



POPULATION TEMPS TERRITOIRES

POPULATION
TIME
TERRITORIES
POBLACIÓN
TIEMPO
TERRITORIOS

Campus Condorcet
Paris-Aubervilliers
18-20 novembre 2020

Colloque CIST – Session G – Villes petites et moyennes , décroissance – 19.11.2020

Transformation in hospital equipment: How are small and medium size cities affected?

Sophie BAUDET-MICHEL, Anne-Claire CHANTAL, Benoit CONTI, Charlène LE NEINDRE.



2000-2016 : Changes in surgery process

Ambulatory turn, public/private differences

- **From bed to places: changes in hospital equipment**
 - Start in the 1980s in France, continuation in the 2000
 - A transformation and a replacement process shared by OECD countries

- **Factors of change:**
 - Technological Innovations: anesthesia and surgery less invasive
 - Organisational innovations: hospital as a health factory; hospital as a company (Pierru, 2012 ; Delas, 2013)
 - Management innovations: growth in productivity: more patients, less beds, more places ; reducing length stay to reduce cost (Domin, 2015)

- **Earlier transformation in private hospitals, private hospital domination in surgery**
 - 60% of acts are due to private hospitals, among which hospitalisation through places
 - Large offer of hospitalisation in private bodies (Delas, 2013)
 - Reorganisations towards a concentration in large are medium size cities

How does the ambulatory turn is operating in the urban system?

Is the ambulatory turn differentiating cities when looking at private or public bodies?

Hypothesis

- **Hypothesis 1 : The ambulatory turn make a difference between private and public bodies**
 - Private sector continues to share a majority
 - Ambulatory change is more intense in public hospital : it is a catch-up phenomena
 - Ambulatory change is supporting a geographical shrinkage of private sector

- **Hypothesis 2 : ambulatory turn and city size**
 - Ambulatory turn means disappearance of beds and places in small cities
 - Change from beds to places is more intense in large cities

- **Hypothesis 3 : in 2016 there is a link between city size and beds and places density**
 - Larges cities are less densely equiped than small ones (in bed and places)
 - Equipement densities are very different from one small city to another

- **Data base**
 - Statistique annuelle des établissements de 2000 à 2016
 - Recensement de la population 1999 et 2016

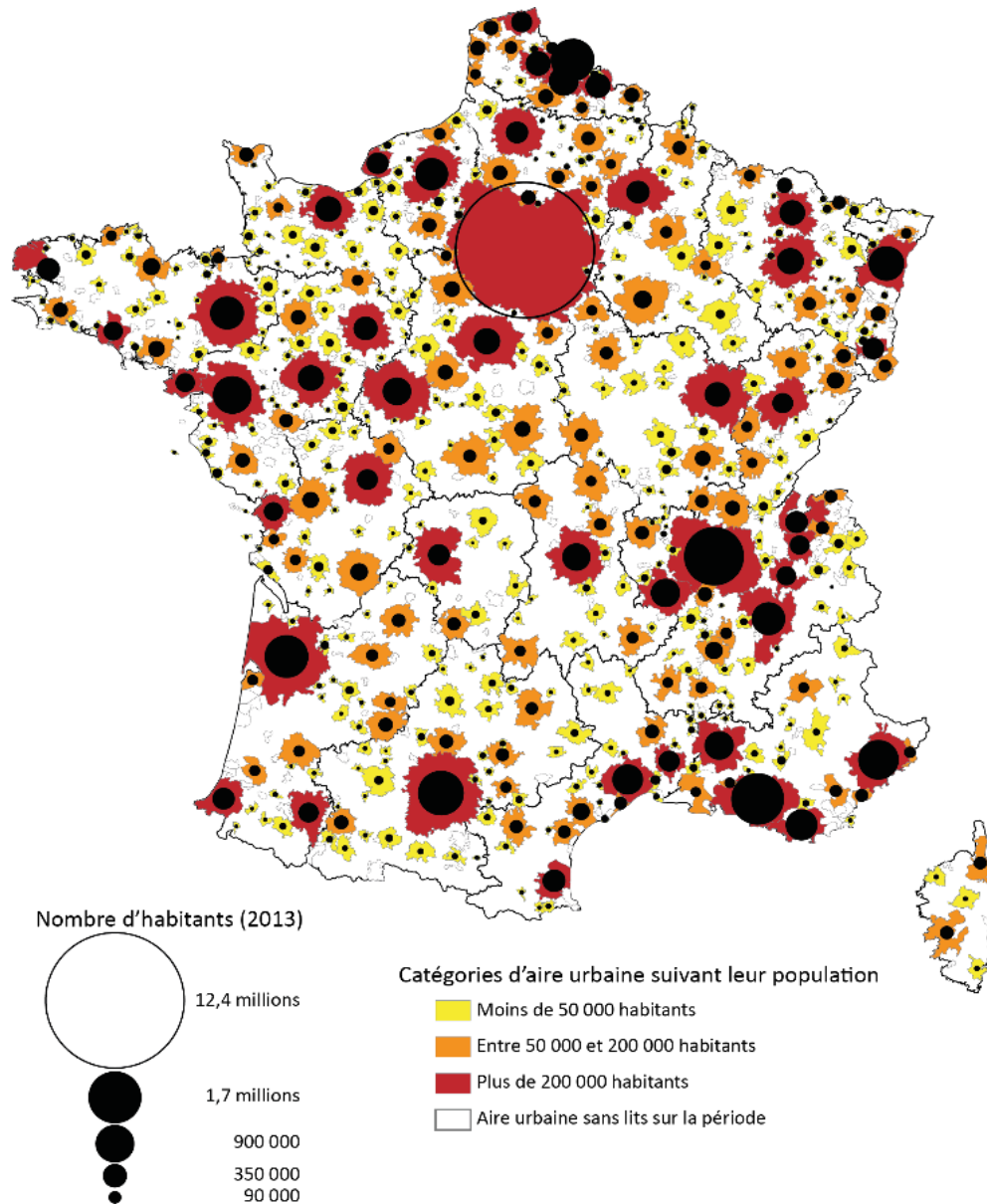
- **Observation level**
 - Functional urban areas equipped with beds or places, private or publics (250 with private, 331 with public)

