



# Does the Surgical Technique have an impact on Unwarranted Geographical Variation for Benign Hysterectomy?

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#### Abstract

**Background:** Waiting times for elective treatments, including elective surgery, are a source of public concern and therefore are on policy makers' agenda. The long waiting times have often been tackled through the allocation of additional resources, in an attempt to reduce them, but results are not straightforward. At the same time, researchers have reported wide geographical variations in the provision of elective care not driven by patient needs or preferences but by other factors.

The paper analyses the relationship between waiting times and treatment rates for nine high-volume elective surgical procedures in order to support decision making regarding the availability of these services for the citizens. Using the framework already proposed for the diagnostic services, we identify different patterns that can be followed to align the supply with patient needs in the Italian context.

**Methods:** After measuring the waiting times and the treatment rates for nine procedures in the 34 districts in Tuscany, we performed correlation analyses. Then, we plotted the results in a matrix cross-checking waiting times and rates. By doing so, we identified four different contexts that require a second step analysis to tackle unwarranted geographical variations and ensure timely care to patients. Finally, for each district and elective surgical procedure, we measured the economic impact of the different treatment rates in order to evaluate whether there are any supply criticalities and eventually some room for maneuver. We also included active and passive mobility of patients.

**Results:** The results show a high degree of variation both in treatment rates and waiting times, especially for the orthopaedic procedures: knee replacement, knee arthroscopy and hip replacement. The analysis performed for the nine interventions shows that the 34 districts are in varying positions in the waiting time-treatment rate matrix, suggesting that there is no straightforward relationship between rates and waiting times. Each combination in the matrix may have different determinants that require healthcare managers to adopt diversified strategies. The decision making process needs to be supported by a two-level analysis: the first one to put in place the matrix that cross-checks waiting times and treatment rates, the second one to analyse the characteristics of each quadrant and the improvement actions that can be proposed.

**Conclusions:** In Italy, waiting times in elective surgical services are a main policy issue with a relevant geographical variation. Our analysis reveals that this variation is due to multiple elements. In order to avoid simplistic approaches that do not solve the problem but often lead to increased expenditure, policy makers and healthcare managers should follow a two-step strategy firstly identifying the type of context and secondly analysing the impact of elements such as resource productivity, resource availability, patients' preferences and care appropriateness. Only in some cases it is required to increase the service supply.

Keywords: Elective surgery, Waiting times, Use rates, Unwarranted variation, Decision making









#### Background

- Starting from our findings, we began discussing results with local health professionals.
- Professionals: hysterectomy surgeries performed with mini-invasive techniques are increasing and this leads to higher treatment rates and longer waiting lists







#### Methods

Geographical Area	Tuscany (Central Italy)
Number of inhabitants	3.7 million
Number of health districts	26
Years of the study	2016, 2017, 2018







#### Extent of variation for Benign Hysterectomy



Mean	36.56		
Standard Deviation	10.66		





## Extent of variation for Benign Hysterectomy

Waiting times (in days) – 2018



Mean	85.52
Standard Deviation	28.72





## Extent of variation for Benign Hysterectomy







## Use of mini-invasive technique









- 1. treatment rates
- 2. waiting times
- 3. length of stay
- 4. outcomes (post-operative complications)







- 1. treatment rates
- 2. waiting times
- 3. length of stay
- 4. outcomes (post-operative complications)





# Items explored - 1. treatment rates

#### Treatment rate for 100,000 inhabitants (std) - 2018







Signif.

P = 0.0681

#### Items explored - 1. treatment rates









- 1. treatment rates
- 2. waiting times
- 3. length of stay
- 4. outcomes (post-operative complications)





### Items explored - 2. waiting times



Coeff.	Signif.	
-0.38	P = 0.058	





# Items explored - 2. waiting times



Coeff.	Signif.		
-0.967	P = 0.6457		







- 1. treatment rates
- 2. waiting times
- 3. length of stay

4. outcomes (post-operative complications)





#### Items explored - 3. LOS









- 1. treatment rates
- 2. waiting times
- 3. length of stay
- 4. outcomes (post-operative complications)





# Items explored - 4. complications

	2016	2017	2018
N° of mini-invasive procedures	324	366	392
N° open procedures	718	710	702
Total number of cases	1042	1076	1094
Percentage of mini-invasive procedures	31,09%	34,01%	35,83%

Clinical complications	2016	2017	2018	
Complications (%)	2,02%	1,49%	1,46%	
Complications for mini-invasive procedures	2,16%	1,09%	0,51%	
Complications for open procedures	1,95%	1,69%	1,99%	

+ 21%



# Conclusions



Hypothesis	Verified
% mini invasive –> treatment rates	Positive indication
% mini invasive –> waiting times	Yes (but p=0.058)
% mini invasive –> LOS	Yes
% mini invasive –> outcomes	Yes (but small numbers)

Standardising the use of mini-invasive benign hysterectomy procedures could reduce geographical variation in terms of:

- treatment rates
- waiting times
- length of stay
- postoperative complications







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