



35TH INTERNATIONAL GEOGRAPHICAL CONGRESS 2024
24-30 August | Dublin, Ireland

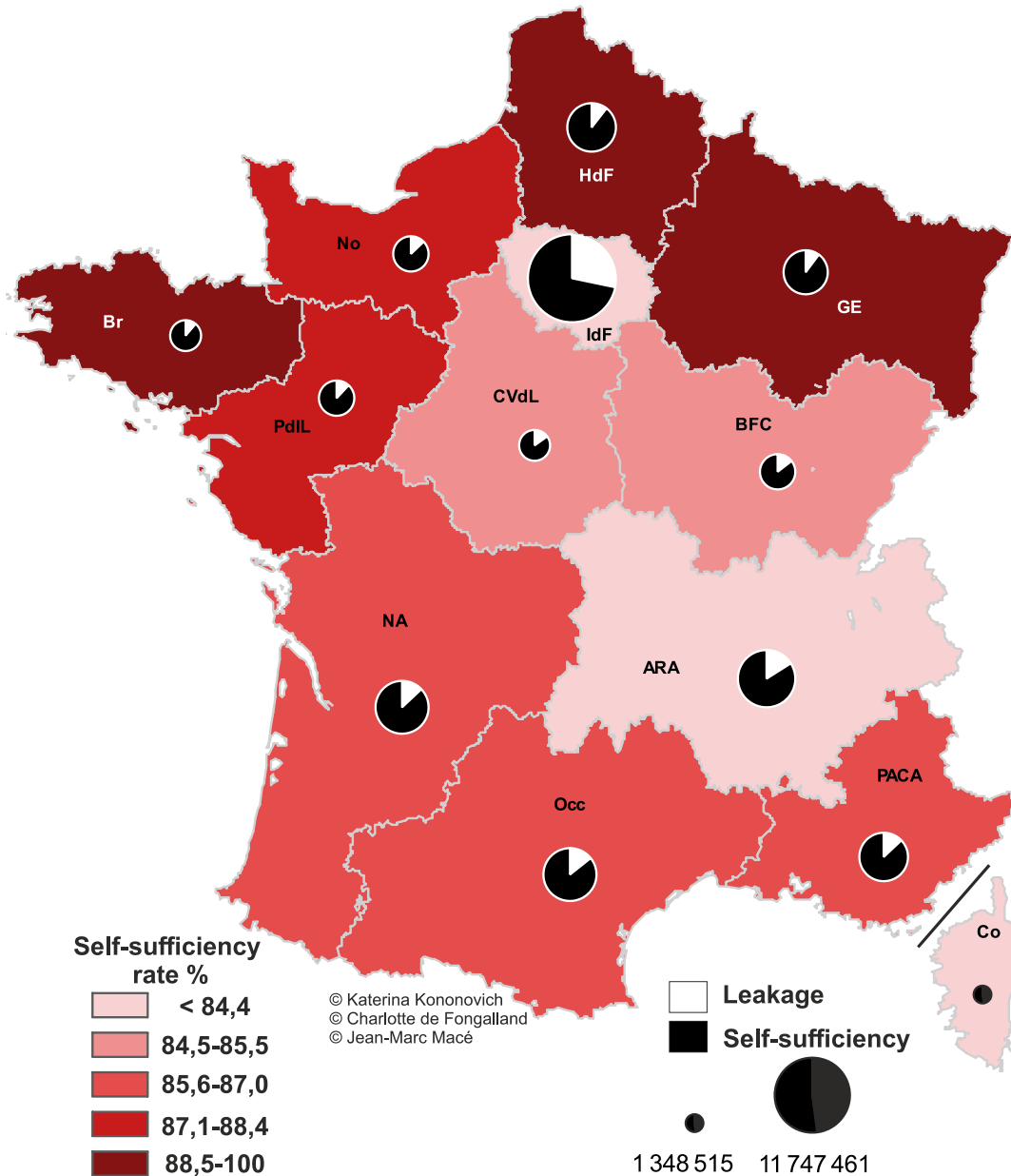
C.23: Health and Environment
Frontiers in geospatial health
27th August 2024

**Spatial disparities in access to general practitioners' services :
longitudinal study of the lived territories of the Centre-Val-de-Loire region in France between 2013 and 2022.**

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Consultations of local inhabitants per region in 2013