- **Statistical indicators computed from variation rates in equipment**
 - Categories of evolutions in beds and places
 - places : appearance in non equipped cities
 - beds: disappearance in equipped cities

- **An ratio between beds and places to describe the transformation k**

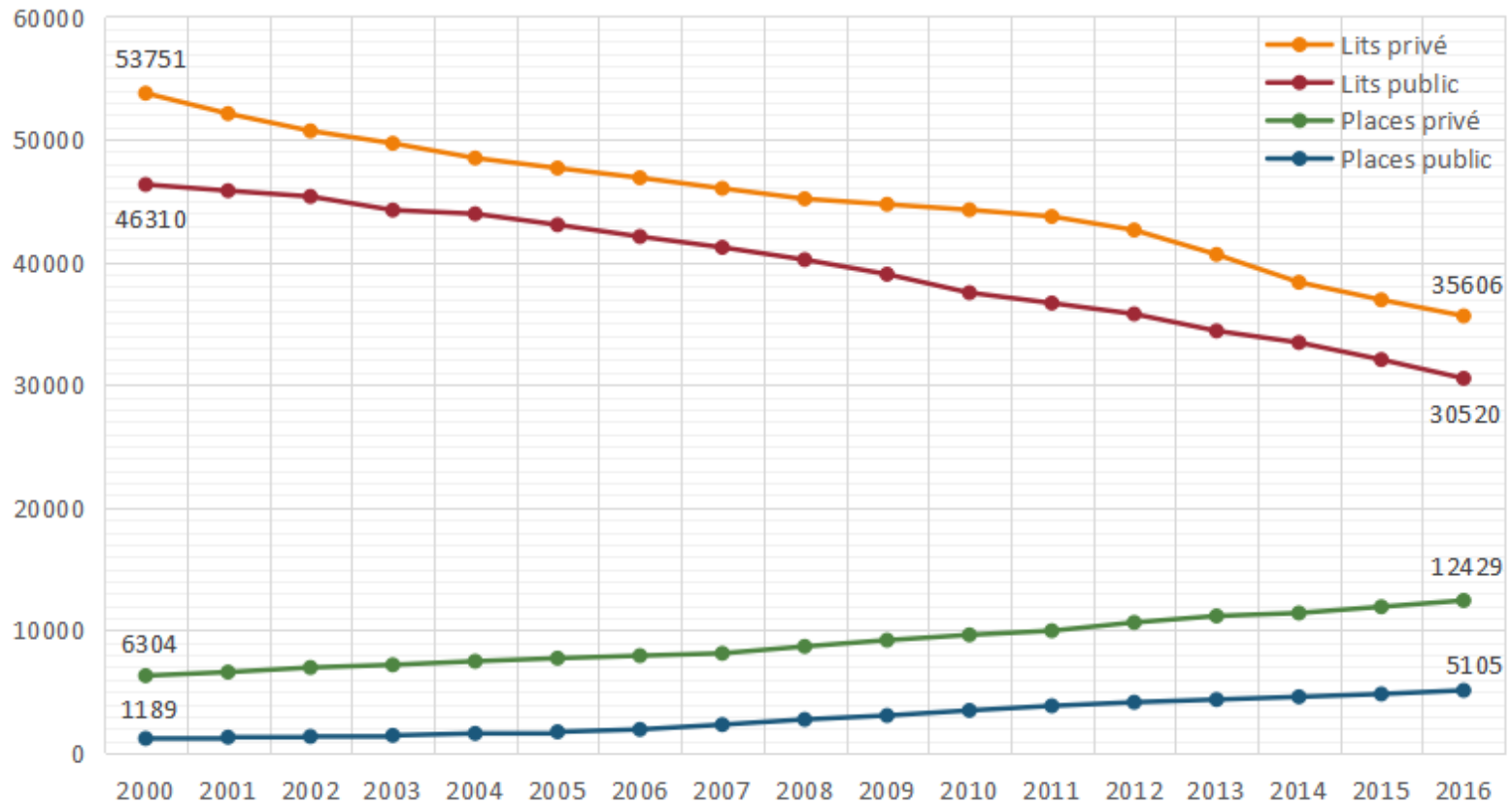
- **Statistical tests**
 - Chi2 for categorial indicators
 - Linear coefficient for continuous indicators

Study space : 771 FUAs



Private sector : a major part
Eventhough the transformation is more intense
in the public sector

