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## **1. Introduction**

The work performed for the training activities of MD Paedigree was significantly expanded since the project inception, back in 2012 and have changed considerably since the original conception of the project. Iinitially, training was considered to be part of WP18 "Dissemination and Exploitation"; containing a set of objectives as detailed below, solely focused on the use of training as a vehicle for dissemination and exploitation (verbatim from the DoW).

"Building on the belief that a main goal is to link MD-Paedigree outcomes with clinical practice, the dissemination activities will be developed in close connection with the training. The training activity will be carried out by UCL, that have gained a meaningful experience within the DISCIPULUS (Roadmap Towards the Digital Patient) project. Building on that experience, that brought out the importance of training as the most solid and long-lasting dissemination strategy, MD-Paedigree will organise a number of dedicated workshops with the key aims to expose the outcomes achieved both in disease modelling and in building the Infostructure, highlighting the potential for change management and innovation in the participating clinical centres"

However, training within MD Paedigree evolved considerably in terms of remit and scope, and training became also part of the implementation of the Infostructure. Training and the development of materials for dissemination and exploitation were integral components of the development of the MD Paedigree platform and the training team provided assistance and guided feedback to the developers, as well as feedback in the way the clinicians and platform were interacting.

Between 2016-2017, the training team organised the final training session of MD Paedigree in Leuven and a training event during the bi-annual meeting of the project in Rome, including elements of formal training (and feedback) as well as demonstration purposes, and prepared specific online tutorials for the basic features of the MD-Paedigree Infostructure. The description of such activities is provided below.

# 2. Description of MD Paedigree Training Session During the Meetings in Rome (February 2016) and Leuven (September 2016) - during the MD Paedigree Bi-Annual Meetings

It is important to mention that the work in year 4 of the project was again, expanded from what was originally planned (1 meeting), meaning that the training team interacted with all Infostructure partners all year around.

The elements of preparation for both meetings were *identical* and in order to avoid repetition, the general process will be described here. In fact, in order to familiarise clinicians (who have very limited time to practice with the tools developed by the project on their own) with the resources developed within the Infostructure WP, the delivery of the training was identical, the tools chosen were the same for each event and just refinement of the tools based on the feedback from the first meeting concerning this report (Rome, February 2016) was performed for the last training event (Leuven,

September 2016). It was deemed that familiarisation was an important issue, based on earlier feedback (please see below), as well as getting the clinicians involved in the project used to work with the novel tools and Infostructure the project was developing. A part of familiarisation is the fact that each use of the same tools makes users feel more confident since the learning aspects become less and less prominent and hence users can devote more time to the application of the tools per se and to focus on how 'useful' the tool is.

#### 2.1 Recap: Early Feedback, Agile Methodology and Solving Issues

At the early stages of the development of the platform (year 2 of the project), well ahead of the release of the Beta-version overall feedback about the platform was obtained during the 1<sup>st</sup> training event (bi-annual MD Paedigree meeting in Utrecht, September 2014) and it focused on usability and friendliness. Specific capabilities of the platform were addressed in the 2nd training/demonstration event held in Crete (October 2015) and further capabilities were implemented and polished for the meetings in Rome and Leuven.

## 2.1.1 Summary of the 1st MD Paedigree feedback session

During the 1<sup>st</sup> training event the platform was vigorously stress-tested. In general, clinicians engaged with the work to be done and feedback was provided throughout the process. From the sign-in, to the notification e-mail received (security), to the medical terms used to describe the 'operations' or 'tasks' available in the platform. The robustness of the platform was also tested by having a significant number of users engaging with the work simultaneously and reporting back any weaknesses. Different OS were tested (for Mac & Windows) and also tablets (mainly iPads) and laptops. A number of improvements to functionality (small, since functionality was the objective of the meeting in Crete) in terms of simple upload patients' files and categorisation were also highlighted. Further functionality was tested and successfully shown to clinical users during the meetings in Rome and Leuven (details provided below).