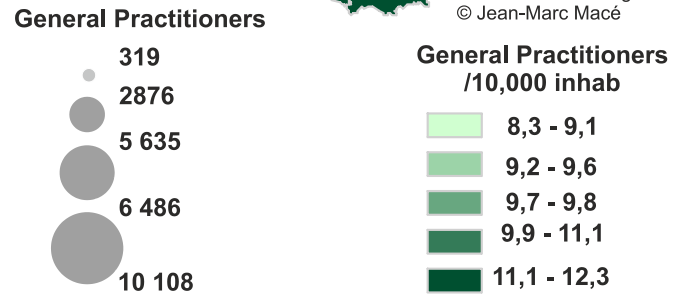
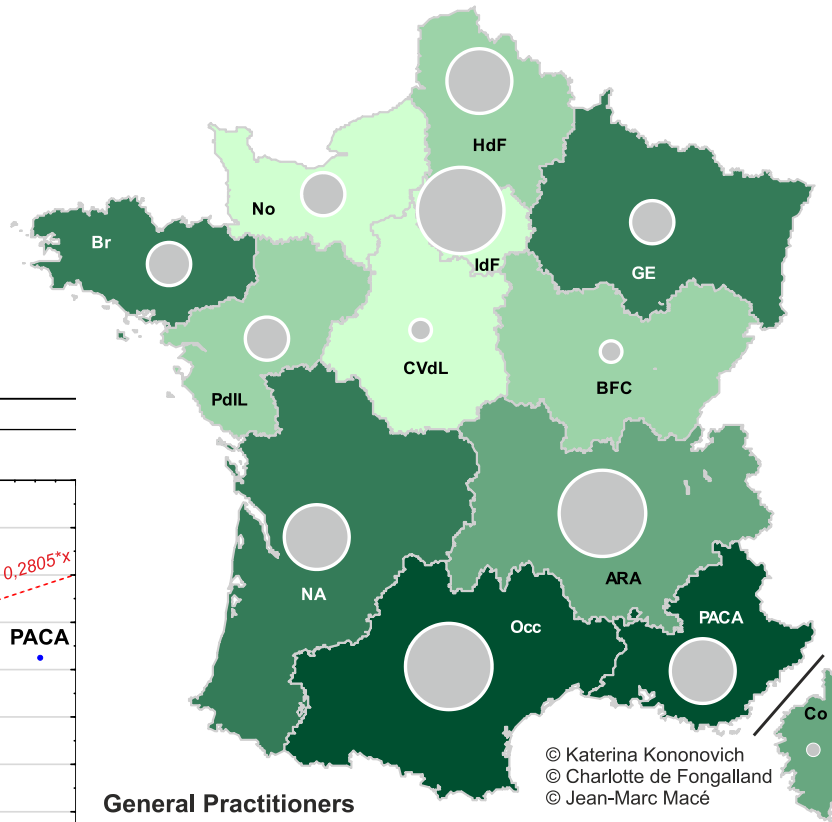
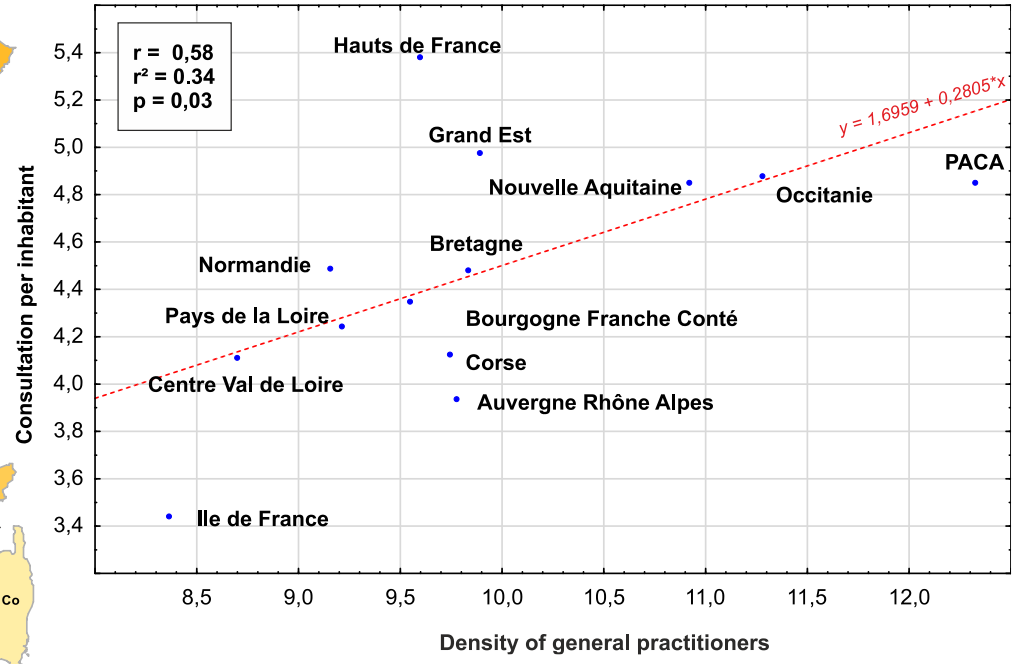
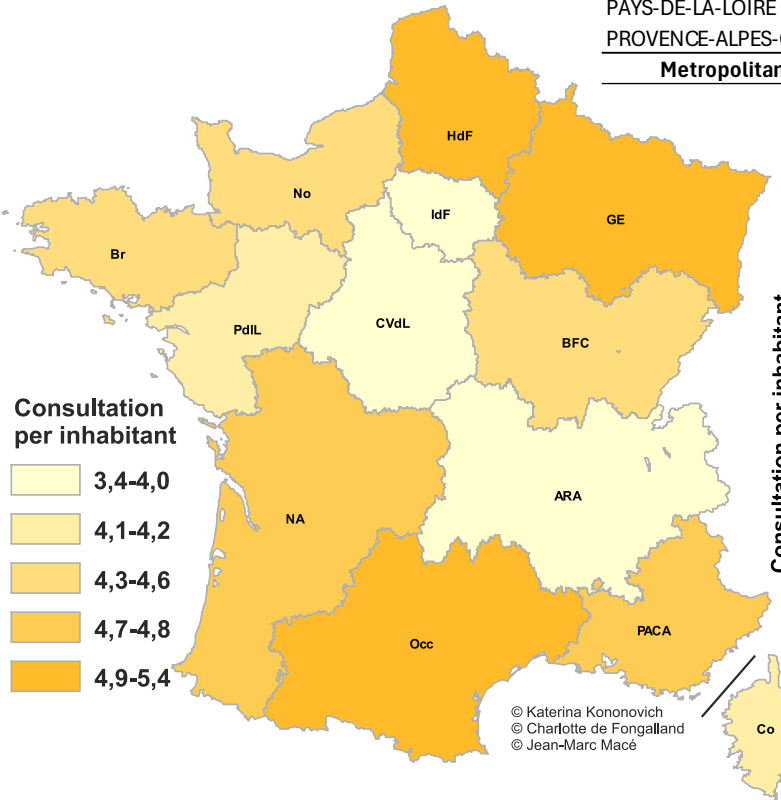
Regions	Total	Consultations in the region	Consultation outside the region	Inside region (%)	Outside region (%)
AUVERGNE-RHONE-ALPES	31 006 378	26 055 105	4 951 273	84,0	16,0
BOURGOGNE-FRANCHE-COMTE	12 259 288	10 481 787	1 777 501	85,5	14,5
BRETAGNE	14 755 279	13 112 425	1 642 854	88,9	11,1
CENTRE-VAL DE LOIRE	10 582 465	8 985 492	1 596 973	84,9	15,1
CORSE	1 348 515	1 348 515	0	100	0,0
GRAND-EST	27 625 593	24 825 366	2 800 227	89,9	10,1
HAUTS-DE-FRANCE	32 300 969	28 904 391	3 396 578	89,5	10,5
ILE DE FRANCE	41 561 151	29 813 690	11 747 461	71,7	28,3
NORMANDIE	14 979 369	13 057 111	1 922 258	87,2	12,8
NOUVELLE-AQUITAINE	28 639 197	24 929 279	3 709 918	87,0	13,0
OCCITANIE	28 137 417	24 115 461	4 021 956	85,7	14,3
PAYS-DE-LA-LOIRE	15 767 480	13 891 425	1 876 055	88,1	11,9
PROVENCE-ALPES-COTE D'AZUR	24 270 856	21 126 166	3 144 690	87,0	13,0
Total FRM	283 233 957	240 646 213	42 587 744	85,0	15,0
CSS MAYOTTE	131 991	130792	1 199	0,0	0,9
GUADELOUPE	1 506 177	1418218	87 959	0,0	5,8
GUYANE	610 585	596407	14 178	0,0	2,3
MARTINIQUE	1 354 562	1317495	37 067	0,0	2,7
REUNION	5 644 869	5488957	155 912	0,0	2,8
Total with DOM	9 248 184	8 951 869	296 315	96,8	3,2
Overall total France	292 482 141	249 598 082	42 884 059	85,3	14,7

Consultations of local inhabitants per region in 2013.

General practitioners per region in 2013

Consultations per inhabitant

Regions	Population	General Practitioners (GP)	Consultations locals	Consultation per inhabitant	General Practitioners /10,000 inhab
AUVERGNE-RHONE-ALPES	7 877 698	7 705	31 006 378	3,9	9,8
BOURGOGNE-FRANCHE-COMTE	2 820 940	2 694	12 259 288	4,3	9,6
BRETAGNE	3 293 850	3 241	14 755 279	4,5	9,8
CENTRE-VAL DE LOIRE	2 578 592	2 244	10 582 465	4,1	8,7
CORSE	327 283	319	1 348 515	4,1	9,7
GRAND-EST	5 559 051	5 500	27 625 593	5,0	9,9
HAUTS-DE-FRANCE	6 009 976	5 771	32 300 969	5,4	9,6
ILE DE FRANCE	12 082 144	10 108	41 561 151	3,4	8,4
NORMANDIE	3 339 131	3 058	14 979 369	4,5	9,2
NOUVELLE-AQUITAINE	5 911 482	6 459	28 639 197	4,8	10,9
OCCITANIE	5 774 185	6 514	28 137 417	4,9	11,3
PAYS-DE-LA-LOIRE	3 718 512	3 426	15 767 480	4,2	9,2
PROVENCE-ALPES-COTE D'AZUR	5 007 977	6 176	24 270 856	4,8	12,3
Metropolitan France	64 300 821	63 215	283 233 957	4,4	9,8

