EUROCAT Data Management Software Analyse data Statistical surveillance - Trends



Introduction

- Accessing the statistical surveillance components of the DMS requires to install the « R distribution for Eurocat DMS.msi ». Please, refer to the chapter on <u>setting up DMS</u>.
- DMS performs the trends analysis according to the methodology described in the <u>Statistical monitoring protocol</u>.
- The analysis can run on one or several centres. If two or more centres are selected, the program also outputs pan-centre/pan-European results, based on the aggregation of the data from the individual centres selected.
- <u>Section 1</u> (*respectively* <u>section 2</u>) shows how the trends analysis run for 1 registry selected (*resp.* 2 or more registries selected)

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1. Run trends analysis for 1 registry

2. Run trends analysis for several registries

1. Run trends analysis for 1 registry



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Run trends analysis in the DMS

1 local registry selected

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Run trends analysis in the DMS

1 local registry selected

1. A pop-up window asks to locate the folder where you want to save the outputs of the R script (graphs and csv).



2. A pop-up message warns that the analysis will run on all the anomaly subgroups.



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Run trends analysis in the DMS

1 local registry selected

Once the analysis has run, DMS displays:

1. a table with the total number of births in the selected registry

Births	-	
year	total	
2012	36933	
2013	35899	
2014	35346	
2015	33849	
2016	33026	
2017	32484	
2018	32025	
2019	31734	
2020	31329	
2021	32448	

2. a summary of the detected trends in the selected registry

Trends -												
Anomaly	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	SlopeAndPercentageChange
All anomalies	1126	1037	968	1001	955	1014	1036	1067	990	960	10154	Increasing: 1.0% (95% CI 0.4% to 1.79
Nervous system anomalies	83	78	87	121	89	118	80	105	95	96	952	Increasing: 3.2% (95% CI 1.0% to 5.5%
Neural Tube Defects	39	36	42	60	37	49	44	46	41	49	443	
Anencephaly and similar	20	14	13	29	19	24	25	21	18	27	210	Increasing: 5.4% (95% CI 0.6% to 10.4
Encephalocele and meningocele	5	6	5	7	5	6	1	6	4	3	48	
Spina Bifida	14	16	24	24	13	19	18	19	19	19	185	
Hydrocephaly	9	14	5	11	7	10	4	7	8	8	83	
Severe microcephaly	4	5	2	5	7	6	1	4	4	4	42	
Arhinencephaly / holoprosencephaly	3	2	8	7	4	8	4	4	4	2	46	
Agenesis of corpus callosum	9	3	15	10	9	11	4	4	10	3	78	
Eye anomalies	11	13	8	11	19	17	24	25	25	22	175	Increasing: 13.1% (95% CI 7.3% to 19
Anophthalmos / microphthalmos	3	3	2	2	3	2	2	3	5	4	29	
Anophthalmos	1	1	1	1	0	0	0	0	0	1	5	
Congenital cataract	6	5	2	4	8	5	7	12	7	8	64	Increasing: 10.5% (95% CI 1.4% to 20
Congenital glaucoma	0	2	0	1	0	0	2	0	2	2	9	
Ear, face and neck anomalies	6	7	6	5	4	7	4	11	7	3	60	
Anotia and atresia / stenosis / stricture of external auditory canal	4	5	5	5	3	4	1	5	6	2	40	
Congenital Heart Defects	418	389	353	347	304	332	341	343	326	281	3434	Decreasing: -1.3% (95% CI -2.4% to -
Severe congenital heart defects	68	82	68	76	58	79	73	81	81	50	716	
Common arterial truncus	0	2	1	2	0	2	0	1	0	0	8	
Double outlet right ventricle	1	5	1	7	8	4	8	7	8	0	49	
B H AND AND		6	0	6	0	0	0	0	0	0	-	

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Run trends analysis in the DMS

1 local registry selected

Neural Tube Defects

The tables can be exported to Excel \rightarrow 1 spreadsheet per table

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If you choose to export to csv, DMS will create one csv file per table (i.e. one for the total number of births and one for the summary of the trends).

Excel may give an error when opening the *.xlsx* generated. Please ignore it.

