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Assessing the impact of tourism on hospitals' performance in a coastal destination

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Abstract:

Tourism represents one of the most relevant industries in promoting the development of a destination, but tourism and its seasonality can produce negative outcomes. The additional demand caused by tourism can strongly affect public service providers which cannot adapt their supply to seasonal variations as a result of organisational, financial and institutional limitations. This work focuses on hospital services in an Italian coastal destination and it aims to explain the impact tourism and its related seasonality have on the performance of hospitals in a coastal destination. The activity of three hospitals located in Gallura, a region in the north-east of Sardinia, Italy, has been analysed. The analysis has been carried out using data on hospital admissions from 2014 and 2015. The study highlights the critical impact tourism can have on the activity of healthcare providers in a coastal destination, identifying the reduction of hospital performance and a potential cause of bed crises.

Keywords: *impact of tourism; hospital admission; host communities; seasonality, bed crisis*

INTRODUCTION

Tourism is a pivotal industry for the economic and social development of a destination. The positive impacts of tourism are fundamental to obtaining the support of local communities for the industry; at the same time, policymakers and tourism managers are expected to identify, assess and tackle the potential negative impacts of tourism and its seasonality. This paper examines the relationship between the seasonal fluctuations in demand for public services and their performance in terms of accessibility for locals to elucidate how hospitals deal with the additional demands generated by tourists.

Tourism can cause an increase in demand for services that can lead to a reduction in performance resulting in lower accessibility, quality and quantity (Albaladejo & Bel, 2010). A reduction in the performance of fundamental services for locals can be a significant source of dissatisfaction among residents (Hao, Long, & Kleckley, 2011). Specifically, the additional demand caused by tourism can strongly affect public service providers (e.g. hospitals, emergency departments, garbage disposal, public utility supply), which cannot adapt their supply to seasonal variations as a result of organisational, financial and institutional limitations.

This work focuses on hospital services in an Italian coastal destination. Specifically, the activity of three public hospitals located in Gallura, a region in the north-east of Sardinia, Italy, has been analysed. Given its strong tourism industry, Gallura is a suitable case study to assess the impact of summer seasonality on the accessibility of healthcare facilities to locals. The analysis is intended to identify whether tourism causes a “bed-crisis” effect, a phenomenon that emerges when hospitals face a reduction in available beds (Vasilakis & El-Darzi, 2001). Such reductions are normally related to epidemiological factors (Fullerton & Crawford, 1999) and the increase in hospitalisation caused by weather-related diseases during the winter, but bed crises can also be caused by tourism (Matter-Walstra, Widmer, & Busato, 2006; Küçükaltan & Pirnar, 2016; Volgger et al., 2017; Chatzigeorgiou, 2017).

In light of the importance of healthcare services to community well-being, this paper aims to identify whether tourism reduces the level of healthcare services for locals, thus becoming a source of dissatisfaction among residents. By identifying a pattern of peaks in tourism and lows in healthcare service performance for locals, this paper will contribute to a knowledge-based policy-making process capable of determining how to effectively tackle the increase in healthcare demand during seasonal tourism peaks to guarantee both citizens and tourists an adequate level of accessibility and quality. This informed process will limit locals' dissatisfaction towards tourism and win their support for the development of the tourism industry.

THEORETICAL FRAMEWORK

Tourism is currently one of the fastest-growing industries worldwide. Its relevance in promoting the economic, social and environmental development of a destination is beyond question, but it must be noted that together with its positive effects, tourism can also produce negative outcomes. Over the last several decades, scholars have shown a growing interest in assessing the impact of tourism (Ap, 1992; Easterling, 2004; Lundberg, 2017; Pizam, 1978; Christou, 2002). The enduring interest in the topic is related to an increased awareness of the potential negative outcomes of tourism, which can hinder the development of a tourism destination.