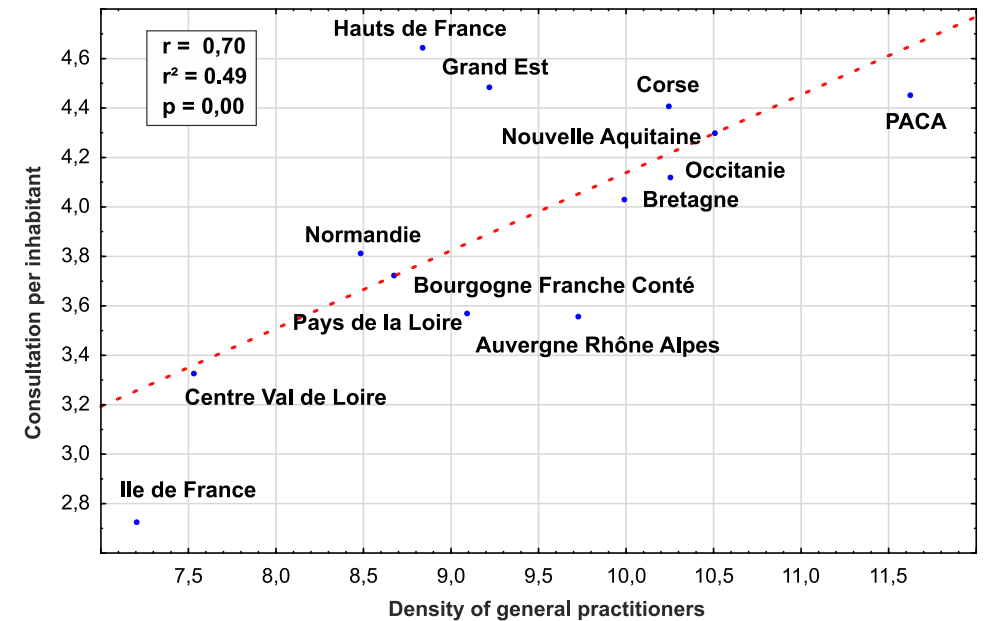
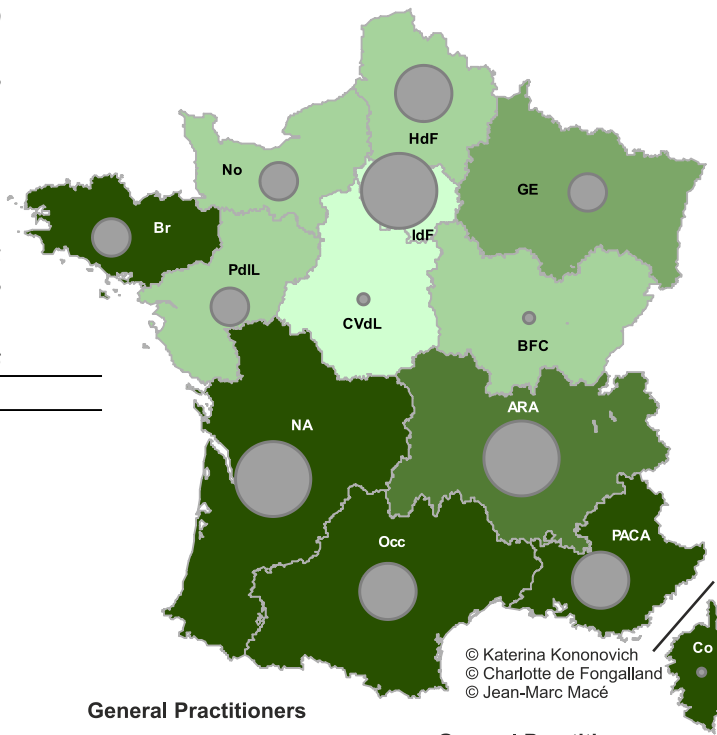
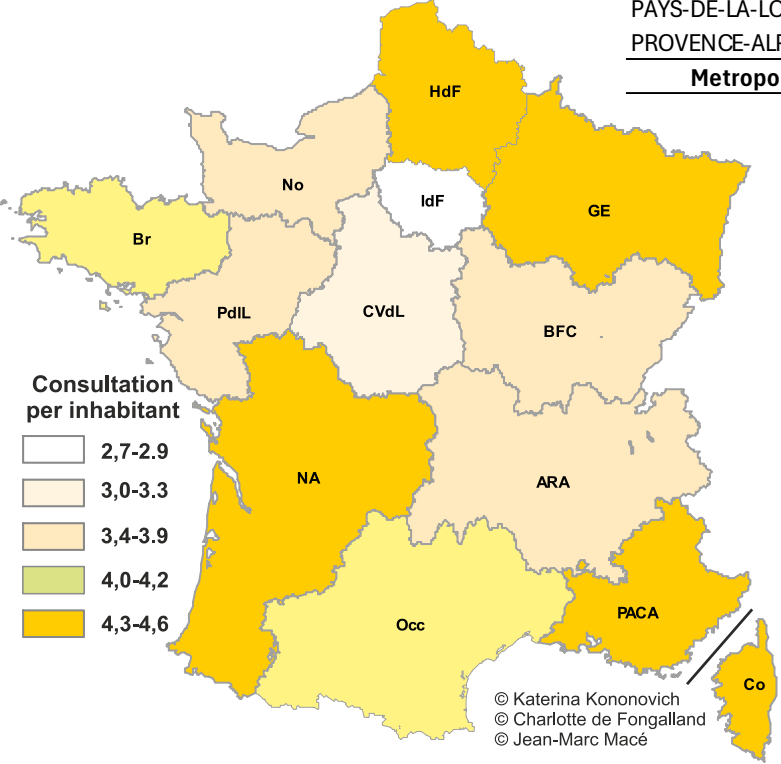


Consultations of local inhabitants per region in 2022.

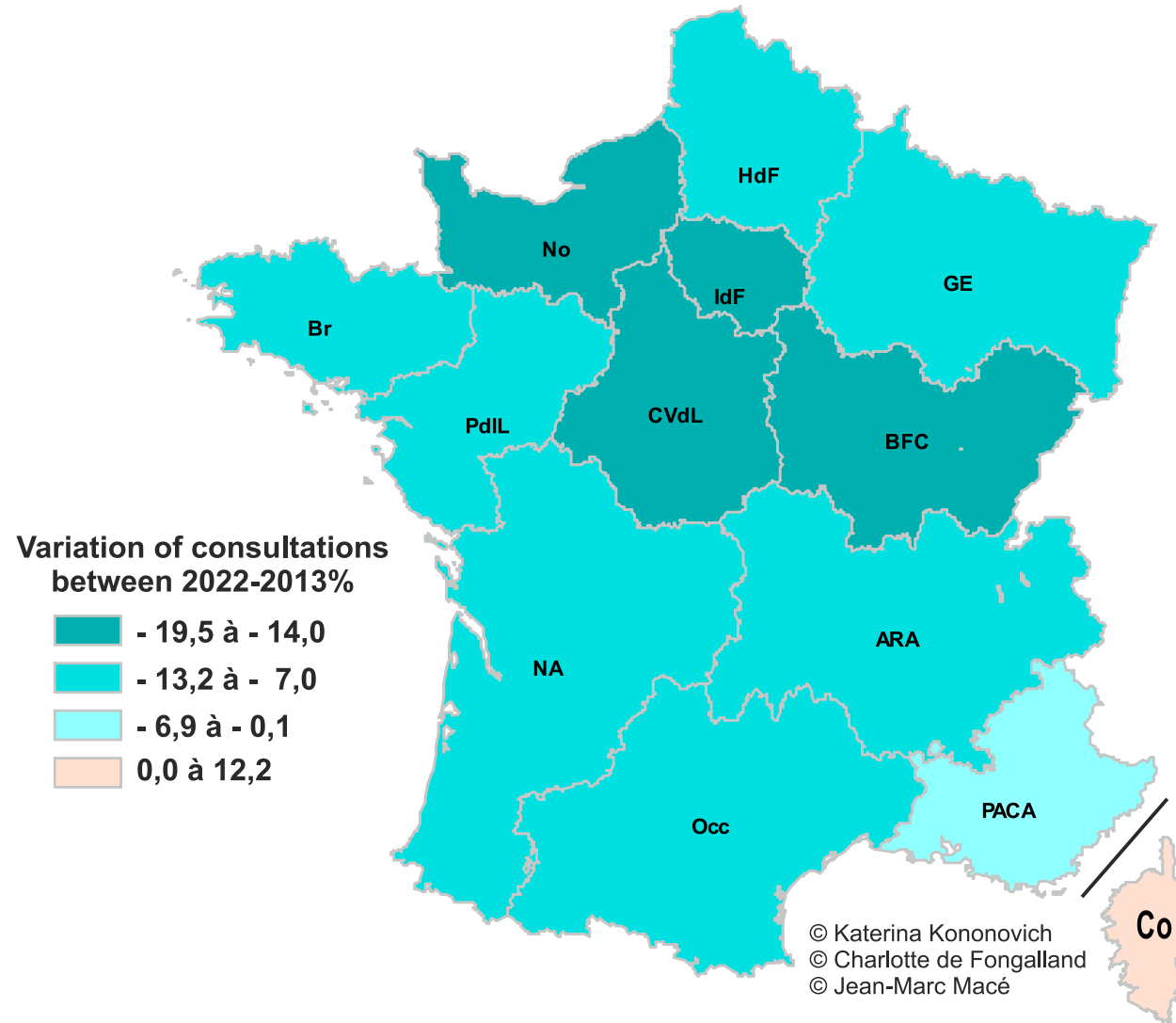
General practitioners per region in 2022

Consultations per inhabitant

Regions	Population	General Practitioners (GP)	Consultations locals	Consultation per inhabitant	General Practitioners /10,000 inhab
AUVERGNE-RHONE-ALPES	8 073 060	7 853	28 686 956	3,6	9,7
BOURGOGNE-FRANCHE-COMTE	2 801 139	2 431	10 411 370	3,7	8,7
BRETAGNE	3 371 937	3 371	13 586 928	4,0	10,0
CENTRE-VAL DE LOIRE	2 574 818	1 940	8 558 109	3,3	7,5
CORSE	343 352	352	1 513 092	4,4	10,3
GRAND-EST	5 560 186	5 127	24 907 713	4,5	9,2
HAUTS-DE-FRANCE	5 996 103	5 304	27 818 224	4,6	8,8
ILE DE FRANCE	12 270 108	8 848	33 431 138	2,7	7,2
NORMANDIE	3 322 500	2 820	12 652 201	3,8	8,5
NOUVELLE-AQUITAINE	6 030 530	6 338	25 899 632	4,3	10,5
OCCITANIE	5 970 143	6 124	24 555 906	4,1	10,3
PAYS-DE-LA-LOIRE	3 830 024	3 485	13 657 812	3,6	9,1
PROVENCE-ALPES-COTE D'AZUR	5 097 540	5 926	22 678 856	4,4	11,6
Metropolitan France	65 241 440	59 919	248 357 937	3,8	9,2

