

Health networks: an innovation in the territorial offer of medical cares in France

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Abstract : The variety of changes in the modes of producing have led us to re-discover the active and structuring part played by territories in the present economic dynamics, particularly the new reticular organizations - including within the public service, and especially in the health sector. The latter has recently developed some changes that have allowed to go beyond the existing territorial divisions. These forms of partnerships initiate territorial links which coincide less and less with the institutional boundaries - notably urban boundaries - so as to play a significant part in the dynamics of recombining in urban spaces.

This is particularly the case of cancer treatments in the Rhône-Alpes region, which have been partly organized according to this new reticular mode, built on a pivot-institution : the Lyons Léon Bérard Centre. Especially through the cancer network in Rhône-Alpes (ONCORA), this centre sets relationships between various actors of health in the ambulatory and hospital sectors located in about twenty towns of the Rhône-Alpes region and its periphery.

In this paper, we propose to analyse the changing of medical and territorial trajectories, while considering a sample of patients set up at two different dates, one before the foundation of the network, the other afterwards ; then, we will study and evaluate, in terms of economic efficiency and social justice, the effects of this innovative network - ONCORA - in the regional offer of care.

It is necessary to break with the over-simple idea that the increased mobility afforded by the technological development of communications would undermine the specific meaning of places, leaving them completely equal and interchangeable. On the contrary, the variety of changes in the modes of production have led us to re-discover the active and structuring role played by space in the present economic dynamics, particularly the new networked organisations - including within the public service.

In this respect, the health sector appears particularly pertinent. In fact, it has recently developed some changes that have gone beyond existing territorial divisions. The main change may be seen in the substitution of more clinical care for an offer of more and more technical medical services, in the context of the necessary control of health service expenditure, and also a development of an equitable access to the care services. Consequently, new innovative organisations have been set up which have raised more and more various forms of partnership between the care providers, between these providers and other actors such as local authorities and the community and voluntary sector. These forms of partnership initiate territorial links which coincide less and less with the institutional boundaries - notably urban boundaries - so as to play a significant part in the dynamics of reconstructing urban spaces.

In France, in recent years, within the context of a new definition of the methodology of the medical planning – the introduction of qualitative criteria into a purely quantitative logic concerning the health master plan – there have emerged new networked forms of care which

respond to the regulations introduced by the hospital law of the 31-07-1991, confirmed by the regulations of 1996. Some of these medical care networks are developing within the traditional city boundaries ; others spread out on territorial scales that go beyond the strict urban area. This is particularly the case of cancer treatments in the Rhône-Alpes region, which have been partly organised according to this new networked mode, built on a pivotal institution : the Lyons Léon Bérard Centre (LBC) and partner of this research. Through the cancer network in Rhône-Alpes (ONCORA), in particular, this centre establishes relationships between various health actors in the out-patients and in-patients sectors - either public or private - located in about twenty towns of the Rhône-Alpes region and its surroundings. In this specific case, the urban network is structuring oncology services in the framework of medical disciplines, situating it at the intersection of organ-based specialities (vertical specialities) and, while giving it its disciplinary profile, contributes to restructuring the territories through the urban centres concerned, from Lyons to the medium-sized towns. Also, the network takes part in a logic of setting up a new medical culture in bringing to work together cares providers trained, up to now, in relatively separate, independent “schools”.

Consequently, these innovative medical care organisations are leading to a redesigning of the French medical infrastructure : in which a mosaic of units with varied but co-ordinated competencies is replacing a system with hierarchical, centralised and separated units.

From the starting point of the ONCORA network, our paper aims to study the spatial and medical restructuring of the supply side of medical care promoted by this

innovation. We adopt a static comparative analysis based upon the data collected by the LBC. The data is organised according to three types of documents (A. Brunet 2000). The first one - “paper file” - is the most traditional and exhaustive in concerning information as it should include, for each patient, the medical correspondence and the reports of the various tests ; but it is also the most difficult to handle and the least systematically organised. The second document is the “computerised file”, set up in 1992, well organised and informed, but its use is restricted to medical purposes. The third file, named “IPC” is created for each patient arriving at the LBC and is allotted to feed the “Permanent Cancer Inquiry” led at the national level. So, it registers the main variables that describe the characteristics of the tumours and their treatments. Also, this file contains data about the initial consultation, in particular the reason for the consultation and the geographical home address of the patient that are both useful to prepare the samples.

