# Presence of Primary Care Physicians and Patients' Ability to Register: A Simulated-Patient Survey in the Paris Region

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## ABSTRACT

Using the health care system fully in some countries requires patients to register with a primary care physician (PCP). Public health policies measure PCP density to maintain satisfactory local PCP supplies and limit geographic inequalities. In an exhaustive simulated-patient survey in the Paris, France region, we analyzed how well presence of PCPs was associated with patients' ability to register for care. Of 5,188 census blocks, 55.4% had at least 1 PCP; however, only 38.6% had at least 1 PCP accepting registration for office visits, and only 19.4% had at least 1 PCP accepting registration for home visits ($P < .001$ across the 3 indicators). Cross-block inequalities in accepting registration were steeper than those related to PCP density, indicating that this density metric offers false reassurance and is inadequate to support policy decisions.

## INTRODUCTION

Most developed countries use patient registration with a primary care physician (PCP) as a policy instrument[1]; patients register with a PCP who coordinates their care and regulates their access to secondary care.[2] Although patients in France can choose their PCP, care for unregistered patients is reimbursed at lower levels, and access to specialist and inpatient care is limited (both require referral letters). Furthermore, as PCPs are not responsible for specific geographic populations, they can decline to register new patients.

Finding a PCP with whom to register is thus a prerequisite for benefiting fully from the French health care system, access to which can be undermined if a substantial share of PCPs decline to register new patients. PCPs can also decline appointments to unregistered patients.[3]

Public health policies use PCP density (or more sophisticated derived indicators)[4] to maintain satisfactory local PCP supplies and to limit geographic inequalities. Nonetheless, the association between PCP presence and a patient's ability to register for care remains unknown.

In this observational survey, we analyzed the local PCP supply by several indicators—related to whether a PCP was present in the area and was accepting registration of new patients—to compare local PCP supply and inequalities in PCP supply by population density and by deprivation level.

## METHODS

We obtained the postal addresses and telephone numbers of all PCPs in the Paris region (ie, Ile-de-France region or Paris metropolitan area, with more than 12 million inhabitants) as of January 2017 from the online health insurance fund directory (https://annuairesante.ameli.fr/). This directory is designed to facilitate patient searches for health professionals.

We constructed 3 indicators of a census block's local PCP supply: (1) PCP was present; (2) PCP was accepting new patient registration for office visits; and (3) PCP was accepting new patient registration for home visits. Each indicator was used both in binary form and in continuous form (by calculating the number of PCPs of given type per 10,000 inhabitants).

For our first objective, we used a log-binomial model to compare the 3 binary indicators of the possibility of finding at least 1 PCP of a given type and a Poisson model for the 3 continuous indicators, that is, the numbers of PCPs of a given type per 10,000 inhabitants, which generally reflects patients' ability to choose among several PCPs.

For our second objective, we used similar models and separately integrated, as independent variables, the municipal density ([https://www.data.gouv.fr/fr/datasets/r/24d09554-a18a-4813-888e-23ff9c5da677](https://www.data.gouv.fr/fr/datasets/r/24d09554-a18a-4813-888e-23ff9c5da677)) and the social deprivation index, both in tertiles.[5] We tested interactions to determine whether the magnitude of inequality by tertile was similar for each indicator.

The study was reported to the National Data Protection Authority. We subsequently informed all physicians by postal mail that they had participated and could object use of their data, but none did.

**Table 1. Comparison of PCP Presence and Willingness to Register Patients for Visits (N = 5,188 Census Blocks)**

| Indicator of Local PCP Supply | Present | Registering Patients for Office Visits | Registering Patients for Home Visits | *P* Value[a] |
|---|---|---|---|---|
| Block has ≥1 PCP of this type, No. (%) | 2,905 (55.4) | 2,004 (38.6) | 1,008 (19.4) | <.001[b] |
| Number of PCPs of this type per block per 10,000 inhabitants, mean (SD) | 7.59 (18.4) | 3.32 (6.10) | 1.31 (9.20) | <.001[c] |

PCP = primary care physician.