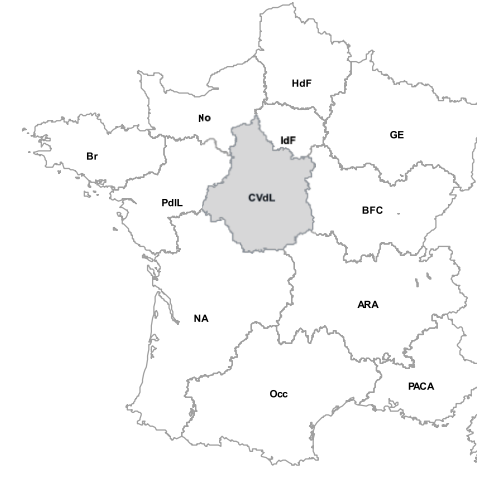
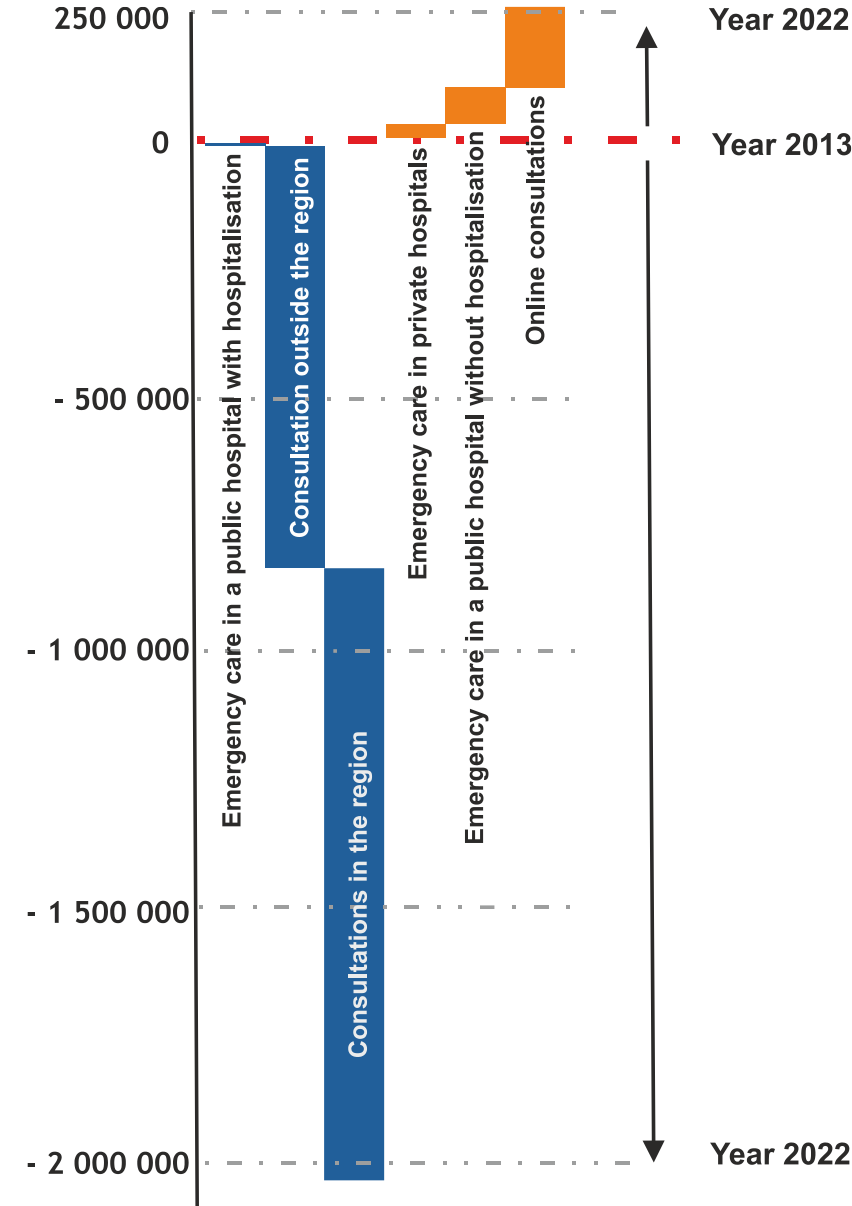


Consultations of local inhabitants per region in 2022. Variation between 2013 and 2022



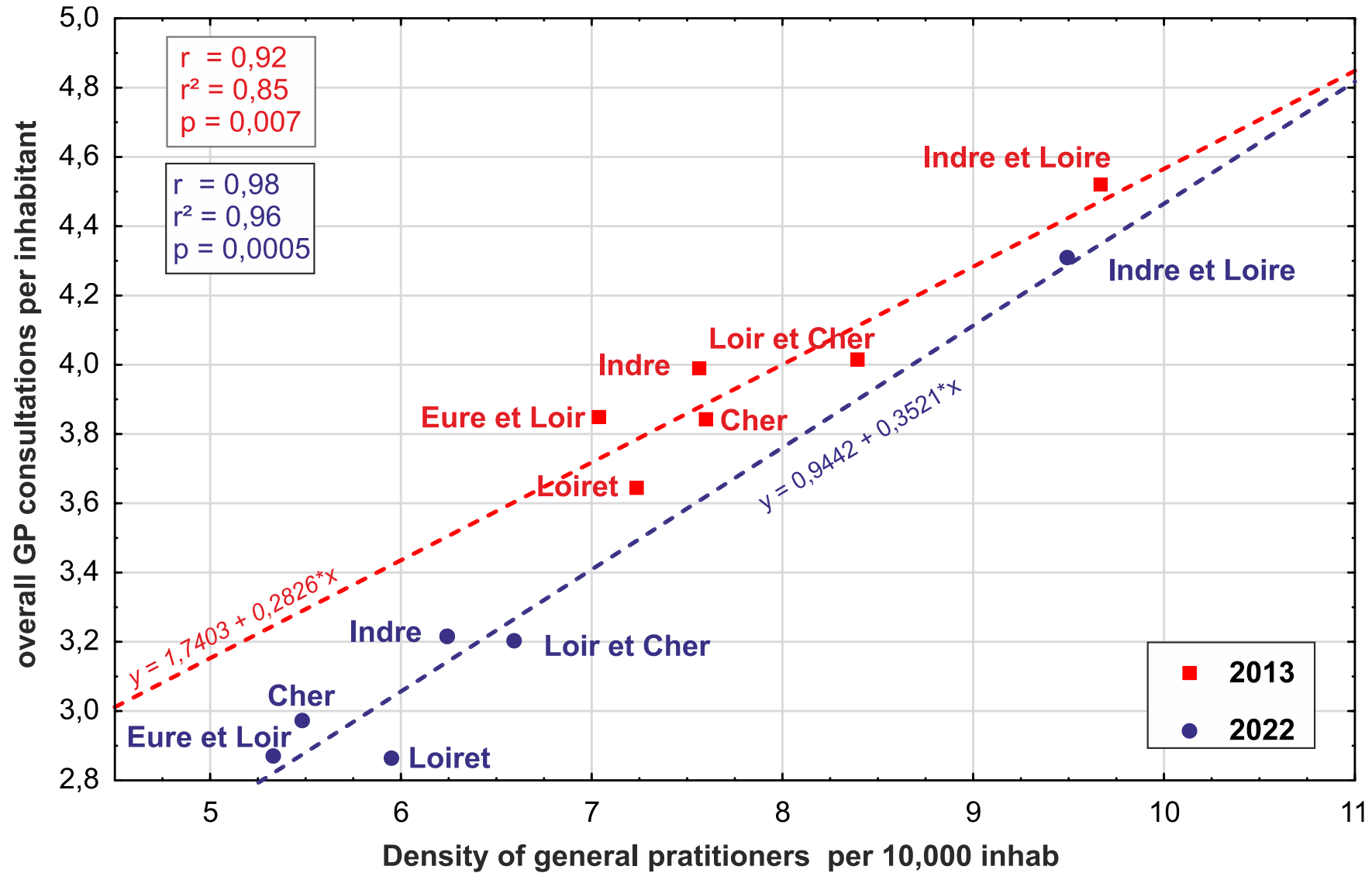
Variation of consultations between 2022-2013		
Regions	Consultations	%
AUVERGNE-RHONE-ALPES	-2 319 422	-7,5
BOURGOGNE-FRANCHE-COMTE	-1 847 918	-15,1
BRETAGNE	-1 168 351	-7,9
CENTRE-VAL DE LOIRE	-2 024 356	-19,1
CORSE	164 577	12,2
GRAND-EST	-2 717 880	-9,8
HAUTS-DE-FRANCE	-4 482 745	-13,9
ILE DE FRANCE	-8 130 013	-19,6
NORMANDIE	-2 327 168	-15,5
NOUVELLE-AQUITAINE	-2 739 565	-9,6
OCCITANIE	-3 581 511	-12,7
PAYS-DE-LA-LOIRE	-2 109 668	-13,4
PROVENCE-ALPES-COTE D'AZUR	-1 592 000	-6,6
Overall total FRM	-34 876 020	-12