Our method has been to analyse, firstly, the IPC files also created in 1992 – a year before the birth of the ONCOR network - in order to describe the population of new female patients that had consulted for a breast cancer¹ at these two dates. So, we collect the necessary elements to set up our two samples of population, the individual cases of which will then be characterised by more complete variables than those included in these IPC files, as they are taken from the paper files. Secondly, we will be able to analyse the data of our samples to identify the dynamics of the spatial and medical trajectories between 1992 and 1999.

Finally, this comparative statistical analysis will lead us to reveal various networked consequences at the territorial medical level.

I. Recombining the health area and the LBC data capture

The data taken from the IPC files from 1992 and 1999 are of a spatial or medical nature. They give information about the patients' geographical origin when they first come to the LBC or the reason for this initial consultation in terms of admission conditions and required objectives.

I.1 Evolution of the geographical origins of the patients of the LBC

The geographical origin of the patient is given by the EPC files with the home address (commune and postal code). These elements allow us, in the first instance, to describe the distribution of the patients by "département", then, secondly, to specify the location by urban areas; from the postal code we can obtain the commune name and, then, its INSEE² code and, consequently, its particular urban area.

The new LBC patients live primarily in the départements of the Rhône-Alpes Region. In 1992 and 1999 respectively, 83% and 85% of patients lived in one the 8 departments of the Region. Only 11% of the group in 1992, and only 5% in 1999, come from the neighbouring départements, mainly from the Saône-et-Loire département, which belongs to the Bourgogne Region. So, for further analysis, these initial findings lead us to keep only the patients coming from the Rhône-Alpes Region and the Saône-et-Loire département. For further study, therefore, the total number is 985 persons in 1992 (91% of

the new patients) and 1270 in 1999 (88% of the new patients).

The details of the breakdown of the population according to urban areas of origin are presented in table 1 where we notice, in particular, between 1992 and 1999, a decrease of the number of patients coming from the Annecy and Mâcon urban areas, and, on the other hand, an increase of number of patients coming from the Grenoble urban area.

Table 1 : Distribution of the new patients according to their home area

Urban areas	en 1992	en 1999	Evolution between 1992 et 1999
Lyons	453	674	+221
Other urban areas	386	462	+76
Aix-les-bains	9	5	-4
<i>Albertville</i>	6	4	-2
<i>Amberieu-en-Bugey</i>	3	0	-3
<i>Annecy</i>	32	13	-19
<i>Annemasse</i>	17	28	+11
<i>Annonay</i>	15	6	-9
<i>Aubenas</i>	4	7	+3
<i>Autun</i>	0	1	+1
<i>Belley</i>	4	2	-2
<i>Bourg-en-Bresse</i>	15	15	0
<i>Bourgoin-Jallieu</i>	7	18	+11
<i>Bourg-St-Maurice</i>	4	1	-3
<i>Chalon-sur-Saône</i>	7	11	+4
<i>Chambéry</i>	18	12	-6
<i>Chamonix</i>	1	3	+2
<i>Cluses</i>	6	6	0
<i>Le Creusot</i>	1	3	+2
<i>Feurs</i>	0	0	0
<i>Grenoble</i>	8	35	+27
<i>Livron</i>	3	1	-2
<i>Louhans</i>	1	3	+2
<i>Mâcon</i>	32	8	-24
<i>Montbrison</i>	1	0	-1
<i>Montceau-les-mines</i>	3	3	0
<i>Montélimar</i>	6	10	+4
<i>Oyonnax</i>	3	9	+6
<i>Pierrelatte</i>	2	0	-2
<i>Privas</i>	4	4	0
<i>Roanne</i>	10	23	+13
<i>Romans</i>	12	17	+5

