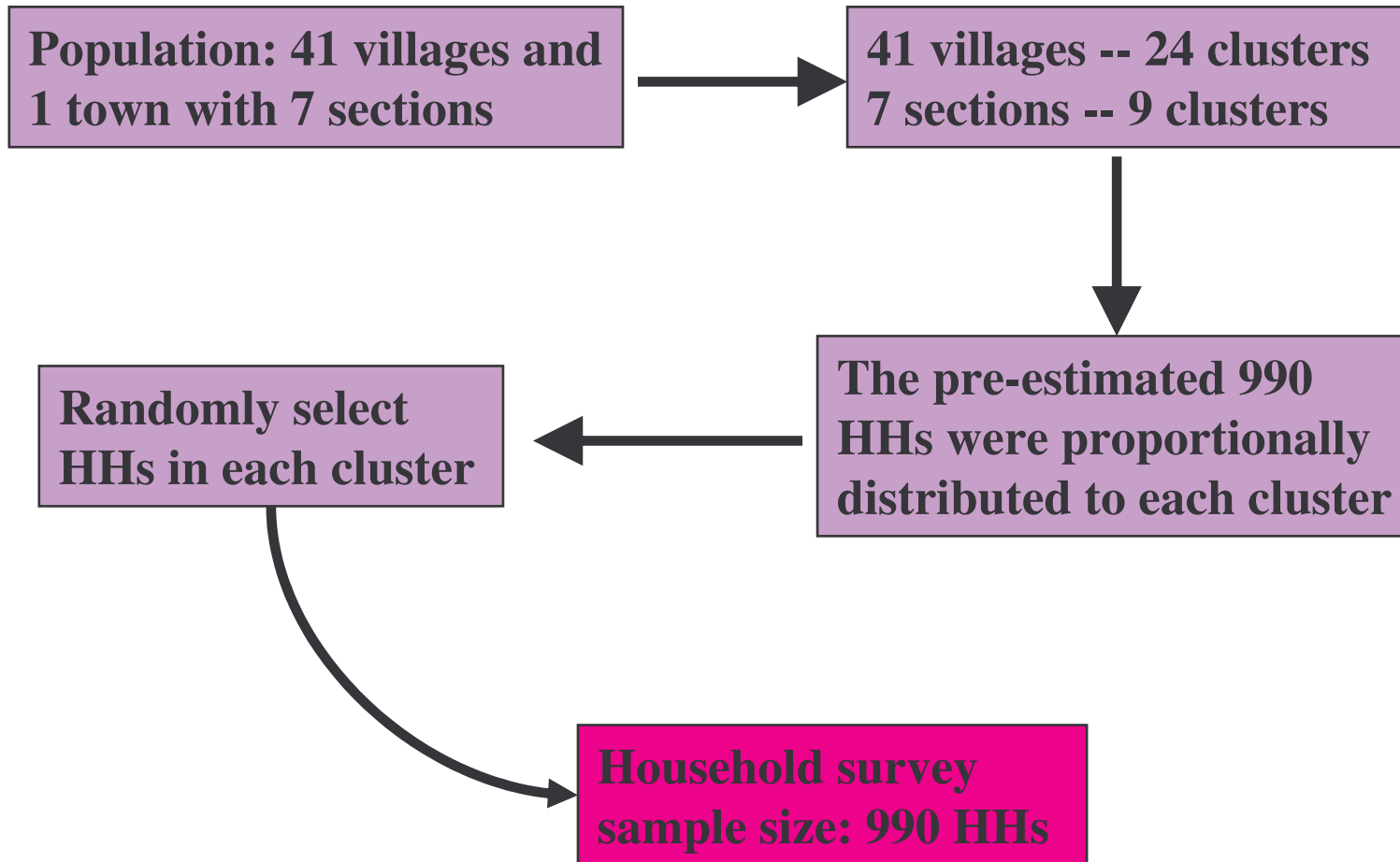








# Sampling and sample size



# Household survey

- **The survey includes**
  - **each household member's basic information**
  - **social economic information**
  - **morbidity**
  - **demand for health care**
- **3-day workshop for training interviewers**
- **The household survey was carried out during April and May 2003**

