



European Health Economic Trial on Home Monitoring in ICD Patients

www.clinicaltrials.gov NCT00776087

Fast-Track publication in European Heart Journal

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on behalf of the EuroEco investigators

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Disclosures

H. Heidbuchel: Unconditional Research Grants through the University of Leuven from Medtronic, St. Jude Medical, BIOTRONIK and Boston Scientific.

Other authors: as listed in the Fast-Track Eur Heart J manuscript

The sponsor of the trial was BIOTRONIK.

[www.clinicaltrials.gov NCT00776087](http://www.clinicaltrials.gov/NCT00776087)

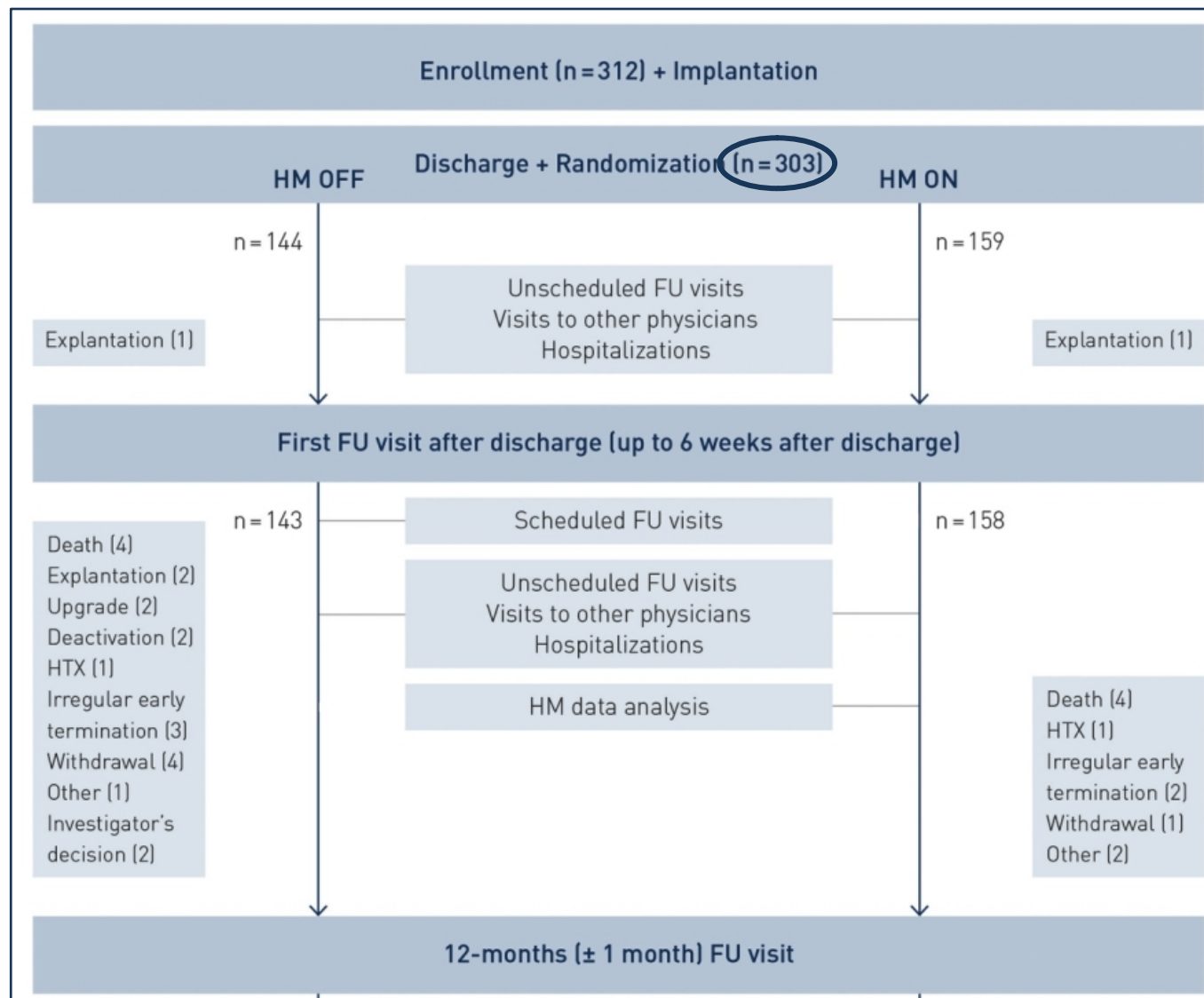


- All stakeholders see potential benefits in remote monitoring based device follow-up
 - patients^{1-2,5}
 - physicians and hospitals (“providers”)²⁻³
 - insurance payers of health care⁴⁻⁶
- A formal cost-analysis from the provider viewpoint has never been performed
 - although it may influence willingness to change care models

- Primary endpoint:
 - Total follow-up related **cost for providers** (hospitals, physicians) classical (i.e. only in-office visits) vs. Home Monitoring based
- Secondary endpoints:
 - Impact of Home Monitoring on the **net income of providers**
 - Total **cost from a healthcare payer perspective**
 - In-office **visits with relevant findings**
 - **Quality-of-life** (SF-36)