Run trends analysis in the DMS

1 local registry selected

In the folder you selected in step 2 (see <u>page 6</u>), the program has created 2 folders and 3 csv files.



dataclean.csv: input data prepared for analysis

	A	В	С	D	E	F	G	Н	1	J
1	reg	anom	year	case	рор	ganom	nyears	minyr	descanom	regna
2		1	2012	1126	36933	0	10	2012	All anoma	
3		1	2013	1037	35899	0	10	2012	All anoma	
4		1	2014	968	35346	0	10	2012	All anoma	
5		1	2015	1001	33849	0	10	2012	All anoma	
6		1	2016	955	33026	0	10	2012	All anoma	
7		1	2017	1014	32484	0	10	2012	All anoma	
8		1	2018	1036	32025	0	10	2012	All anoma	
9		1	2019	1067	31734	0	10	2012	All anoma	
10		1	2020	990	31329	0	10	2012	All anoma	
11		1	2021	960	32448	0	10	2012	All anoma	
12		2	2012	83	36933	1	10	2012	Nervous s	
13		2	2013	78	35899	1	10	2012	Nervous s	

Run trends analysis in the DMS

1 local registry selected

In the folder you selected in step 2 (see <u>page 6</u>), the program has created 2 folders and 3 csv files.



Pop_Case by Reg_year.csv: total number of cases by year and by registry

	A	в	C	D	
1	reg	year	рор	case	
2		2012	3877965	4012	
3		2013	3769395	3781	
4		2014	3711330	3599	
5		2015	3554145	3675	
6		2016	3467730	3562	
7		2017	3410820	3684	
8		2018	3362625	3725	
9		2019	3332070	3847	
10		2020	3289545	3554	
11		2021	3407040	3498	
12					

Run trends analysis in the DMS

1 local registry selected

In the folder you selected in step 2 (see <u>page 6</u>), the program has created 2 folders and 3 csv files.



individual_results.csv: detailed results of the linear and spline models, for the local registry selected in each anomaly group

	A	в	С	D	Е	F	G	н	1	J	к	L	M	N	0	Р	Q	B	S	т	U	V
1	reg	regname	ganom	descano	year	case	рор	nyears	minyr	ncase	prevalen	prev.lci	prev.uci	p.log.inte	p.log.inte	p.log.yea	p.log.yea	p.log.yea	p.devian	p.df	p.chi.squ	p.cor
2			0	All anoma	2012	1126	36933	10	2012	10154	0.0305	0.0288	0.0323	-3.501	0.01	0.0103	0.0034	0.0026	24.986	8	0.0016	FAL
3			0	All anoma	2013	1037	35899	10	2012	10154	0.0289	0.0272	0.0307	-3.501	0.01	0.0103	0.0034	0.0026	24.986	8	0.0016	FAL
4			0	All anoma	2014	968	35346	10	2012	10154	0.0274	0.0257	0.0291	-3.501	0.01	0.0103	0.0034	0.0026	24.986	8	0.0016	FAL
5			0	All anoma	2015	1001	33849	10	2012	10154	0.0296	0.0278	0.0314	-3.501	0.01	0.0103	0.0034	0.0026	24.986	8	0.0016	FAL
6			0	All anoma	2016	955	33026	10	2012	10154	0.0289	0.0272	0.0308	-3.501	0.01	0.0103	0.0034	0.0026	24.986	8	0.0016	FAL
7			0	All anoma	2017	1014	32484	10	2012	10154	0.0312	0.0294	0.0332	-3.501	0.01	0.0103	0.0034	0.0026	24.986	8	0.0016	FAL
8			0	All anoma	2018	1036	32025	10	2012	10154	0.0323	0.0305	0.0343	-3.501	0.01	0.0103	0.0034	0.0026	24.986	8	0.0016	FAL
9			0	All anoma	2019	1067	31734	10	2012	10154	0.0336	0.0317	0.0357	-3.501	0.01	0.0103	0.0034	0.0026	24.986	8	0.0016	FAL
10			0	All anoma	2020	990	31329	10	2012	10154	0.0316	0.0297	0.0336	-3.501	0.01	0.0103	0.0034	0.0026	24.986	8	0.0016	FAL
11			0	All anoma	2021	960	32448	10	2012	10154	0.0296	0.0278	0.0315	-3.501	0.01	0.0103	0.0034	0.0026	24.986	8	0.0016	FAL
12			1	Nervous :	2012	83	36933	10	2012	952	0.0022	0.0018	0.0028	-5.879	0.0331	0.0317	0.0112	0.0046	21.951	8	0.005	FAL
13			1	Nervous :	2013	78	35899	10	2012	952	0.0022	0.0017	0.0027	-5.879	0.0331	0.0317	0.0112	0.0046	21.951	8	0.005	FAL
14				Nervous	2014	87	35346	10	2012	952	0.0025	0.002	0.003	-5.879	0.0331	0.0317	0.0112	0.0046	21 951	8	0.005	FΔL