Use of primary care services by inhabitants of the Centre-Val-de-Loire region. Variation between 2013 and 2022



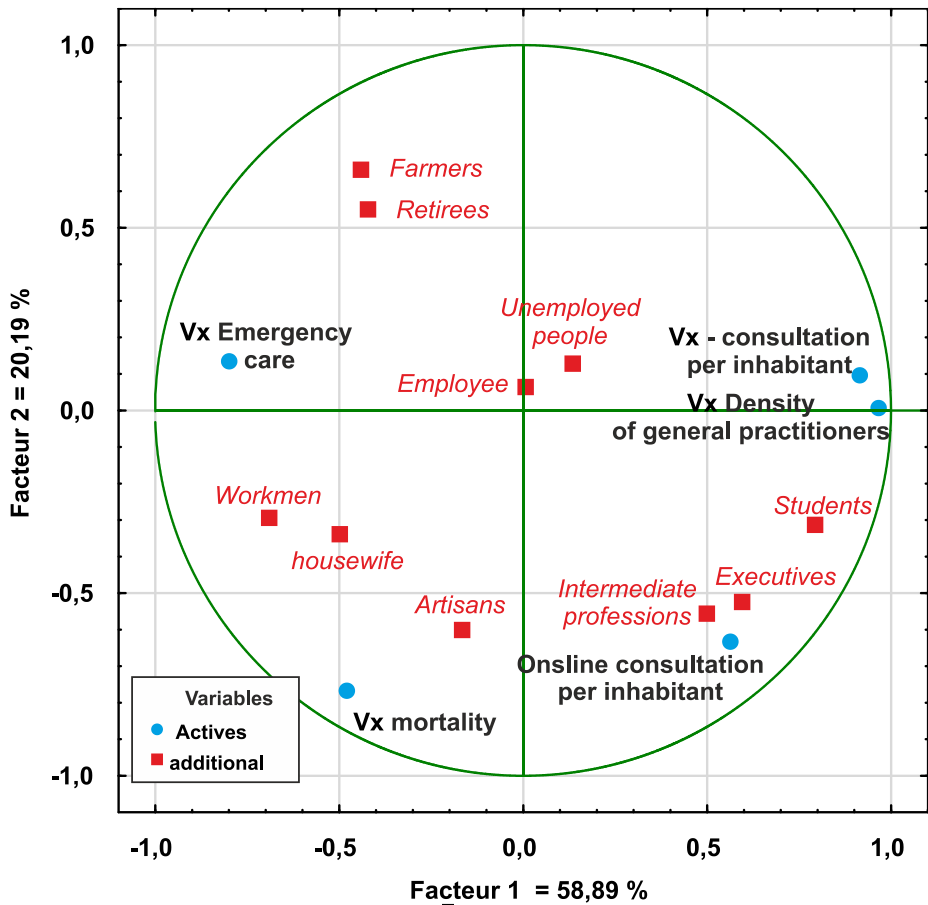
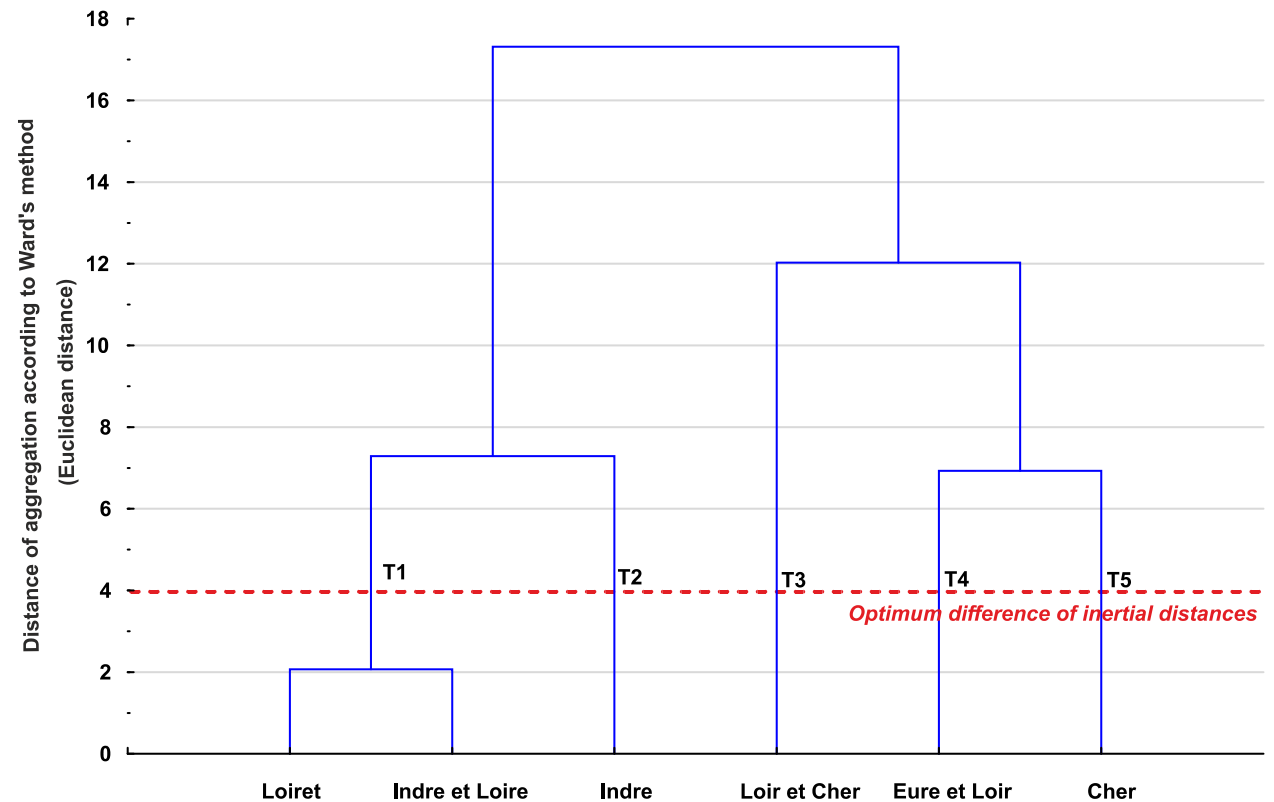
Région Centre-Val-de-Loire	2013	2022	Variation 22/13	Variation 22/14 (%)
<i>GP Consultation outside the region</i>	1 596 973	771 296	-825 677	-51,7
<i>GP Consultations in the region</i>	8 985 492	7 786 813	-1 198 679	-13,3
Overall GP consultations	10 582 465	8 558 109	-2 024 356	-19,1
Online consultations	0	162 157	162 157	100
Emergency care in a public hospital with hospitalisation	180 933	173 466	-7 467	-4,1
Emergency care in a public hospital without hospitalisation	517 175	588 378	71 203	13,8
Emergency care in private hospitals	46 211	75 341	29 130	63,0
Overall consultations (1st line)	11 326 784	9 557 451	-1 769 333	-15,6

Counties dynamics in the Centre-Val-de-Loire region between 2013 and 2022 (1)



Counties dynamics in the Centre-Val-de-Loire region between 2013 and 2022 (2)