Table 1 summarises the literature review undertaken by Almeida García, Balbuena Vázquez and Cortés Macías (2015) on the potential positive and negative impacts of tourism. The effects identified are categorised according to well-established classifications that gather factors under three headings: economic, sociocultural and environmental (Andereck, Valentine, Knopf, & Vogt, 2005).

According to Sharpley (2014), tourism should be considered a source of potential costs, which can limit the benefits of tourism as perceived by local communities and consequently their positive attitude towards the industry. As a consequence, national and local government, tourism planners and stakeholders involved in the tourism market should identify the factors causing dissatisfaction among residents (Andriotis & Vaughan, 2003) to establish an appropriate trade-off between tourism's positive and negative effects and to create a sustainable development plan for the destination (Presenza, Del Chiappa, & Sheehan, 2013). In other words, destinations must face and solve the "development dilemma", which implies that "they are, in a sense, required to engage in a trade-off between the benefits they perceive to receive from tourism and the negative social and environmental consequences of its development" (Sharpley, 2014: 37).

Table 1. The positive and negative impacts of tourism

Economic impacts	Sociocultural impacts	Environmental impacts
<i>Positive</i>	<i>Positive</i>	<i>Positive</i>
Employment opportunities	Better services offered to the community	Awareness in the importance of preserving nature
Income for residents	Higher opportunity for leisure	Improved appearance of cities
Opportunities to negotiate	Cultural stimuli	
Development of economic business environment	Awareness of the importance of cultural sites	
Improved infrastructure and public facilities	Increased pride and cultural identity	
Improved living standards	Improved quality of life	
	Promotes social interactions among residents and tourists	
<i>Negative</i>	<i>Negative</i>	<i>Negative</i>
Seasonality of employment and business activity	Traffic congestion and parking problems	Increased pollution
Increased cost of living	Increased crime and vandalism	Increased garbage production
Increase in prices and inflation	Increased drug and alcohol abuse	Overcrowding and congestion
	Increased prostitution	Agglomeration in public facilities and resources

Adapted from (Almeida García et al., 2015)

There is the potential for tourism and its related industries to exploit destinations and local communities and be the source of substantial negative effects. One of the most well-known and visible effects of tourism and its seasonality, the increase in population and overcrowding, is perceived by locals as distinctly negative (Brunt & Courtney, 1999; Chenini & Touaiti, 2018).

Moreover, this surge in population has an adverse effect on the activity of service providers. Increased demand can lead in some positive features (i.e. increase in revenues, improved economic sustainability of a business, etc.) but it can generate some negative externalities. To illustrate, tourism destinations can experience an increase in the overall cost of service provision (e.g. water supply and treatment, waste treatment) and reduced accessibility to or overcrowding of public facilities and public places (e.g. transportation, parking, cinemas, beaches, restaurants) (Sharpley & Telfer, 2015). It should also be noted that seasonality will expand tourism's negative effects, imposing a harsher impact on local communities (Albalade & Bel, 2010). Locals should be considered key to the success of the tourism industry since their positive attitude strongly affects the attractiveness and success of a tourism destination (Bachleitner & Zins, 1999). Consequently, it is crucial to reduce the negative externalities affecting locals and thus the risk of local-visitor conflict.

This work focuses on the impact of the reduced accessibility to public services caused by the seasonal increases in demand. As highlighted by the literature, locals are negatively affected by the reduced accessibility to or overcrowding of public facilities (Brunt & Courtney, 1999; Gursoy, Jurowski, & Uysal, 2002; Gursoy & Rutherford, 2004; Lindberg & Johnson, 1997; McCool & Martin, 1994). It is worth noting that public providers normally do not boast a high degree of supply flexibility due to organisational, financial and institutional limitations. Consequently, they adopt a passive

approach to tackle additional demand and suffer from lower accessibility (e.g. longer waiting lists, access blocks, delayed service provision), quality or efficiency during peak times (Albalade & Bel, 2010).

