



# Evaluation of Hospital Specialist Referrals and Diagnostic Tests in Primary Care: Patterns and Outcomes



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# Introduction

Primary care is the gateway to the health system and is central to managing the overall health of the patients

Effective primary care ensures that diagnostic tests and referrals to the hospital specialists are only recommended when truly needed



# Objectives

- Evaluate referral and diagnostic test patterns
- Understand doctor-to-doctor variations
- Identify influencing factors in decision making

# Methods & Settings



Our urban primary care team include specialists in family and community medicine, pediatricians, nurses, social workers, a community health activities team and dentists



Covers 36,000 citizens (6,000 children) with 14 doctors, each with ~2,200 patients (balanced by age and disease)



Fully electronic health records



Evaluation of referrals and tests considering the number visits, the workload, the patient's comorbidity, and years working with the same list of assigned patients

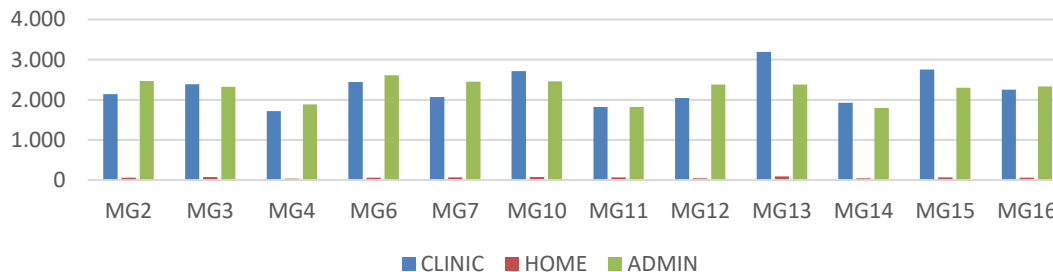
# Data Overview (2024)



- ✓ 24,741 face-to-face visits
- ✓ 768 home visits
- ✓ 27,224 telephone calls + admin tasks
- ✓ 4,181 specialist referrals
- ✓ 3,431 diagnostic tests

# Data Analysis

Total visits by GP



GP	CLINIC	HOME	ADMIN	TOTAL
MG2	2.140	62	2.469	4.671
MG3	2.391	73	2.325	4.789
MG4	1.715	40	1.884	3.639
MG6	2.441	62	2.613	5.116
MG7	2.067	70	2.453	4.590
MG10	2.717	78	2.463	5.258
MG11	1.824	70	1.825	3.719
MG12	2.048	47	2.382	4.477
MG13	3.197	93	2.379	5.669
MG14	1.922	42	1.797	3.761
MG15	2.753	71	2.303	5.127
MG16	2.256	60	2.331	4.647
TOTAL	27.471	768	27.224	55.463

# Data Analysis

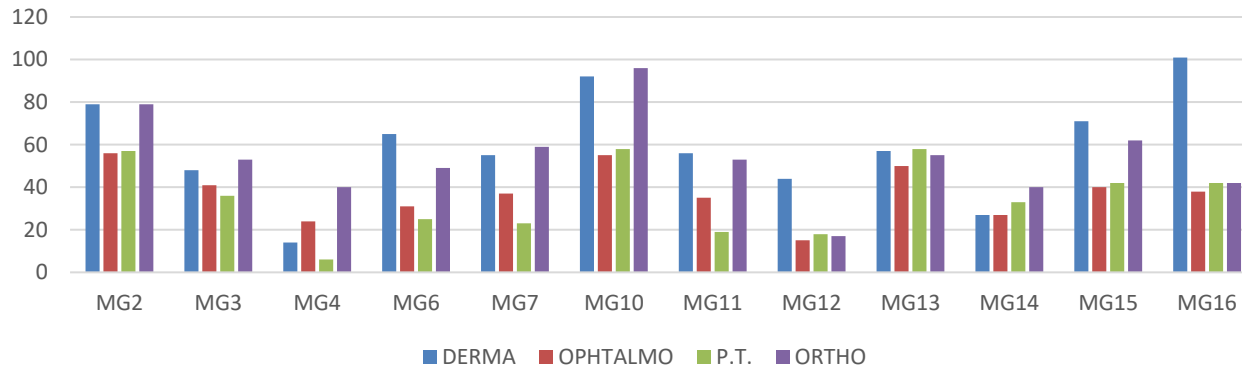
## Referrals – Key Findings

MG TOTAL	CARDIO	CIR	DERMA	ENDOCRINO	GASTRO	NEURO	OPHTALMO	ENT	PNEUMO	Physical Therapy	RHEUMA	ORTHO	URO	
MG2	26	10	79	21	19	46	56	38	19	57	25	79	17	492
MG3	23	1	48	17	29	25	41	38	14	36	20	53	28	373
MG4	2	10	14	4	7	5	24	19	3	6	5	40	12	151
MG6	20	25	65	16	26	12	31	29	14	25	32	49	17	361
MG7	7	16	55	3	21	14	37	33	7	23	8	59	18	301
MG10	26	19	92	18	38	49	55	34	17	58	15	96	22	539
MG11	17	18	56	12	8	11	35	28	6	19	14	53	19	296
MG12	5	11	44	13	7	1	15	12	5	18	2	17	11	161
MG13	25	40	57	11	39	34	50	45	18	58	15	55	18	465
MG14	6	13	27	3	18	14	27	20	12	33	10	40	11	234
MG15	20	13	71	23	32	30	40	25	16	42	13	62	12	399
MG16	26	9	101	23	36	21	38	25	14	42	8	42	24	409
TOTAL	203	185	709	164	280	262	449	346	145	417	167	645	209	4181