Notes: The binary indicators (block has vs does not have at least 1 PCP of given type) reflect the minimum ability of patients to find a physician; the continuous indicators (numbers of PCPs of given type per number of inhabitants) reflect patients' possible ability to choose among several physicians. See Methods for details.

[a] Indicators of local PCP supply were compared by using empty mixed models (ie, those without any independent variables) with a random intercept and 2 levels (block level and municipality level, to take into account possible municipal policies related to primary care supply).
[b] The 3 binary indicators were compared with a log-binomial model.
[c] The 3 continuous indicators were compared with a Poisson model containing as an offset the logarithm of the number of inhabitants in the block, to take physician density into account.

## RESULTS

Among the 9,505 PCPs identified, 1,334 (8.6%) were excluded, mainly because they were unreachable (**Supplemental Figure 1**). Of the 8,171 PCPs contacted, 4,061 (49.7%) were willing to register a new patient for office visits and 1,532 (18.8%) were willing to register a new patient for home visits.

Of the 5,188 census blocks in Ile-de-France, 55.4% had at least 1 PCP; however, only 38.6% of blocks had at least 1 PCP accepting new patients for office visits and only 19.4% had at least 1 PCP accepting new patients for home visits (*P* <.001) (Table 1). The number of PCPs per block for each indicator decreased similarly and significantly.

Regardless of the indicator of local PCP supply considered, the indicator increased with density and inversely to deprivation (Table 2). These inequalities of PCP supply varied significantly in magnitude with the local supply indicator considered (interaction tests were significant) and were greater for indicators of willingness to register patients than for PCP presence.

## DISCUSSION

Physicians' desire to reduce or not increase their workloads might explain the limited willingness to register new patients that we observed.[6] PCPs most commonly declined the most time-consuming care—home visits—and in areas with the highest workloads (lowest PCP density and most disadvantaged population). As the COVID-19 pandemic has reminded us,[7] workload, associated with professionals' well-being and quality of care, could be a determinant in physicians' decisions to stop accepting new patients.

Our indicators were constructed at the census block level. They do not consider the distance between blocks that patients must travel to find a PCP. As distances are more difficult to traverse in the least dense and the least advantaged

blocks,[8] we have probably underestimated patients' difficulties in accessing a PCP in these areas.

The decrease in the number of PCPs in the Paris region since our data collection (–1.4% between 2018 and 2022[9]) is likely to continue, suggesting that rates of declining may be higher now and over the next 10 years.

The very wide diversity of municipal density and socioeconomic disparities in the Paris region is much like that of France as a whole. Thus, similar observations, with some variations, could likely be made throughout the country.

Despite the demonstrated mortality-reducing benefits of home visits, access to these visits seems particularly limited.[10] This finding implies that accelerating the delegation of this task to nurse practitioners and other nonphysicians may be useful.

Many countries have reformed their health care system by mandating that patients register with a PCP, with enforcement by financial penalties. Difficulties in accessing registration could exclude a group of patients from the health care system. Reforms that increase inequitable access to registration may aggravate existing geographic inequalities in health.[11] The indicators of PCP presence alone appear too reassuring—both globally and in terms of cross-block inequalities—to justify building public health policies on these indicators alone.