Study design /1

New or replacement VVI or DDD ICD*



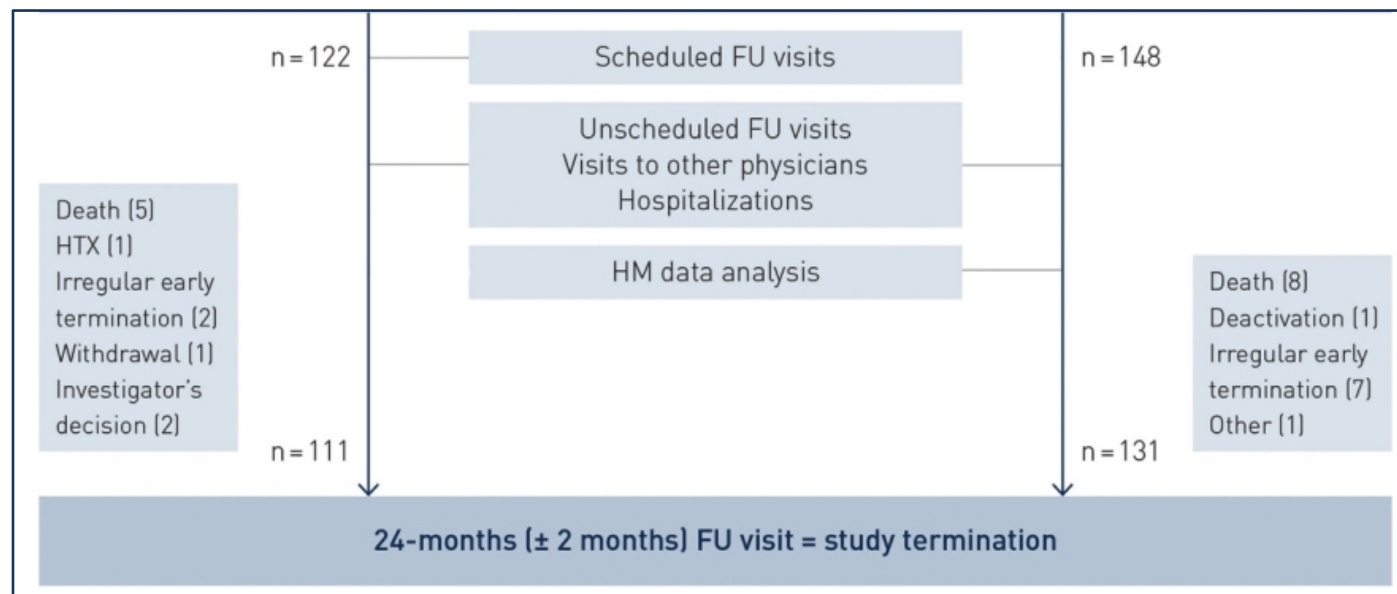
	Ctrs	Pts
DE	4	88
BE	3	87
ES	4	54
UK	3	47
NL	1	25
FI	1	2
	17	303

*: Replacement: 12%

Capable of HomeMonitoring with electrogram transmission (BIOTRONIK Lumos n=3 or Lumax)

Study design /2

24 month follow-up



21.2%	Termination before 24 month visit: NS	22.4%
10.2 ±7.5 m	Follow-up before termination: NS	13.8 ±9.0m

Note: Extension CRT-cohort (n=104) is still enrolling

Study design /3

Resource utilisation

- FU visits
- Patient contacts outside of FU services (phone calls)
- Internal discussions among staff
- Remote data review (monitoring)

For each: frequency, type of staff involved, staff time

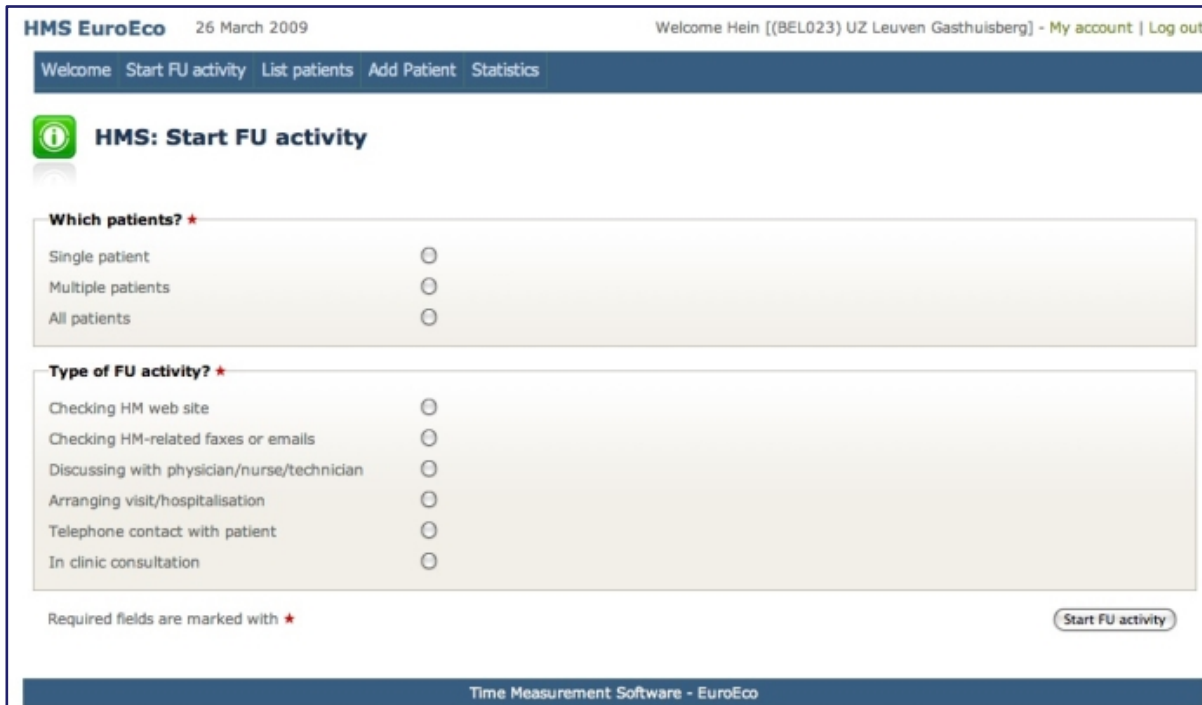
Provider
cost

- FU services if reimbursed
- Examinations initiated during FU services
- Other CV health care utilisation
(other physician visits, hospitalisations)