Dendrogram of Agglomerative Hierarchical Clustering



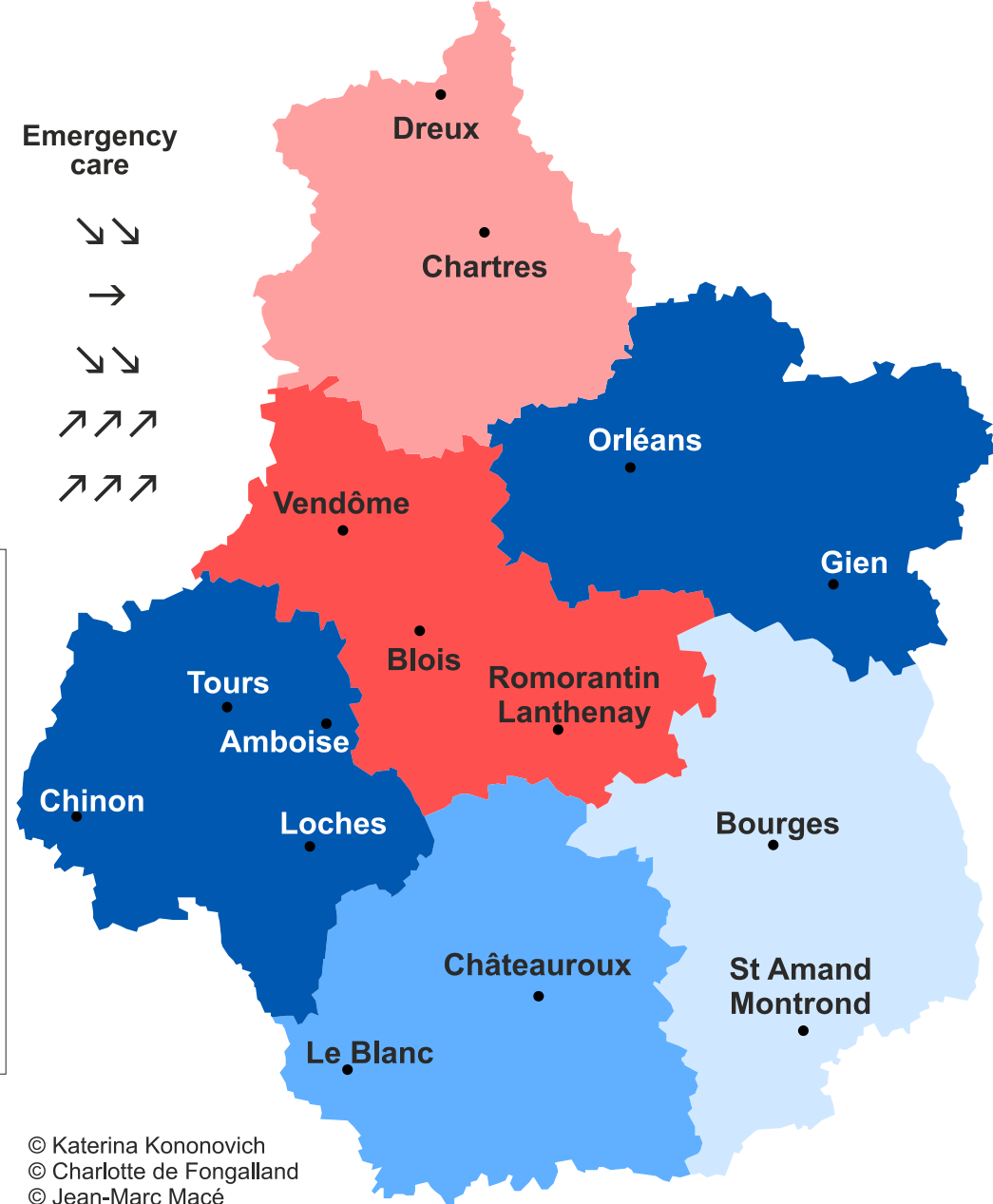
The correlation circle of Principal Components Analysis

Counties dynamics in the Centre-Val-de-Loire region between 2013 and 2022 (3)

	Mortality	Density of GP	Consultation per inhabitant	Emergency care
T1	↘↘↘	↗↗	↘↘	↘↘
T2	↘↘↘	→	↗	→
T3	↗↗↗	↘	↘	↘↘
T4	↗↗↗	↘	↗↗	↗↗↗
T5	↘↘	↘↘	↗	↗↗↗

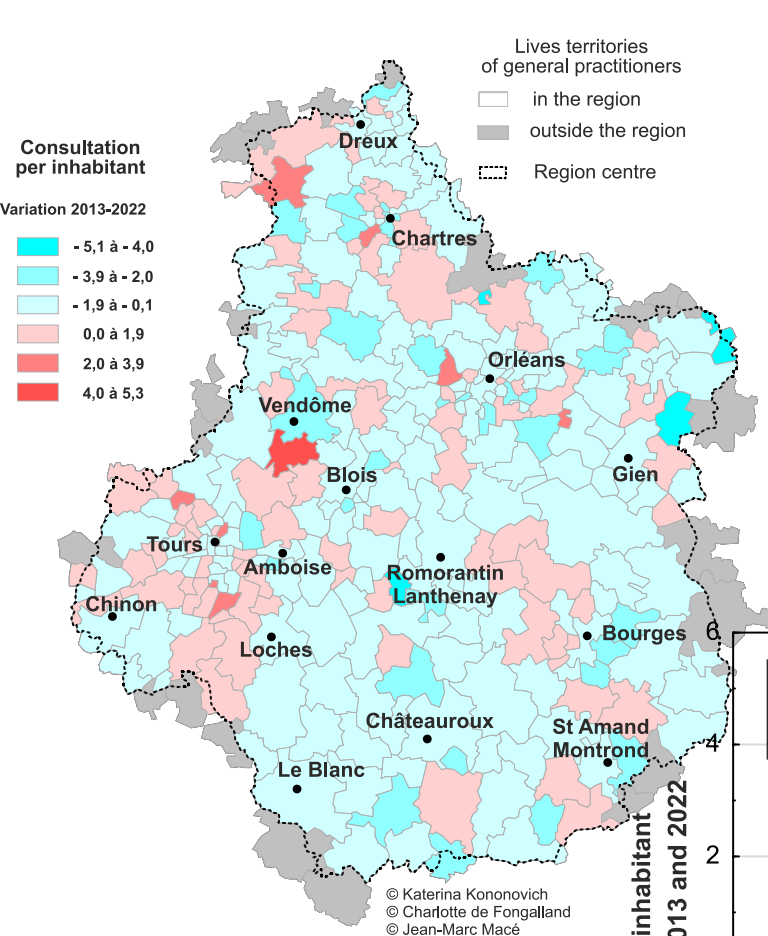
The legend

- ↗↗↗ Dramatic increase
- ↗↗ Moderate increase
- ↗ small increase
- Similar to 2013
- ↘ Very small decrease
- ↘↘ Small decrease
- ↘↘↘ Dramatic decrease