Change in the number of beds and places between 2000 and 2016 in functional urban areas in metropolitan France



A more intense retraction for the private sector ? Depends on the indicators used

Private hospitals : 250 FUA with beds in
2000 or 2016

Change in beds	Number of FUA (%)
DISAPPEARANCE	60 (24%)
DECREASE	131 (52%)
STAGNATION	38 (15%)
INCREASE	19 (8%)
CREATION	2 (1%)
Total	250

Public hospitals : FUA with beds in
2000 or 2016

Change in beds	Number of FUA (%)
DISAPPEARANCE	71 (22%)
DECREASE	200 (62%)
STAGNATION	34 (10%)
INCREASE	13 (4%)
CREATION	7 (2%)
Total	325

A more intense shrinkage for the private sector ? Depends on the indicators used

Private hospitals : 238 FUAs with places in
2000 or 2016

Change in places	FUA numbers (%)
DISAPPEARANCE	46 (19%)
DECREASE	7 (3%)
STAGNATION	16 (7%)
INCREASE	166 (70%)
CREATION	3 (1%)
Total	238

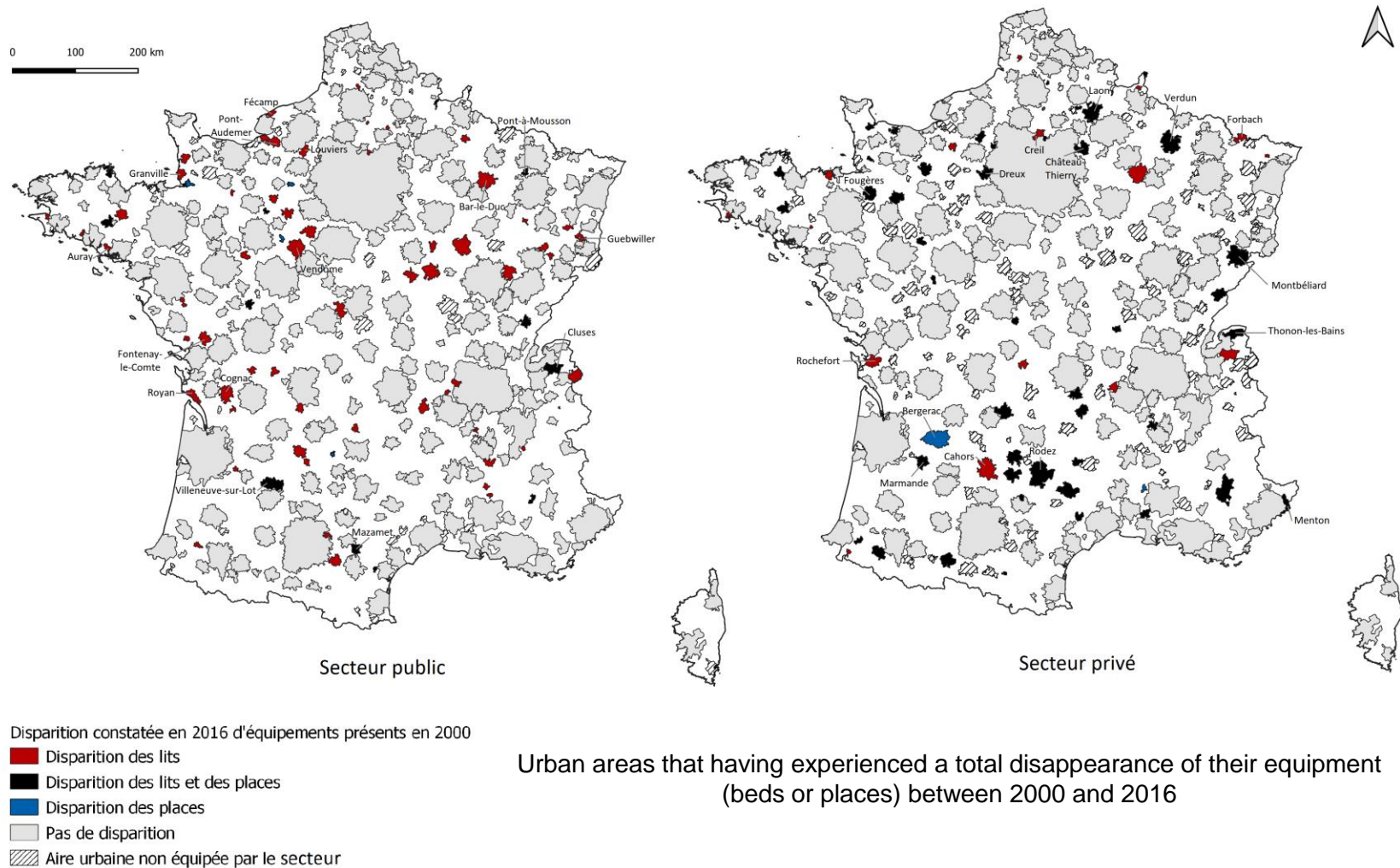
Publics hospitals : 282 FUAS with places
in 2000 or 2016

Change in places	FUA numbers (%)
DISAPPEARANCE	17 (6%)
DECREASE	6 (2%)
STAGNATION	9 (3%)
INCREASE	111 (39%)
CREATION	139 (49%)
Total	282