Payer
cost

Time measurement tools

- Blackberry phones, dedicated chronometers, Web-based time tracking tool:



The screenshot shows the HMS EuroEco web interface. At the top, it displays the date '26 March 2009' and a welcome message for 'Hein [(BEL023) UZ Leuven Gasthuisberg]' with links for 'My account' and 'Log out'. A navigation bar includes 'Welcome', 'Start FU activity', 'List patients', 'Add Patient', and 'Statistics'. The main section is titled 'HMS: Start FU activity' and contains two form sections. The first section, 'Which patients? ★', has three radio button options: 'Single patient', 'Multiple patients', and 'All patients'. The second section, 'Type of FU activity? ★', has six radio button options: 'Checking HM web site', 'Checking HM-related faxes or emails', 'Discussing with physician/nurse/technician', 'Arranging visit/hospitalisation', 'Telephone contact with patient', and 'In clinic consultation'. A note at the bottom left states 'Required fields are marked with ★'. A 'Start FU activity' button is located at the bottom right. The footer reads 'Time Measurement Software - EuroEco'.

HMS EuroEco 26 March 2009 Welcome Hein [(BEL023) UZ Leuven Gasthuisberg] - My account | Log out

Welcome Start FU activity List patients Add Patient Statistics

HMS: Start FU activity

Which patients? ★

Single patient ☐

Multiple patients ☐

All patients ☐

Type of FU activity? ★

Checking HM web site ☐

Checking HM-related faxes or emails ☐

Discussing with physician/nurse/technician ☐

Arranging visit/hospitalisation ☐

Telephone contact with patient ☐

In clinic consultation ☐

Required fields are marked with ★

Start FU activity

Time Measurement Software - EuroEco

- => paper CRF

- Country specific
 - staff costs
 - overhead
 - reimbursement tariffs (DRG or fee-for-service)
 - consumer price index for conversion to 2013 Euro
- Remote monitoring equipment was not included
- Since only 2 patients from Finland: no monetary valuation
- Exploratory analysis comparing countries with different reimbursement systems
 - 2 sets of countries with homogeneous resource utilisation

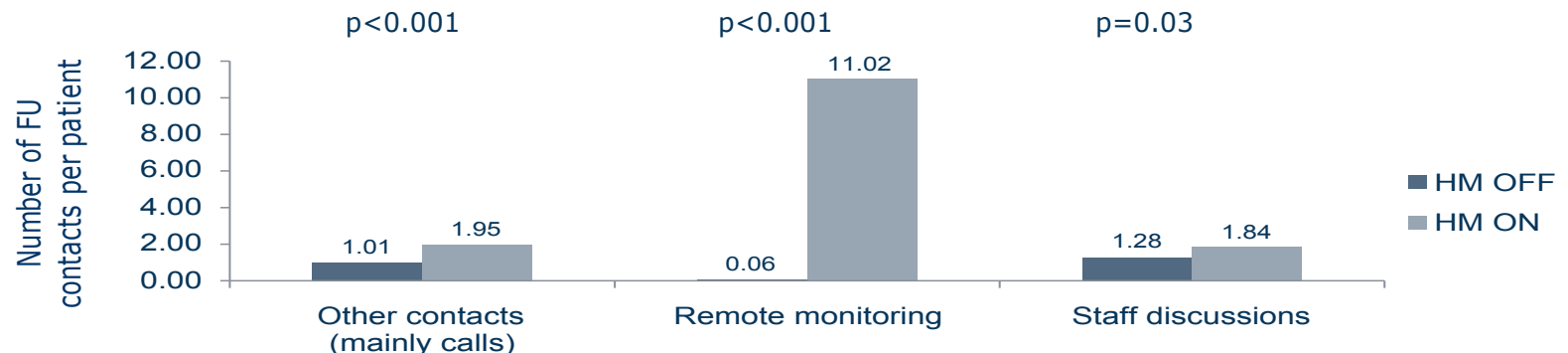
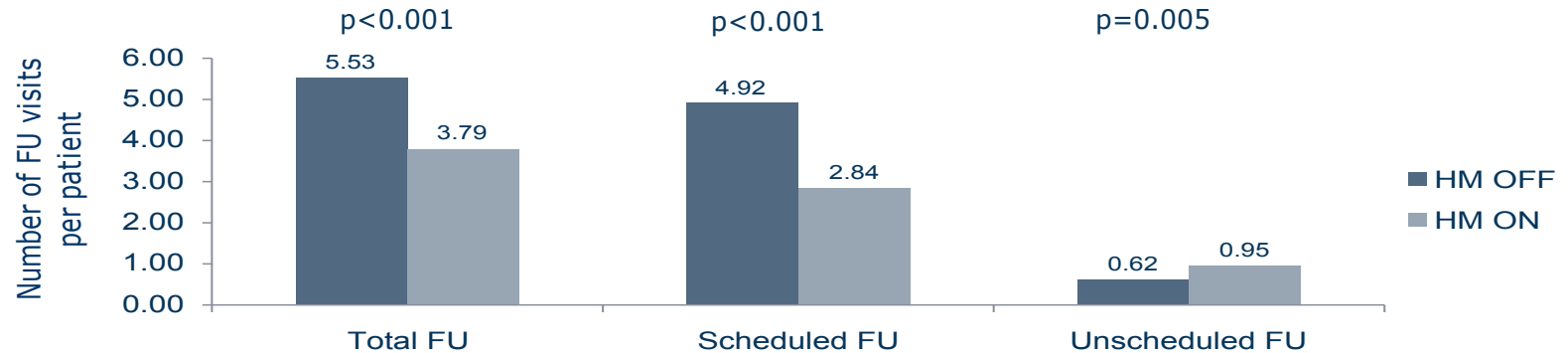
Baseline characteristics