# Data analysis and model

- A multinomial logistic regression model was used to analyse the factors that influence demand for health care
- This model was selected because the dependent variable, demand for health care, has more than two categories
- The categories have been defined as no-care, self-care, traditional care and western care
- The explanatory variables were selected based on the study hypotheses, the relevant knowledge and the needs of the model
- A novel feature is to introduce in the model the ratio between the price of western medicine (per visit) and the six-month household cash-income rather than price

$$\mathbf{Prob (Y = 0)} = \frac{e^{x\beta^{(0)}}}{1 + e^{x\beta^{(0)}} + e^{x\beta^{(1)}} + e^{x\beta^{(2)}}}$$

$$\mathbf{Prob (Y = 1)} = \frac{e^{x\beta^{(1)}}}{1 + e^{x\beta^{(0)}} + e^{x\beta^{(1)}} + e^{x\beta^{(2)}}}$$

$$\mathbf{Prob (Y = 2)} = \frac{e^{x\beta^{(2)}}}{1 + e^{x\beta^{(0)}} + e^{x\beta^{(1)}} + e^{x\beta^{(2)}}}$$

$$\mathbf{Prob (Y = 3)} = \frac{1}{1 + e^{x\beta^{(0)}} + e^{x\beta^{(1)}} + e^{x\beta^{(2)}}}$$

# Price elasticity

- **The price elasticity of demand is defined as the magnitude of the proportionate change in quantity demanded over the proportionate change in price**

$$\frac{((Q_2 - Q_1) / Q_1)}{((P_2 - P_1) / P_1)}$$

# Results

## Household and individual characteristics of the whole sample

Characteristics	Mean	S.D.	Mini- mum	Maxi- mum
<b>Household<sup>1</sup></b>				
Size	8.04	5.89	1	57
<=15 years old size	3.87	3.36	0	27
6-month cash income <sup>2</sup>	215417	442536	0	10414750
6-month expenditure <sup>2</sup>	176083	435205	0	10863954
Living in Nouna town (%)	36.23			
<b>Individual<sup>3</sup></b>				
Age	22.03	19.03	0	101
Sex (male, %)	50.69			
Married (%)	35.75			
Years of schooling	0.83	2.20	0	22
6-month cash income <sup>2</sup>	25670	131978	0	8410000
6-month expenditure <sup>2</sup>	21273	136849	0	10034954
Living in Nouna town (%)	34.73			

Note: 1. 988 households have been interviewed.

2. CFA (€1 = 655 CFA).

3. There are 7939 individuals in total.

### Household characteristics of health care users and non-users

Characteristics	No-care	Self-medication	Traditional care	Western care	Total/average	Spearman R
Sample size (%)	95 (17.03)	293 (52.51)	60 (10.75)	110 (19.71)	558	
Household size	9.73	11.08	9.57	11.44	10.76	0.039
Education (years)						
0 (%)	83 (87.37)	260 (88.74)	54 (90.00)	90 (81.82)	487 (87.28)	
>0 (%)	12 (12.63)	33 (11.26)	6 (10.00)	20 (18.18)	71 (12.72)	
6-month cash income	132124	208547	261803	723230	302723	0.196**
6-month expenditure	133227	175099	241649	429953	225366	0.192**