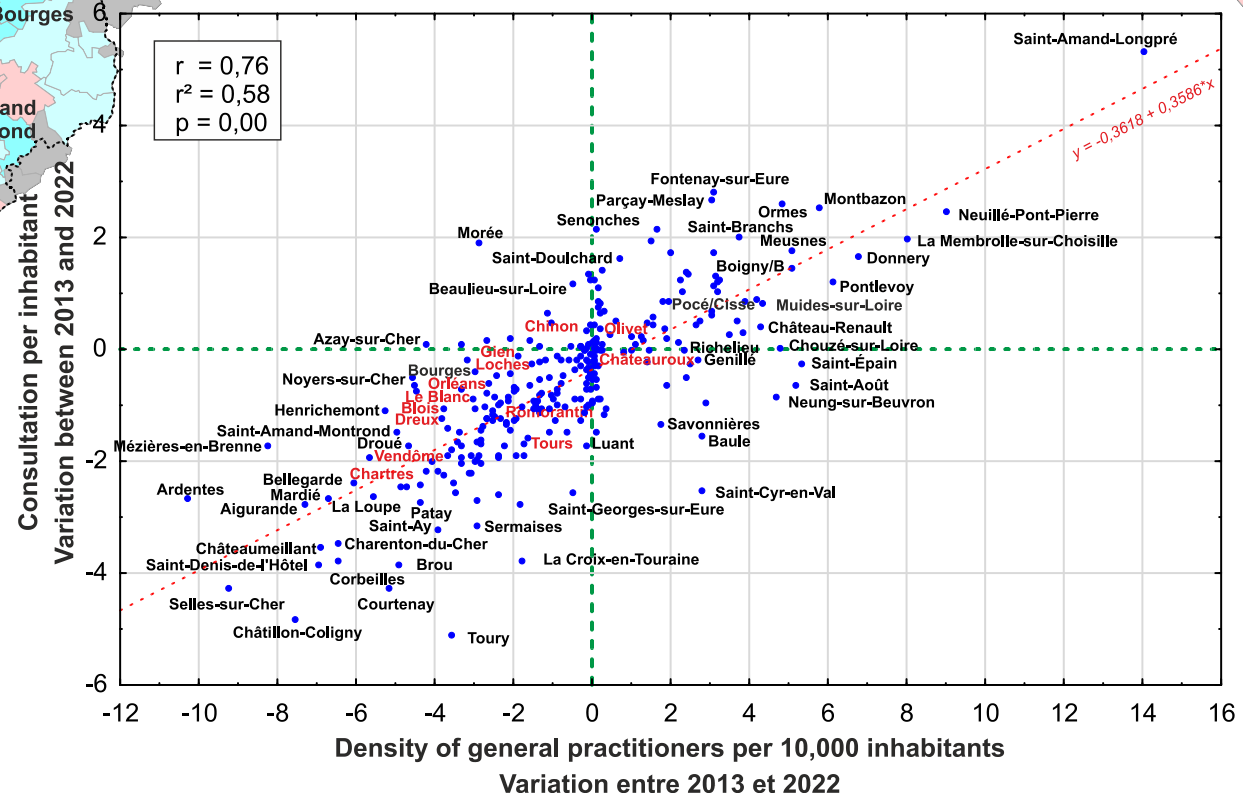


Typology of Départements	T1	T2	T3	T4	T5	T6	T7	Regional average
Variation of mortality	115	14	27	-66	-25	3	-5	0
Variation of GP density	1,0	-0,6	-1,1	-0,8	-1,2	-1,1	-1,9	-1,2
Variation of GP consultations	1,1	-0,4	-0,7	-0,9	-0,6	-0,7	-0,9	-0,7
Variation of emergency care use	-3,3	9,8	4,0	-1,3	-2,1	1,7	-0,5	1,5

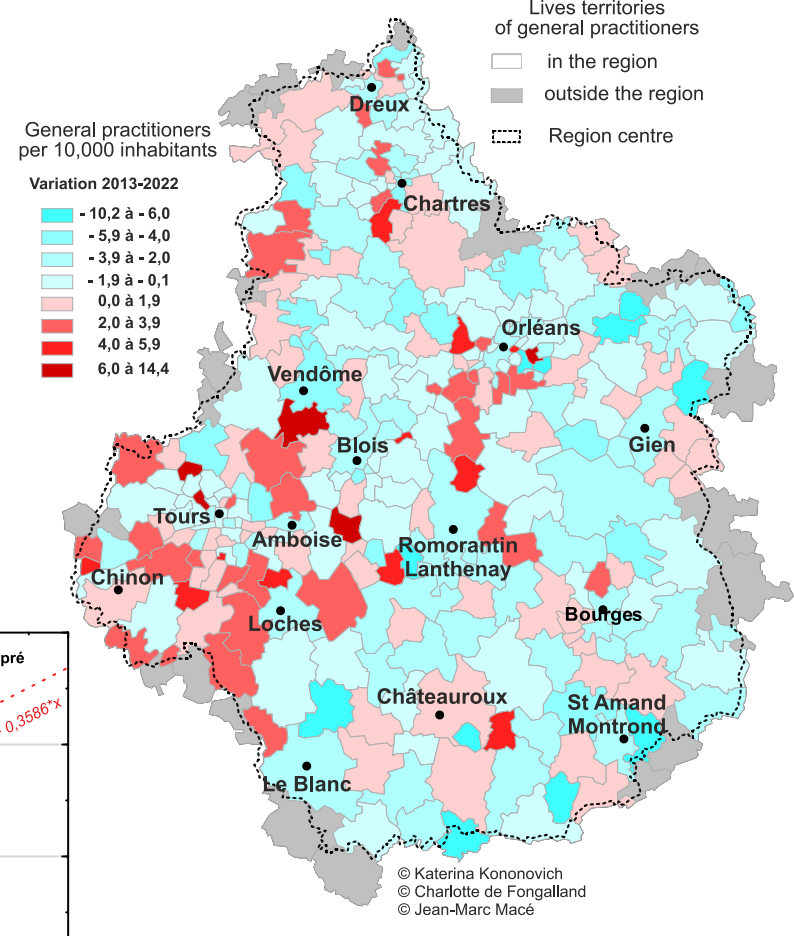
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Dynamics of lived territories in the Centre-Val-de-Loire region between 2013 and 2022 (1)

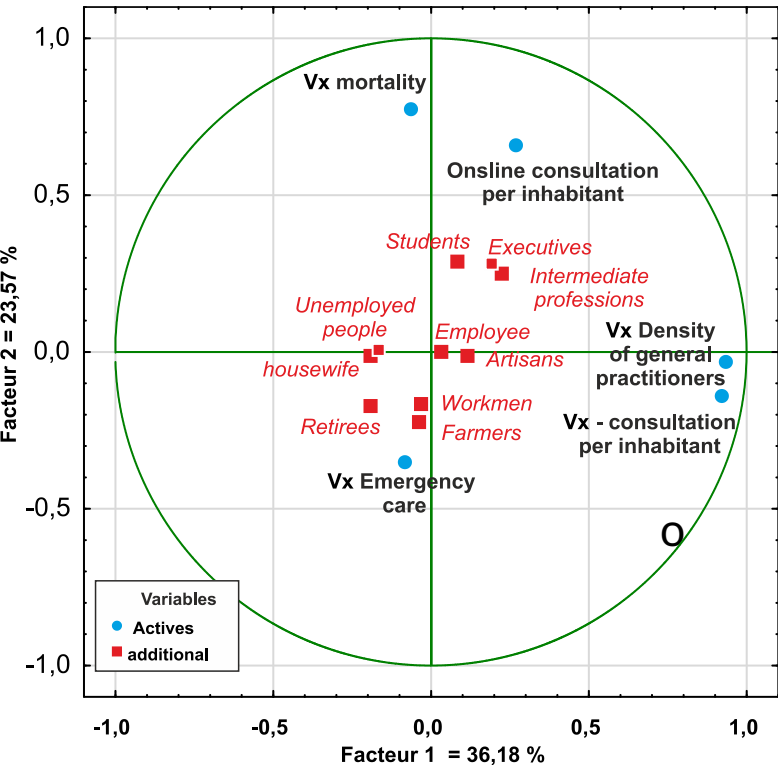


Variation of local inhabitant consultations per lived territory between 2013 and 2022



Variation of general practitioners density per lived territory between 2013 and 2022