As a direct outcome of the first training event and the discussions between the 'technical side' and the 'clinical side' as well as the managing team, the Consortium realised that there was a need to implement changes faster. For this reason, an 'Agile' Project Management approach was adopted for the implementation of the Infostructure, which meant in essence, that problems were highlighted as they appeared and the developers dealt with them continuously. For this, a number of tasks/interactions were included within the work plan in order to improve the interplay among clinicians and technical partners, promoting a feedback-based implementation of the tools developed. Among these activities, a scenario analysis session was included, which formed the core of the 'scripts' described in section 2.2.

#### 2.2 Preparation prior to the meeting in Rome and Leuven

The training team in UCL attended the MD Infostructure teleconferences and requested for each partner involved in the development of tools to develop a 'script' so as to guide the users (and the researchers delivering the training) in the use of the tools. A key element of these 2 training events

was a significant amount of work into uploading different, complete and coherent datasets (part of the project) so that the Infostructure tools could show their full potential.

A very brief summary for each tool during the training (and the 'script') is presented below.

#### 2.2.1 Data Curation and validation - DCV DEMO (Athena)

**Objective**: The idea of this tool is to produce an automatic data cleaning process to troubleshoot the imported data from the project and to detect numerical outliers, missing values, alphanumeric typographical and logical errors.

During the training event, a link was provided to all project partners (handouts were given) so they could access the tool, as well as a username and password. A step-by-step process was followed for the users to get familiarised with the tool. Users were guide from what the actual database was (Fig 1) to what the visualisation of the analytics would look like (Figs. 2 and 3), including correction tools (Fig. 4) and the computation of a score (Fig. 5)

2. 02:51 (100/2015) 2. 100/2015 (100/2015) 3. 17/12/2014 M 4. 27/12/2014 M 5. 17/02/2015 M 6. 17/02/2015 M 10:02 M	Male 01/08/19 Female 01/07/19 Male 14/03/19	196 British 196 Turkish 196 British 196 British 191 British White and	generation	language English English	emp_jobtitle_father solicitor delivery truck loader accountant	emp_jobtitle_mother teacher	dob_mother 09/12/1958 01/07/1972		wt_lb_mother 158 211		ht_m_mother 1.75 1.65	ht_ft_mother 5	ht_in_mother	dob_father 18/12/1965 01/03/1961	90	198	wt_oz
1.         02:51         M           2.         1602/2015         602/2015         602/2015           3.         17/12/2014         M           4.         22/12/2014         M           5.         17/02/2015         M           6.         17/02/2015         M           9.         10/02         M           9.         10/02/2015         M	Female 01/07/19 Male 14/03/19 Male 12/02/20	196 Turkish 196 British 201 British White and		English	delivery truck loader							-	-				6.66
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<ul> <li>3. 07:20</li> <li>4. 2212/2014</li> <li>5. 17/02/2015</li> <li>6. 17/02/2015</li> <li>7. 10/02/2015</li> </ul>	Male 12/02/20	001 British White and		-	accountant							9	5	01/03/1961	110	242	8.14
<ol> <li>07:43</li> <li>17/02/2015</li> <li>07:00</li> <li>M</li> <li>1/1/02/2015</li> <li>10:02</li> <li>16/02/2015</li> <li>16/02/2015</li> </ol>		White and		Epolich		practice manager	21/02/1964	89.36	197		1.63	5	4	26/08/1965	82.1	181	
5. 07:00 M 6. 17/02/2015 M 7. 16/02/2015 E	Male 28/04/20			Linguan	clinical perfusionist	nurse	04/03/1969	63	138	14.26	1.68	5	6	11/05/1970	88	194	0.11
0. 10:02 M		Caribbean	Second	English	youth worker	communication support worker / interpreter	08/06/1984	60	132	4.44	1.68	5	6	26/04/1984			
	Male 21/10/19	96 British- French		English	Hedge Fund Partner	HR / Recruitment	26/02/1964	61	134	7.71	1.69	5	6.5	19/10/1961	72	158	11.73
10:33	Female 10/12/20	000 Caribbean	Second	English	builder	author	23/10/1981	76	167	8.82	1.7	5	7	11/12/1979			
B. 03/02/2015 03:20 Fe	Female 25/11/19	95 British		English		receptionist/administrator	26/09/1958	108	238	1.59	1.63	5	4	04/07/1957	93	205	0.48
9. 27/04/2015 04:52 Fe	Female 06/11/19	97 Caribbean	Second	English			10/06/1974				1.68	5	6	03/06/1973			
10. 01/04/2015 M	Male 07/01/19	98 White and Arabic		English	tutor	cleaner	12/06/1974	115	253	8.51	1.6	5	2.99	10/07/1958	83	182	15.74
11. 08/04/0015 M	Male 30/09/19	999 Black Caribbean		English	personal trainer / coach	support coordinator	29/08/1980	89	196	3.38	1.7	5	7	09/10/1979	77	169	12.1
12. 13/04/0015 Fe	Female 22/12/20	000 British		English	medical consultant	nurse	03/05/1967	55	121	4.07	1.55	5	1	09/06/1960	90	198	6.66
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Fig. 1: Example database (DCV Demo)