<i>Roussillon</i>	10	13	+3
<i>Rumilly</i>	1	1	0
<i>St-Chamond</i>	11	12	+1
<i>St-Claude</i>	0	0	0
<i>St-Etienne</i>	16	14	-2
<i>St-Jean-de-Maurienne</i>	1	1	0
<i>St-Just-St-Rambert</i>	1	2	+1
<i>St-Marcellin</i>	1	0	-1
<i>Sallanches</i>	2	6	+4
<i>Tarare</i>	5	9	+4
<i>Thonon-les-bains</i>	5	12	+7
<i>Tour-du-pin</i>	1	6	+5
<i>Tournon-sur-Rhône</i>	1	2	+1
<i>Valence</i>	28	30	+2
<i>Vienne</i>	10	9	-1
<i>Villefranche-sur-Saône</i>	14	27	+13
<i>Voiron</i>	1	5	+4
<i>Communes multipolarisées</i>	44	65	+21
Rural communes	146	134	-12
Total	985	1270	+285

If we combine these urban areas into three large categories : Lyons urban area, other urban areas, rural communes, it appears, between 1992 and 1999 that there has been a slight reduction of the catchment area attraction of the LBC. In fact, the centre received in 1999, proportionally more patients living in the Lyons urban area than in 1992 and less patients from the other urban areas and rural communes (figures 1a and 1b).

Fig. 1a : Distribution of the new patients in 1992 according to their home urban area

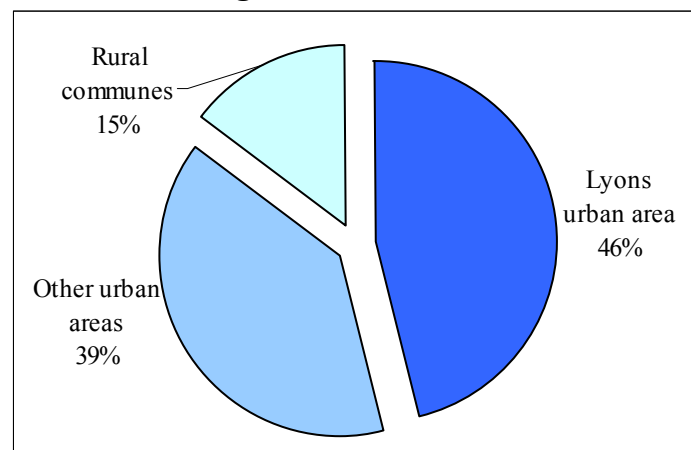
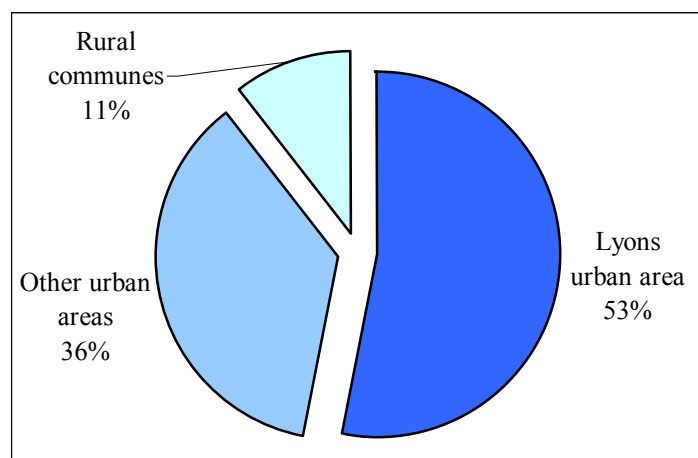


Fig. 1b : Distribution of the new patients in 1999 according to their home urban area



This first result concerning the comparison between 1992 and 1999 of the origin of the new patients may be explained as the consequence of a network effect. The forming of the ONCORA network, its spatial extension with new partners and the working out of care protocols which contribute to its cumulative growth and to the generalisation of the actors' competencies in this network environment, induce the patients to find care that meets their needs and demands closer to their residence in 1999 than in 1992.

