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AUSTRALIAN CENTRE  
FOR  
ECONOMIC RESEARCH  
ON HEALTH

# Health Service Utilisation in the Absence of User Fees: Does Travel Time Matter? The Case of Tonga

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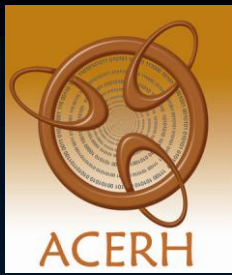


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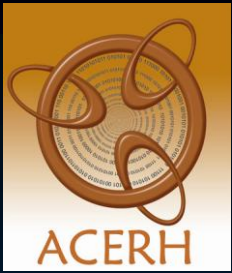
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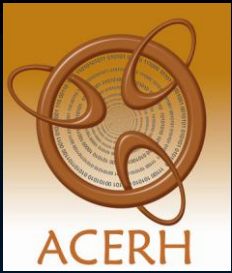
## Literature Review

- The argument that providing medical care free of charge or at a very low cost will promote equal access and remove financial barriers has not worked rather this policy has benefited the high income urban population (Avi and Jacques van der Gaag,1993).
- Earlier studies undertaken on user charges and health service utilisation suggest that user charges make a small contribution to the total costs of care, but exclude the poorest from access to services and result in delays before seeking treatment, sometimes in the case of critical illness (Russell and Gilson, 1997; Gilson, 1997; Palmer et al 2004; McPake, 1993).
- Indirect access costs such as travel time also play an important role in rationing health care utilisation. Health care demand amongst poorer individuals is substantially more travel time elastic than amongst the rich (Dor. A et al 1987).



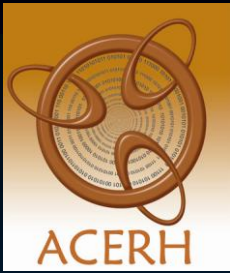
## Literature Review (cont.)

- Hyo Jung (2006) found that increased time cost reduces medical care demand significantly. Men and individuals in labor market use less medical care and they are more responsive to changes of time cost in most cases. Time cost has greater effect for general doctor visits than for emergency room usage.



## Health System in Tonga

- Public hospitals are the principal providers of health care in Tonga
- Health services are available free or at a very low user fee
- Total expenditures on health (THE) as a percent of GDP rose from 4.7% in 1995 to 5.2% in 2003
- Ratio of GGEH to general government expenditures increased from 9.7 in 1995 to 11.7 in 2007 (WHO, 2008)



## Objectives of study

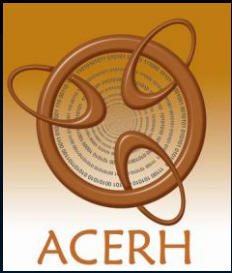
- To measure the effect of travel time and other socio-economic and demographic variables on the probability of seeking health care
- To examine the health care provider choice across public or private providers relative to not seeking care

### *Dependent variables*

- Probability of seeking medical care
- Probability of seeking medical care from public or private providers relative to not seeking care

### *Independent variables*

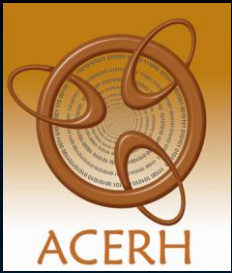
- Demographic
- Socio-economic status
- Health complaints
- Travel time



## Econometric Model and Estimation Methods

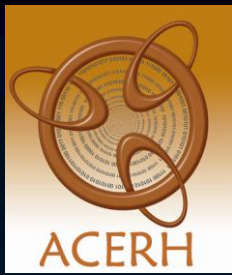
- Standard logit regression was applied to look at impact of travel time on demand for medical care
- Multinomial logit regression was used to examine the provider choices
- A mathematical form of the model can be demonstrated as