🏂 DCV-ATHENA 🗙 🕂								
()   localhost:9090/project?user=eyJhbGciOiJIUzi11	NilsInR5cCl6lkpXVCJ9.eyJ1c2Vylj	oidXNlcjY3MDQyNDcifQ.6ZEqYva	mZZQBf4MBbCugYigZtXN2NOF	1O5HjBN1aDw&project=74	C Q Search	¥	☆ 白 ♥ ♣ ★ 👳	⊛ ≡
Home								
Projec	ts	Data Cleaning		Compute Score	Kr	owledge Discovery		
History Statistics	31 Records 45 Columns	22 Errors < >				Search:	C Show all	Download
0. "Create project"	[8] emp_jobtitle_mother	[9] dob_mother	[10] wt_kg_mother	[11] wt_lb_mother	[12] wt_oz_mother	[13] ht_m_mother	[14] ht_ft_mother	[15] ht_in_n
"Edit row 11 of column date_quest with value 08/04/2015 05:15 from previous value 08/04/0015 05:15"     Extend workflow     Run workflow	25 Categories	15/12/1949 02/10/1985	10	0 200	0 10		4 5.1 0	
Extract workflow Run workflow	teacher	09/12/1958	72	158	11.73	1.75	5	
		01/07/1972	96	211	10.3	1.65	5	
	practice manager	21/02/1964	89.36	197		1.63	5	
	nurse	04/03/1969	63	138	14.26	1.68	5	
	communication support worker / i	08/06/1984	60	132	4.44	1.68	5	
	HR / Recruitment	26/02/1964	61	134	7.71	1.69	5	
	author	23/10/1981	76	167	8.82	1.7	5	
	receptionist/administrator	26/09/1958	108	238	1.59	1.63	5	
		10/06/1974				1.68	5	
	cleaner	12/06/1974	115	253	8.51	1.6	5	
	support coordinator	29/08/1980	89	196	3.38	1.7	5	
	nurse	03/05/1967	55	121	4.07	1.55	5	
	legal assistant	22/09/1970	62	136	10.99	1.73	5	
	HR employee	26/02/1964	61	134	7.71	1.69	5	
	resident engagement officer	19/10/1970	88	194	0.11	1.67	5	
	Former Chartered Librarian	18/11/1956	44.45	98		1.52	5	
	librarian	18/11/1956	44.45	98		1.52	5	
	cook	15/12/1949	52	114	10.25	1.5	4	
	nurse	29/08/1972	73	160	15	1.7	5	
	Bursar	15/05/1961	67.4	148	9.47	1.68	5	
	Security Guard	25/07/1970	53	116	13.52	1.57	5	
	Barristers Clerk	02/04/1968	63	138	14.26	1.7	5	
	Teacher	16/06/1965	62	136	10.99	1.62	5	

