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# A comparative evaluation of the publications of French public teaching hospitals from 2004 to 2014.

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## *Evaluation comparative des publications des centres hospitalo-universitaires français de 2004 à 2014.*

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**Conflit d'intérêt : aucun.**

# A comparative evaluation of the publications of French public teaching hospitals from 2004 to 2014.

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## *Evaluation comparative des publications des centres hospitalo-universitaires français de 2004 à 2014.*

### **ABSTRACT**

Care, teaching, and research are all priorities of the French public teaching hospitals. In 2004, the remuneration method evolved from a global endowment to a fee-for-services system, based on the use of bibliometric tools. These were used in the present study to describe the research patterns of public teaching hospitals in regards to care and teaching activities. The present study was based on data from the 32 French public teaching hospitals, between 2004 and 2014. Records concerning the publications number, hospital stays, full-time equivalent (FTE) practitioners, and residents per FTE physician were accessed. Statistical analyses were performed using means, Pearson correlation coefficients, and regression lines. The mean number of publications per FTE physician was 0.73, the mean number of hospital stays per FTE physician was 235.8 and the mean number of residents per FTE physician was 0.63. There was a moderate positive correlation between the number of publications per FTE physician and the number of residents per FTE physician ( $r=0.53$ ) and a negligible correlation between the number of residents per FTE physician and the number of hospital stays per FTE physician ( $r=0.12$ ). There was a low negative correlation between publication numbers per FTE physician and the number of stays per FTE physician ( $r=-0.41$ ). All public teaching hospitals presented different patterns in terms of care, teaching, and research activities. None of the 32 hospitals performed well in all three activities. Only nine performed well in at least two out of the three missions.

**Keywords:** bibliometrics; publications; impact factor journal; PubMed; SIGAPS.

### **RESUME**

Le soin, l'enseignement et la recherche sont les priorités des Centres Hospitalo-Universitaires (CHU) français. En 2004, la méthode de rémunération est passée d'une dotation globale à un système de rémunération à l'acte, reposant sur l'utilisation d'outils bibliométriques. Ceux-ci ont été utilisés ici pour décrire l'activité de recherche des CHU en lien avec les activités de soins et d'enseignement. La présente étude est basée sur des données provenant des 32 CHU français entre 2004 et 2014. Les données concernant le nombre de publications, les séjours à l'hôpital, les Equivalents Temps Plein (ETP) des praticiens et le nombre d'internes par ETP médical, ont été collectées. Les analyses statistiques ont été effectuées à l'aide de moyennes, de coefficients de corrélation de Pearson et de droites de régression. En se rapportant toujours au nombre d'ETP médical, le nombre moyen de publications était de 0,73, le nombre moyen de séjours à l'hôpital était de 235,8, et le nombre moyen d'internes était de 0,63. Une corrélation positive modérée

entre le nombre de publications et le nombre d'internes ( $r=0,53$ ) a été trouvée ainsi qu'une corrélation négligeable entre le nombre d'internes et le nombre de séjours à l'hôpital ( $r=0,12$ ). Il y avait également une faible corrélation négative entre le nombre de publications et le nombre de séjours ( $r=-0,41$ ). Tous les CHU présentaient des modèles différents en termes d'activités de soins, d'enseignement et de recherche. Aucun des 32 hôpitaux n'excellait dans les trois activités. Seulement neuf hôpitaux excellaient dans au moins deux des trois missions.

**Mots-clés:** bibliométrie; publications; impact factor ; PubMed ; SIGAPS

## INTRODUCTION

Leading and conducting research is one of the three priorities of the French public teaching hospitals, along with teaching and medical care activities. In 2004, the remuneration system of the French healthcare institutions changed from a global endowment to a fee-for-service practice for medical, surgical and obstetric departments. This new system of funding, based on performance and reward, was also applied to the biomedical research fields using bibliometric tools as performance indicators. Before 2004, bibliometric tools were used mainly to assess and evaluate university careers at an individual level, for instance by calculating the H index of a researcher. To implement this new funding system, a new tool termed SIGAPS (*Système d'Interrogation, de Gestion et d'Analyse des Publications Scientifiques*) was created and implemented at the national level under the impulse of the Ministry of Health. The SIGAPS software enables the counting of the number of PubMed-listed publications of an author who is affiliated to a healthcare institution, and who is part of the funding scheme. SIGAPS attributes a composite score (SIGAPS indicator) based both on the position of the author in the author list and the category of the biomedical journal in which the study is published. The categories are based on a journal's impact factor distribution within each Journal Citation Report (JCR) research discipline [1]. Category A refers to the top 10% (scored 8), those above the third quartile not included in the top 10% are category B (scored 6), those above the second quartile are C (scored 4), those above the first quartile are D (scored 3), and those below the first quartile

are E (scored 2). Journals which are not indexed by JCR, but are listed in PubMed, are categorised NC (scored 1). The position of the author is scored as follows: the first and last authors are scored the highest (scored 4) followed by second and second-to-last author positions (scored 3), third position (scored 2) and finally other position, and investigator list (both scored 1).

The present study aimed at describing the research patterns of the 32 French existing public teaching hospitals, from 2004 to 2014, by analysing the number of publications, the number of publications in high journal categories, and the position of the authors. The medical care activity was also assessed by the number of hospital stays while the teaching activity was assessed by the number of resident students, the number of full time equivalent (FTE) university hospital practitioners. All data were normalised by the number of FTE physicians.

## **METHODS**

### Data collection

Each French public teaching hospital is attributed a FINESS (*Fichier National des Etablissements Sanitaires et Sociaux*) number by the French directory of health and social establishments, which is unique to each hospital [2]. For the 32 existing public teaching hospitals, all included in the present study, the FINESS number was the key identifier used for retrieving data over the 2004-2014 period from all databases of interest. For one particular case, that is the hospital of La Réunion which became a public teaching hospital in 2012 after the merger of two public hospitals, analysis was performed based on the sum of data from these two hospitals, prior to 2012. The publication dataset from 2004 to 2014 period was retrieved from the SIGAPS database in September 2015, following special authorization by the Ministry of Health (*Bureau Innovation et Recherche Clinique*, issued on 22/12/2014). The year 2004 was chosen because this year was the first year of the new funding system. From this 11-year dataset,

the following data were extracted: the number of publications for each public teaching hospital, the year of publication, the journal category (A, B, C, D, E, and NC), the author position (first, second, third, other, second-to-last, and last), and the type of publication (editorial, original article, review). In the present study, the best author position was defined as being either the first or last position and the best journal category was considered being A and B. All publications whose authors were flagged as investigator list were excluded from this study as this position is more reflective of a collaborative contribution.