This evolution of the localised system of medical care in oncology leads us to formulate a new hypothesis. As the LCB is partly relieved of the admission of certain patients, can it substitute a part of its routine activity for more advanced activities duties, that is to say an offer of medical care more in keeping with the sophistication of its technical equipment and the high skills of its staff ? To verify this hypothesis needs an analysis of the changing of the conditions of the initial consultation.

I.2 Evolution of the medical registration at the LCB

The IPC files provide information on two characteristics of the initial consultation with two variables. The first variable, called “origin” concerns the individual who initiated the demand ; the second, called “purpose” describes the nature of the required investigations.

The initiators of the initial consultation

The factors of the variable “origin” are grouped in three categories: patient, practitioner, and medical establishment.

Overall, we see a two-fold structural evolution (figures 2a and 2b) which manifests itself, on the one hand, by the increasing proportion of referrals made by the practitioners of the ambulatory sector in referring patients to the LBC (from 50% in 1992 to 62% in 1999) ; while, on the other hand, by the decreasing proportion of new patients coming to LBC in the first instance on their own initiative (from 30% in 1992 to 18% in 1999).

Fig. 2a : Distribution of the new patients in 1992 according to the origin of the initial consultation

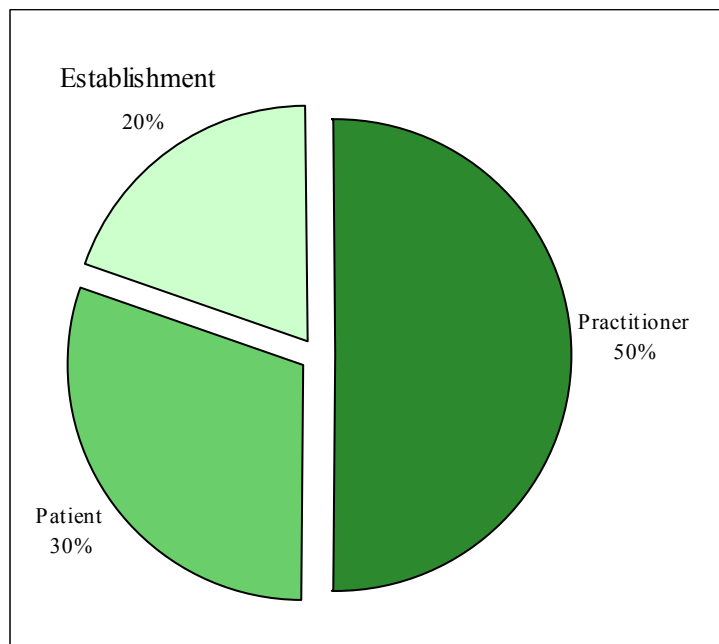
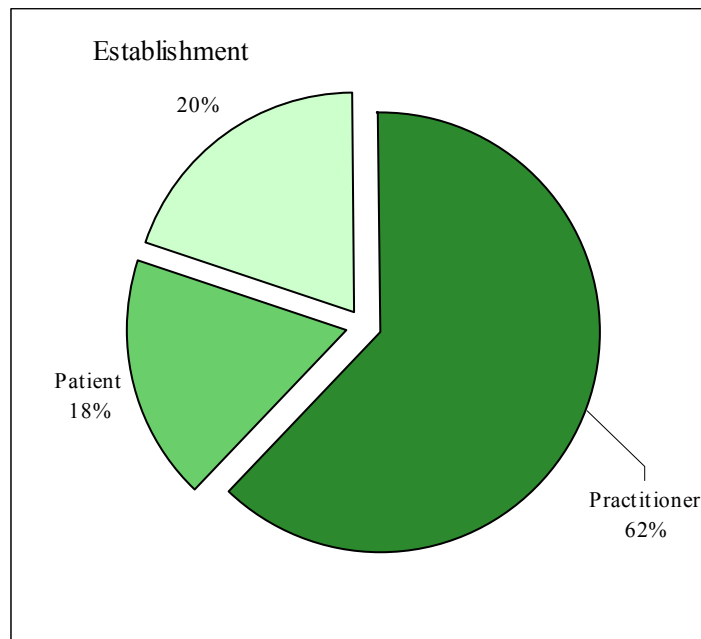
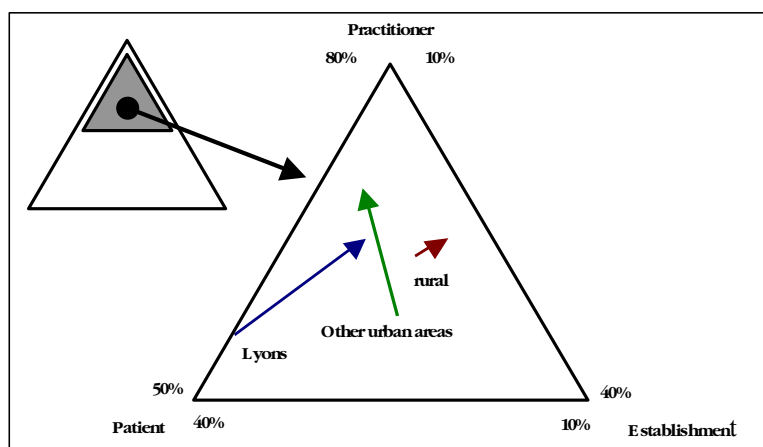