	Total cohort (N=303)		
	HM OFF (N=144)	HM ON (N=159)	p
Age [years, mean] (SD)	62.9 (12.3)	62.0 (13.9)	NS
Male [%]	83.3	78.0	NS
Primary prevention [%]	44.1	57.0	0.029
Single chamber [%]	60.8	59.7	NS
LVEF [%] (SD)	39.5 (15.6)	39.2 (14.8)	NS
NYHA profile [%]			NS
No heart failure	19.4	19.5	
I	18.1	23.3	
II	39.6	34.6	
III	13.2	10.7	
IV	0.7	1.3	

Abbreviations: FU, follow up; HM, Home Monitoring; SD, standard deviation

Resource utilisation /1

Provider perspective

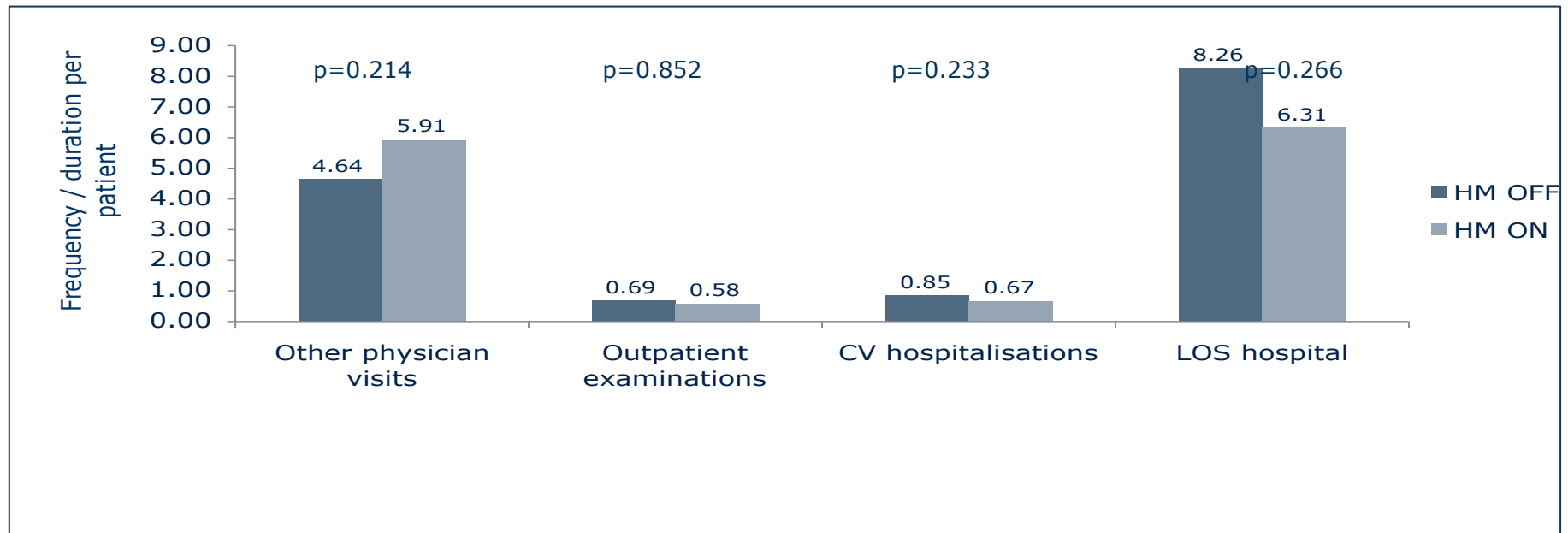


Abbreviations: FU, follow up; HM, Home Monitoring

Notes: All information as mean per patient. Numbers may not add up due to rounding. Data for total cohort.