In France, the rate of medical care activity for a given hospital can be assessed by the number of hospital stays according to the Diagnosis Related Groups classification (*Groupe Homogène de Malade*, DRG), which pools homogeneous groups of patients. These groups are based on the inclusion of patients with the same medical condition, of a similar severity, and the care of which is equivalent. Each hospital stay ends up in a DRG according to an algorithm based on the medical administrative information contained in the standardised output summary of each patient. For each 32 public teaching hospital, the number of hospital stays from 2004 to 2014 was extracted from Scansante. Scansante is an open access database hosted by the technical agency for hospital information (*agence technique de l'information sur l'hospitalisation*) [3].

In public teaching hospitals, physicians can occupy the position of hospital practitioner, or university hospital practitioner. Herein, a hospital practitioner includes clinical assistants and attending physicians as well as hospital practitioners. University hospital practitioners include titular and non-titular university hospital practitioners. In the present study, a university hospital practitioner was attributed 0.5 FTE due to his/her double mission as physician and teacher. Private practitioners were excluded from the study. In order to take into account the effective time of each physician, the number of FTE was analysed instead of the number of physicians. To assess the teaching activity within a public hospital, the number of residents per FTE

physician was considered as reflective of teaching time based on the postulate that the higher the number of residents per FTE physician, the more teaching time is required. This, however, does not take into account the quality of the teaching. Since residents can be trained by hospital practitioners or university hospital practitioners, the number of residents was divided by the number of FTE physicians and not by the number of FTE university hospital practitioners.

For each of the 32 public teaching hospitals, data concerning the number of FTE physicians as well as their position, *i.e* hospital practitioner only or university hospital practitioner, and the number of residents' student were retrieved from different questionnaires from the French directorate for research, studies, evaluation and statistics (*Direction de la recherche, des études, de l'évaluation et des statistiques*). These questionnaires are to be fulfilled each year by the public teaching hospitals. The questionnaire Q20a form indexed the medical staff of public healthcare establishments (except residents) from 2004 to 2012, and the questionnaire Q20 form for the 2013-2014 period [4]. The number of residents' students was obtained from the questionnaire Q22 form, which indexed the number of residents.

### Data analysis

Individual hospital means were estimated over the period 2004-2014 for each of the 32 public teaching hospitals. An overall annual mean with standard deviation (SD) and 95% confidence interval ([95%CI]) for the 32 public teaching hospitals was then calculated. Each individual hospital mean was then compared to the [95%CI] of the overall annual mean to establish hospital performance in terms of research, teaching or medical care activities. If an individual hospital mean was above the [95%CI] of the overall annual mean, it was considered that the establishment performed well. If it was comprised within the [95%CI] of the overall annual mean it was considered to perform within the mean. If the individual hospital mean was below the [95%CI] of the overall annual mean, this hospital was considered to perform poorly. Variables analysed were the number of publications per FTE physician, the number of DRG per

FTE physician, the number of residents per FTE physician, as well as the proportion of university hospital practitioners, the proportion of publications in the best journal category (A and B), and the proportion of best author position (first and last authors). Pearson correlation coefficients and linear regression analyses were used for the following variables: number of publications, number of hospital stays, number of FTE university hospital practitioners, and number of residents per FTE physician [5].

## RESULTS

Table 1 shows the number of publications for the 32 public teaching hospitals over the ten-year period (2004-2014).

The overall annual mean (SD; [95%CI]) number of publications per FTE physician (both hospital practitioners and university hospital practitioners) was 0.73 (0.29; [0.63; 0.83]). A total of 14 teaching hospitals (Nancy, Montpellier, Lille, Bordeaux, Marseille, Paris, Toulouse, Angers, Grenoble, Strasbourg, Lyon, Nantes, Rennes, and Dijon) had a mean number of publications per FTE physician above the [95%CI] of the overall annual mean. Among the others, 11 had a mean within the [95%CI] and 7 had a mean below. Regarding medical care activity, the overall annual mean (SD; [95%CI]) number of hospitals stays per FTE physician was 235.8 (51.8; [217.8; 253.7]). A total of 8 public teaching hospitals had a mean medical care activity above the 95%CI of the overall annual mean (Poitiers, Metz, Orléans, Limoges, Besançon, Bordeaux, Tours, and Amiens), while 10 were within the interval and 14 below. Concerning teaching activities, the overall annual mean (SD; [95%CI]) number of residents per FTE physician was 0.63 (SD=0.17; [0.57; 0.68]) Out of the 32 public teaching hospitals, 11 had a mean number of residents per FTE physician above the [95%CI] of the overall annual mean (Poitiers, Dijon, Reims, Caen, Marseille, Amiens, Lille, Besançon, Rouen, Toulouse, and



Nancy). Another 11 had a mean number of residents comprised within the [95%CI] whereas 10 public teaching hospitals had a mean below. None of the French public teaching hospitals performed well, *i.e* had means above the [95%CI] of the overall annual mean, in all 3 activities that are medical care, teaching and research. Out of the 32 public teaching hospitals, 9 performed well in 2 activities out of 3. Amiens, Besançon, and Poitiers performed well in care and teaching activities; Dijon, Lille, Marseille, Nancy and Toulouse performed well in research and teaching activities; and Bordeaux performed well in care and research activities. Among the total public teaching hospitals, 15 performed well in at least one of the 3 activities while 8 did not perform well in any of the activities (Table 2).