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**Supplemental materials**

## References

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**Table 2. Inequalities in PCP Supply by Population Density and by Deprivation Level, and Variation of Inequalities Across Indicators (N = 5,188 Census Blocks)**

| Indicator of Local PCP Supply | Tertile of Municipal Population Density | % (No.) of Blocks | RR (95% CI)[a] | P Value | Tertile of Social Deprivation Index | % (No.) of Blocks | RR (95% CI)[a] | P Value |
|---|---|---|---|---|---|---|---|---|
| **Blocks has ≥1 PCP …** | | | | | | | | |
| … present | Low | 41.6 (715) | ref | <.001 | High | 49.7 (850) | ref | <.001 |
| | Medium | 56.8 (987) | 1.36 (1.27-1.46) | | Medium | 50.0 (854) | 1.01 (0.94-1.08) | |
| | High | 69.6 (1,202) | 1.67 (1.56-1.80) | | Low | 68.2 (1,200) | 1.33 (1.25-1.41) | |
| … registering patients for office visits | Low | 26.0 (450) | ref | <.001 | High | 32.2 (550) | ref | <.001 |
| | Medium | 38.0 (663) | 1.46 (1.31-1.62) | | Medium | 33.1 (565) | 1.03 (0.94-1.14) | |
| | High | 51.6 (892) | 1.98 (1.79-2.18) | | Low | 50.5 (889) | 1.57 (1.42-1.74) | |
| … registering patients for home visits | Low | 14.1 (244) | ref | <.001 | High | 13.5 (230) | ref | <.001 |
| | Medium | 17.9 (311) | 1.26 (1.06-1.50) | | Medium | 16.2 (277) | 1.20 (1.02-1.42) | |
| | High | 26.2 (453) | 1.84 (1.58-2.14) | | Low | 28.5 (501) | 2.12 (1.81-2.48) | |
| **Number of PCPs … per block per 10,000 inhabitants** | Tertile of Municipal Population Density | Mean (SD) | IRR (95% CI)[b] | P Value | Tertile of Social Deprivation Index | Mean (SD) | IRR (95% CI)[b] | P Value |
| … present | Low | 5.45 (20.6) | ref | .001 | High | 6.71 (26.2) | ref | <.001 |
| | Medium | 7.05 (10.7) | 1.06 (0.95-1.18) | | Medium | 5.90 (11.0) | 1.13 (0.95-1.33) | |
| | High | 10.3 (21.6) | 1.29 (1.13-1.48) | | Low | 10.1 (14.4) | 1.47 (1.28-1.68) | |
| … registering patients for office visits | Low | 1.97 (5.11) | ref | <.001 | High | 2.42 (5.34) | ref | <.001 |
| | Medium | 3.06 (5.93) | 1.19 (1.03-1.38) | | Medium | 2.24 (5.70) | 1.02 (0.89-1.18) | |
| | High | 4.45 (6.89) | 1.67 (1.44-1.93) | | Low | 4.50 (6.92) | 1.60 (1.40-1.82) | |
| … registering patients for home visits | Low | 0.93 (3.33) | ref | .02 | High | 1.18 (15.2) | ref | <.001 |
| | Medium | 1.12 (3.24) | 0.88 (0.70-1.11) | | Medium | 1.00 (3.37) | 1.13 (0.83-1.54) | |
| | High | 1.91 (15.2) | 1.28 (1.02-1.60) | | Low | 1.78 (3.76) | 1.82 (1.31-2.54) | |

IRR = incidence rate ratio; PCP = primary care physician; ref = reference group; RR = relative risk.

Notes: The least dense and the most deprived tertiles are the reference groups. For example, patients in the least deprived vs most deprived tertile were 33% more likely to have access to at least 1 PCP (RR = 1.33), 57% more likely to have access to at least 1 PCP willing to register a new patient for office visits (RR = 1.57), and 112% more likely to have access to at least 1 PCP willing to register a new patient for ongoing home visits (RR = 2.12). All interactions of indicators with tertiles were statistically significant (P <.001).

[a] RRs were calculated by a univariate log binomial mixed model with a random intercept and 2 levels (block level and municipality level, to take into account possible municipal policies related to the primary care supply).
[b] IRRs were calculated by a univariate Poisson mixed model with a random intercept and 2 levels (block level and a municipality level, to take into account possible municipal policies related to the primary care supply). The offset is the number of inhabitants per census block.

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