Resource utilisation /2

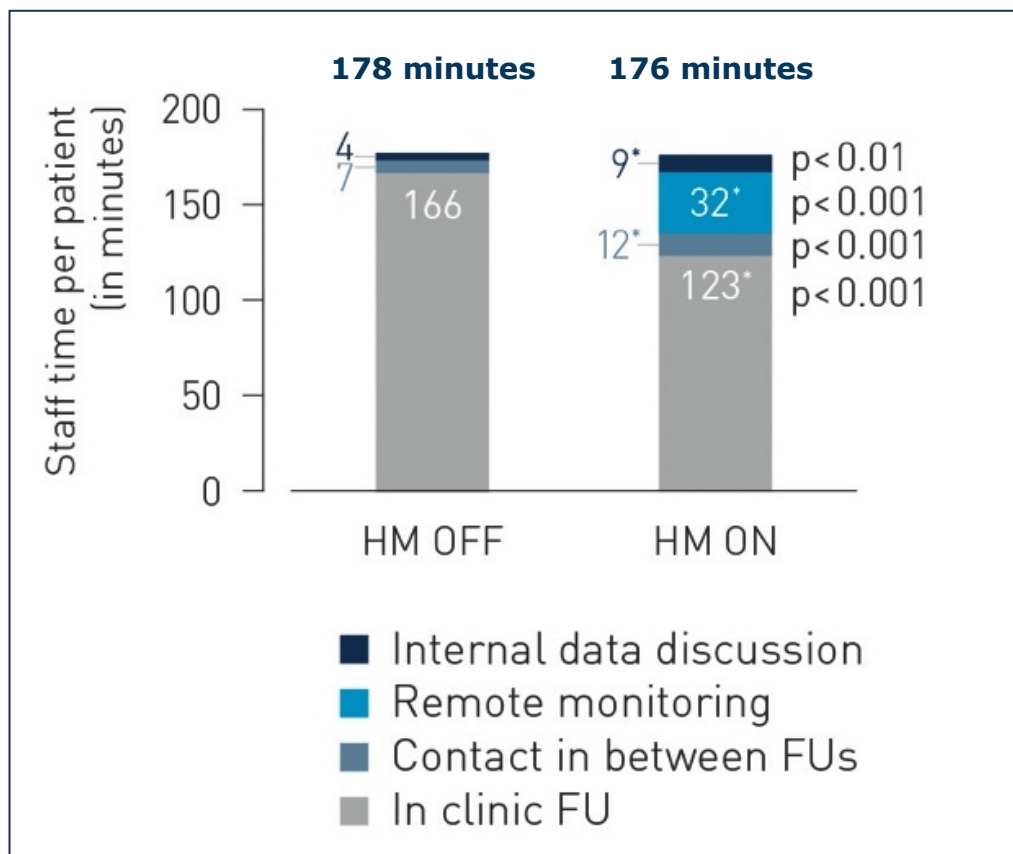
Payer perspective



Abbreviations: FU, follow up; HM, Home Monitoring

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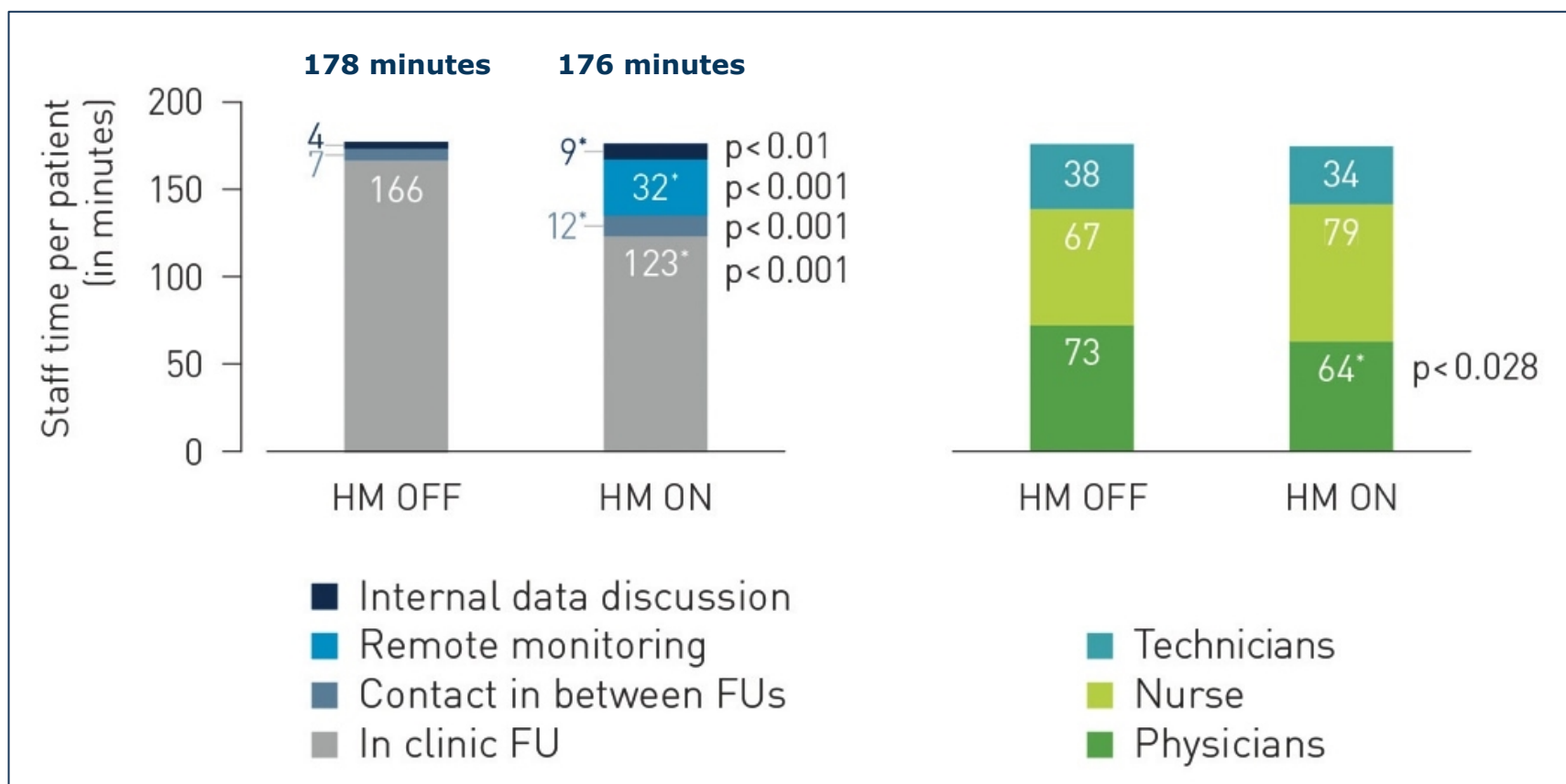
Total staff time for follow-up



Abbreviations: FU. Follow-up; HM, Home Monitoring; hrs, hours

Notes: All information as mean per patient.