Analysis found a moderate positive correlation between the number of publications per FTE physician and the number of residents per FTE physician ( $r=0.53$ ;  $p=0.002$ ), a negligible correlation between the number of residents per FTE physician and the number of hospital stays per FTE physician ( $r=0.12$ ;  $p=0.51$ ), and a low negative correlation between the number of publications per FTE physician and the number of hospital stays per FTE physician ( $r=-0.41$ ;  $p=0.02$ ).

The overall annual mean (SD; [95%CI]) proportion of university hospital practitioners was 0.18 (0.08; [0.16; 0.21]; Table 2). Among the 32 public teaching hospitals, 12 had a mean proportion of university hospital practitioners above the [95%CI] of the overall annual mean (Bordeaux, Strasbourg, Marseille, Nancy, Rennes, Lille, Reims, Montpellier, Toulouse, Caen, Angers, and Lyon). A total of 14 hospitals had a mean comprised within the [95%CI] and 6 had a mean below. Analysis found a very high correlation between the proportion of university hospital practitioners and the number of publications per FTE physician ( $r=0.90$ ;  $p<0.05$ ; Figure 1), a high correlation between the proportion of university hospital practitioners and the number of residents per FTE physician ( $r=0.72$ ;  $p<0.05$ ; Figure 2), and a low negative correlation between

the proportion of university hospital practitioners and the number of stays per FTE physician ( $r=-0.32$ ;  $p=0.06$ ).

The overall annual mean (SD; [95%CI]) proportion of best journal category was 0.37 (0.05; [0.36; 0.39]). A total of 12 hospitals achieved a mean proportion of best journal category above the [95%CI] of the overall annual mean (Bordeaux, Nantes, Paris, Montpellier, Nice, Dijon, Grenoble, Lyon, Strasbourg, Toulouse, Brest, and Poitiers). Another 12 were comprised within the [95%CI] and 8 were below. Analysis found a high positive correlation between the proportion of university hospital practitioners and the best journal category ( $r=0.78$ ;  $p<0.05$ ; Figure 3).

The overall annual mean (SD; [95%CI]) proportion of best author position was 0.52 (0.06; [0.50; 0.54]). Among the total university hospitals, 8 hospitals had a mean proportion of best author position above the [95%CI] of the overall annual mean (Paris, Marseille, Amiens, Besançon, Lille, Lyon, Rouen, and Reims), while 18 were comprised within the interval and 6 were below. A high positive correlation was found between the proportion of university hospital practitioners and best author position ( $r=0.71$ ;  $p<0.05$ ; Figure 4).

Concerning research activity, 14 hospitals performed well in terms of publication number. None of the 14 hospitals that had a high number of publications, had a proportion of university hospital practitioners, a proportion of best journal category, and a proportion of first and last authors below the 95%CI of the overall annual mean. Only two hospitals (Paris and Lyon) had a mean number of publications published in the best journal category and with the best author position that were higher than the [95%CI] of the overall annual mean. Of note, Lyon had a higher proportion of university hospital practitioners whereas Paris did not. Moreover, 7 (Bordeaux, Dijon, Grenoble, Montpellier, Nantes, Strasbourg; and Toulouse) performed well in terms of best journal category but their performance for best author position was within the

[95%CI] of the overall annual mean. Among these 7 hospitals, 4 (Bordeaux, Montpellier, Strasbourg, and Toulouse) had a higher proportion of university hospital practitioner whereas the other 3 (Dijon, Grenoble, and Nantes) did not. Another 5 public teaching hospitals (Angers, Lille, Marseille, Nancy, and Rennes) had a mean number of best journal category within the [95%CI] of the overall annual mean, 3 of them (Angers, Nancy, Rennes) with a best author position comprised within the [95%CI] of the overall annual mean and 2 (Lille, Marseille) over. All had a mean proportion of university hospital practitioners higher than the [95%CI] of the overall annual mean.

Among the 14 who performed well in terms of research, only Bordeaux performed also performed well in terms of medical care activity, while 5 performed within the mean, and 8 performed poorly. In terms of teaching activity depicted by the number of residents per FTE physician, 5 performed well (Dijon, Lille Marseille, Nancy, and Toulouse), 6 were within the mean, and 3 performed poorly.

Among the 18 public teaching hospitals who did not perform well in terms of research, *i.e.* publication number within or under the [95%CI] of the overall annual mean, 7 (Amiens, Besançon, Limoges, Metz, Orleans, Poitiers, Tours) performed well in care activity, and 6 (Amiens, Besançon, Caen, Poitiers, Reims, and Rouen) performed well in teaching activity.

## **DISCUSSION**

The results of the present study showed that the number and quality of publications released each year, between 2004 and 2014, by public teaching hospitals relies on the proportion of university hospital practitioners. Paris and Lyon hospitals are the only two public teaching hospitals who published a high number of publications, in the best journal categories, and with

best author positions. Bordeaux is the only hospital who performed well in the two sectors that are care and research.

As the French public teaching hospitals all vary from one another and are hardly comparable in terms of size, data were normalised by the number of FTE physicians. Indeed, Paris comprises 31.1% of the total SIGAPS scores attributed to all hospitals and is also the most successful in obtaining public funding (29.3% of total public funding) whereas, for instance, 9 public teaching hospitals together obtain 32.9% of that funding [6]. In many countries, research funding is correlated with the number of publications as reported by Man *et al.* [7]. Herein, the number of publications was extracted from a database used for allocating funds and thus, funding was not analysed in the present study. The yearly fluctuation in funding allocation can be a bias. Moreover, in order to limit the impact of yearly fluctuations of the number of publications, the results presented herein were calculated over a ten-year period.

According to a report by the Swiss ministry of education and research (*Secretariat d'Etat à l'éducation et à la recherche du département fédéral de l'intérieur*) [8]. France produced, between 2005 and 2009, 582 publications per 1000 researchers in all fields. It is however difficult to compare the results presented herein with those from the Swiss report as the first were calculated in terms of FTE and the latter in terms of number of researchers. The number of FTE is less numerous than physicians. This could explain that the number of publications per FTE found herein is higher than the number of publications per researchers published in the Swiss report [8]. Another point of interest is that the first and last author positions represented more than half of the publications listed. The public teaching hospitals share their research activities between initiating its own research and collaborating with other hospitals, thus enhancing its role in term of knowledge production. Of note, almost 40% of their publications were published in the best journal category.