$$\Pr(y_j \neq 0 \mid x_j) = \frac{\exp(x_j\beta)}{1 + \exp(x_j\beta)}$$



## Data

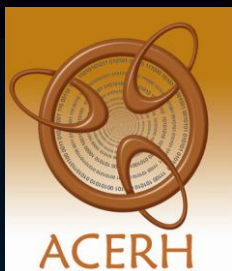
- Kingdom of Tonga Health Assessment Project also known as World Bank Household Health Survey, conducted in 2003.
- 10,994 individuals of all ages- about 10 % of the population.
- 2,089 Households
- 103 census blocks across all 5 divisions of Kingdom of Tonga (Ha'apai, Niuas, Tongatapu, Vava'u and Eua)
- Analysis of this study is based on general health and outpatient consultations of 795 (7.23%) individuals who reported health complaints during the past two weeks preceding the interview.



## Summary Statistics

### Of the 795 who reported health complaints:

- Females – 49%
- Under 14 – 29%; 65+ – 11% (in the survey, 6% children of age less than 14 while 14% people of age 65+ reported any health complaints)
- By illness type: Acute – 75%; Chronic – 19%; Severe & other – 6%
- More than one health complaint – 36%
- Work disruption – 63%
- Household size – 6.23
- Housing index – 7.52
- Mean household annual expenditures (in thousands of Pa'anga) – 10.28
- Mean one way travel time to obtain medical care (in minutes) – 21.07
- 536 (67%) sought medical care (95% from Public providers, 5% from private providers)



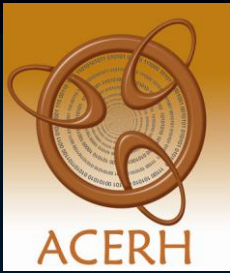
# Determinants of demand for medical care for 795 cases with health complaints during past 14 days (Logit estimates)

Variables	Model 1		Model 3		Model 5	
	Coef	S.E	Coef	S.E	Coef	S.E
<b>Employment</b>						
Full/part time	-1.215	0.774	-1.230	0.777	-1.170	0.768
Farm/fishing/handicrafts employed	-1.754**	0.804	-1.735**	0.807	-1.729**	0.795
House & farming	-1.354***	0.764	-1.376***	0.766	-1.381***	0.759
Unemployed	-1.267	0.866	-1.258	0.869	-1.251	0.859
Housework only	-1.605**	0.760	-1.633**	0.761	-1.640**	0.754
Students	-1.159***	0.703	-1.997***	0.704	-1.124	0.702
Old/retired/disab	-1.146	0.884	-1.122	0.889	-1.073	0.882
<b>Health complaints</b>						
Acute illness	0.188	0.459			0.191	0.453
Acute (mild)			0.069	0.459		
Acute (severe)			0.943	0.588		
Chronic illness	0.907***	0.493	0.883***	0.429	0.849***	0.487
Severe illness	0.234	0.705	0.195	0.706	0.235	0.700



# Logit estimates (cont.)

Variables	Model 1		Model 3		Model 5	
	Coef	S.E	Coef	S.E	Coef	S.E
<b>Second health complaint</b>	0.581*	0.190			0.599*	0.191
Second complaint (acute mild)			0.704*	0.219		
Second complaint (acute sever)			0.342	0.630		
Second complaint (chronic)			0.765**	0.359		
Second complaint (other)			1.052	0.718		
Work disruption	1.312*	0.176	1.305*	0.178	1.278*	0.175
Current Smoker	-0.810*	0.246	-0.809*	0.249	-0.786*	0.245
<b>Socio-economic status</b>						
Housing index	0.143*	0.043	0.139*	0.043	0.111*	0.041
Household non-durable expenditures (in thousands)					0.027	0.020
Household durable expenditures (in thousands)					0.052**	0.024
Household church donations (in thousands)					-0.108***	0.062
Log of household annual expenditures	0.441*	0.138	0.439*	0.139		