Fig. 2b : Distribution of the new patients in 1999 according to the origin of the initial consultation



In spatial terms, the evolution of this practice is not as marked (figure 3). The origin of the consultation appreciably varies according to the place of residence of the patients. The mode of registration is clearly indirect for the rural patients and very slightly changes during the period. On the other hand, it radically changes for the patients of the Lyons urban area. In 1992, 38% of the patients from Lyons had sought a consultation on their own initiative, while only 25% of the patients living outside this area did the same. In 1999, the behaviour of different groups tends to standardise, the proportion of the patients seeking a consultation themselves is significantly reduced and they mainly come after an initial consultation and are referred by a physician.

Fig. 3 : Evolution of the origin of the initial consultation between 1992 and 1999 according to the place of residence of the patients.



So, overall, we see between 1992 and 1999 a clear trend to extend the usual and upstream chain of care for the new patients, especially those coming from the Lyons urban area.

Evolution of the modalities of the initial consultation request

Figure 4 describes the distribution of the initial consultation at the LBC between 1992 and 1999 according to the details of their “purpose”. Cancer detection is a very marginal activity of the centre ; it concerns about 1% of the requests for advice. But special examinations are more important in 1999 accounting for 10% of the visits (compared to only 1% in 1992) and it is principally ordered by practitioners or medical establishments. About 90% of all visits are shared between three items : diagnosis, therapeutic advice, and treatment combining initial, complementary and secondary treatments. A noticeable change occurred between 1992 and 1999 with a clear increase of therapeutic advice.