An important result from the present study, corroborated by a report from the French financial authority, (*la Cour des comptes*) [9] is that the three public hospital activities were not carried out equally. Public teaching hospitals focus first on medical care activity before research organisations emerge. Based on each hospital's result, it appears that, hospitals must choose between excelling in the field of research or perform well in terms of medical care. The present study found that only the hospital of Bordeaux performed well in these two activities. However, external factors were not studied herein and could explain some patterns. For instance, demographic factors and attractiveness, differences in population (epidemiology, socio-professional levels, population density), and/or competitive factors (implantation of private hospitals, presence of cancer centre...) can all affect care activity [9]. It is important to note that although Orléans and Metz hospitals are only involved in care activity, these were considered as public teaching hospitals in this study since they are part of the 32 regional teaching hospitals [10]. This explains their lack of university hospital practitioners and low number of residents. However, Nancy and Strasbourg which are geographically close to Metz showed poor performance in terms of care activity but performed well in research. Hence, Metz can manage some of Nancy and Strasbourg's care activities while Nancy and Strasbourg can include Metz's research activity. Other examples such as Fort de France, La Réunion, and Pointe à Pitre can hardly be compared with the 27 other public hospitals due to their isolated geographic location and thus specific working environment. Coordination between research and teaching activities largely depend on historical and local factors between public teaching hospitals and their associated universities [6] [11]. Interestingly, this is reflected herein by the strong association between the proportion of university hospital practitioners and the proportion of residents.

It is important to note that the workload of a resident can be very important [12] [13] [14]. Thus, it could be envisioned that the higher the number of residents, the higher the care activity in a given hospital. However, only 3 public teaching hospitals (Amiens, Besançon, and Poitiers)

performed well in terms of both the number of residents and care activity. The present results therefore do not confirm that residents create care activity. According to another report from the French financial authority [6] a high ratio of resident per university hospital practitioner reduces the available time for research and care due to student supervision time. However, it is likely that the new directives concerning medical theses, which will now be in form of a published article, will increase the publication numbers for hospitals with a high number of residents and hence enhance their research funding, if the system is kept that way.

Looking at a 10-year pattern (2004-2014) from the 32 public teaching hospitals, which were created more than 50 years ago, was of particular interest as 2004 was a pivotal year during which a new economic model was implemented. Since then, the hospitals have entered the era of management which involves evaluation of performance activities (e.g. publications) and commitment to assurance quality. This is the first ten-year assessment in terms of publications, and it showed that, overall, the hospitals have succeeded in adapting to this new funding scheme. Indeed, almost 40% of French public teaching hospitals publish in high category journals, whatever the therapeutic field of interest, and more than 50 % of the authors are ranked in the best position.

## **CONCLUSION**

All French public teaching hospitals presented different patterns in terms of care, teaching, and research activities. None of the 32 hospitals performed well in all 3 activities. Only nine out of the 32 hospitals studied performed well in at least 2 out of the 3 missions.

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## References

- [1] Devos P. [From the bibliometry to the financing: the SIGAPS software]. *J Neuroradiol J Neuroradiol* 2011;35:31–3.
- [2] Agence technique de l'information sur l'hospitalisation. fichier national des établissements sanitaires et sociaux. *Fich Natl Établ Sanit Sociaux* n.d. /fr/datasets/finess-extraction-du-fichier-des-etablissements/ (accessed February 12, 2019).
- [3] Agence technique de l'information sur l'hospitalisation. *ScanSanté* n.d. [http://www.scansante.fr/applications/casemix\\_ghm\\_cmd](http://www.scansante.fr/applications/casemix_ghm_cmd) (accessed January 29, 2019).
- [4] Direction de la recherche, des études, de l'évaluation et des statistiques. *data.Drees etudes et statistique* n.d. <http://www.data.drees.sante.gouv.fr/ReportFolders/reportFolders.aspx> (accessed January 29, 2019).
- [5] Mukaka MM. A guide to appropriate use of Correlation coefficient in medical research. *Malawi Med J* 2012;24:69-71–71.
- [6] Cour des comptes. *Le rôle des CHU dans l'enseignement supérieur et la recherche médicale*. 2017.
- [7] Bredan A, Benamer HTS, Bakoushil O. Why are journals from less-developed countries constrained to low impact factors? *Libyan J Med* 2014;9. doi:10.3402/ljm.v9.25774.
- [8] Département fédéral de l'intérieur. *Analyse bibliométrique de la recherche scientifique en Suisse 1981 - 2011*. ResearchGate n.d. [https://www.researchgate.net/publication/273403641\\_Analyse\\_bibliometrique\\_de\\_la\\_recherche\\_scientifique\\_en\\_Suisse\\_1981\\_-\\_2011](https://www.researchgate.net/publication/273403641_Analyse_bibliometrique_de_la_recherche_scientifique_en_Suisse_1981_-_2011) (accessed January 29, 2019).
- [9] Cour des comptes. *Le rôle des CHU dans l'offre de soins*. 2018.
- [10] 32 CHRU - Réseau CHU, l'actualité des CHU n.d. <https://www.reseau-chu.org/32-chru/> (accessed January 29, 2019).
- [11] Le CHU de demain n.d. [http://cncem.fr/sites/default/files/documents\\_en\\_ligne/01%20Rapport%20CHUdemain%202018\\_BD.pdf](http://cncem.fr/sites/default/files/documents_en_ligne/01%20Rapport%20CHUdemain%202018_BD.pdf) (accessed January 29, 2019).
- [12] Cintas C, Cousineau M, Langlois V. S'occuper de nos futurs médecins. Quand l'épuisement professionnel se fait sentir dès l'internat. *RIMHE Rev Interdiscip Manag Homme Entrep* 2016;23:27–46. doi:10.3917/rimhe.023.0027.

