Analyzing Beach Recreationists´Preferences for the Reduction of Jellyfish Outbreaks: Economic Results from a Stated Choice Experiment in Catalonia, Spain

Paulo A. L.D. Nunes, Maria L. Loureiro, Laia Piñol, Sergio Sastre and Louinord Voltaire

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Area of Study (1)

Map of Spain and Catalonia

Area of Study: Catalonia

Area of Study (2)

Share

1. Barcelona, Spain

Objective

- To asses the impact of jellyfish outbreaks in recreationists´preferences in Catalonia (Spain).

    - Catalonia is a world leading tourism destination: 580 Kms of coastline, 263,7 million beach recreational visits in 2011.

1. We assess the impact of risk of jellyfish outbreaks on beach recreationists, understanding preferences of beach attributes (including services and water quality).
2. We compute the willingness to pay to avoid jellyfish outbreaks by the implicit value of the additional time that visitors are willing to travel to the beach in order to reduce the probabilty of encountering jellyfish.

Structure of Presentation

- Data collection procedure
- Methology
- Empirial Estimates
- Overal significance of the results

Data collection procedure

- Selection of beaches has been done according to different morphological and locational characteristics of beaches.
- Face to face interviews were conducted in summer 2012 at selected beaches.
  - 362 completed questionnaires were collected at selected beaches.

Questionnaire design

- The design of the interview was tested by several focus groups and pilot experiences.
- Enumerators took the shortline as a reference line and walked ten meters straight ahead between each respondent, randomly inquired.
- Interviewers were carried out only to beachgoers.
- Beachgoers were approached while sunbathing or walking along shoreline.

Survey Structure

- Six sections:
  - Initial questions about beach use and travel habits to the beach
  - Second section about expenses on traveling to the beach
  - Third section (not used for this paper) about contigent behavior type of questions
  - Forth section socio-economic impact of jellyfish outbreaks: stings and treatment costs
  - Fifth section about choice exercise between beach type A and B
  - Sixth section concluded with socio-demographic questions

Choice Experiment: Example of a choice card

	BEACH/PLAYA A	BEACH/PLAYA B	OTRA ACTIVIDAD OTHER ACTIVITY
Riesgo de medusas Jellyfish risk			    
Calidad del agua Water quality			
Servicios Services			
Tiempo adicional Additional Time			

MIN	20%
10	12
20	24
30	36
40	48
50	60
60	72
70	84
80	96
90	108
100	120

MIN	30%
10	13
20	26
30	39
40	52
50	65
60	78
70	91
80	104
90	117
100	130

Choice Experiment: Attributes levels

Attributes	Levels		
Jellyfish risk	Low risk (=<2days/week)	High risk (more than 5 days/week)	
Water quality	Average	Above average	
Services	Parking and toilettes	Parking, toilettes and children play area	Parking, toilettes, children play area and security
Additional Time	A	B	C

Sample Description

Variable	Description	Mean	Std. Dev.
Man	1, if the respondent was a man; 0 otherwise	0.218	0.413
Less half a day	1, if the respondent has planned to stay at this beach less than half a day; 0 otherwise	0.726	0.446
Half a day	1, if the respondent has planned to stay at this beach half a day; 0 otherwise	0.210	0.408
Whole day	1, if the respondent has planned to stay at this beach whole a day; 0 otherwise	0.064	0.244
Resident	1, if the respondent has his/her first residence in this place; 0 otherwise	0.437	0.496
Length stay	Length stay	15.906	24.629
Foot or bike	1, if the respondent has come to the beach on foot or bicycle; 0 otherwise	0.474	0.499
Car or motorbike	1, if the respondent has come to the beach by car or by motorbike; 0 otherwise	0.390	0.488
Public transport	1, if the respondent has come to the beach by public transport; 0 otherwise	0.136	0.343
Yes stung	1, if the respondent has been stung by a jellyfish; 0 otherwise	0.217	0.412
Know somebody	1, if the respondent knows someone who has been stung by a jellyfish; 0 otherwise	0.172	0.377
No stung	1, if the respondent has not been stung by a jellyfish or does not know anyone who has been stung; 0 otherwise	0.611	0.488
Age	Age of respondent	42.709	13.500
International	1, if the respondent is international; 0 otherwise	0.236	0.424
Area residence	1, if the respondent does not live in Spain; 0 otherwise	0.178	0.383
Educational level	1, if the respondent has above high school; 0 otherwise	0.496	0.500
Job	1, if the respondent has a job; 0 otherwise	0.722	0.448
Low income	1, if the respondent has lower income; 0 otherwise	0.367	0.482
Medium			

Choice experiment results (1)

$$U_{ij} = \beta_1 additional\ time_{ij} + \beta_2 water\ quality_{ij} + \beta_3 services_{ij} + \beta_4 jellyfish\ risk_{ij} + \varepsilon_{ij}$$

- Conditional Logit (Clogit)

CLOGIT			
Variable	Coefficient	Std. Err.	P|z|>Z*
Risk	-0.349	0.049	0.000
Water	0.730	0.036	0.000
Environment	0.409	0.038	0.000
Nominal time	0.079	0.016	0.000
Nominal time^2	-0.001	0.000	0.000

Willingness to pay (WTP) (1)

Table: WTP for Conditional Logit model

	WTP				
Variable	**Coefficient**	**Std. Err.**	**P |z|>Z***	**95% Confidence Interval**	
Jellyfish risk	-3.810	0.890	0.000	-5.553	-2.066
Water quality	7.975	1.773	0.000	4.500	11.450
Services	4.472	1.104	0.000	2.309	6.635