Fig. 4 : Distribution of the advice in 1992 and 1999 according to their purpose

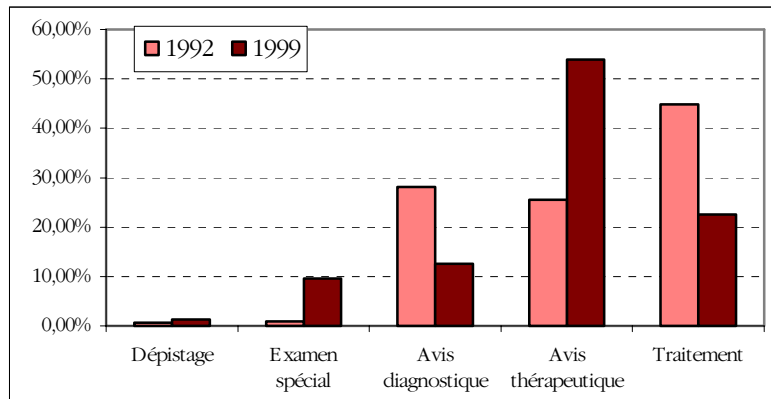
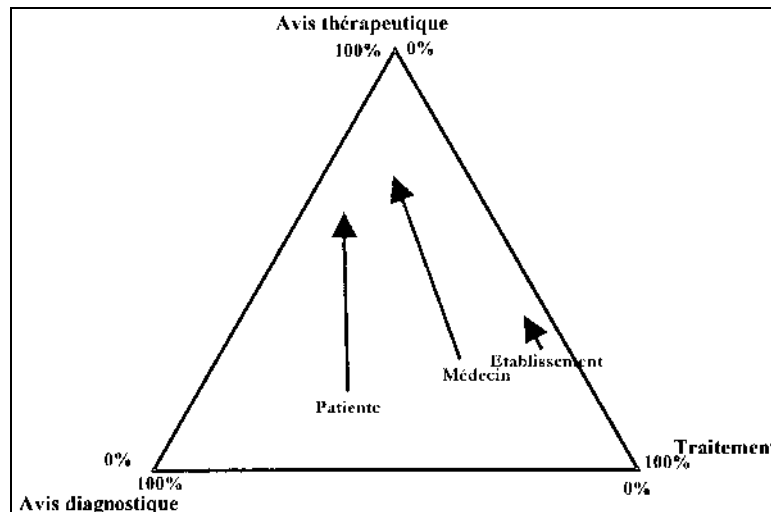


Figure 5 shows that the evolution of the purposes of the visits observed in figure 4 depends on the patients' status. The medical establishments principally lead the patients towards the centre for treatments and there is no real change between 1992 and 1999. On the contrary, for the patients sent by practitioners or coming on their own, the consultations are more frequently for therapy in 1999 than in 1992.

Fig. 5 : Evolution of the purpose of the initial consultation between 1992 and 1999 according to the origin



To conclude this section, it is necessary to underline the trend to lengthen the usual and upstream channels of care for the new patients, allowed by the existing and strengthening of the ONCORA network, in terms of health actors and enlarged competencies, the latter being also more common in the networked organisation. The network allows the LBC to be relieved of more routine and standardised medical treatments and advice that may be realised in others agents and places, letting the centre concentrate more on innovative activities.

The evolution, described above, of the nature of the request for the initial consultation of the new patients, confirms, in the first instance, the strengthening of the high-tech medical activity of the centre. In fact, we see, relatively, a decrease of the diagnostic advice but an increase of the special examinations and therapeutic advice and demands, from medical establishments, for treatments that we may assume are more and more sophisticated.

We now need to precise our analysis in trying to identify and describe more precisely the medico-spatial trajectories of the patients received for the first time at the LBC in 1992 and 1999.

II. Analysis of the medico-spatial trajectories between 1992 and 1999

To describe the evolution of the medico-spatial trajectories between 1992 and 1999, we have set up, out of the IPC files, a sample of patients, for which we can add more precise data taken from the “paper files”. This sample is made of two sub-samples set out the files of the new patients received in 1992 and 1999, respectively. The samples have been made with the purpose to represent the

three possible geographical origins of patients - Lyons urban area, other urban areas, rural communes (table 2).

Tableau 2 : Description of the sample

Area of residence	Sample for 1992	Sample for 1999
Lyons urban area	35	45
Other urban areas *	29	34
Rural communes	32	33
Total	96	112

*Albertville, Annecy, Chambéry, Grenoble, Mâcon, Roanne, Sallanches, St Etienne, Valence, Villefranche-sur-Saône.

For the 208 persons, the following variables are selected and organised under three main headings :

1-Patient identification ; Year and place of birth ; INSEE code of the place of residence ; Profession ; Marital status- State of morbidity

2-Conditions of the first visit at LBC : Date ; Origin (same items as in the IPC files) ; Name and address of the practitioner (or establishment) who referred the patient ; Purpose (same items as in the IPC files) ; Decision taken during the visit

3-Pathologic history of the patient : Nature, dates of the treatments realised at the centre ; Nature, dates of the treatments realised out of the centre (in this case : name, quality and location of the care producers).

The treatment of the enquiry allows us to analyse the evolution of the medico-spatial trajectories at three times which match the three segments of the care channels : the trajectories leading to the first consultation in the LBC, the treatments and the follow-up realised at the LBC.