As regards healthcare services, negative perceptions of tourism can emerge as a result of the inability of service providers to deal with increased demand during peak season. Hospitals and healthcare service providers in general, will face a significant rise in hospitalisations when a region's population increases. This so-called "bed-crisis" effect reduces the availability of beds and ability for healthcare facilities to admit patients (Vasilakis & El-Darzi, 2001). This will cause negative knock-on effects such as the cancellation or delay of elective and non-urgent surgeries and procedures. However, the increase in admission rates and related decrease in hospital accessibility is normally concentrated on a specific kind of disease/condition and it can thus be predicted (Fullerton & Crawford, 1999).

Reduction in hospital accessibility normally occurs during the winter as a result of the weather and seasonal flu. However, according to Matter-Walstra et al. (2006), tourism and its seasonality can also cause an increase in hospitalisation rates. It can be assumed that health needs do not drive tourists in choosing their destination during peak tourist seasons. In other words, the increase in demand will be focused on a specific group of health concerns, normally emergency-related, and procedures (i.e. urgent).

Since 1978, the Italian healthcare system has been a universal system and it thus guarantees universal coverage for citizens (Marinò, 2008). Italian patients can request treatment from public or private healthcare providers accredited by the Ministry of Health for free and are charged a limited co-payment for only a small group of health services. Visitors with an European Health Insurance Card (EHIC) will receive the same free (or co-paid) treatment as Italian citizens. In contrast, patients not covered any bilateral agreement with Italy must pay for healthcare services.

Since health procedures for Italian patients are financed through taxation, the absence of actual market exchanges in this sector has led to the adoption of quasi-market mechanisms to fund hospitals with the aim of stimulating access to resources (Bartlett & Le Grand, 1993; Le Grand, 2011; Nella & Christou, 2016). Specifically, Italian hospitals are financed depending upon the amount and kind of services provided to patients. Using the Diagnosis Related Group (DRG) classification, admissions are classified and identified with a unique code and weighting to parametrise their complexity. As their main source of revenue, hospitals receive funds from public healthcare agencies. It is worth noting that the higher the weighting and thus complexity of a DRG, the higher the tariff received by a hospital. Quasi-market reforms have aimed to stimulate competition being hospitals by incentivising them to attract increased demand and thus increase their revenues. Consequently, the increase in hospitalisation demand from tourists can potentially be positive since it can lead to an increase in total hospital revenues. However, to cater for increased demand, providers must be able to simultaneously expand their supply capacity. If not, they will be unable to deal with the pressures of increased demand.

Italy's national legislation ranks hospitals established in the country on a three-level hierarchy reflecting the complexity of their supply and the specialisation of their organisation. Specifically, a "basic hospital" is established to offer services to around 80,000 residents, a "first-level" hospital to 150,000 while a "second-level" hospital will offer its services to more than 600,000 inhabitants. The assumption underpinning this classification is that demand is positively related to the number of people living in an area. Using that parameter, it is possible to define the size of a health facility and avoid overlap or under-use of resources. However, population use estimates can lead to the incorrect forecast of potential demand since they do not consider the fluctuations in population caused, for instance, by commuters (e.g. workers or universities students) or tourists.

With the critical importance of healthcare service provision to the wellbeing of locals firmly in mind, this paper aims to highlight how public hospitals in a coastal tourism destination deal with seasonality. The analysis has been carried out by observing admissions to three Italian public hospitals (year=2014-2015, 31,399 admissions) located in Gallura in the north-east of Sardinia, Italy. The principal assumption of this paper is that hospitals, in light of organisational and institutional constraints (e.g. the number of beds available), are incapable of handling the increase in demand. Consequently, they are forced to change the composition of admission of specific groups of patients and treatment for specific diseases/conditions to tackle demand peaks. In particular, this paper seeks to understand if seasonality causes:

- a) an increase in overall admissions;
- b) a "summer-bed-crisis" effect for specific kinds of patients (locals vs tourists);
- c) an increase in the complexity of the healthcare services provided and an increase in revenues;
- d) a reduction in accessibility to specific wards for locals.