# Fig. 2: Visualisations of the DCV tool

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	[9] dob_mother	[10] wt_kg_mother	[11] wt_lb_mother		[13] ht_m_mother     Rename column     Delete column     Detect misspellings	[14] ht_ft_mother	[15] ht_in_mother	[16] di
Select all	09/12/1958	72	158	11.73	Discretise column	75		18/12/1965
[4] ethnicity	01/07/1972	96	211	10.3	Visualizations	55	5	01/03/1961
12 11 10 9	21/02/1964	89.36	197			53	i 4	26/08/1965
10-	04/03/1969	63	138	14.26	Linechart	58	6	11/05/1970
7- 6-	08/06/1984	60	132	4.44	1.	58 5	6	26/04/1984
5- 4-	26/02/1964	61	134	7.71	1.	59 5	6.5	19/10/1961
31	23/10/1981	76	167	8.82	1	.7	7	11/12/1979
ôJ 1 Categories	26/09/1958	108	238	1.59	1.	53 5	i 4	04/07/1957
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23 C Select all	12/06/1974	115	253	8.51	1	.6	2.99	10/07/1958
[4] and	29/08/1980	89	196	3.38	1	.7 8	7	09/10/1979
	03/05/1967	55	121	4.07	1.	55 t	1	09/06/1960
Mala	22/09/1970	62	136	10.99	1.	73	8	23/09/1967
Female	26/02/1964	61	134	7.71	1	59 5	6.5	19/10/1961
	19/10/1970	88	194	0.11	1.	57 1	5.75	09/08/1963
	18/11/1956	44.45	98		1.	52 5	i	
Select all	18/11/1956	44.45	98		1.	52 5	÷	
1 .	15/12/1949	52	114	10.25	1	.5	11.06	06/07/0046
1.8- 0	29/08/1972	73	160	15	1	.7 5	i 7	27/10/1970
	15/05/1961	67.4	148	9.47	1.	58 0	6	20/02/1965
1.6 0 0 0 0 0 0	25/07/1970	53	116	13.52	1.	57 5	1.81	25/07/1968
.5	02/04/1968	63	138	14.26	1	.7 5	6.93	27/11/1967
20 40 60 80 100 120 wt kg mother	16/06/1965	62	136	10.99	1.	52 5	3.78	27/01/1975

Fig. 3: Visualisations selected functionality (DCV tool)

(i) localhost:9090/project?user=eyJhbGciOUIU2					Iproject=74 C Q Search		▶☆ 自	♥ ♣ ♠ ֎ ֎
Home								
Pro	ects		Data Cleaning	Compute	Score	Knowledge Discov	ery	
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Merge values of selected group	s 🗆 #	[1] date_quest	[2] sex	[3] dob	[4] ethnicity	[5] generation	[6] language	[7] emp_jobtitle_fat
ethnicity frequency							( <b></b>	
+ British, French								
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	1	25/09/2014 02:51	Male	01/08/1996	British		English	solicitor
	2	16/02/2015 06:39	Female	01/07/1996	Turkish			delivery truck loader
	0 3	17/12/2014 07:20	Male	14/03/1996	British		English	accountant
	4	22/12/2014 07:43	Male	12/02/2001	British		English	clinical perfusionist
	5	17/02/2015 07:00	Male	28/04/2001	White and Black Caribbean	Second	English	youth worker
	6	17/02/2015 10:02	Male	21/10/1996	British-French		English	Hedge Fund Partner
	7	16/02/2015 10:33	Female	10/12/2000	Caribbean	Second	English	builder
	8	03/02/2015 03:20	Female	25/11/1995	British		English	
	9	27/04/2015 04:52	Female	06/11/1997	Caribbean	Second	English	
	10	01/04/2015 02:00	Male	07/01/1998	White and Arabic		English	tutor
	11	08/04/2015 05:15	Male	30/09/1999	White and Black Caribbean		English	personal trainer / coach
	12	13/04/0015 05:33	Female	22/12/2000	British		English	medical consultant
	13	20/04/0015 05:48	Male	03/11/2001	British		English	production planner
	14	17/02/0015 06:28	Male	21/10/1996	British, French	Second	English	hedge fund partner
	15	27/05/2015 03:09	Male	14/12/2000	South American		English	lettings
	16	06/07/2015 11:41	Female	14/05/1997	Caribbean	Second	English	Telecoms Engineer
	17	10/06/0015 02:22	Female	14/05/1997	Caribbean		English	telecoms
	18		Female	09/05/1997	Chinese	First	English	cook
	19	08/07/0015 07:58	Female	09/02/1998	British		English	accountant
	20	13/07/0015 08:24	Male	02/08/1998	British			Head of Finance
	21	14/07/0015 08:27	Male	01/02/1998		Second	Portuguese	Security Guard
	22	22/07/0015 08:31	Female	02/01/2000	British		English	fiberous plasterer