II.1 The patient trajectory towards the practitioner

Tableau 3 : The patient trajectories towards the practitioner

			Popul ation	Movi ng popul ation	Area of the practitioner		
					Lyons urban area	Other urban areas	Rural commun es
Area of the patient residen ce	19 92	Lyons urban area	21	1	0	1	0
		Other urban areas	26	1	0	1	0
		Rural communes	23	9	1	8	0
	19 99	Lyons urban area	41	1	0	1	0
		Other urban areas	21	3	1	2	0
		Rural communes	28	19	3	16	0

The patient files indicate, in the case where the patient does not go directly to the LBC, the location of the health professional who ordered this first consultation. This data allows us to observe the movement between the different spatial areas being considered (table 3). So, for instance, in 1992, among the 23 patients living in a rural commune and who have not been to the LCB at first, 9 travel to an urban area (including one towards Lyons) to see the practitioner who will guide them towards the LBC.

We can see an almost complete absence of travel when the patients live in an urban area. Most of the travelling concerns the patients who live in rural communes. The study of these journeys (tables 4a and 4b) illustrates the fact that they are mainly towards the next urban area where the patient seeks a practitioner, generalist or specialist, or a medical establishment. The longest journeys (more than 40 km) are very few, in this case the patient sees a specialist rather than a generalist or being received by a medical establishment.

Tableau 4b : Details of the journeys between the patients and their practitioner in 1992

Residence area	Commune of residence	Commune of the practitioner	Area of the practitioner	Activity of the practitioner	Distance in Km
Lyons	Ste-Foy-les-Lyons (69)	Montpellier (34)	Montpellier	CAC	303
Annecey	Annecey (74)	Lyons(69)	Lyons	university hospital centre	146
Chambéry	Chambéry (73)	Nancy	Nancy	CAC	506
Valence	Valence (26)	Romans (26)	Romans	generalist	21
Rural Communes	Anglefort (01)	Annecey (74)	Annecey	specialist	36
	St-Etienne-sur-Chalaronne (01)	Villefranche-sur-Saône (69)	Villefranche-sur-Saône	hospital	22
	Menglon (26)	Valence (26)	Valence	hospital	72
	Mirabel-et-Blacons (26)	Montélimar (26)	Montélimar	hospital	37
	Piegros-la-Clastre (26)	Valence (26)	Valence	specialist	29
	St-Vallier (26)	Annonay (07)	Annonay	hospital	16
	Brangués (38)	Lyons(69)	Lyons	university hospital centre	60
	Chimilin (38)	Grenoble (38)	Grenoble	university hospital centre	56
	Fontaine (38)	Grenoble (38)	Grenoble	generalist	6
	Marcilloles (38)	St-Marcellin (38)	St-Marcellin	specialist	72
	Montchal (42)	Tarare (69)	Tarare	specialist	12
	Fleurie (69)	Villefranche-sur-Saône (69)	Villefranche-sur-Saône	hospital	25
	Marchampt (69)	Villefranche-sur-Saône (69)	Villefranche-sur-Saône	generalist	21
	Odenas (69)	Lyons (69)	Lyons	specialist	39
	St-Lager (69)	St-Georges-de-Reneins	Multipolarisée	generalist	4
	Issy-L'Eveque (71)	Lyons (69)	Lyons	specialist	149
	Romenay (71)	Chalon-sur-Saône (71)	Chalon-sur-Saône	hospital	41
	Faverges (74)	Annecey (74)	Annecey	advanced consultation.	19
	St-Ferreol (74)	Annecey (74)	Annecey	specialist	23

II.2 The patient trajectory linked to the treatments and the follow-up

Table 5 allows us to compare the two samples according to the percentages of patients in treatments at the centre and according to the main types of treatments (radiotherapy, chemotherapy, and surgery) and to the various areas of residence. Less than a third of the patients living in the Lyons urban area are treated by chemotherapy at the LCB compared to radiotherapy, which accounts for nearly half of them in 1992 and two thirds of the new patients in 1999.