METHODOLOGY

Research context

This paper is an explanatory case study as it aims to explain the impact tourism and its related seasonality have on the performance of public hospitals in a coastal destination (Yin, 2009). The analysis has been carried out in the context of Gallura. Figure 1 illustrates the boundaries of the research area and locations of the three hospitals surveyed.

Gallura can be considered a suitable case study given its popularity among tourists. The north-eastern area of Sardinia is an established coastal tourist destination. Over the past several decades, the influence of the Consortium of Costa Smeralda, has increased the relevance of Gallura nationally and internationally, turning it into a high-level tourist offering (Becheri, 1991; Del Chiappa, Atzeni, & Ghasemi, 2018). To date, Gallura has the biggest hospitality industry

in the region, accounting for more than a third of all hotel beds and 60% of luxury hotel beds are in the area (Regional Bureau of Statistics, 2017). Furthermore, the indicator “Arrivals / Residents”, ranks Gallura as the seventh-most attractive Italian tourist destination at the province level, after Bolzano, Venice, Rimini, Aosta, Trento and Siena, with 4.8 arrivals and 27.4 overnight stays for each resident.

Figure 1. Research context



Tourism in the area displays a strong seasonal pattern with the higher concentration in the summer (83% of overnight stays are in June to September), in line with the natural and meteorological characteristics of a Mediterranean “sea-and-sun” destination (Butler, 2001; Fadda, Rotondo, & Giovanelli, 2016; Koenig-Lewis & Bischoff, 2005). The extent of seasonality can be easily perceived using the Gini indicator, the seasonality ratio and the seasonality indicator (Yacoumis, 1980; Lundtorp, 2001; Karamustafa & Ulama, 2010). In this study, the Gini coefficient ($G=0.5930$) confirms that tourism demand in Gallura, measured by overnight stays, is concentrated in the summer (Regional Bureau of Statistics, 2016). This result is confirmed by the seasonality ratio ($R=3.3789$) and seasonality indicator ($\omega=0.2959$).

The boundaries of the Gallura overlap those of the former province of Olbia-Tempio and of the socio-health area of Olbia, as identified by the Regional Healthcare Authority. Around 160,000 inhabitants live within these boundaries (3,399 km²), residing across 26 municipalities with local populations concentrated on the coast. It is worth noting that the area includes the La Maddalena Archipelago, which is connected to the main island exclusively via a ferry, and that Tempio Pausania, the second-biggest city in Gallura in terms of inhabitants after Olbia, is located inland and thus appears less affected by sea-and-sun tourism.

The Gallura hospital care network relies on three public hospitals located in Olbia, Tempio Pausania and La Maddalena and managed directly by the Regional Healthcare Authority. The Olbia hospital is classified by national and regional legislation (National Law n. 135 of 2012 and National Ministry of Health Decree 70/2015) as a first-level hospital and is the pillar of the local hospital network, while the hospitals located in Tempio Pausania and La Maddalena provide more localised services. The different roles of these facilities are also reflected in their size: Olbia has 10 wards and 170 beds, Tempio Pausania has 6 wards and 93 beds and La Maddalena has 4 wards and 45 beds.

As previously stated, the Italian healthcare system is a universal system in which where hospitalisation and most healthcare services are free and financed through taxation (France, Taroni, & Donatini, 2005; Marinò, 2008). Moreover, foreign patients with an EHIC will enjoy the same access to free healthcare as Italians. Given the demographics of tourists arriving in Sardinia, it can be concluded that approximately 80% of tourists are entitled to access free health services in Italy (Regional Bureau of Statistics, 2016).

Dataset

Research was carried out using data on admissions and discharges (31,399 unique records of admissions) registered from 1 January 2014 to 31 December 2015, (the latest data available, at the time of the research) obtained through the Regional discharge register. To assess the number of services provided by each hospital, the number of patients admitted daily has been calculated. Furthermore, to conduct a more in-depth analysis of the kind of hospitalisation services provided to patients, admission has been classified according to level of urgency using the code defined by regional guidelines. Specifically, type “1” refers to planned admission for non-urgent disease; “2” identifies urgent admissions, while “4” indicates planned admissions with pre-hospitalisation. (Type “3”, which indicates mandatory health treatment was not considered in this study.)