Run trends analysis in the DMS

1 local registry selected

In the folder you selected in step 2 (see <u>page 6</u>), the program has created 2 folders and 3 csv files.



IPS: Fitted prevalence graphs by anomaly group





Run trends analysis in the DMS

1 local registry selected

In the folder you selected in step 2 (see <u>page 6</u>), the program has created 2 folders and 3 csv files.



IT: Forest plot of decreasing/increasing trends + list of anomaly groups excluded (e.g. too few cases)



2. Run trends analysis for 2 or more registries



Run trends analysis in the DMS

2 or more local registries selected

Home		Home	Statistical surveillance ×	
Manage data	Report View and download a predefined report, with various	Csv	CSV X Excel	
Import / export		Centre(s)	Anomaly group(s)
Analyse data	Data quality indicators	All cen	res -	All anomaly groups
Data configuration	View the report about the quality of the data	Year from	n/	Year to
Help	Missing values View the report about completeness of the data	⊙ Øth	er options	
About	Web analysis	All analy:	is will be performed only on EUROCAT cases that are not spontaneous abortions (<20 Trend analysis	weeks of GA) Cluster analysis
License	Extract the data for the website analysis			,
System configuration	Statistical surveillance Perform the statistical surveillance on the data			
Home Sta CSV Centre(s) 2 centres sel Scicila (IT) Slovakia (SK) Slovakia (SK) Slovakia (SK) Sofia (BG) Spain Hospit	atistical surveillance × Excel ected select the centres (dropdown list)	And Lear V	Excel Anomaly group(s) All anomaly group(s) All anomaly groups enter the time period of the analysis ns e performed only on EUROCAT cases that are not spontaneous abortions (<20 weeks of GA)	Unnecessary to select an anomaly. The program always run on all the subgroups.
Strasbourg (F Styria (AT)	R)		Trend analysis Cluster analysis	Trend analysis button
15 Trento (IT)				

Run trends analysis in the DMS

2 or more local registries selected

1. A pop-up window asks to locate the folder where you want to save the outputs of the R script (graphs and csv).



2. A pop-up message warns that the analysis will run on all the anomaly subgroups.



Run trends analysis in the DMS

2 or more local registries selected

Once the analysis has run, DMS displays:

1 - a table with the total number of births in each of the selected registry

Births	-	
year	total	
2012	31179	
2013	29640	
2014	29573	
2015	29777	
2016	29480	
2017	28398	
2018	27690	
2019	26767	
2020	26135	
Births	-	
year	total	
2012	52246	
2013	49976	
2014	10075	

2 – a summary of the detected trends in each of the selected registry and at « pan-European » level