### Individual characteristics of health care users and non-users

Characteristics	No-care	Self-care	Traditio nal care	Western care	Total/ average	Spearman R
<b>Age</b>	<b>36.96</b>	<b>28.69</b>	<b>32.33</b>	<b>26.95</b>	<b>30.15</b>	<b>-0.108*</b>
<b>Sex (male)</b>	<b>0.47</b>	<b>0.43</b>	<b>0.52</b>	<b>0.49</b>	<b>0.46</b>	<b>0.030</b>
<b>Married</b>	<b>0.65</b>	<b>0.46</b>	<b>0.48</b>	<b>0.53</b>	<b>0.51</b>	<b>-0.059</b>
<b>Household head</b>	<b>0.23</b>	<b>0.21</b>	<b>0.25</b>	<b>0.24</b>	<b>0.22</b>	<b>0.015</b>
<b>Education (years)</b>						
<b>0 (%)</b>	<b>86</b>	<b>251</b>	<b>51</b>	<b>89</b>	<b>477</b>	
	<b>(90.53)</b>	<b>(85.67)</b>	<b>(85.00)</b>	<b>(80.91)</b>	<b>(85.48)</b>	
<b>&gt;0 (%)</b>	<b>9 (9.47)</b>	<b>42</b>	<b>9 (15.00)</b>	<b>21</b>	<b>81</b>	
		<b>(14.33)</b>		<b>(19.09)</b>	<b>(14.52)</b>	
<b>6-month cash income</b>	<b>35767</b>	<b>30737</b>	<b>21409</b>	<b>60293</b>	<b>36417</b>	<b>0.036</b>
<b>6-month expenditure</b>	<b>31079</b>	<b>27228</b>	<b>22563</b>	<b>59644</b>	<b>33772</b>	<b>0.030</b>
<b>Living in Nouna town</b>	<b>0.21</b>	<b>0.29</b>	<b>0.38</b>	<b>0.41</b>	<b>0.31</b>	<b>0.142**</b>

**Other characteristics of health care users and non-users (1)**

<b>Characteristics</b>	<b>No-care</b>	<b>Self-care</b>	<b>Traditional care</b>	<b>Western care</b>	<b>Total/average</b>	<b>Spearman R<sup>3</sup></b>
<b>Perceived severity of disease</b>	<b>1.55</b>	<b>1.78</b>	<b>2.03</b>	<b>2.06</b>	<b>1.82</b>	<b>0.245**</b>
<b>Perceived limitation imposed by disease</b>	<b>3.79</b>	<b>3.57</b>	<b>2.90</b>	<b>3.18</b>	<b>3.46</b>	<b>0.075</b>
<b>Number of episodes in past month</b>	<b>1.07</b>	<b>1.08</b>	<b>1.05</b>	<b>1.03</b>	<b>1.06</b>	<b>-0.045</b>
<b>Perceived quality of CSPS<sup>2</sup></b>	<b>3.37</b>	<b>3.23</b>	<b>3.66</b>	<b>3.53</b>	<b>3.36</b>	<b>0.063</b>
<b>Perceived quality of healer</b>	<b>2.96</b>	<b>2.91</b>	<b>3.09</b>	<b>2.81</b>	<b>2.92</b>	<b>-0.018</b>
<b>Cost per visit<sup>1</sup></b>	<b>0</b>	<b>474</b>	<b>1163</b>	<b>4399</b>	<b>1241</b>	<b>0.630**</b>
<b>Distance to the nearest health facility (km)</b>	<b>5.87</b>	<b>6.31</b>	<b>5.43</b>	<b>4.79</b>	<b>5.84</b>	<b>-0.075</b>

**Other characteristics of health care users and non-users (2)**

<b>Characteristics</b>	<b>No-care</b>	<b>Self-care</b>	<b>Traditio nal care</b>	<b>Western care</b>	<b>Total/ average</b>
<b>Main reasons for choosing the treatment</b>					
<b>Not enough money (%)</b>	<b>44 (46.32)</b>	<b>182 (62.12)</b>	<b>20 (33.33)</b>	<b>4 (3.64)</b>	<b>250 (44.80)</b>
<b>Not severe (%)</b>	<b>17 (17.89)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>17 (3.05)</b>
<b>Trusting (%)</b>	<b>0 (0)</b>	<b>79 (26.96)</b>	<b>33 (55.00)</b>	<b>62 (56.36)</b>	<b>174 (31.18)</b>
<b>Near home (%)</b>	<b>0 (0)</b>	<b>1 (0.34)</b>	<b>0 (0)</b>	<b>22 (20.00)</b>	<b>23 (4.12)</b>
<b>Severe (%)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>1 (1.67)</b>	<b>21 (19.09)</b>	<b>22 (3.94)</b>
<b>Others (%)</b>	<b>34 (35.79)</b>	<b>31 (10.58)</b>	<b>6 (10.00)</b>	<b>1 (0.91)</b>	<b>72 (12.90)</b>