Fig. 4: Detection of errors (misspelling in this case). CDV Tool



Fig. 5: Computation of Score (CDV tool)

#### 2.2.2 Case-Based Retrieval service (CBR) (HES-SO)

Objective: This tool helps physicians to find similar patients based on the discharge synthesis of a given patient. The tool proposes a summary of the returned cases of similar patients at different points in time.

Again, during the training event, a link was provided to all project partners (handouts were given) so they could access the service. A step-by-step process was followed for the users to get familiarised with the tool. The case-based retrieval service is a 4-step process: Query, refinement, filters, results. The user can then iterate (steps 2-4) to refine his query and thus obtain more relevant results. Two examples were presented: one patient being in the PCDR and one not. The figures below serve as an illustration of the first case. From 'loading' patients (Fig. 6) to 'query' of the database to 'refinement' ('MeSH' and 'Rocchio' refinement; Figs. 7 and 8 respectively). Finally, the user is able to apply filters to their query (Fig. 9) and visualise the results (Fig. 10)

				New q
c	Query	2 Refinement	3 Filters	4 Results
INFORMATIONS ABOUT	MY PATIENT	~		
Patient in PCDR	Patient not in PCDR	Advanced mode		
Patient identifier: afo	46c4ee1993fe12ec30d8331ba	f3dbd4269d1		
Ç	Tracce di rigurgito aortico, di ne	essuna rilevanza. Per il resto es le flussimetria delle restanti val	ame nei limiti: Normali i ritorni ve	o del lembo posteriore in regione. A2-P2. nosi sistemici e polmonari. Normale vitarie. Normale la cinesi biventricolare. Non
				Next

Fig. 6: The physician inserts the patient *id*. The system will automatically load the existing clinical syntheses for this patient. The user can then select any of them (if several).

			3	4
	Query	Refinement	Filters	Results
MY PATIENT				
				nbo posteriore in regione. A2-P2. Tracce di
			enosi sistemici e polmonari. Normale ar are. Non dotto arterioso pervio. Arco ad	natomia intracardiaca. Normale flussimetria ortico normale.
ge: 10 years				
ender: NA				
ender. 197				
QUERY REFINEME	NT			
MeSH terms			Rocchio refinement	
D001022	Aortic Valve Insufficiency	64	Rocchio refinement Not available for first query	
D004374	Ductus Arteriosus, Patent	2		
D012212	Rheology	2		
D045268	Flowmeters	2		
D008944	Mitral Valve Insufficiency	C <sup>2</sup>		
D004373	Ductus Arteriosus	67		
D000715	Anatomy	2		
	Anatomists	C7		
D054814		F2		
D011391	Prolapse			
D011391	Kinesis	2		
D011391 D007698 D001158	Kinesis Arteries	ខេត		
D011391 D007698 D001158 D001167	Kinesis Arteries Arteritis	នេតនា		
D011391 D007698 D001158 D001167 D016011	Kinesis Arteries Arteritis Normal Distribution	នេតត្ត		
D011391 D007698 D001158 D001167 D016011 D010920	Kinesis Arteries Arteritis Normal Distribution Placenta	। র র র র র		
D011391 D007698 D001158 D001167 D016011 D010920 D001021	Kinesis Arteries Arteritis Normal Distribution Placenta Aortic Valve	<u>রে</u> রেরের		
D011391 D007698 D001158 D001167 D016011 D010920 D001021 D013524	Kinesis Arterites Arteritis Normal Distribution Placenta Aortic Valve Surgical Flaps	<u>র</u> র র র র র		
D011391 D007698 D001158 D001167 D016011 D010920 D001021 D0013524 D001023	Kinesis Arteritis Arteritis Normal Distribution Placenta Aortic Valve Surgical Flaps Aortic Valve Prolapse	<u>রে ৫ ৫ ৫ ৫ ৫ </u>		
D011391 D007698 D001158 D001167 D016011 D010920 D001021 D013524 D001023 D008943	Kinesis Arteritis Arteritis Normal Distribution Piacenta Aortio Valve Surgical Flaps Aortio Valve Prolapse Mitral Valve	ধেওওওও		
D011391 D07698 D001158 D01167 D016011 D010920 D001021 D013524 D001023 D001023 D008943 D016292	Kinesis Arteritis Arteritis Normal Distribution Placenta Aortic Valve Surgical Flaps Aortic Valve Prolapse Mitral Valve Conscious Sedation	121222222222222222222222222222222222222		
D011391 D007698 D001158 D001167 D016011 D010920 D001021 D013524 D001023 D008943	Kinesis Arteritis Arteritis Normal Distribution Piacenta Aortio Valve Surgical Flaps Aortio Valve Prolapse Mitral Valve	<u> </u>		