# Logit estimates

Variables	Model 1		Model 2		Model 3	
	Coef	S.E	Coef	S.E	Coef	S.E
Travel time	-0.008*	0.003	-0.008*	0.003	-0.008*	0.003
Constant	-1.628	0.929	-1.516	0.933	-0.702	0.872
Elasticity						
Income elasticity	0.13*	0.040	0.13*	0.040		
Travel time elasticity	-0.05*	0.016	-0.05*	0.016	-0.05*	0.016
Log likelihood	-425.97		-422.25		-426.86	
$\chi^2$	151.59		159.04		149.82	
Prob> $\chi^2$	0.000		0.000		0.000	
Pseudo R2	0.15		0.16		0.15	

\* Statistically significant at 1 percent

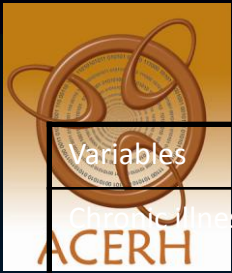
\*\* Statistically significant at 5 percent

\*\*\* Statistically significant at 10 percent



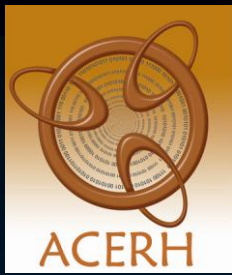
## Determinants of choice between public/private health providers relative to not seeking health care during past 14 days (Multinomial Logit Regression)

	Model I				Model II			
	Public Health Providers		Private Health Providers		Public Health Providers		Private Health Providers	
	Coef.	S.E	Coef.	S.E	Coef.	S.E	Coef.	S.E
Age <14	0.379	0.309	-0.371	0.820	0.262	0.303	2.302	1.433
Age 65+	0.467	0.300	0.320	0.686	0.413	0.337	-0.926	0.964
Primary	-0.642**	0.317	-0.408	0.863				
Secondary	-0.603***	0.365	-0.559	0.966				
Tertiary	-0.441	0.523	-0.743	1.436				
Full/part time					-0.587	0.395	2.467	1.608
Farm/fishing/handicrafts employed					-0.890*	0.412	1.216	1.823
House & farming					-0.806**	0.346	2.219	1.510
Students					-0.625*	0.287	-1.496	1.195
Old/retired/disab					-0.536	0.620	4.328*	1.661
Acute (mild)	0.262	0.435	0.261	0.810	0.243	0.439	0.333	0.867
Acute (severe)	1.259**	0.559			1.221**	0.561		



# Multinomial Logit Regression

Variables	Coef.	S.E	Coef.	S.E	Coef.	S.E	Coef.	S.E
Change in stress	1.071**	0.469	1.097	0.876	1.034**	0.473	1.065	0.917
Severe illness	0.547	0.671			0.371	0.689		
Second health complaints	0.649*	0.190	0.027	0.498	0.667*	0.192	0.138	0.518
Work disruption	1.273*	0.175	2.304*	0.638	1.261*	0.174	2.231*	0.641
Current smoker	-0.778*	0.218	-1.642**	0.776	-0.763*	0.232	-1.615**	0.799
Housing index	0.139*	0.042	0.065	0.108	0.135*	0.042	0.090	0.111
Log of household annual expenditures	0.471*	0.133	0.002	0.334	0.465*	0.133	-0.019	0.347
Travel time	-0.009*	0.003	-0.008	0.007	-0.008*	0.003	-0.005	0.007
Constant	-2.026*	0.777	-3.858**	1.899	-1.847**	0.756	-6.662*	2.192
Log likelihood	-522.50				-511.07			
$\chi^2$	160.61				183.47			
Prob> $\chi^2$	0.000				0.000			
Pseudo R <sup>2</sup>	0.13				0.15			



## Conclusions

- Age, gender, education and household size show no significant association with demand for medical care
- Household socio-economic status displays significant and positive association with demand for medical care and visiting public health providers.
- Travel time has significant and negative association with demand for medical care and visiting public health providers
- Travel time is an important determinant of seeking medical care and need to be considered in provision of public health facilities.
- Ignores the quality of health care