N.B. : Catégories according to variation rate between 2000 et 2016

Disappearance [-100 %] ; Decrease]-100%;-10 %] ; Stagnation]-10%;+10%[; Increase [+10%

Disappearance happens in small cities, both for private and public beds and places



The disappearance of beds and squares concerns small cities

Results of chi2 tests on the hypothesis of city size for the private sector

Observed size and difference in independence (in italics in parenthesis) of functional urban areas according to their size category (in rows) and their evolution rate category (in columns)

Bed: hypothesis validated

	DISAPPEARANCE	DECREASE	OTHER CASES	Total
≥ 200,000 inhabitants	0 (-11)	34 (+9)	13 (+2)	47
50 000 to 200 000 inhabitants	10 (-14)	67 (+15)	23 (-1)	100
≤ 50 000 inhabitants	50 (+25)	30 (-24)	23 (-1)	103
Total	60	131	59	250

Tschuprow's T : 0,36

Place : hypothesis validated

	DISAPPEARANCE/ DECREASE	STAGNATION	INCREASE/ CREATION	Total
≥ 200,000 inhabitants	0 (-10)	2 (-1)	45 (+12)	47
50 000 to 200 000 inhabitants	13 (-9)	7 (0)	77 (+8)	97
≤ 50 000 inhabitants	40 (+19)	7 (1)	47 (-20)	94
Total	53	16	169	238

Tschuprow's T : 0,30

N.B. : Categories calculated using the rate of change between 2000 and 2016
Disappearance -100 %] ; Decrease]-100%;-10 %] ; Stagnation]-10%;+10%[; Increase [+10%

The disappearance of beds and squares concerns small cities

Results of chi2 tests on the hypothesis of city size for the public sector

Observed size and difference in independence (in italics in parenthesis) of functional urban areas according to their size category (in rows) and their evolution rate category (in columns)

Bed: hypothesis validated

	DISAPPEARANCE	DECREASE	OTHER CASES	Total
≥ 200,000 inhabitants	0 (-10)	39 (+10)	8 (0)	47
50 000 to 200 000 inhabitants	2 (-19)	78 (+18)	18 (+2)	98
≤ 50 000 inhabitants	69 (+30)	83 (-28)	28 (-2)	180
Total	71	200	54	325

Tschuprow's T : 0,32

Place: hypothesis not validated

	OTHER CASES	INCREASE	CREATION	Total
≥ 200,000 inhabitants	1 (-4)	31 (+13)	15 (-8)	47
50 000 to 200 000 inhabitants	5 (-6)	47 (+9)	45 (-3)	97
≤ 50 000 inhabitants	26 (+10)	33 (-21)	79 (+11)	138
Total	32	111	139	282

Tschuprow's T : 0,26

The transformation of beds into places

An indicator to measure this transformation: k

$$k = \frac{\textit{number of beds in 2000} - \textit{number of beds in 2016}}{\textit{number of places in 2016} - \textit{number of places in 2000}}$$

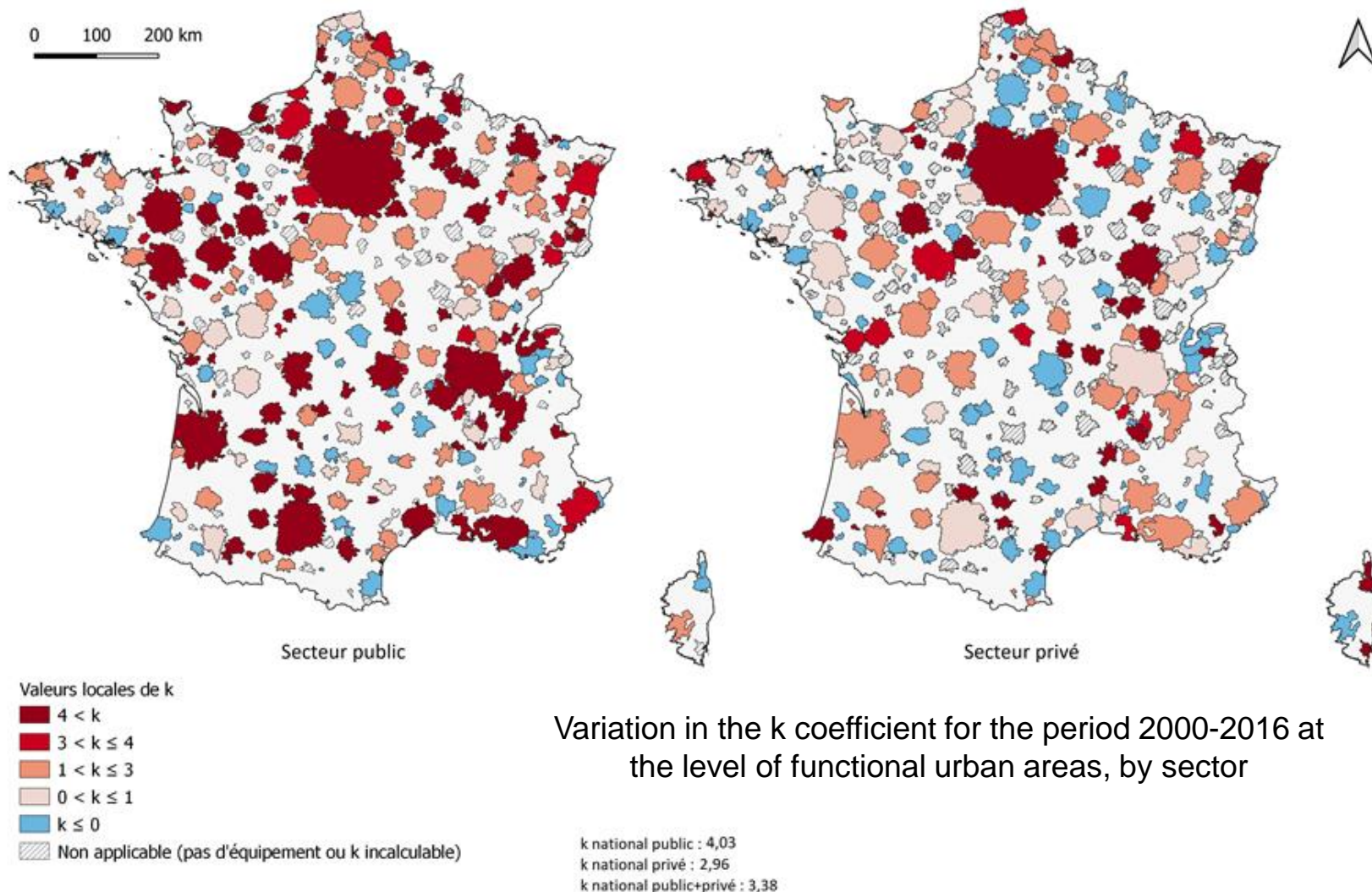
Example: Between 2000 and 2016, a city will go from 90 to 60 beds (remove of 30 beds). and increases from 15 to 25 places (creation of 10 places).