Fig. 7: Refinement (MeSH refinement): consisting on automatically normalising the clinical synthesis (i.e. the query). Up to 20 MeSH terms are suggested, and the top-3 is by default pre-selected. The physician can select/unselect the MeSH terms he wants to add to his query



Fig. 8: Rocchio refinement: this is based on the episodes of care judged as similar by the physician (in the results section). The clinical syntheses of these episodes of care are taken and the Rocchio service retrieves the most frequent words in these texts.

	*		
Query	Refinement	Filters	4 Results
QUELY	Reinement	r itters	riesurs.
My patient			
Clinical synthesis: Insufficienza mitralica di rigurgito aortico, di nessuna rilevanza. Per il n			
delle restanti valvole. Normali dimensioni end	ocavitarie. Normale la cinesi biventrico	lare. Non dotto arterioso pervio. Arco ao	rtico normale.
Age: 10 years			
Gender: NA			
FINAL QUERY			
Query		Filters	
Query	× oderato con apici dei lembi	Show only patients that are	
Query Insufficienza mitralica di grado mo valvolari ispessiti e piccolo prolas	so del lembo posteriore in	Show only patients that are Gender:	
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#### Fig. 9: Application of filters

	- 00 results		00 results	Page Lof 10				
	1	- Au	Made	Similar events and future events	Beere			
1)	Ş	10 years	Valvola mitrale (D008643) Dotto anterioso pervio (D004374) Emodinamica (D006439)	Lieve protease del tembo alnteriore della velvola mitrate con teve insufficianza di nessun significato emodimenso. Normale la cinesi biventricolare. Non dotto arterioso pervis.	*****	die of the	•	0
				IN Show similar and future events				
2	Ŷ	10 years	Dutto enterioso pervio (D004374) Emodinamica (D008438) Reologia (D012212)	Lieve protesso ed iperecegenicoli(, Vi del lembs anteriore mitratico con insufficienza costituita de jets multipil complexalvamente di grado lieve- moderativimodensto. Normali dimensioni endocavitarie. Normate.	*****	(rein)	•	0
				is Show similar and future events				
3)	o	0 years	Velvola aortica (D601021) Dotto arterioso pervio (D004374) Emodinamica (D006439)	Normali dimensioni endocavitarie e spessori parietali. Normali dimensioni endocavitarie. Arco aortico normale.	*****	(TOM)	•	•

Fig. 10: Results. In this part, similar episodes of care are displayed.

#### 2.2.3: CaSiReView (Siemens Healthcare)

**Objective:** Given a cohort of patients or a dataset, the objective of this tool is to provide a user friendly and visually intuitive tool to browse and visualise the simulation results, browse modelling results for all patients, inspect left ventricular (LV) volumes, inspect LV pressures, inspect LV ejection fraction, inspect LV SV, inspect cardiac movement over one heart cycle, to report potential issues and finally, to analyse cohort statistics.