Total staff time for follow-up



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Primary endpoint

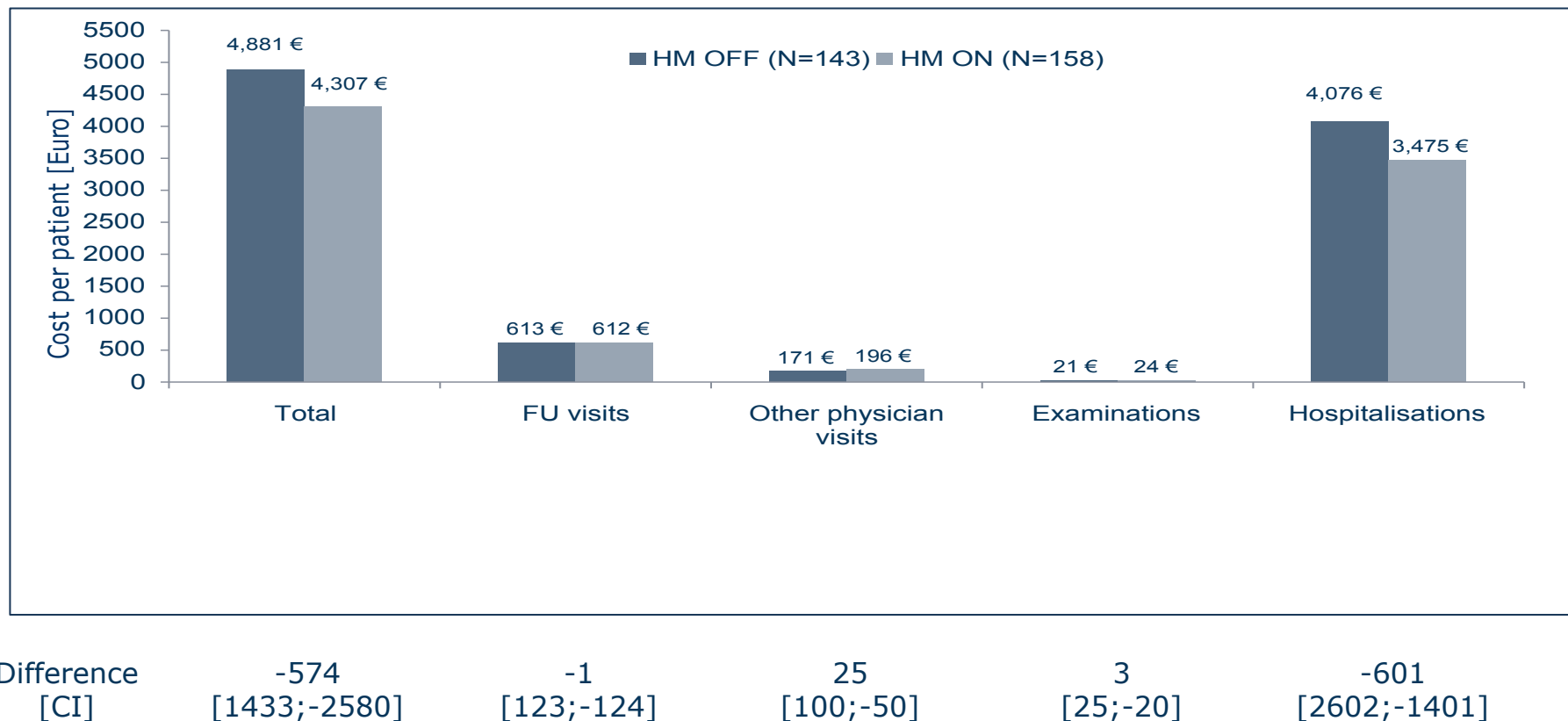
Provider cost for follow-up



Abbreviations: FU. Follow-up; HM, Home Monitoring
Notes: All information as mean per patient, unless stated otherwise.