Willingness to pay (WTP) (2)

- The attribute of *time* is divided into quartiles

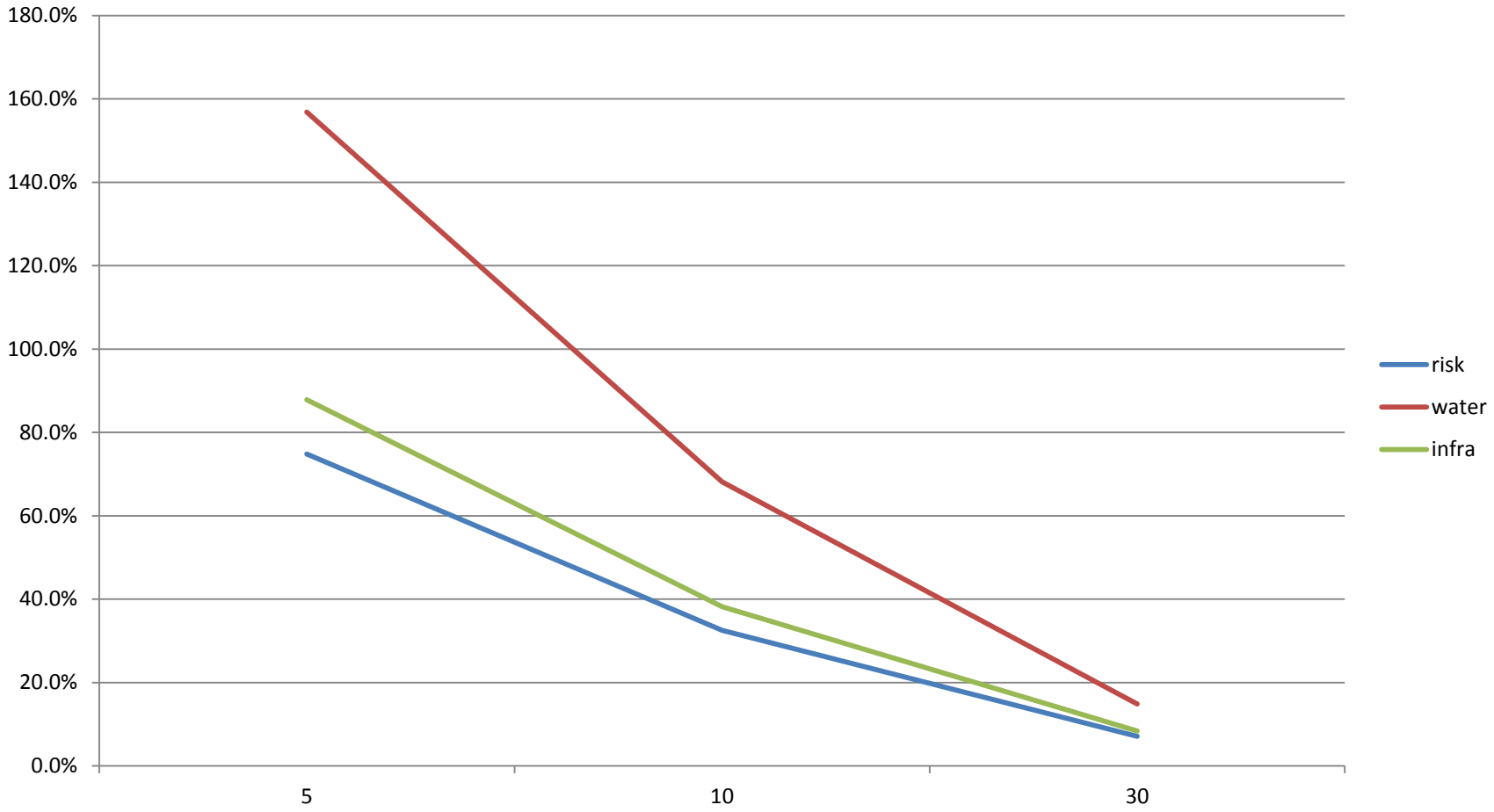
Quantile	Time
First quantile	5 minutes
Second quantile	10 minutes
Third quantile	30 minutes
Fourth quantile	180 minutes

Willingness to pay (WTP) (3)

- Willingness to pay with Clogit results

	WTP for Clogit per quantiles of traveling time			
	First Quantile	***Second quantile***	***Third quantile***	***Fourth quantile***
Risk	3.74 min	3.25 min	2.13 min	0.59 min
Water	7.84 min	6.81 min	4.46 min	1.24 min
Environment	4.39 min	3.82 min	2.50 min	0.69 min

Relative Willingness to pay (WTP)



Relative Willingness to pay (WTP)

	5 minutes	10 minutes	30 minutes
risk	74,8%	32,5%	7,1%
water	156,8%	68,1%	14,9%
infra	87,8%	38,2%	8,3%

Monetary Figures

- **Time has value**: monetarization technique employing earned income per hour.
- In total, we find that Catalan tourists are willing to pay about 274,6-316,1 million Euro/year.
- This implies that visitors are willing to pay 16%-19% of the Catalonian tourism receipts just to avoid jellyfish outbreaks.

Conclusions

- Jellyfish outbreaks cause important nuisense to tourists.
- Tourists are willing to make sacrifies on time in order to visit beaches with less probability of outbreaks.
- Results show that cost-benefit analysis of jellyfish control operations pass a cost-benefit analysis as long as anual costs are below the estimated WTP to avoid outbreaks.
- Important nice for information devises such as smart phone applications (medjelly iphone application).

Thank you!

Comments and questions are appreciated!

maria.loureiro@usc.es