Anomaly	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	Slop	eAnd	PercentageCha
All anomalies	516	572	508	357	492	507	607	508	462		4529	Incre	easing:	1.8% (95% CI
Nervous system anomalies	69	55	59	58	66	72	57	60	46		542			
Neural Tube Defects	30	24	18	27	36	42	36	32	25		270	Incre	easing:	5.2% (95% CI
Anencephaly and similar	12	11	4	14	15	20	14	15	11		116			
Encephalocele and meningocele	2	6	4	2	5	4	6	7	6		42			
Spina Bifida	16	7	10	11	16	18	16	10	8		112			
Hydrocephaly	20	14	17	17	11	19	8	10	8		124	Decr	reasing	p: -7.1% (95% (
Trends -														
Anomaly		2012	2013	2014	4 201	5 201	6 201	17 20	18 20	19 2	020 2	021	Total	SlopeAndPe
All anomalies		1061	1121	1032	758	782	917	10	37 93	2 7	73		8413	
Nervous system anomalies		134	147	129	98	102	117	10	11	6 99	9		1043	
Neural Tube Defects		64	74	59	56	64	58	60	69	51	1		555	
Anencephaly and similar		26	24	21	20	29	24	25	35	20	0		224	
Encephalocele and meningocele		6	8	5	7	2	5	7	9	4			53	
Spina Bifida		32	42	33	29	33	29	28	25	27	7		278	
Hydrocephaly		29	24	21	24	20	26	9	19	19	9		191	
Trends - pan-European														
Anomaly	2	012 2	2013	2014	2015	2016	2017	2018	2019	2020	2021	Tota	al Sl	opeAndPerce
All anomalies	1	577 1	693 1	1540	1115	1274	1424	1644	1440	1235		129	42	
Nervous system anomalies	2	03 2	02 1	188	156	168	189	158	176	145		158	5	
Neural Tube Defects	9	4 9	8 7	77 (83	100	100	96	101	76		825		
Anencephaly and similar	3	8 3	5 2	25	34 4	44	44	39	50	31		340	Inc	reasing: 4.6%
Encephalocele and meningocele	8	1	4 9	9	9	7 9	9	13	16	10		95		
Spina Bifida	4	8 4	9 4	43 4	40 4	49 4	47	44	35	35		390		
Hudesee halo		o 12	a		44 I.	54 L	45	17	20	27	1	215	l na	creation -5.2

Run trends analysis in the DMS

2 or more local registries selected

The tables can be exported to Excel \rightarrow 1 spreadsheet per table

CSV Excel	
2 centres selected	
Year from 2012	
(Other options	
All analysis will be performed only on EUROCAT cases that a	re not spontaneo
<	
Trends - pan-European	
Anomaly	
All anomalies	
Nervous system anomalies	
Neural Tube Defects	
Anencephaly and similar	

F	2.0					DM	6 output.xlsx	[Repaired]	Excel				m –	
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A1		* E	× v	f _* Ch	eck for tre	nds								
al	А	в	c	D	E	F	G	н	1.1	J.	к	L	м	N
1 0	Check for	trends												
2														
3 1	rears test	ed 2012-2	021											
4														
5													Trend	
6 4	Anomaly	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	Slope and	Probabil
7 /	All anoma	1577	7 1693	1540	1115	1274	1424	1644	1440	1235		1294	2	
8 1	Nervous s	203	3 202	188	156	168	189	158	176	145		158	5	
9	Neural To	94	98	77	83	100	100	96	101	76		82	5	
10	Anence	38	3 35	25	34	44	44	39	50	31		34) Increasing	0.033
11	Encepha	8	3 14	9	9	7	9	13	16	10		9	5	
12	Spina Bi	48	3 49	43	40	49	47	44	35	35		39)	
13	Hydroces	45	38	38	41	31	45	17	29	27		31	5 Decreasin	0.016
14	Severe m	7	7 11	4	2	6	10	5	5	0		5)	
15	Arhinenc	7	7 10	8	9	6	8	11	13	7		7	9	
16	Agenesis	5	8	12	10	8	10	15	18	11		10	1	
17 8	Eye anom	20	22	25	12	8	23	24	13	5		15	2	
18	Anophth	5	5 4	4	2	1	4	4	2	1		2	7	
19	Anophti	(1	2	0	0	2	0	0	0			5	
20	Congenit	Ę	3 5	8	2	2	8	11	8	1		5	3	
21	Congenit	(0 0	1	0	0	0	1	1	0			3	
22 E	Ear, face a	15	5 18	16	20	7	7	2	4	3		9	2	
23	Anotia ar	2	2 1	4	1	2	1	1	0	2		1		
24 (Congenita	404	422	358	314	396	457	440	420	427		363	8 Increasing	0.028
25	Severe co	171	172	136	145	164	187	168	174	169		148	5 Increasing	0.002
26	Common	3	6	2	1	2	4	3	10	8		3	9 Increasing	0.010
27	Double o	17	7 19	19	22	16	17	20	12	13		15	5	
28	Double g			0	0		0	0	0	1			2	

If you choose to export to csv, DMS will create one csv file per table (i.e. one for the total number of births and one for the summary of the trends).