[13] Pougnet R, Loddé B, Dantec F, Dewitte J-D, Pougnet L. Le travail de l'interne en médecine est riche de sens et de difficultés : étude qualitative. Arch Mal Prof Environ 2018;79:471.  
doi:10.1016/j.admp.2018.03.599.

[14] InterSyndicat National des Internes des Hopitaux. Internes en médecine : Gardes, Astreintes et Temps de travail 2012.



## **FIGURE CAPTION**

**Figure 1: Publication activity and proportion of university hospital practitioners**

**Figure 2: Teaching activity and proportion of university hospital practitioners**

**Figure 3: Proportion of best journal category and proportion of university hospital practitioners**

**Figure 4: Proportion of best author position and proportion of university hospital practitioners**

**Conflit d'intérêt: aucun.**

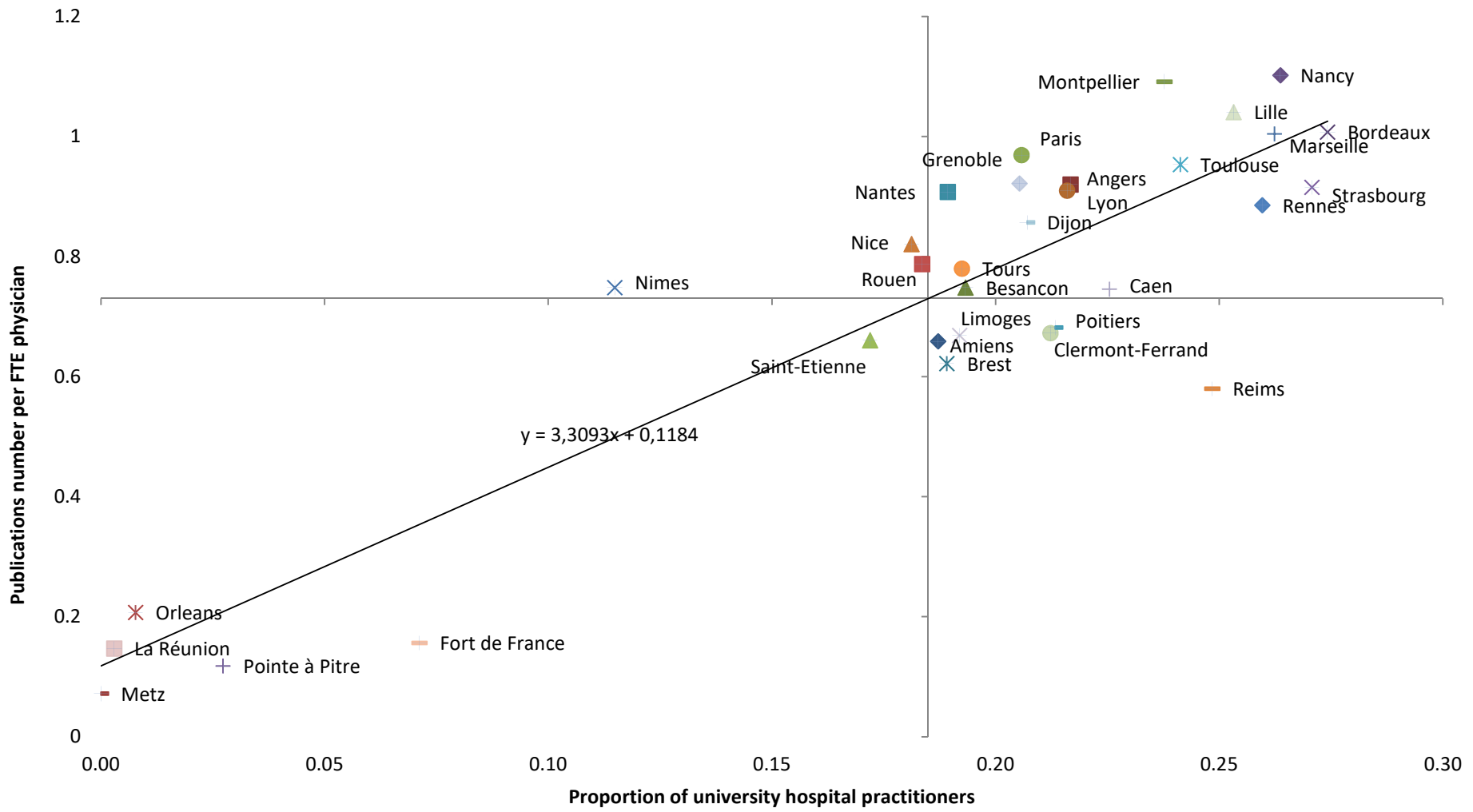


Figure 1: Publication activity and proportion of university hospital practitioners