$$k = \frac{90 - 60}{25 - 15} = \frac{30}{10} = 3$$

$k=3$: for each place created, three beds have been removed

The larger k is, the more beds have been removed to create one place

The transformation of beds into places between 2000 and 2016 : k varies spatially and by sector



H2: Higher k values in the group of large cities

No correlation (linear test and Chi2)
between the size of cities and the intensity of the transformation

But there are differences between the private sector and the public sector
(sample $k \geq 0$):

-> k stronger in the public sector

Private sector

Value of k

Average: 3.6

Median: 1.8

36% of cities with $k \geq 3$

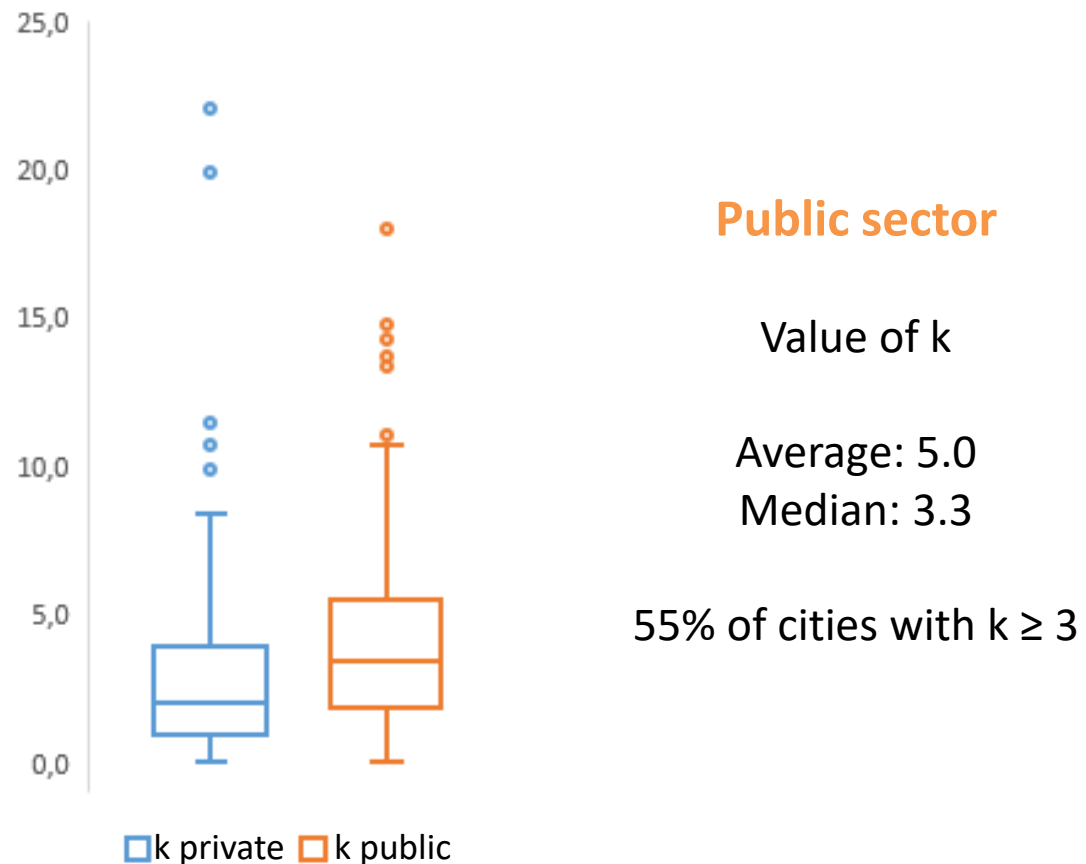
Public sector

Value of k

Average: 5.0

Median: 3.3

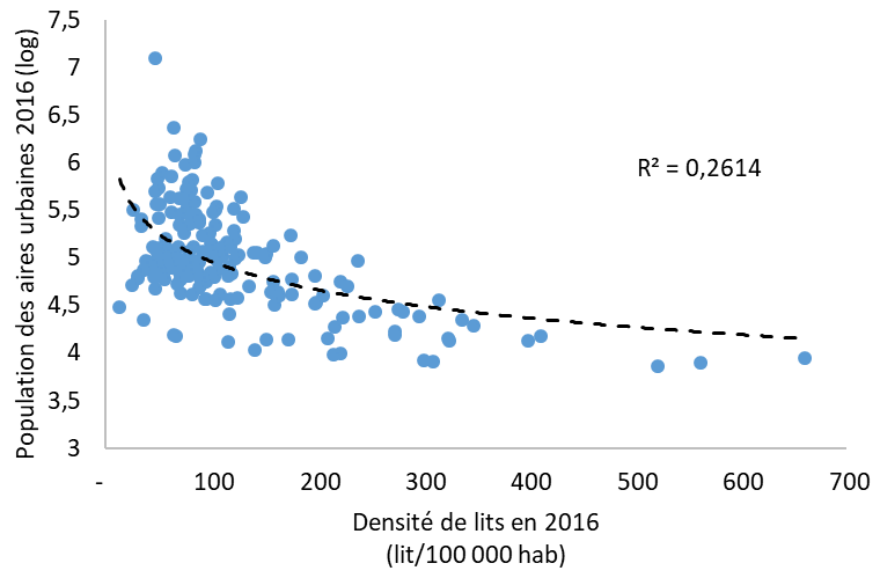
55% of cities with $k \geq 3$



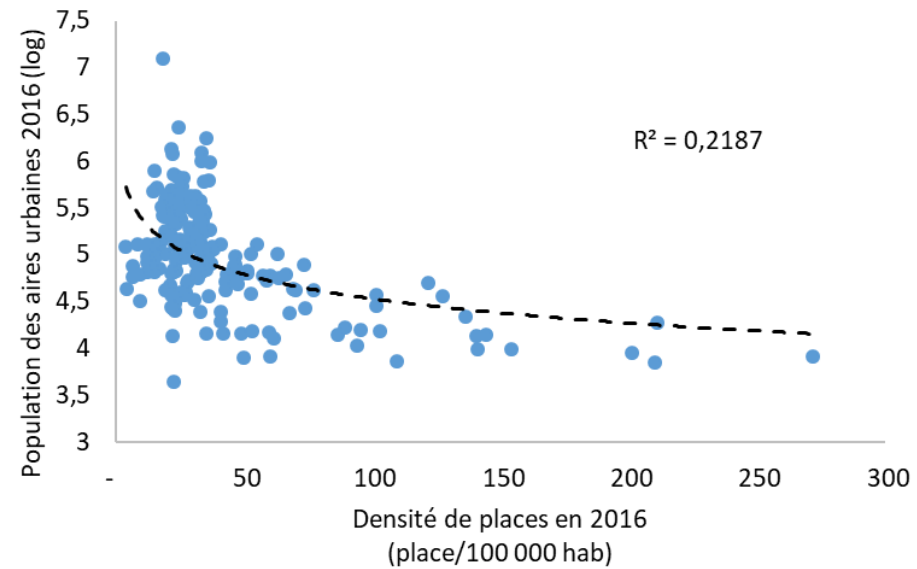
Higher densities of beds and places and more variable in the small town group