Excel may give an error when opening the .xlsx generated. Please ignore it.

Run trends analysis in the DMS

2 or more local registries selected

In the folder you selected in step 2 (see <u>page 16</u>), the program has created 4 folders and 4 csv files.



dataclean.csv: input data prepared for analysis

	A		D	U U	U	E	Г	0	п	1	
1	reg		anom	year	case	рор	ganom	nyears	minyr	descanom	re
2			1	2012	516	31179	0	9	2012	All anoma	
3			1	2013	572	29640	0	9	2012	All anoma	i.
4			1	2014	508	29573	0	9	2012	All anoma	i.
5			1	2015	357	29777	0	9	2012	All anoma	i.
6			1	2016	492	29480	0	9	2012	All anoma	i.
7			1	2017	507	28398	0	9	2012	All anoma	ł
8			1	2018	607	27690	0	9	2012	All anoma	
9			1	2019	508	26767	0	9	2012	All anoma	
10			1	2020	462	26135	0	9	2012	All anoma	
11			2	2012	69	31179	1	9	2012	Nervous s	;
12			2	2013	55	29640	1	9	2012	Nervous s	
13			2	2014	59	29573	1	9	2012	Nervous s	

Run trends analysis in the DMS

2 or more local registries selected

In the folder you selected in step 2 (see <u>page 16</u>), the program has created 4 folders and 4 csv files.

and by registry

Pop_Case by Reg_Year.csv: total number of cases by year



	Α	В	С	D	E
1	reg	year	рор	case	
2		2012	3273795	2113	
3		2012	5485830	4074	
4		2013	3112200	2258	
5		2013	5247480	4194	
6		2014	3105165	1917	
7		2014	5236875	3838	
8		2015	3126585	1570	
9		2015	5204745	3194	
10		2016	3095400	2061	
11		2016	5145420	3462	
12		2017	2981790	2052	
13		2017	5004825	3737	
14		2018	2907450	2353	
15		2018	4881555	4092	
16		2019	2810535	2027	
17		2019	4747995	3682	
18		2020	2744175	1788	
19		2020	4526130	3116	
20					

Run trends analysis in the DMS

2 or more local registries selected

In the folder you selected in step 2 (see <u>page 16</u>), the program has created 4 folders and 4 csv files.



individual_results.csv: detailed results of the linear and spline models, by individual registry for each anomaly group

-		~				Ŷ				15	(
reg	regname	ganom	descanom	year	case	рор	nyears	minyr	ncase	prevalence	prev.lci	prev.uci	p.log.inte p
		0	All anoma	2012	516	31179	9	2012	4529	0.01655	0.015192	0.018026	-4.04364
		0	All anoma	2013	572	29640	9	2012	4529	0.019298	0.017793	0.020928	-4.04364
		0	All anoma	2014	508	29573	9	2012	4529	0.017178	0.015758	0.018723	-4.04364
		0	All anoma	2015	357	29777	9	2012	4529	0.011989	0.010814	0.01329	-4.04364
		0	All anoma	2016	492	29480	9	2012	4529	0.016689	0.015289	0.018216	-4.04364
		0	All anoma	2017	507	28398	9	2012	4529	0.017853	0.016377	0.01946	-4.04364
		0	All anoma	2018	607	27690	9	2012	4529	0.021921	0.020262	0.023713	-4.04364
		0	All anoma	2019	508	26767	9	2012	4529	0.018979	0.017412	0.020684	-4.04364
		0	All anoma	2020	462	26135	9	2012	4529	0.017677	0.016149	0.019347	-4.04364
		1	Nervous s	2012	69	31179	9	2012	542	0.002213	0.001749	0.0028	-6.16778
		1	Nervous s	2013	55	29640	9	2012	542	0.001856	0.001426	0.002414	-6.16778
		1	Nervous s	2014	59	29573	9	2012	542	0.001995	0.001547	0.002572	-6.16778
		1	Nervous s	2015	58	29777	9	2012	542	0.001948	0.001507	0.002517	-6.16778

Run trends analysis in the DMS

2 or more local registries selected

In the folder you selected in step 2 (see <u>page 16</u>), the program has created 4 folders and 4 csv files.