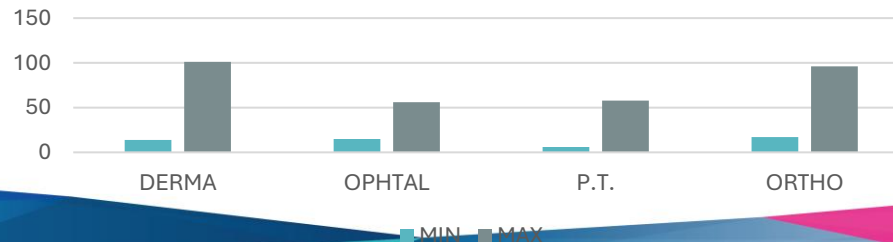
# Data Analysis

## Referrals – Key Findings

Referrals by GP



Variation among GPs





# Data Analysis

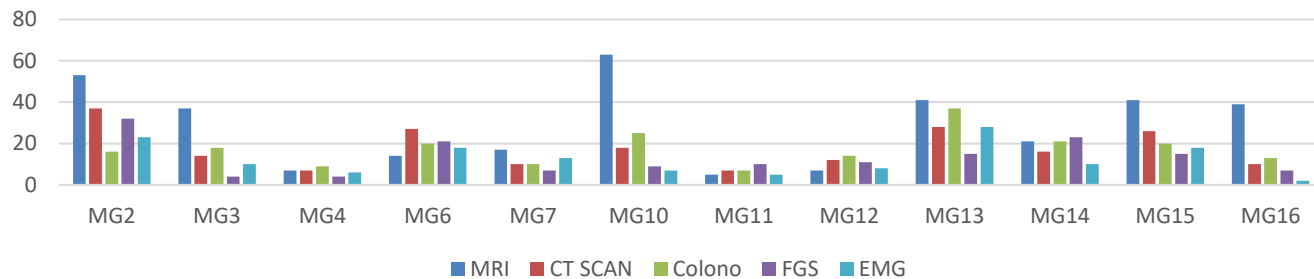
## Referrals – Highlights

- Range: 151 to 539 referrals per doctor
- Top specialties: Dermatology, Orthopedics, Ophthalmology, Physical Therapy
- More visits = more referrals
- No link with patient's comorbidities

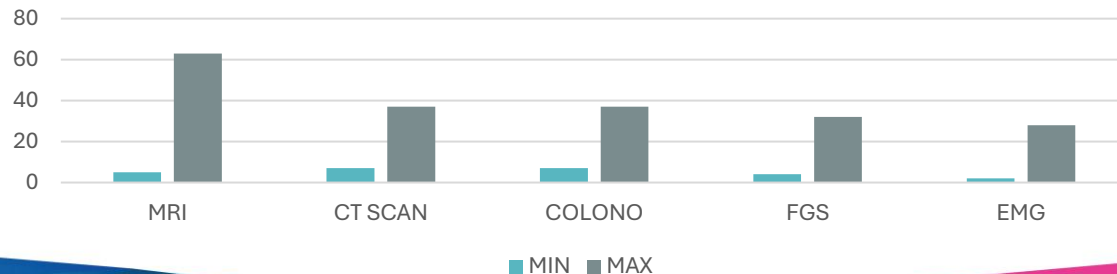
# Data Analysis

## Diagnostic Tests – Key Findings

Tests by GP



Variation among GPs



# Data Analysis

## Diagnostic Tests – Key Findings

- Range: 98 to 434 tests per doctor
- Most relevant: MRI, CT, colonoscopy, FGS, EMG
- More visits = more test
- No link with patient's comorbidities

# Overall findings

The age of the doctor and the number of years in our clinic (with the same assigned patients) had a statistically significant inverse correlation related to both number of referrals and diagnostic tests.

The number of referrals and of diagnostic tests were not related to the patient conditions.

The number of referrals were not related to the number of diagnostic tests.

# Conclusions

Our study showed a wide variability between doctors in clinical practice despite a very similar number of patients with similar age and conditions.

This inconsistency suggests that the medical practice is mostly influenced by the person treating the patients more than the characteristics of the patients.

Doctors with more patient visits tended to make more referrals and order more diagnostic tests.

More experienced doctors ordered fewer referrals and tests.

Suggestions for improvement:

- Regularly reviews of medical guidelines

- Conduct team meetings to align practices

- Provide feedback and promote data-driven decisions

- Focus on consistency and evidence-based care



# THANK YOU



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