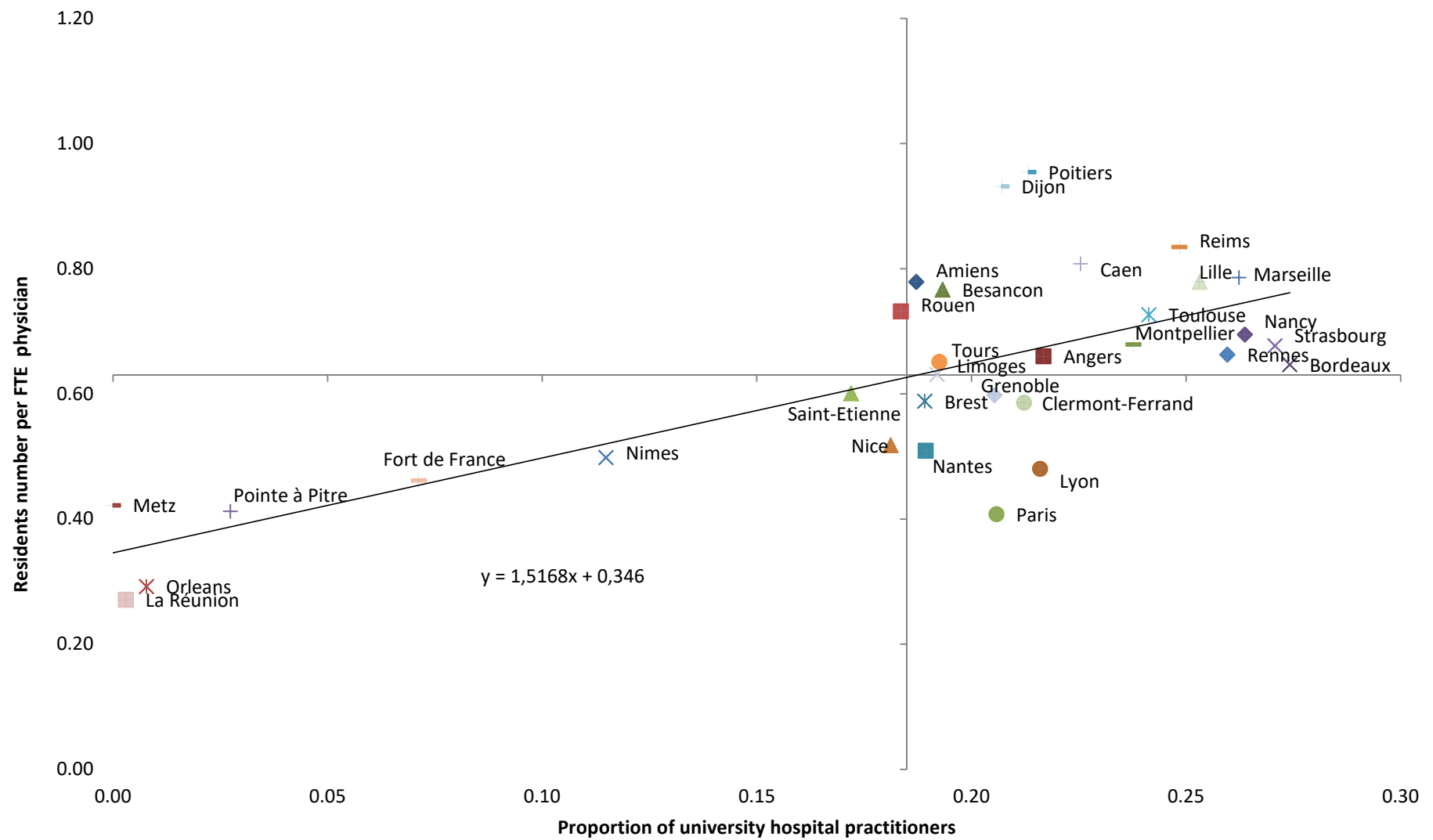


Figure 2: Teaching activity and proportion of university hospital practitioners

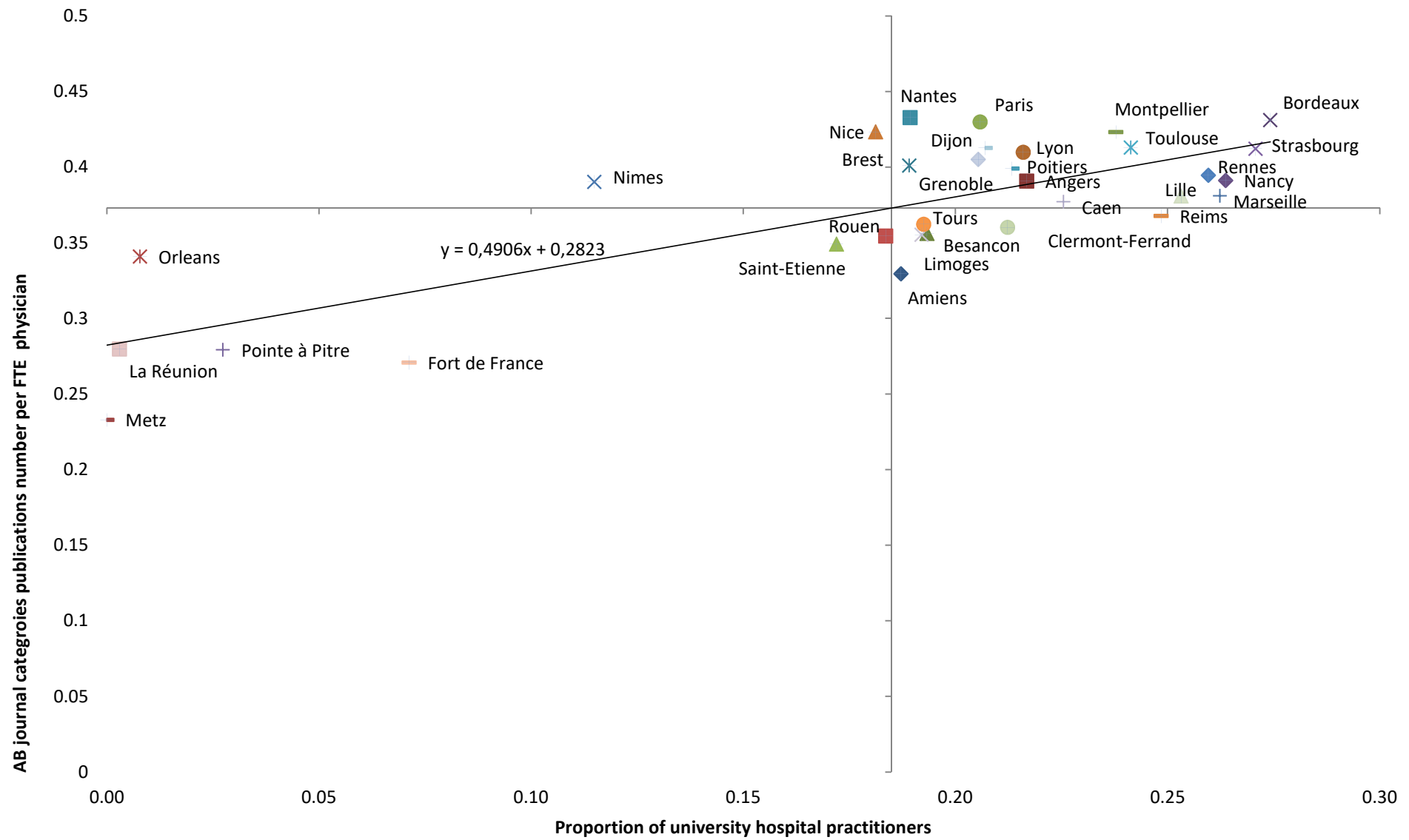


Figure 3: Proportion of best journal category and proportion of university hospital practitioners

