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Cream skimming and discrimination in access to medical care: A field experiment

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Abstract

This study measures the differences in access to healthcare for female patients in France in three medical specialties (dentistry, gynecology and psychiatry) according to two criteria: the African ethnicity of the patient and the benefit of having means-tested health insurance coverage. To this purpose, we conducted a nationally representative field experiment on more than 1500 physicians. We do not find substantial discrimination against the patient of African origin. However, the results indicate that patients with means-tested health insurance coverage are less likely to get an appointment. Differentiating between two types of coverage, we show that the lesser-known coverage (ACS) is more penalized than the other (CMU-C) as poor knowledge of the program increases the physician's expectation of additional administrative tasks and is an important element to explain cream-skimming. We also find that, for physicians who are free to set their fees, the opportunity cost of accepting a means-tested patient increases the penalty. Finally, the results suggest that enrollment in OPTAM, the controlled pricing practice option that incentivizes physicians to accept means-tested patients, reduces cream-skimming.

KEYWORDS

access to health care, audit study, cream-skimming, discrimination, field experiment

JEL CLASSIFICATION

J14, J15, J18, I14

1 | INTRODUCTION

Research on discrimination has shown evidence of discrimination on various grounds (e.g., sex, ethnic origin or place of residence) and in different markets such as the labor and housing markets (Neumark, 2018). The Hippocratic oath taken by physicians and the special nature of the health care market may spare access to medical care from this phenomenon. However, a growing body of research shows that physicians tend to select patients based on characteristics they consider desirable such as ethnicity or health insurance coverage.

Although physicians are allowed to refuse care, they can only do so under certain conditions within a complex legal framework. Discriminatory refusal of care is unlawful. People of lower socio-economic status and minorities often have more healthcare needs, and discrimination acts as a barrier to narrowing the health disparities that exist between these sectors of

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the population and others. Beyond the legal, moral and societal questions, it is also a matter of public health in that people in precarious situations tend to be more exposed to transmissible infectious diseases and this represents a collective health risk (Valin & Girard, 2012).

In this study, we experimentally assess the presence of cream-skimming¹ and discrimination in the refusal of health care to a female patient. Two criteria are tested: ethnic origin and the benefit of means-tested health insurance coverage. The experiment consists of an audit correspondence study by telephone conducted in France between February and April 2019 to solicit appointments from a large and nationally representative sample of physicians in three medical specialties: gynecology, dentistry and psychiatry. For each specialty, three female patients requested an appointment: a patient of French origin as revealed by her first name and last name; a patient of French origin indicating that she benefits from means-tested health insurance coverage; a patient of African origin (first names with alternating Muslim and Christian connotations) indicating half of the time that she benefits from means-tested health insurance coverage. We tested 1500 physicians (500 per specialty), with 4500 appointment requests.

We do not find substantial discrimination toward patients of African origin. However, we find that patients with means-tested health insurance coverage are less likely, by between 15% and 23%, to get an appointment in the three medical specialties tested. Differentiating between two types of coverage, we show that the lesser-known coverage (ACS) is more penalized than the other (CMU-C), suggesting that poor knowledge of the programs cause the physician to expect additional administrative tasks, thus resulting in cream-skimming. Exploring differences in cream-skimming by physician characteristics, reveals that the penalty is higher for physicians who are free to set their fees as they face a loss of earning when they accept a means-tested patient. The results also indicate that participation in OPTAM, the controlled pricing practice option that incentivizes physicians to accept means-tested patients, reduces cream-skimming. Finally, we find no strong evidence of discrimination in indirect refusal of care in the form of longer waiting times for an appointment (see online Supporting Information S1).

Our first contribution is to extend the evidence on ethnic discrimination in access to healthcare outside the United States. Indeed, despite the growing body of literature on the subject, evidence of ethnic discrimination in access to healthcare remains largely limited to this country (Button et al., 2020; Kugelmass, 2019; Leech et al., 2019; Sharma et al., 2015, 2018; Shin et al., 2016; Wisniewski et al., 2021; Wisniewski & Walker, 2020). The fact that its healthcare system is mainly private and has a lower level of regulation compared to most OECD countries may could lead to greater discrimination.