Tableau 5 : Comparison between the part of patients in treatments at the LCB according to the type of treatment and the area of residence

Area of residence	Sample 1992			Sample 1999		
	Chemotherapy	Radiotherapy	Surgery	Chemotherapy	Radiotherapy	Surgery
Lyons urban area	20,0%	45,7%	60,0%	24,4%	55,6%	55,6%
Other urban areas	31,0%	13,8%	55,2%	11,8%	17,6%	44,1%

In terms of the treatment of patients who live in rural areas, the distance from the LCB has no influence in 1992. This is in contrast to 1999 where the admissions at the LCB for chemotherapy and radiotherapy are less frequent in the sample of patients living far from the centre (table 6).

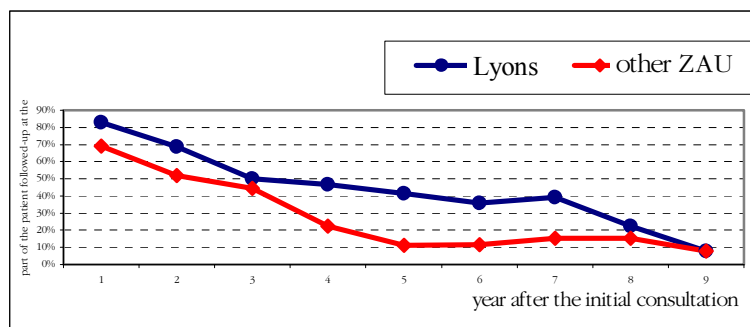
Tableau 6 : Distribution of the patients living in rural area and treated at the LCB according to the type of treatment and the distance (in kilometres) between the place of residence and the LCB.

Distance to the CLB	Sample 1992				Sample 1999			
	Population	Chemotherapy	Radiotherapy	Surgery	Population	Chemotherapy	Radiotherapy	Surgery
Less than 90 km	18	4	7	9	18	9	14	13
More than 90 km	14	4	3	11	15	3	0	8
Total	32	8	10	20	33	11	14	21

The percentage of patients treated by surgery at the centre varies very little between 1992 and 1999 and accounts for half of the patients. The area of residence is of no significance.

In concerning the follow-up care at the centre, figure 6 describes the changes in the proportion of patients, from the sample of 1992, having at least one further follow-up consultation. So, during the first year, 83% of the patients living in the Lyons urban area have a further consultation at least once time during the first year following the initial referral ; this proportion reaches 60% for the patients living in another urban area. The difference significantly increases after the fourth year of the follow-up, leading to the assumption that this is conducted outside of the LBC for the patients living in another urban area.

Figure 6 : Comparison of the follow-up of the patients in 1992, according to their residence area



Conclusion

The static comparative analysis, based on data collected from the EPC files or from the paper files of the LBC, shows various consequences linked to the existence of the ONCOR network. The territorial organisation allows, by a spatial distribution of the medical partners better trained in oncology problems due to the collective creation and diffusion of shared methods and terminology, to change the medico-spatial trajectories of the patients coming to

the centre for the first time. Whilst the process of referring patients to the LBC takes longer and generally needs the advice of an intermediate practitioner, the need for patients to travel is also reduced. Consequently, the LBC activities are reoriented towards a more high-tech medicine, as the other partners of the ONCORA network are able to provide follow-up care to the patients, being, to a large extent, users of more standardised examinations (diagnostic advice, chemotherapy). Finally, there is a better allocation of the various resources and the medical care is easier to reach for patients.

These first results need to be thoroughly studied, through work on the establishments members of the ONCORA network, to precise the shape of this network and the new medical care it proposes : network spatially organised by nested – (or otherwise) - micro networks.

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¹ Breast cancer is the most frequent form. In 1992, 5148 IPC Files were created, 3511 out of them give the tumour location 1082 cases (about 31% of the cases) of which were in the breast. In 1999, 6906 files were created, 5894 out of them give the tumour location, and 1445 are breast cancers (24,5%).

² INSEE : National institute for statistical and economic studies