Master's Degree in Economics and Data Science

"The Impact of Telemedicine on Healthcare Access for Patients with Cognitive Disorders and Dementias"

Supervisor: Candidate:

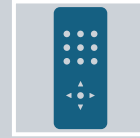Prof. Marcello MONTEFIORI   Damiano LOGOZZO

Academic Year 2023/24
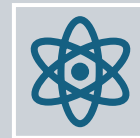
What is *telemedicine?*

Remote patient-physician interaction

Exploitation of telecommunications and electronic technologies

Wide range of applications (remote control, online consultations, nursing care, rehabilitation etc.)

Open and constantly evolving science

Does the healthcare system *need* telemedicine?

Aging population

Rising healthcare demand

Rising healthcare costs

Income disparities

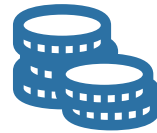Need for upgrades to improve physician-patient communication

Advantages

Efficiency

Rapid medical
information exchange

Cost-effectiveness

Improved access

Social Distancing

Costs, limits and barriers

COSTS:

- Technology investments
- Staff training
- Security and Compliance

LIMITS:

- Technological access
- Equipment malfunction
- Ineffectiveness under some specific conditions

BARRIERS:

- Privacy concerns
- Data quality
- Medical liability
- Fraud and abuse
- Regulatory challenges
- Lack of face-to-face interactions

ASL4 case study: the dataset

- 2599 patients suffering from cognitive disorders or dementia

- Time frame from 2019 to 2022

- Panel dataset

- Introduction of telemedicine visits starting from 2021

CONSIDERED VARIABLES:

- Emergency room accesses

- Hospital admissions

- Telemedicine visits

- Personal data (age and sex)

- Charlson Comorbidity Index (CCI)

- Year

Descriptive statistic: main results

- Majority of female patients

- Large majority of over 65s

- Low number of remote visits

- Low number of emergency room visits and hospitalizations

- Effects of the pandemic on the hospitalizations

- Presence of many zeros also for CCI scores

Models

- Emergency room accesses and hospital admission as dependent variables

- Poisson regression

- Zero-Inflated Poisson regression

Hospital admissions

VARIABLES	IRR Hospital admissions
Telemedicine	2.132***
	(0.424)
CCI	1.149***
	(0.019)
Female	0.954
	(0.062)
Age over 65	0.146
	(0.195)
Year 2022	1.115*
	(0.072)
Constant	0.151***
	(0.026)
/lnalpha	-15.64
	(702.5)
Observations	4,604
Number of id_paziente	2,302

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

VARIABLES	(1) Hospital admissions	(2) inflate
Telemedicine	0.772*	0.232
	(0.405)	(1.861)
CCI	0.0869***	-1.723
	(0.0219)	(1.270)
Female	-0.0349	
	(0.0643)	
Age over 65	0.0825	
	(0.200)	
Year 2022	0.109	
	(0.0697)	
Constant	-1.611***	-0.929***
	(0.226)	(0.360)
Observations	4,604	4,604

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Emergency room accesses

VARIABLES	IRR Emergency room visits
Telemedicine	3.686***
	(1.373)
Female	1.0974
	(0.178)
Age over 65	2.684
	(1.616)
CCI	1.242***
	(0.051)
Year 2022	1.092
	(0.157)
Constant	0.109***
	(0.067)
/lnalpha	0.740**
	(0.298)
Observations	4,604
Number of id_patient	2,302

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

VARIABLES	(1) Emergency room visits	(2) inflate
Telemedicine	1.088**	-1.165
	(0.431)	(1.289)
CCI	-0.0422	-3.791**
	(0.0910)	(1.863)
Female	0.135	
	(0.163)	
Age over 65	0.548	
	(0.566)	
Year 2022	0.0895	
	(0.144)	
Constant	-3.101***	1.851***
	(0.648)	(0.438)
Observations	4,604	4,604

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Conclusions

Use of telemedicine and CCI score:

statistically significant

positively impact healthcare access
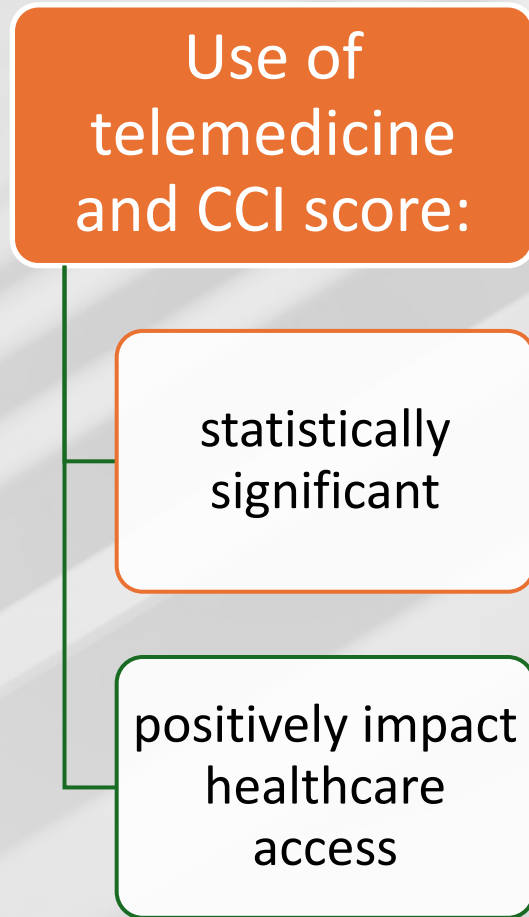
Thanks for your attention