**Results of multinomial logistic regression (1)**

<b>Independent variable and description</b>		<b>B</b>	<b>S. E.</b>	<b>Sig.</b>	<b>Exp (B)</b>
<b>No-care vs. western care</b>	<b>Intercept</b>	<b>3.0254</b>	<b>0.6740</b>	<b>0.0000</b>	
	<b>Household head education (literate = 1)</b>	<b>-0.1121</b>	<b>0.4659</b>	<b>0.8099</b>	<b>0.8940</b>
	<b>Household 6-month cash income</b>	<b>-0.000002</b>	<b>0.0000</b>	<b>0.0179</b>	<b>1.0000</b>
	<b>Price per visit for western care/household 6-month cash income</b>	<b>2.4830</b>	<b>1.2006</b>	<b>0.0386</b>	<b>11.9777</b>
	<b>Age</b>	<b>0.0324</b>	<b>0.0105</b>	<b>0.0021</b>	<b>1.0329</b>
	<b>Marital status (married = 1)</b>	<b>-0.3427</b>	<b>0.3930</b>	<b>0.3831</b>	<b>0.7098</b>
	<b>Living in Nouna town (yes = 1)</b>	<b>-0.8924</b>	<b>0.4231</b>	<b>0.0349</b>	<b>0.4097</b>
	<b>Household head (yes = 1)</b>	<b>-1.1600</b>	<b>0.4497</b>	<b>0.0099</b>	<b>0.3135</b>
	<b>Perceived severity of disease</b>	<b>-1.3729</b>	<b>0.2936</b>	<b>0.0000</b>	<b>0.2534</b>
	<b>Perceived limitation imposed by disease</b>	<b>-0.0724</b>	<b>0.1272</b>	<b>0.5690</b>	<b>0.9301</b>
	<b>Distance to the nearest health facility (km)</b>	<b>-0.0150</b>	<b>0.0274</b>	<b>0.5850</b>	<b>0.9852</b>
<b>Type of disease (acute = 1, chronic = 0)</b>	<b>-1.2506</b>	<b>0.3505</b>	<b>0.0004</b>	<b>0.2863</b>	

**Results of multinomial logistic regression (2)**

<b>Independent variable and description</b>		<b>B</b>	<b>S. E.</b>	<b>Sig.</b>	<b>Exp (B)</b>
<b>Self-care vs. western care</b>	<b>Intercept</b>	<b>2.4205</b>	<b>0.5401</b>	<b>0.0000</b>	
	<b>Household head education (literate = 1)</b>	<b>-0.3865</b>	<b>0.3337</b>	<b>0.2468</b>	<b>0.6795</b>
	<b>Household 6-month cash income</b>	<b>-0.0000004</b>	<b>0.0000</b>	<b>0.0451</b>	<b>1.0000</b>
	<b>Price per visit for western care/household 6-month cash income</b>	<b>2.5516</b>	<b>1.1788</b>	<b>0.0304</b>	<b>12.8271</b>
	<b>Age</b>	<b>0.0178</b>	<b>0.0089</b>	<b>0.0456</b>	<b>1.0179</b>
	<b>Marital status (married = 1)</b>	<b>-0.6468</b>	<b>0.3202</b>	<b>0.0434</b>	<b>0.5237</b>
	<b>Living in Nouna town (yes = 1)</b>	<b>-0.2432</b>	<b>0.3198</b>	<b>0.4470</b>	<b>0.7841</b>
	<b>Household head (yes = 1)</b>	<b>-0.6506</b>	<b>0.3684</b>	<b>0.0774</b>	<b>0.5217</b>
	<b>Perceived severity of disease</b>	<b>-0.6404</b>	<b>0.2034</b>	<b>0.0016</b>	<b>0.5271</b>
	<b>Perceived limitation imposed by disease</b>	<b>-0.0467</b>	<b>0.0983</b>	<b>0.6351</b>	<b>0.9544</b>
	<b>Distance to the nearest health facility (km)</b>	<b>0.0174</b>	<b>0.0214</b>	<b>0.4172</b>	<b>1.0175</b>
	<b>Type of disease (acute = 1, chronic = 0)</b>	<b>-0.1940</b>	<b>0.2621</b>	<b>0.4592</b>	<b>0.8237</b>