To measure the complexity of hospital service supply, the DRG weighting of admissions was analysed. As described in the ICD-9-CM (v. 24), each admission is given a DRG code and weighted (DRG weight) to measure its complexity. In the dataset, the sum of daily DRG weights and the case-mix index (CM) as the ratio of DRG weights to

the number of patients admitted have been calculated. Furthermore, the total amount of fees allocated to the three hospitals as a result of the services provided per day has been calculated.

Table 2. Descriptive statistics (2014 and 2015. TP: Tempio Pausania; LM: La Maddalena; OL: Olbia)

	Stats	Adm.	Adm. Local	Adm. Ita	Adm. Foreign.	Type 1	Type 2	Type 4	DRG Weight
TP	min.	1	1	1	1	1	1	1	0.26
	p25	9	8	1	1	2	5	2	7.01
	median	12	11	1	1	3	6	3	9.8
	p75	16	15	2	1	5	8	5	12.61
	max.	33	33	6	2	10	16	14	29.14
	mean	12.54	12	1.56	1.14	3.35	6.59	3.76	10.08
	SD	4.86	4.86	0.91	0.35	2.09	2.62	2.56	4.09
LM	min.	1	1	1	1	1	1	1	0.2
	p25	2	2	1	1	1	1	1	1.22
	median	3	2	1	1	1	2	1	1.97
	p75	4	4	1	1	1	3	2	2.97
	max.	12	12	3	2	2	10	7	8.02
	mean	2.98	2.79	1.21	1.05	1.05	2.13	1.58	2.26
	SD	1.73	1.68	0.5	0.23	0.22	1.13	1.04	1.42
OL	min.	1	1	1	1	1	1	1	0.46
	p25	20	18	1	1	1	13	3	16.47
	median	27	25	2	1	1	16	7	22.65
	p75	35	33	3	2	2	19	14	28.9
	max.	61	61	11	5	7	30	38	54.81
	mean	27.78	25.8	2.59	1.43	1.96	15.86	9.24	22.98
	SD	10.09	10.03	2.09	0.72	1.3	4.56	7.45	8.47

Finally, each of the variables has been calculated with reference to overall admission rates and then analysed referring only to patients who reside in Sardinia (Local), to patients who reside in any other Italian region (Italian) and those who reside abroad (Foreigner). Table 2 lists the descriptive statistics for key variables across the three hospitals surveyed.

RESULTS

The correlation matrix shown in Table 3 confirms the main assumption of this paper that tourist seasonality (measured by the monthly overnight stays in the area observed) does not have any significant correlation with the number of patients admitted to the three hospitals overall. However, as predicted, the analysis reveals a significant positive correlation between seasonality and the admission of foreigners to hospitals.

Table 3. Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)
(1) Overnight Stays	1				
(2) Admitted	0.024	1			
(3) Admitted (Local)	-0.074	0.991*	1		
(4) Admitted (Italian)	0.003	0.998*	0.995*	1	
(5) Admitted (Foreigner)	0.486*	0.675*	0.590*	0.653*	1

* shows significance at the .01 level

Table 4 presents the results of a log-linear panel regression analysis with random effects at the hospital level. Each column illustrates the relationship between the independent variable and a dummy variable (Peak) used to identify days of the seasonal peak in tourism (July and August). Two other dummy variables were added to assess the specific variations linked to the single hospitals (LM: La Maddalena, TP: Tempio Pausania), using Olbia as a reference. Model 1 confirms the absence of any significant relationship between seasonality and the number of patients admitted, while, the other three display conflicting behaviour in the admission of locals and patients who reside outside Sardinia.