Secondary endpoints /1

Payer cost

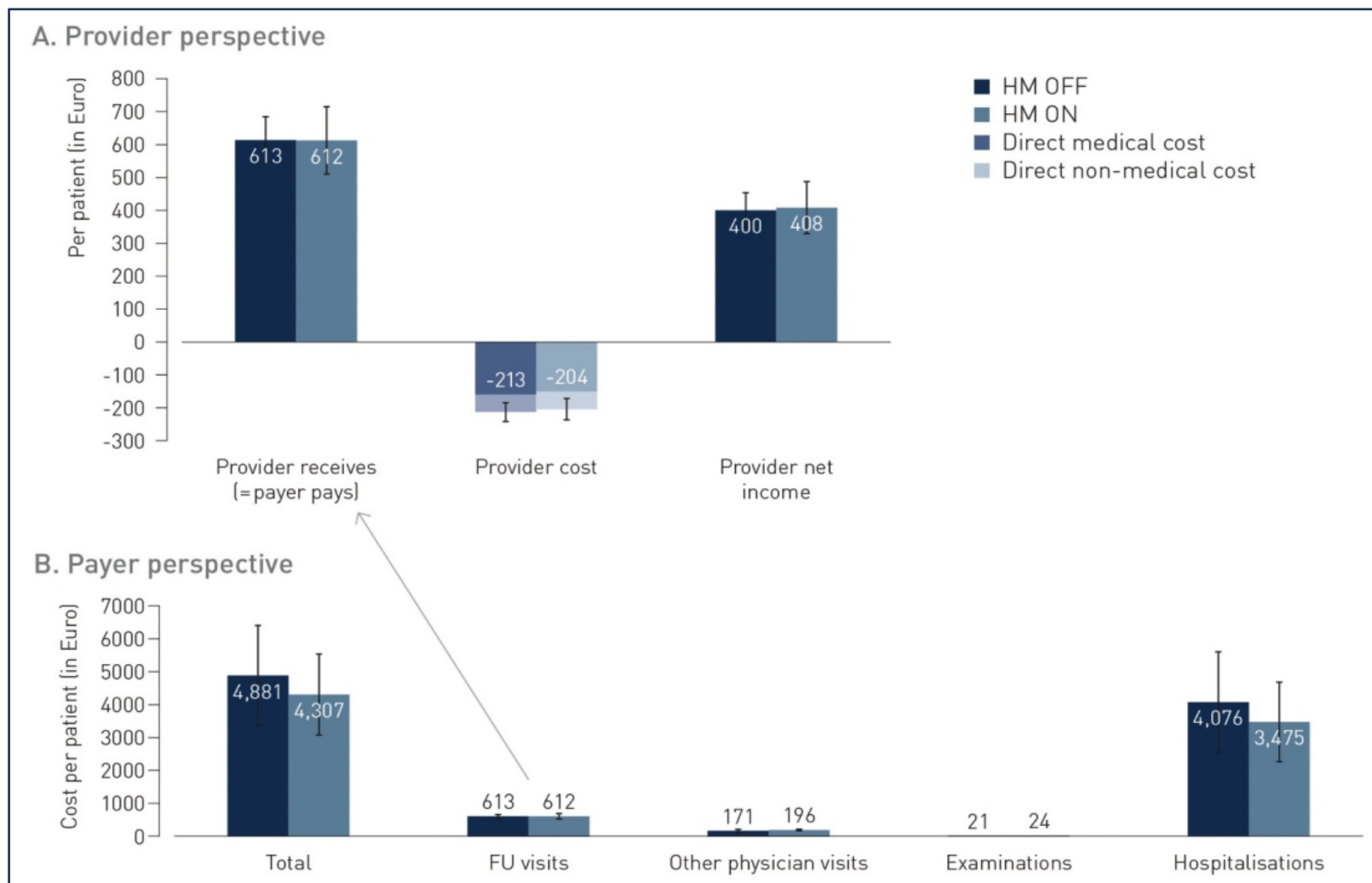


Abbreviations: FU, Follow-up; HM, Home Monitoring

Notes: All data in Euro, as mean per patient. Patients from Finland excluded due to small number (n=2).