**Results of multinomial logistic regression (3)**

<b>Independent variable and description</b>		<b>B</b>	<b>S. E.</b>	<b>Sig.</b>	<b>Exp (B)</b>
<b>Traditional care vs. western care</b>	<b>Intercept</b>	<b>0.7795</b>	<b>0.7468</b>	<b>0.2966</b>	
	<b>Household head education (literate = 1)</b>	<b>-0.5635</b>	<b>0.5283</b>	<b>0.2861</b>	<b>0.5692</b>
	<b>Household 6-month cash income</b>	<b>-0.0000004</b>	<b>0.0000</b>	<b>0.1731</b>	<b>1.0000</b>
	<b>Price per visit for western care/household 6-month cash income</b>	<b>1.0827</b>	<b>1.6343</b>	<b>0.5076</b>	<b>2.9528</b>
	<b>Age</b>	<b>0.0117</b>	<b>0.0116</b>	<b>0.3113</b>	<b>1.0118</b>
	<b>Marital status (married = 1)</b>	<b>-0.6889</b>	<b>0.4342</b>	<b>0.1126</b>	<b>0.5021</b>
	<b>Living in Nouna town (yes = 1)</b>	<b>-0.0047</b>	<b>0.4576</b>	<b>0.9917</b>	<b>0.9953</b>
	<b>Household head (yes = 1)</b>	<b>-0.4524</b>	<b>0.5076</b>	<b>0.3729</b>	<b>0.6361</b>
	<b>Perceived severity of disease</b>	<b>0.1842</b>	<b>0.2793</b>	<b>0.5097</b>	<b>1.2022</b>
	<b>Perceived limitation imposed by disease</b>	<b>-0.2746</b>	<b>0.1403</b>	<b>0.0504</b>	<b>0.7599</b>
	<b>Distance to the nearest health facility (km)</b>	<b>0.0091</b>	<b>0.0311</b>	<b>0.7692</b>	<b>1.0092</b>
<b>Type of disease (acute = 1, chronic = 0)</b>	<b>-1.7165</b>	<b>0.3987</b>	<b>0.0000</b>	<b>0.1797</b>	

**Probability of choosing health-care types before and after introducing community-based health insurance (CBI) and price elasticities**

	Household cash income				Total
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	
<b>Projected probability before CBI</b>					
No-care	0.2769	0.2604	0.2295	0.0923	0.2024
Self-care	0.5162	0.5255	0.5421	0.5944	0.5558
Traditional care	0.0770	0.0785	0.0812	0.0908	0.0835
Western care	0.1299	0.1356	0.1472	0.2225	0.1584
<b>Projected probability after CBI</b>					
No-care	0.2620	0.2458	0.2157	0.0845	0.1895
Self-care	0.4842	0.4919	0.5053	0.5396	0.5159
Traditional care	0.0866	0.0881	0.0908	0.0988	0.0930
Western care	0.1672	0.1742	0.1882	0.2770	0.2016
<b>Projected probability difference</b>					
No-care	-0.0149	-0.0146	-0.0138	-0.0078	-0.0129
Self-care	-0.0320	-0.0336	-0.0368	-0.0548	-0.0398
Traditional care	0.0096	0.0096	0.0096	0.0081	0.0095
Western care	0.0372	0.0385	0.0410	0.0545	0.0433
<b>Price elasticities</b>					
No-care	0.0565	0.0586	0.0629	0.0885	0.0668
Self-care	0.0649	0.0670	0.0712	0.0966	0.0751
Traditional care	-0.1313	-0.1287	-0.1237	-0.0932	-0.1190
Western care	-0.3005	-0.2976	-0.2919	-0.2569	-0.2864