During peak season, the share of locals admitted to the three hospitals strongly decreases (around -13%) to tackle the increase in demand coming from national and international tourists. Indeed, model 3 and 4 highlight a significant increase in Italian and Foreigner patients. LM and TP are found to have a significant negative coefficient.

Table 4. The impact of seasonality on admissions

	(1) Admitted (log)	(2) Locals Admitted (log)	(3) Italians Admitted (log)	(4) Foreigners Admitted (log)
Peak	0.0416 (0.0278)	-0.130*** (0.0286)	0.699*** (0.0396)	0.138*** (0.0393)
LM	- 2.326*** (0.0260)	-2.310*** (0.0267)	-0.713*** (0.0567)	-0.222*** (0.0621)
TP	- 0.804*** (0.0253)	-0.774*** (0.0259)	-0.463*** (0.0438)	-0.189*** (0.0465)
Constant	3.242*** (0.0185)	3.189*** (0.0189)	0.474*** (0.0275)	0.226*** (0.0244)
Observations	2,122	2,108	702	382
Number of Hospitals	3	3	3	3

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 5 shows the results of log-linear panel regression analysis with random effects at the hospital level. This analysis was conducted to determine the impact of seasonality on specific kinds of admissions. In particular, models 1 and 2 examine non-urgent (Type 1 and 4) and urgent admissions (Type 2), while models 3 and 4 focus on the same type of admissions but provided only to locals.

In line with the results previously described, model 1 shows a significant negative coefficient which underlines that hospitals in a coastal tourism destination are forced, as a result of organisational constraints, to reduce access to specific kinds of healthcare services. In particular, the additional tourist demand for healthcare services is reflected in the increase in urgent admissions and simultaneous decrease in non-urgent admissions (model 2 shows a positive and significant coefficient with $p < 0.01$). Models 3 and 4 focus on the level of services for locals. As shown in model 3 (negative coefficient statistically significant at 0.01), hospitals are forced to provide fewer elective procedures to ensure beds are available for urgent cases. Finally, model 4 shows that there is no significant relationship between seasonality and the rate of admission of locals for urgent procedures.

Table 5. The impact of seasonality on admission types

	(1) Non-Urgent (log)	(2) Type 2 (log)	(3) Non-Urgent Local (log)	(4) Type 2 Local (log)
Peak	-0.306*** (0.0582)	0.184*** (0.0245)	-0.330*** (0.0604)	-0.0194 (0.0248)
LM	-1.381*** (0.0998)	-2.095*** (0.0232)	-1.338*** (0.106)	-2.044*** (0.0235)
TP	-0.450*** (0.0425)	-0.916*** (0.0222)	-0.426*** (0.0431)	-0.880*** (0.0222)
Constant	2.342*** (0.0324)	2.685*** (0.0162)	2.316*** (0.0329)	2.609*** (0.0162)
Observations	800	2,061	785	2,039
Number of Hospitals	3	3	3	3

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The following analysis, presented in Table 6, aims to determine whether seasonality influences the activities of hospitals and the revenues they generate. The analysis has been carried out by calculating an indicator of the average complexity of admissions, the CM, as the ratio of the sum of the DRG weights to the number of patients discharged daily. The model does not show any relationship between hospital activities and the seasonal peak in tourism. Consequently, the total revenues produced by hospitals during peak season do not show any significant relationship to seasonality.