Secondary endpoints /2

Provider net income

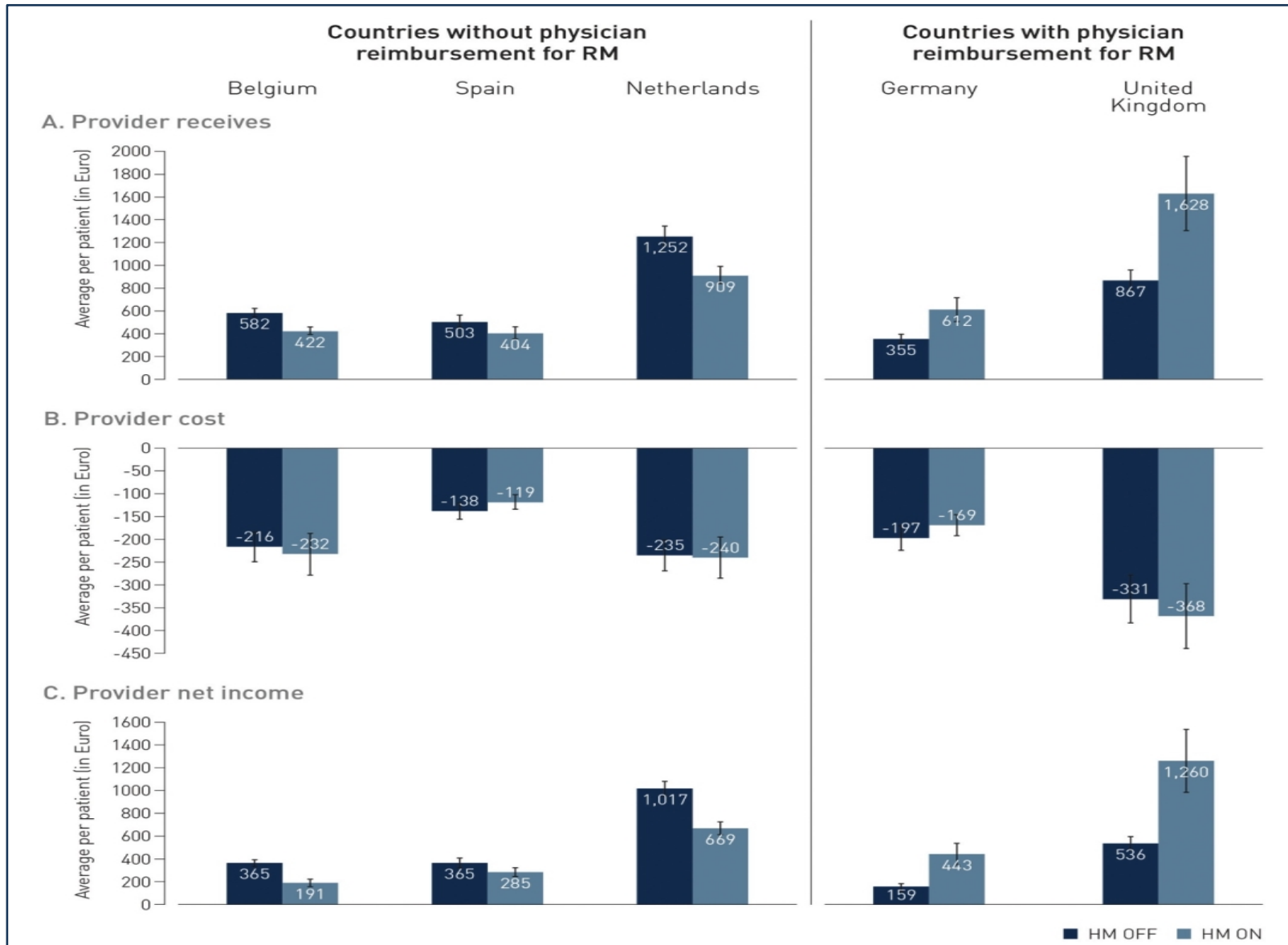


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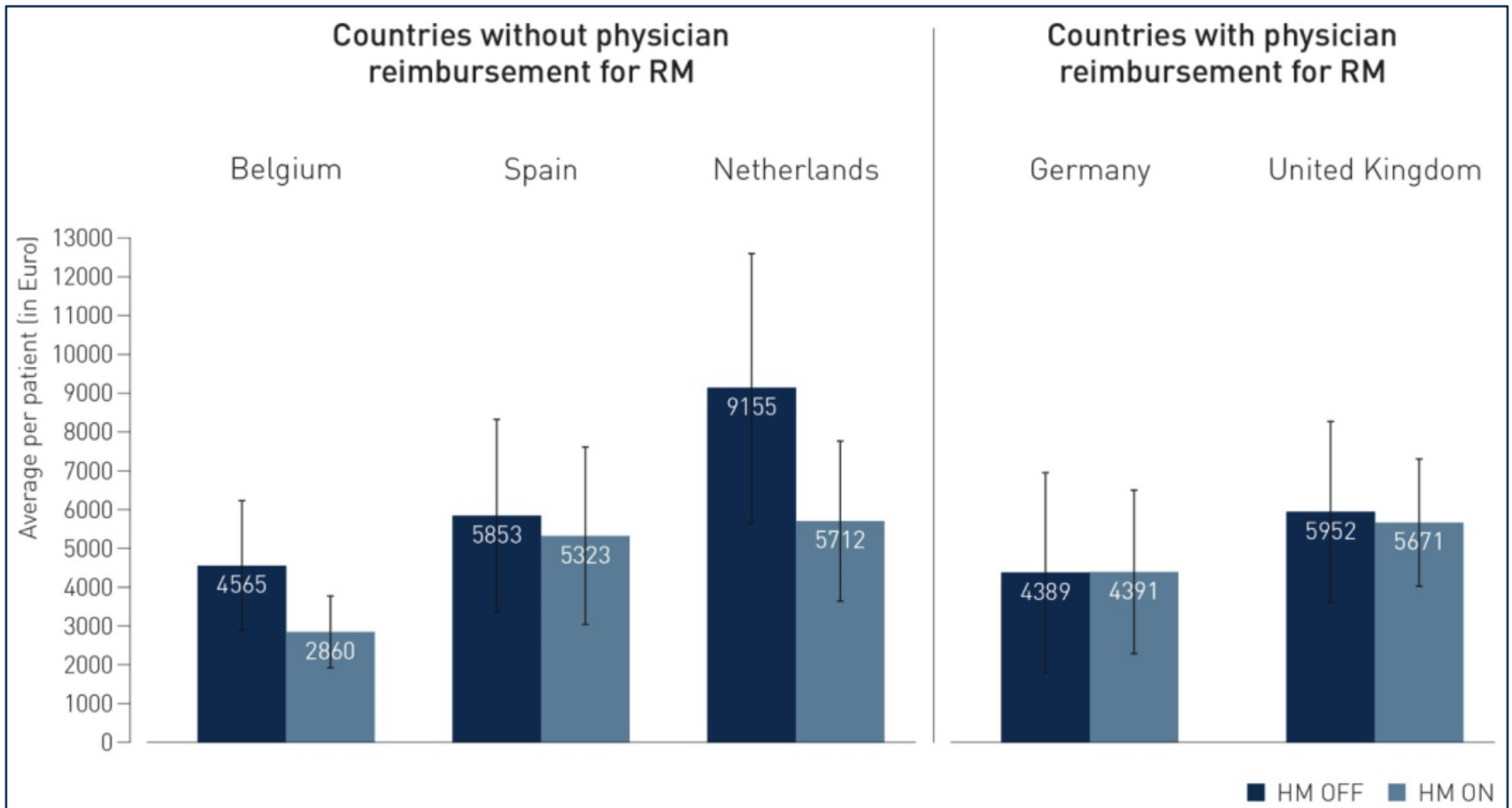
Country dependent variations

Provider perspective



Country dependent variations

Payer perspective



Even in countries with remote monitoring reimbursement (UK and Germany), total costs for insurers over 2 years of follow-up do not increase.

- EuroEco population as a whole:
 - provider costs are equal when FU is based on Home Monitoring
 - despite saving on office visits and physician time
 - increasing other contacts (calls; discussions; remote sessions), handled by others.
 - payer costs are not significantly different (with a trend to be lower)
- Country analysis shows important impact of reimbursement
 - provider income increases or decreases
 - which may incentivise reorganisation towards remote monitoring based FU or not
 - payer costs do not increase, even with reimbursement present
 - allowing room for equipment reimbursement (not included in EuroEco analysis)
- EuroEco may facilitate discussions towards balanced reimbursement, benefiting all:
 - industry, physicians, insurers
 - while providing patients more continuous care



I thank you and the Investigators



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ESC HOT LINE

Arrhythmial/electrophysiology

EuroEco (European Health Economic Trial on Home Monitoring in ICD Patients): a provider perspective in five European countries on costs and net financial impact of follow-up with or without remote monitoring

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