As for the other demonstrators, during the training event, a link was provided to all project partners (handouts were given) so they could access it. The link was hosted internally in the Siemens server but an updated tool is now part of the MD Paedigree platform. As with the previous demos, a stepby-step process was followed for the users to get familiarised with the tool.

Users were guided through the tool (Figs. 11-13) by accessing the online version whilst its different features were highlighted. The data presented here was obtained from UCL and uploaded via the interface designed for this purpose.



Fig. 11: Summary of the tool and quantitative information of the patient cohort



Fig. 12: Information for individual patients including error quantification, including video control (bottom right)



Fig. 13: Browsing through the cohort

#### 2.3 Presentation during the meetings in Rome and Leuven

The training session provided an overview of the platform and a step-by-step use of the different tools available. The tutorials covered every aspect of these tools and showed the end users (clinicians) how to start exploring the data space.

The training session had a group of engaged and interested clinicians (Fig. 14) and the feedback was overall extremely positive.



Fig. 14: Training session – clinical group

## **3 Comments and feedback**

Prior to the meeting, the developers were asked to share their demo session with the training team to see if these were user-friendly for the meeting (particularly the end users) and also to see if the content of the demos was as expected. This process was also used to provide advice on improvements to the demos. As previously described, a total of three demos were shown prior to the meeting from those listed below.

- 1. ATHENA: data curation and validation (mainly based on one of the end users' cases)
- 2. Siemens: Case reasoner; showing the same similarity search features based on several variables such as age and vessel diameter.
- 3. HESSO: case based retrieval service

A number of comments and suggestions were given to the software developers by the training team on their demos; these were mainly on the examples used (if it was easy to follow and challenging/useful enough to show) or if there was a missing function (for example a legend or use of a better colour tab).

#### **3.1 Addressing Previous Feedback**

Prior to the demo presentations, the training team asked the end users to provide their constructive comments and to feel free to interrupt the presenter or wait for the time given in the end of each presentation.

It is important to mention that after the training events, users were positive about the tools and developers received a number of supportive comments, such as 'I would definitely use this tool for my work' which validate the design process. For completeness, previous feedback is presented below but it is important to highlight that developers *did address these comments in their entirety* and the user community was satisfied.

For completeness, a brief summary of previous Feedback (as presented in 18.3) is shown below:

- 1. ATHENA: a few comments were given regarding
  - A better definition for time-woke and time-bed options
  - The connection between the patients in a line chart
  - Ordering the x-axis in a plot
  - Filtering down the data
  - Scaling the parameters
- 2. HESSO: several comments were given to improve the functionality, the comments were on;
  - Discharge summary
  - English translation (it is only in Italian at the moment)
  - The ranking of the similarity algorithm
  - The outcome of the time function
  - How is the query defined
  - Weighing the importance of the similarity (if certain things are important than others, to prioritise)
  - A better visualisation of different icons
  - Inclusion and exclusion of time
  - The conclusion of each patient must be better accessed
  - The type of data that can be processed
- 3. Siemens: A general set of questions were asked and addressed;
  - How many features can be handled?
  - How many options can you select?
  - What type of data will be needed?
  - Can it be completely automated?
  - Can the engine be taken out so the data run is performed elsewhere?

## **4** Conclusion

The remit of the initial training activities during MD Paedigree was significantly expanded during the life of the project. All concerns and questions were documented during and after each training session from years 2 to 4, which ultimately led to the development of clinically relevant and useful tools for the MD Paedigree platform. This was evidenced by increased satisfaction from the clinical user groups, with the last session (Leuven) providing extremely positive comments and clinicians willing to use the tools in their daily work. Part of the success was due to the fact that training was used dynamically inside the project as a tool to gather feedback, instead of focusing solely on the delivery of the tools. For future applications, the recommendation is that 'training' activities are also part of the Implementation (in this case 'Infostructure') work package and part and parcel of the evaluation of the tools.