Table 6. The impact of seasonality on hospital activities

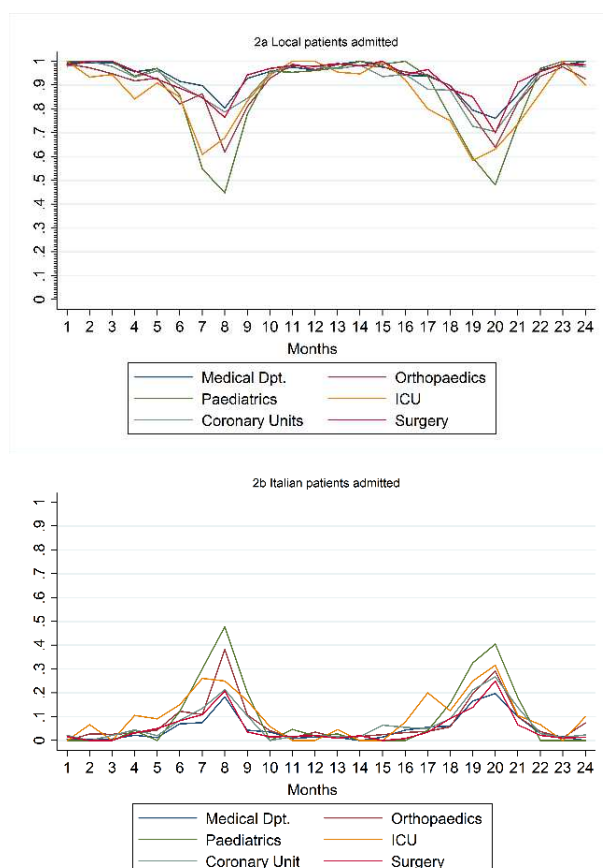
	(1) CM Index	(2) CM Index Locals	(1) Revenues (fee)
Peak	0.0127 (0.0107)	0.0176 (0.0111)	184.7 (925.1)
LM	-0.0658*** (0.00999)	-0.0586*** (0.0104)	-57,623*** (865.0)
TP	-0.0255*** (0.00974)	-0.0171* (0.0101)	-38,696*** (843.6)
Constant	0.832*** (0.00712)	0.826*** (0.00738)	63,715*** (616.8)
Observations	2,122	2,108	2,122
Number of Hospitals	3	3	3

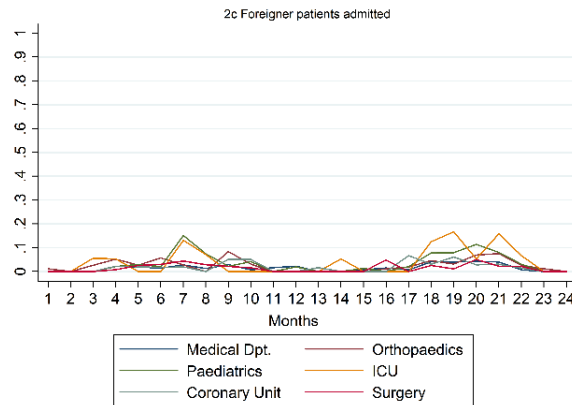
Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The three graphs presented in Figure 2 identify the percentage of patients for each group of residents admitted to six wards of the Hospital of Olbia. The analysis has been carried out with reference to the hospital in Olbia considering its pivotal role in the hospital network. Figure 2a shows the percentage of local patients admitted to the six wards, revealing a significant reduction in the number of local patients admitted. During peak season, the lowest percentage of local patients is registered in Paediatrics (44.78% in 2015), but significant reductions in local patient registrations can also be seen in the Intensive Care Unit (ICU) and Orthopaedics. The Medical Department, Coronary Units and Surgery show lower decreases in the admission of locals. Figure 2b shows a contrasting trend regarding the percentage of Italian patients admitted to the six wards. Finally, the percentage of foreigners admitted to the Hospital of Olbia (Figure 2c) seems to be less affected by seasonality.

Figure 2. Monthly percentage of patients admitted to six wards in the Hospital of Olbia according to residency status (2014 and 2015)





DISCUSSION AND CONCLUSION

This paper analyses how public hospitals in a coastal destination deal with the increase in demand caused by tourists, and to explain the related impact seasonality have on their performance.

In particular, the work has focused on the services provided by three public hospitals located in Gallura, a sea-and-sun coastal destination in the northern part of Sardinia, Italy. The analysis has been carried out using data on hospital admission from 2014 and 2015 and by developing a dataset with daily and monthly data.