# Discussion (1)

<i>Country</i>	<i>Data</i>	<i>Service type</i>	<i>Own-price elasticity</i>			<i>Source</i>
			<i>Overall</i>	<i>Low-income</i>	<i>High-income</i>	
Burkina Faso	1985	Public provider				Sauerborn and others (1994)
	All ages		-0.79	-1.44	-0.12	
	Ages 0-1		-3.64	—	—	
	Ages 1-14		-1.73	—	—	
	Ages 15+		-0.27	—	—	
Côte d'Ivoire	1985	Health clinic	—	-0.61	-0.38	Gertler and van der Gaag (1990)
		Hospital outpatient	—	-0.47	-0.29	
Côte d'Ivoire	1985-87	Health clinic	-0.37	—	—	Dow (1996)
		Hospital outpatient	-0.15	—	—	
Ghana	1987	Hospital inpatient	-1.82	—	—	Lavy and Quigley (1993)
		Hospital outpatient	-0.25	—	—	
		Dispensary	-0.34	—	—	
		Pharmacy	-0.20	—	—	
		Health clinic	-0.22	—	—	
Kenya	1980-81	Government provider	-0.10	—	—	Mwabu and others (1993)
		Mission provider	-1.57	—	—	
		Private provider	-1.94	—	—	

## Discussion (2)

Country	Data	Service type	Own-price elasticity			Source		
			Overall	Low-income	High-income			
Indonesia	1991-93 Children	Health center	-1.07	—	—	Gertler and Molyneaux (1997)		
		Health subcenter	-0.35	—	—			
	Adults	Health center	-1.04	—	—			
		Health subcenter	-0.47	—	—			
	Elderly	Health center	-0.47	—	—			
		Health subcenter	-0.11	—	—			
Mali	1982		-0.98	—	—	Birdsall and others (1983)		
Nigeria						Akin and others (1995)		
Pakistan	1986 Female Children	Traditional healer	—	-0.43	-0.24	Alderman and Gertler (1997)		
		Public clinic	—	-0.43	-0.23			
	Pharmacist	—	-0.44	-0.25				
	Private doctor	—	-0.17	-0.09				
	Male Children	Traditional healer	—	-0.60	-0.26			
		Public clinic	—	-0.61	-0.27			
		Pharmacist	—	-0.63	-0.27			
		Private doctor	—	-0.25	-0.10			
	Peru	1985	Private doctor	—	-0.44		-0.12	Gertler and van der Gaag (1990)
			Hospital outpatient	—	-0.67		-0.33	
Health clinic			—	-0.76	-0.30			

# **Conclusion and implication (1)**

- **Two-thirds of all ill individuals do not seek professional care. Most of them only take self-medication**
- **Western medicine is their main choice among the range of the professional care options.**
- **Economic factors strongly influenced people's choice between professional care and non-professional care**
- **However, given the choice for professional care, economic factors did not influence the choice between traditional care and western care**
- **Health care non-users have lower household income and expenditure, older age and lower perceived severity of the disease**

## **Conclusion and implication (2)**

- **The price elasticity for lower income people is higher than for higher income although the quantity demanded is relatively inelastic**
- **The novel feature is to use price-household income ratio as one explanatory variable instead of price of care, allowing the ‘price’ variable to display greater variation**
- **CBI is necessary in Burkina Faso. Introducing CBI can increase the use of medical care, especially for the poor**
- **The health care demand increase will be greater for the poor than for the rich, improving equity in terms of access to and use of care**

## **Conclusion and implication (3)**

- **Co-payment for the rich may be necessary because of their relatively lower price-sensitivity**
- **Premium adjusted for income or subsidies for the poor can be considered in order to absorb more poor households into CBI and further improve the equity impact of the programme in terms of enrolment**
- **Price is not only one of the main determinants for use of health care, other factors, such as quality of services, should be considered in order to improve the utilization**