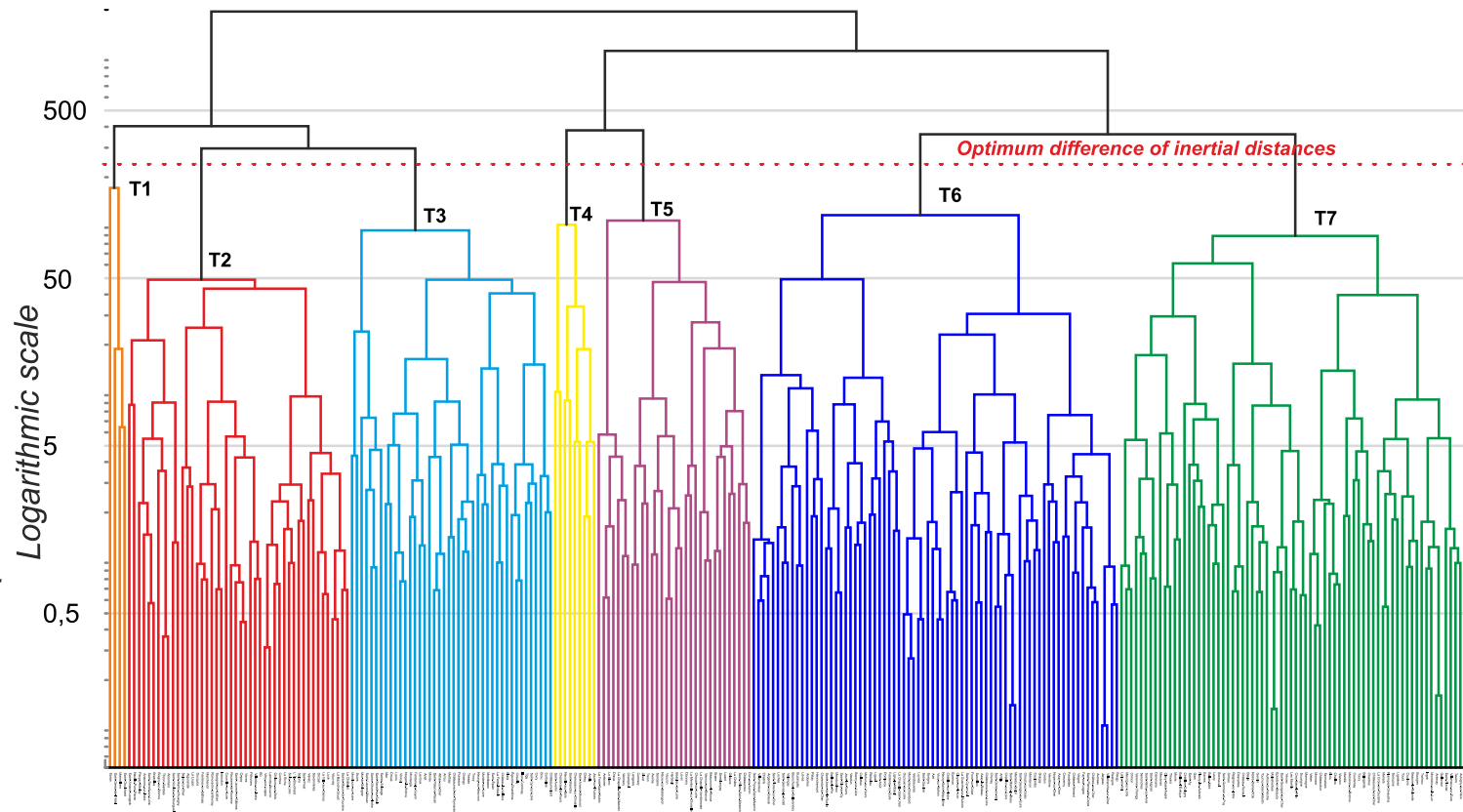
The correlation circle of Principal Components Analysis



Dynamics of lived territories in the Centre-Val-de-Loire region between 2013 and 2022 (2)

Dendrogram of Agglomerative Hierarchical Clustering

Distance of aggregation according to Ward's method (Euclidean distance)



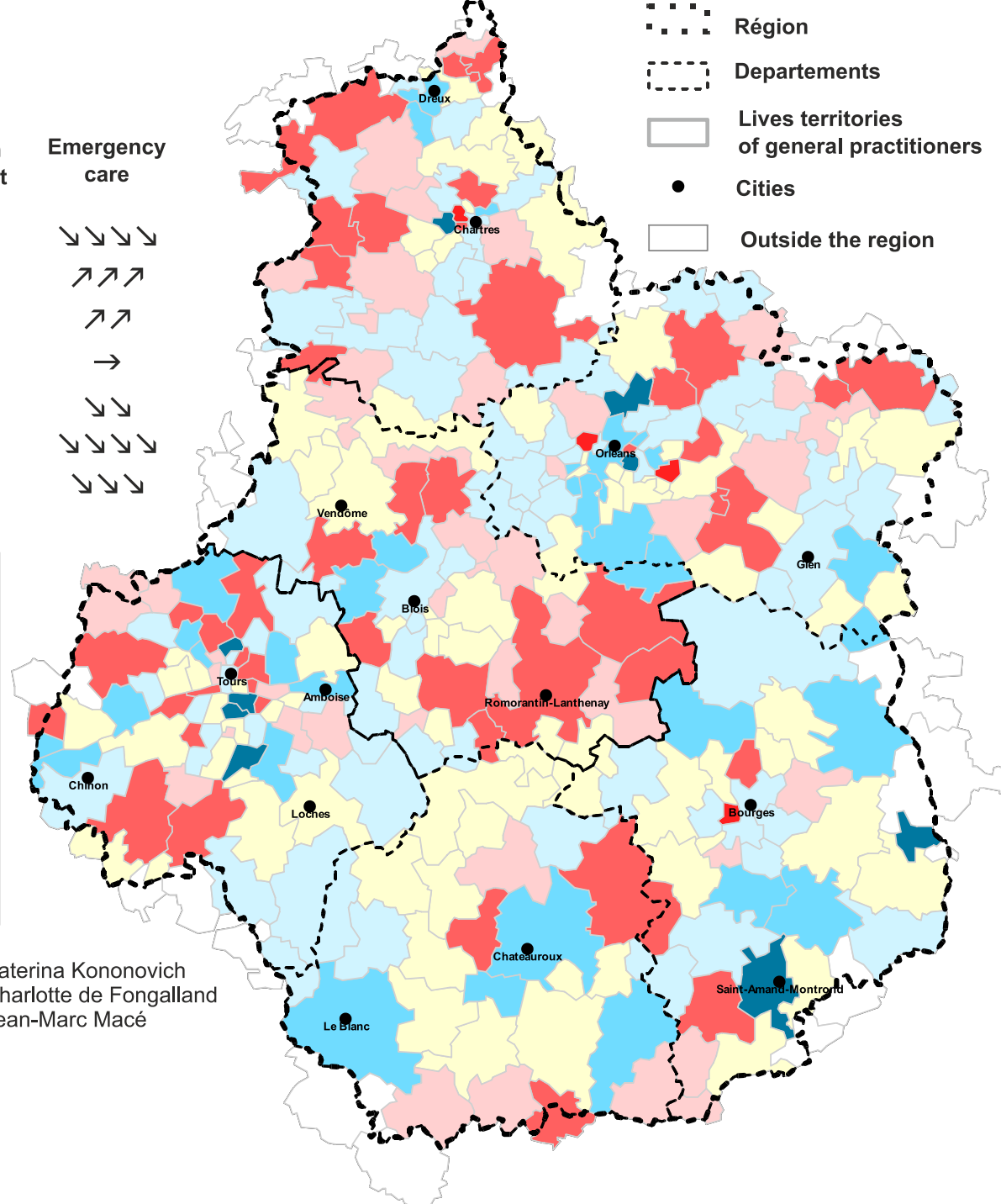
Dynamics of lived territories in the Centre-Val-de-Loire region between 2013 and 2022 (3)

	Mortality	Density of GP	Consultation per inhabitant	Emergency care
T1	↗↗↗	↗↗	↗	↘↘↘↘
T2	↗↗	↘↘	↘	↗↗↗
T3	↗↗	→	→	↗↗
T6	→	→	→	→
T7	↘	↘↘↘	↘↘↘	↘↘
T5	↘↘	→	→	↘↘↘↘
T4	↘↘↘↘	↘	↘↘↘	↘↘↘

The legend

- ↗↗↗ Dramatic increase
- ↗↗ Moderate increase
- ↗ small increase
- Similar to 2013
- ↘ Very small decrease
- ↘↘ Small decrease
- ↘↘↘ Moderate decrease
- ↘↘↘↘ Dramatic decrease

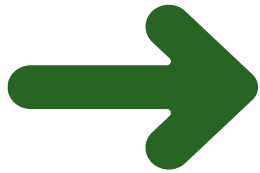
- ⋯ Région
- ⋯ Departements
- ▭ Lives territories of general practitioners
- Cities
- ▭ Outside the region



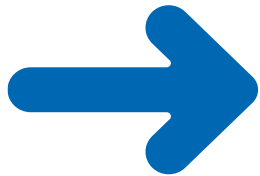
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Typology of lived territories	T1	T2	T3	T4	T5	T6	T7	Regional average
Variation of mortality	115	14	27	-66	-25	3	-5	0
Variation of GP density	1,0	-0,6	-1,1	-0,8	-1,2	-1,1	-1,9	-1,2
Variation of GP consultations	1,1	-0,4	-0,7	-0,9	-0,6	-0,7	-0,9	-0,7
Variation of emergency care use	-3,3	9,8	4,0	-1,3	-2,1	1,7	-0,5	1,5

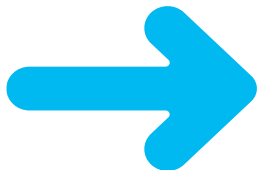
In conclusion



Observations vary greatly depending on the **scale** and **area** of observation.



For the most relevant territorial diagnosis possible, we need to go down to the **operational level** to see where the people who are foregoing care are located.



At this level, the **behaviors** of the population and the **systems in place** will enable us to **effectively combat medical desertification**.





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