The findings of the analysis confirmed the main assumption of the work. Specifically, during the period observed, the three hospitals did not significantly increase the number of services offered to patients, measured as the number of admissions. However, as the results demonstrate, the stability in supply does not affirm stability of demand but is instead the result of institutional constraints, in particular, the number of available hospital beds. Hospitals are forced to prioritise the admission of urgent patients and delay or divert patients, usually local patients, with non-urgent health needs. These results, following Albalade and Bel (2010), show the inability of hospitals to tackle the pressure of increased demand, which can produce negative external impacts if tourism is perceived as a cause of hospital admission congestion, overcrowding or the limited accessibility of services.

We can also observe the impact of seasonality when examining the residency status patients, allowing us to identify a potential bed crisis for locals. During peak tourist season, Gallura hospitals are forced to significantly reduce the number of local patients admitted to hospital as a result of the significant increase in patients from outside the region. We assumed that tourists that travel to Gallura are not driven to visit by any health needs and, consequently, emergency health needs drive their requests for hospitalisation services. The findings discussed strongly support this assumption: during peak season, hospitals face a “summer bed crisis”. The increase in admission rates for urgent patients (Type 2) force hospitals to limit the provision of non-urgent or elective procedures. Considering that these procedures are mainly requested by residents, tourism seasonality reduces the accessibility to health services for locals who are then forced to schedule their elective procedures for another period of the year or to seek assistance from another service provider in the region or country. Therefore, tourism in a coastal destination can be identified as a cause of bed crises for locals with non-urgent needs or who request elective procedures.

Furthermore, the three hospitals observed did not face an increase in the complexity of the services they proved as measured by the CM. It is interesting to highlight that the hospitals also did not benefit from an increase in revenue. A public service provider could accept a reduction in its performance during peak season if it increases its revenues. By doing so, it can potentially expand its offering by investing in additional resources or reducing the cost of services for locals. According to several studies, such a trade-off is perceived positively by locals (Andereck et al., 2005; Andereck & Vogt, 2000; Korça, 1996). In our case study, the absence of any increase in revenue excludes this potential positive outcome of tourism for locals.

Lastly, by conducting an analysis of monthly ward population composition, the impact of tourism seasonality on hospital accessibility is developed. Specifically, we examine the composition of patients admitted to six wards of the Olbia Hospital and group them according to their residency status. Again, seasonality produces an overall impact by increasing the percentage of patients from outside Sardinia, especially those from other Italian regions. It is worth noting that the impact of seasonality is not uniform across hospital services and is more visible in Paediatrics, Orthopaedics and ICU, while Surgery and the Medical Department show a significant but lower presence of non-local patients.

This study can contribute to the debate about the impact of tourism by identifying a potential source of local dissatisfaction. The study highlights the critical impact tourism can have on the activity of healthcare providers in a coastal destination, identifying it as a potential cause of bed crises. In light of these results, policy-makers and healthcare managers should consider seasonal fluctuations in demand caused by tourism and properly fund and organise the activities of hospitals, and healthcare service providers in general, located in a tourism destination. The study supports the conclusion of Fullerton and Crawford (1999) since the pattern of seasonal admissions observed is predictable and

can be properly managed. The deeper understanding of the effect of tourist-related seasonal demand increases on hospital services provided in this research will enhance decision-making and planning at the organisational level. Hospitals can focus on those services that show the greatest increase in demand during peak season, for instance, trauma-related or urgent admissions, by increasing the resources available to deal with these cases (e.g. hospitals beds, staff) but also by identifying alternative paths to assure an adequate level of service for local patients.

As in all research, this paper suffers from certain limitations. In particular, the results are derived from a case study of a single coastal destination. Future research will need to broaden the context of analysis to compare the activity of hospitals located across a wider area with high levels of tourism. At the same time, by adopting a comparative approach, future studies can investigate hospitals operating in areas with variable tourism seasonality and popularity. Lastly, these results can be interpreted using a qualitative approach by involving senior hospital management, practitioners and policymakers.

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