Private hospitals

Beds



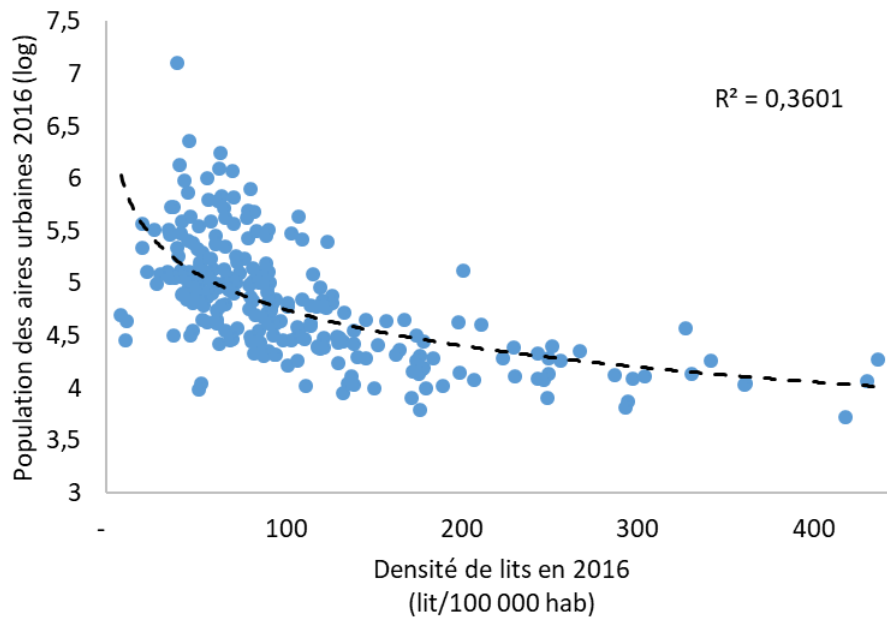
Places



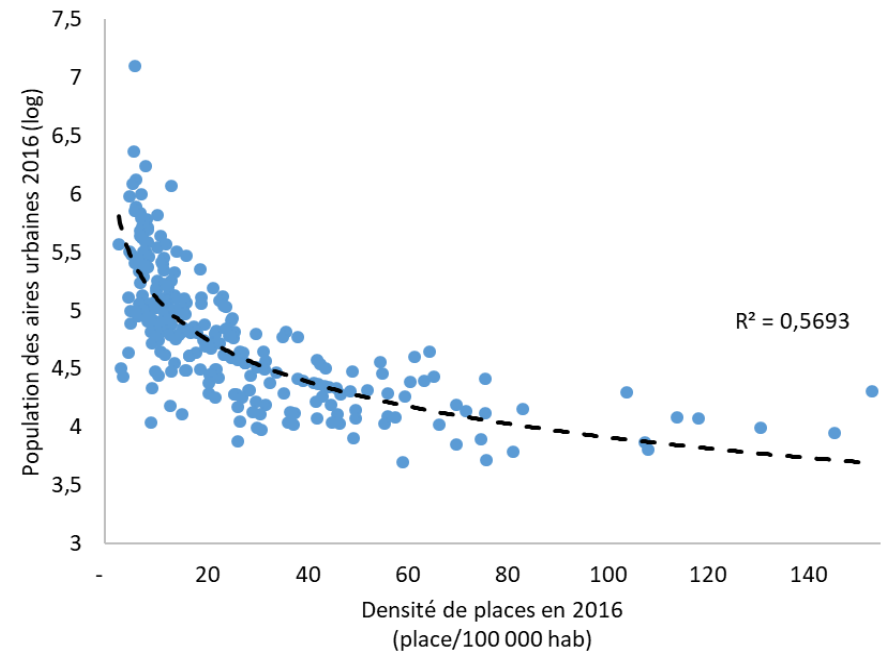
Higher densities of beds and places and more variable in the small town group

Public hospitals

Beds



Places



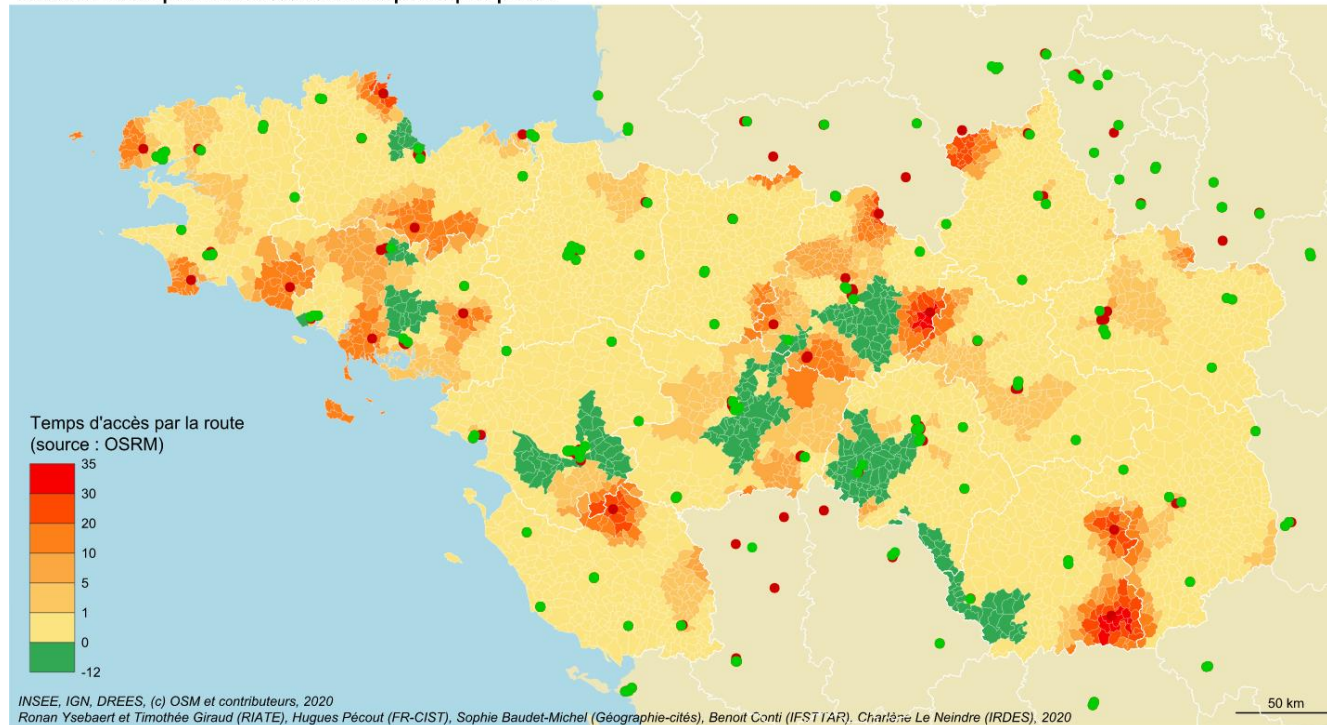
- Private surgery: dominant and less ubiquitous, more present in large cities
- Public surgery: present in more cities, with more variable equipment densities
- Interest in using different indicators to understand the transformation
 - Disappearance = beds
 - Appearance = places
 - Transformation = k
- Results to be nuanced
 - Densities of beds / places per inhabitant: variability in small cities?
 - The use of the perimeter of functional urban areas for small cities?
 - The private non-profit associated with the private: to be associated with the public?