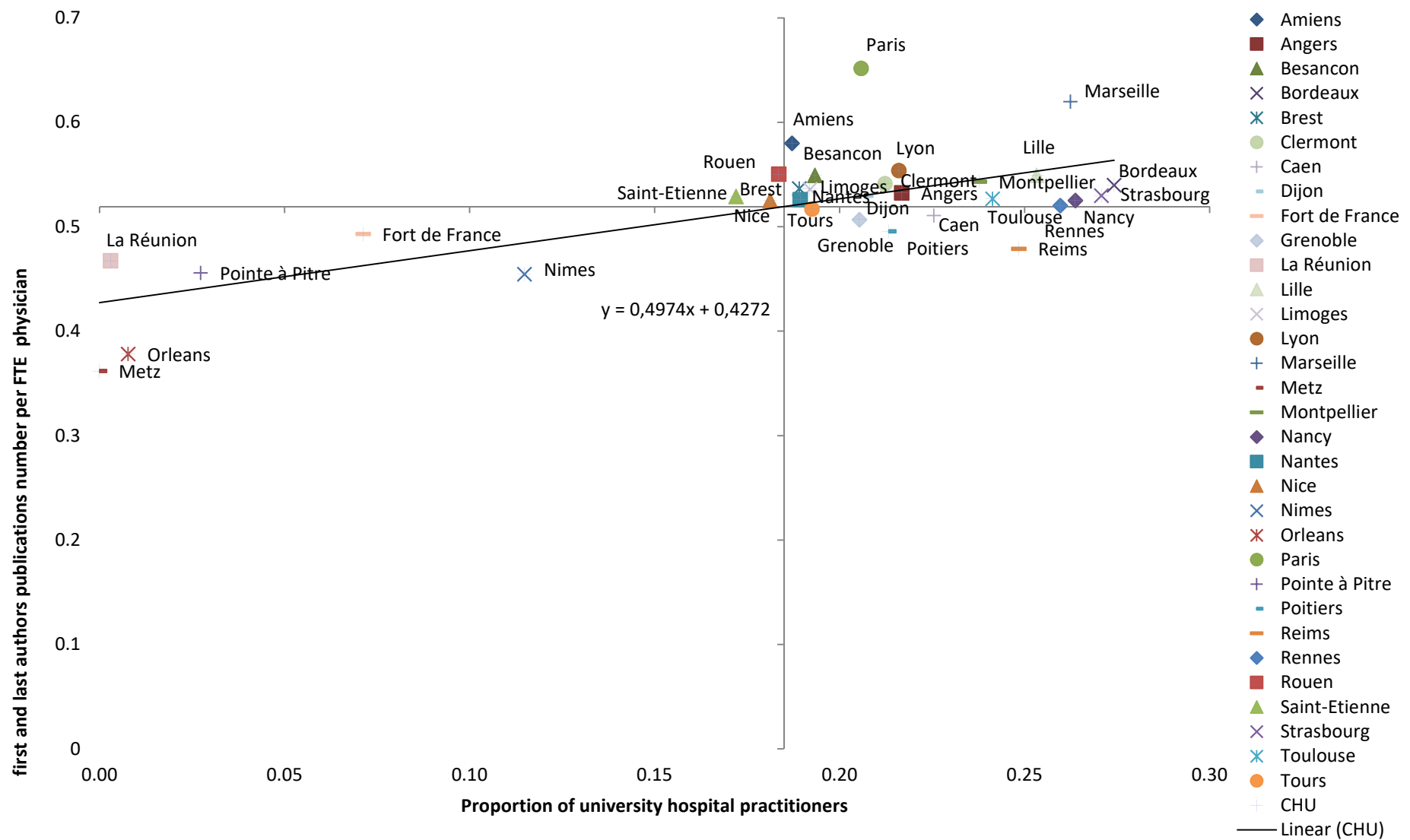


Figure 4: Proportion of best author position and proportion of university hospital practitioners

Table 1: Yearly number of publications for the 32 public teaching hospitals over the ten-year period (2004-2014)

	Number of publications per year										
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Amiens	224	230	220	264	291	315	356	339	342	391	371
Angers	284	302	297	341	350	345	397	417	454	462	521
Besançon	237	240	307	264	285	268	320	352	392	408	452
Bordeaux	630	797	712	796	815	863	883	973	997	961	993
Brest	189	218	242	269	274	276	306	318	332	325	390
Caen	240	252	230	288	311	287	305	288	355	423	425
Clermont-Ferrand	279	261	277	291	309	303	332	362	380	463	472
Dijon	251	249	284	335	350	354	370	419	403	404	451
Fort de France	33	38	42	50	54	67	57	56	51	66	62
Grenoble	413	463	445	474	531	503	562	559	640	676	717
La Réunion	40	52	47	62	55	70	99	103	115	136	117
Lille	739	766	848	792	889	979	1003	1104	1124	1182	1235
Limoges	221	193	255	235	197	235	236	276	293	300	334
Lyon	1237	1301	1335	1440	1540	1460	1575	1638	1795	1756	1790
Marseille	847	947	1000	895	1045	1119	1145	1120	1324	1373	1408
Metz	19	25	27	24	22	19	27	28	37	41	29
Montpellier	612	716	664	694	792	878	922	981	968	1101	1116
Nancy	535	513	565	557	559	584	652	648	710	771	743
Nantes	437	537	507	534	587	641	731	749	770	813	852
Nice	305	385	379	409	428	460	480	446	496	520	557
Nimes	111	152	150	151	269	332	430	432	487	505	520
Orléans	30	47	48	58	59	60	111	65	78	84	106
Paris	5765	6261	6400	6657	7023	7263	7401	7528	7857	8012	7905
Pointe à Pitre	16	18	25	18	24	32	36	29	31	60	69
Poitiers	200	212	200	198	217	236	241	237	310	319	313
Reims	167	248	212	210	244	226	250	236	311	330	310
Rennes	323	365	400	393	423	497	482	458	556	586	616
Rouen	316	359	376	387	394	385	488	438	460	438	454
Saint-Etienne	213	223	240	251	259	278	277	323	378	365	441
Strasbourg	518	534	628	676	700	631	736	743	762	752	763
Toulouse	577	679	757	810	784	861	856	927	1017	1162	1123
Tours	298	322	341	386	371	422	462	473	514	581	588
Total	12780	13712	14186	14337	15195	15649	16204	16440	17314	17846	17737

Each public teaching hospital was named by its town's location.