Pan-Europe.csv: detailed results of the linear and spline models, at pan-European level for each anomaly group

- 4	A	в	L L	U	E	F	u	н		J	ĸ	L	191	IN .	U	P	ų	н	5	1	U	- N
1	year	ganom	descano	case	рор	minyr	nyears	ncase	prevalen	prev.lci	prev.uci p	prev.con	p.log.inte	p.log.inte	p.log.yea	p.log.yea	p.log.yea	p.re.inter	p.re.slop	p.AIC	p.link.fit	p.fit
2	2012	0	All anom	: 1577	83425	2012	9	12942	184.09	159.72	212.17 M	NA	-3.992	0.0362	0.0052	0.0093	0.5775	0.0024	0.0001	389.81	-4.013	0.
3	2017	0	All anom	: 1424	76063	2012	9	12942	187.21	177.74	197.2 M	NA	-3.992	0.0362	0.0052	0.0093	0.5775	0.0024	0.0001	389.81	-3.987	0.0
4	2014	0	All anom	: 1540	79448	2012	9	12942	189.41	166.46	215.51 N	NA	-3.992	0.0362	0.0052	0.0093	0.5775	0.0024	0.0001	389.81	-4.003	0.(
5	2015	0	All anom	: 1115	79346	2012	9	12942	136.09	114.94	161.13 M	NA	-3.992	0.0362	0.0052	0.0093	0.5775	0.0024	0.0001	389.81	-3.998	0.0
6	2016	0	All anom	: 1274	78484	2012	9	12942	162.33	153.65	171.49 M	NA	-3.992	0.0362	0.0052	0.0093	0.5775	0.0024	0.0001	389.81	-3.992	0.0
7	2019	0	All anom	: 1440	71986	2012	9	12942	199.92	188.75	211.76 M	AV	-3.992	0.0362	0.0052	0.0093	0.5775	0.0024	0.0001	389.81	-3.977	0.0
8	2020	0	All anom	: 1235	69241	2012	9	12942	178.36	168.69	188.59 N	NA	-3.992	0.0362	0.0052	0.0093	0.5775	0.0024	0.0001	389.81	-3.972	0.0
9	2013	0	All anom	: 1693	79616	2012	9	12942	209.11	188.39	232.1 M	NA	-3.992	0.0362	0.0052	0.0093	0.5775	0.0024	0.0001	389.81	-4.008	0.0
10	2018	0	All anom	: 1644	74181	2012	9	12942	221.62	211.21	232.53 M	Model fai	-3.992	0.0362	0.0052	0.0093	0.5775	0.0024	0.0001	389.81	-3.982	0.0
11	2017	1	Nervous	: 189	76063	2012	9	1585	24.847	21.545	28.654 N	NA	-6.095	0.049	-0.009	0.0118	0.4232	0.0034	7E-05	145.98	-6.105	0.0
12	2014	1	Nervous	: 188	79448	2012	9	1585	23.431	19.579	28.041 M	NA	-6.095	0.049	-0.009	0.0118	0.4232	0.0034	7E-05	145.98	-6.076	0.0
13	2013	1	Nervous	202	79616	2012	9	1585	23.803	17.281	32.787 N	VA	-6.095	0.049	-0.009	0.0118	0.4232	0.0034	7E-05	145.98	-6.067	0.0

Run trends analysis in the DMS

2 or more local registries selected

In the folder you selected in step 2 (see <u>page 16</u>), the program has created 4 folders and 4 csv files.



IPS: Fitted prevalence graphs for each individual registry by anomaly group



Run trends analysis in the DMS

2 or more local registries selected

In the folder you selected in step 2 (see <u>page 16</u>), the program has created 4 folders and 4 csv files.



IT: Forest plot of decreasing/increasing trends for each individual registry + list of anomaly group excluded (e.g. too few cases)



Run trends analysis in the DMS

2 or more local registries selected

In the folder you selected in step 2 (see <u>page 16</u>), the program has created 4 folders and 4 csv files.



PEPS: Fitted prevalence graphs, at Pan-European level, by anomaly group



Run trends analysis in the DMS

2 or more local registries selected

In the folder you selected in step 2 (see <u>page 16</u>), the program has created 4 folders and 4 csv files.



PET: Forest plot of decreasing/increasing trends at Pan-European level + average prevalence by anomaly group + % change by registry





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