Spatial diffusion of this transformation

- Size of cities: concentration of equipment
- Proximity to equipped towns
- Regional effect (role of Regional Health Agency [RHA])

Access to care: social and territorial consequences

Evolution du temps d'accès 2000-2018 à l'hôpital le plus proche



References

- Barbat-Bussière S. (2008). *L'offre de soins en milieu rural, l'exemple d'une recherche appliquée en Auvergne*. Presses Universitaires Blaise Pascal, CERAMAC Clermont-Ferrand, 488 p.
- Bichier E., Fellinger F. (2005). *Les fermetures de chirurgies et maternités publiques en France, Bilan de 9 années (1997-2005) et prospective*. Rapport pour la Conférence Nationale des Centres Hospitaliers, 14 p.
- Batifoulier ph., Castiel D., Brechat P.H., 2017, « La tarification à l'activité : une complexité contre-productive pour la santé des populations », *Les Tribunes de la santé*, vol. 54, no. 1, 2017, pp. 61 à 78, p.63
- Chantal A.C., 2020, *Recompositions de l'offre de soins en chirurgie en France métropolitaine, une approche par les capacités d'accueil à l'échelle des aires urbaines*, Sous la direction de Baudet-Michel, Conti, Sanders, présenté le 30.6.2020, 134 p.
- Coldefy M., Com-Ruelle L., Lucas-Gabrielli V., Marcoux L. (2011). *Les distances d'accès aux soins en France métropolitaine au 1^{er} janvier 2007*. Rapport n° 1838 et 1839, IRDES.
- Conti et al., 2020, « Envisager la rétraction d'un équipement dans le système urbain français : le cas des lits d'hospitalisation de court séjour », *Géographie, Economie, Société*, pp. 5-33
- Delas A. (2011). « L'hôpital public, un nouvel acteur territorial entre aménagement sanitaire et rivalités stratégiques ». *Hérodote*, 4/2011 (n° 143), pp. 89-119.
- Domin J.P., 2015, « Réformer l'hôpital comme une entreprise. Les errements de trente ans de politique hospitalière (1983-2013) », *Revue de la régulation* DOI : 10.4000/regulation.11293
- Holcman, 2015, *Management hospitalier, Manuel de gouvernance et de droit hospitalier*, Dunod, 800 p.
- Inspection Générale des Affaires Sociales, 2013, *L'Hôpital, La documentation française*, 48 p.
- Jousseau V. (2002). « Diffusion et recomposition de l'offre médicale : l'exemple des Pays de la Loire (1967-2000) ». In Fleuret S., Séchet R. (dir.), *La santé, les soins, les territoires, Penser le bien-être*. Rennes : PUR, pp. 33-49
- Juven PA.A, Pierru Fr., Vincent F., *La casse du siècle, à propos des réformes de l'hôpital public, Raisons d'Agir*, 2019
- HAS, ANAP, « Recommandations organisationnelles », Ensemble pour le développement de la chirurgie ambulatoire, mai 2013
- Labasse J. (1980). *L'hôpital et la ville, Géographie Hospitalière*. Paris : Hermann Editeurs des Sciences et des Arts, 240 p.
- Lalande Fr., Scotton C., Bocquet P.Y., Bonnet J.L. (2012). *Fusions et regroupements hospitaliers : quel bilan pour les 15 dernières années*. Rapport à l'Inspection Générale des Affaires Sociales, RM2012-020P, Mars 2012, 273 p.
- Lefebvre B. (2015). « Emergence, diffusion et déclin d'un réseau de cliniques franchisées en Inde. *Cybergeog : European Journal of Geography*, Espace, Société, Territoire, document 710, mis en ligne le 19 février 2015, consulté le 08 octobre 2015. URL : <http://cybergeog.revues.org/26756> ; DOI : 10.4000/cybergeog.26756
- Lerouvillois G., Vinclet P. (2002). « Les hôpitaux sous contraintes : des restructurations aux recompositions de l'offre, l'exemple de la Basse-Normandie ». In Fleuret S., Séchet R. (dir.), *La santé, les soins, les territoires, Penser le bien-être*. Rennes : PUR, pp. 49-65.
- Lucas-Gabrielli V, Tonnellier F., 2000, « Les équipements hospitaliers en France ». In Mattei M.F., Pumain D. (dir.), *Données Urbaines 3*. Paris : Anthropos, Col Villes, pp. 189-198.
- Vigneron E. (2011). *Les inégalités de santé dans les territoires français, Elsevier Masson*, 194 p.



POPULATION TEMPS TERRITOIRES

POPULATION
TIME
TERRITORIES
POBLACIÓN
TIEMPO
TERRITORIOS

Campus Condorcet
Paris-Aubervilliers
18-20 novembre 2020

Thank you for your attention