Table 2: Data collected for the 32 French public teaching hospitals, from 2004 to 2014, expressed as means per FTE physician: publication numbers, number of hospital stays, number of residents, number of university hospital practitioners, best journal publications and best author position

	Mean from 2004 to 2014						
	publications number / FTE physician	DRG/ FTE physician	number of residents / FTE physician	number of FTE physicians	% of university hospital practitioners / FTE physician	% of best journal / all publications	% of best author position / all publications
Amiens	0,66	<b>256,5</b>	<b>0,78</b>	453,3	0,19	<u>0,33</u>	<b>0,58</b>
Angers	<b>0,92</b>	224,2	0,66	406,3	<b>0,22</b>	0,39	0,53
Besançon	0,75	<b>283,4</b>	<b>0,77</b>	420,6	0,19	0,36	<b>0,55</b>
Bordeaux	<b>1,01</b>	<b>264,2</b>	0,65	844,0	<b>0,27</b>	<b>0,43</b>	0,54
Brest	<u>0,62</u>	<u>215,8</u>	0,59	452,6	0,19	<b>0,40</b>	0,54
Clermont-Ferrand	0,67	<u>200,2</u>	0,59	495,6	0,21	0,36	0,54
Caen	0,73	232,4	<b>0,81</b>	420,0	<b>0,23</b>	0,38	0,51
Dijon	<b>0,86</b>	232,3	<b>0,93</b>	404,7	0,21	<b>0,41</b>	0,53
Fort de France	<u>0,16</u>	<u>208,0</u>	<u>0,46</u>	330,7	<u>0,07</u>	<u>0,27</u>	<u>0,49</u>
Grenoble	<b>0,92</b>	<u>211,5</u>	0,60	582,0	0,21	<b>0,41</b>	0,51
La Réunion	<u>0,15</u>	228,3	<u>0,27</u>	512,9	<u>0,00</u>	<u>0,28</u>	<u>0,47</u>
Lille	<b>1,04</b>	<u>191,7</u>	<b>0,78</b>	919,3	<b>0,25</b>	0,38	<b>0,55</b>
Limoges	0,67	<b>308,2</b>	0,63	373,0	0,19	0,36	0,54
Lyon	<b>0,91</b>	<u>190,1</u>	<u>0,48</u>	1678,3	<b>0,22</b>	<b>0,41</b>	<b>0,55</b>
Marseille	<b>1,00</b>	244,9	<b>0,79</b>	1092,4	<b>0,26</b>	0,38	<b>0,62</b>
Metz	<u>0,07</u>	<b>365,2</b>	<u>0,42</u>	367,9	<u>0,00</u>	<u>0,23</u>	<u>0,36</u>
Montpellier	<b>1,09</b>	<u>166,5</u>	0,68	778,0	<b>0,24</b>	<b>0,42</b>	0,54
Nancy	<b>1,10</b>	<u>209,1</u>	<b>0,69</b>	559,5	<b>0,26</b>	0,39	0,53
Nantes	<b>0,91</b>	<u>191,1</u>	<u>0,51</u>	704,8	0,19	<b>0,43</b>	0,53
Nice	0,82	<u>210,6</u>	<u>0,52</u>	532,1	0,18	<b>0,42</b>	0,53
Nimes	0,75	234,5	<u>0,50</u>	377,0	<u>0,11</u>	0,39	<u>0,45</u>
Orléans	<u>0,21</u>	<b>331,4</b>	<u>0,29</u>	308,7	<u>0,01</u>	<u>0,34</u>	<u>0,38</u>
Paris	<b>0,97</b>	<u>159,2</u>	<u>0,41</u>	7289,2	0,21	<b>0,43</b>	<b>0,65</b>
Pointe à Pitre	<u>0,12</u>	<u>216,4</u>	<u>0,41</u>	247,9	<u>0,03</u>	<u>0,28</u>	<u>0,46</u>
Poitiers	0,68	<b>389,1</b>	<b>0,95</b>	353,2	0,21	<b>0,40</b>	0,50
Reims	<u>0,58</u>	218,0	<b>0,83</b>	423,7	<b>0,25</b>	0,37	<b>0,48</b>
Rennes	<b>0,89</b>	<u>216,1</u>	0,66	514,9	<b>0,26</b>	0,39	0,52
Rouen	0,79	238,6	<b>0,73</b>	516,1	0,18	<u>0,35</u>	<b>0,55</b>
Saint-Etienne	0,66	<u>191,7</u>	0,60	438,0	0,17	<u>0,35</u>	0,53
Strasbourg	<b>0,92</b>	223,9	0,68	735,1	<b>0,27</b>	<b>0,41</b>	0,53
Toulouse	<b>0,95</b>	231,4	<b>0,73</b>	893,6	<b>0,24</b>	<b>0,41</b>	0,53
Tours	0,78	<b>260,2</b>	0,65	542,6	0,19	0,36	0,52
Overall annual mean	0,73	235,8	0,63	780,26	0,18	0,37	0,52
95%CI	[0,63 ; 0,83]	[217,8; 253,7]	[0,57; 0,68]	[357,29;1203,2]	[0,16;0,21]	[0,36;0,39]	[0,50;0,54]

Each public teaching hospital was named by its town's location. All results which are above the 95%CI of the overall annual mean are in bold. All results which are below are underlined. FTE: Full Time Equivalent; DRG: Diagnosis Related Groups