Most of the studies on cream-skimming by patient health insurance coverage are also conducted in the United States. Clemens and Gottlieb (2014), Decker (2015), Skaggs et al. (2006), Chou et al. (2018) and Bisgaier and Rhodes (2011) show that being covered by Medicaid reduces the likelihood of getting an appointment. However, the private nature of the US healthcare system is also likely to have a substantial influence on the level of cream-skimming based on patients' health insurance coverage. In the United States, privately managed healthcare insurers individually negotiate reimbursement rates with networks of providers, with the public system for the poor (Medicaid) paying lower rates than private insurers or the single-payer Medicare system for the elderly (Werbeck et al., 2021). In this context, insurance status is likely to be scrutinized by physicians before accepting a patient. This type of cream-skimming is expected to be less important in a predominantly single-payer system like France. However, there is some evidence from Germany, where the healthcare system is also predominantly public, that patients with public health insurance coverage have to wait longer for an appointment (Heinrich et al., 2018; Kuchinke et al., 2009; Lungen et al., 2008; Schwartz et al., 2006), have fewer appointments (Werbeck et al., 2021) and are less healthy due to poorer access to preventive care (Hulleig & Klein, 2010).

Our second contribution is to extend the literature on cream-skimming and discrimination to medical specialties. Most of the current literature focuses on primary care (Angerer et al., 2019; Bisgaier & Rhodes, 2011; Leech et al., 2019; Olin et al., 2016; Polsky et al., 2015; Rhodes et al., 2014; Sharma et al., 2015, 2018; Werbeck et al., 2021; Wisniewski et al., 2021; Wisniewski & Walker, 2020). Some studies focus on mental healthcare and therapy (Button et al., 2020; Kugelmass, 2016; Shin et al., 2016) and on dermatology (Resneck et al., 2004) but little is known about other medical specialties such as gynecology and dentistry. However, refusal of care in medical specialties, which are generally less regulated, may differ from the situation in primary care. For example, in France in 2013, only 7% of general physicians were free to fix their own fees compared to 33% of psychiatrists and 59% of gynecologists.² This could cause higher levels of cream-skimming in medical specialties.

Our third contribution is to explore the mechanisms underlying patient cream-skimming by health insurance coverage using variations in physician pricing practices and differences between two means-tested health insurance coverage. Although the level of payment associated with a patient's health insurance coverage is likely to be one of the main mechanisms, it is not necessarily the only one (Werbeck et al., 2021). Different forms of health insurance coverage may signal different socio-economic characteristics, a difference in the perceived remuneration for the physician, as well as additional administrative tasks. Indeed, some studies have shown that medical care received can be influenced by the patient's level of education and income. Laudicella et al. (2012) and Monstad et al. (2014) showed that in England and Norway, respectively, patients with lower levels of education

and income have longer waiting times. Education level also appears to affect appointment availability (Angerer et al., 2019) and level of treatment (Gottschalk et al., 2020).

Our last contribution is to the growing literature on testing the effectiveness of anti-discrimination laws (Agan & Starr, 2017; Ameri et al., 2018), incentive schemes (Chareyron et al., 2022) and public service announcements on anti-discrimination laws (Fang et al., 2019; Murchie et al., 2021), using audit field experiments. In this regard, we provide evidence of the effectiveness of an innovative French initiative that aims to reduce refusal of care to patients with means-tested health insurance coverage. This program is an optional controlled pricing practice (OPTAM) that incentivizes physicians to accept means-tested patients. It involves the signatory physician committing to a certain percentage of consultations with means-tested patients in exchange for a better valuation of their activity (i.e., annual bonus).

In the next section, we provide background information on the institutional context and mechanisms to explain cream-skimming. Section 3 describes the protocol of the experiment. Section 4 presents the dataset and Section 5, the statistical method. We outline the results in Section 6. Finally, we discuss the limits and implications of the results in the last section.

2 | BACKGROUND

2.1 | Institutional context

In France, like in many other OECD countries, the financing of a medical act is divided into two parts: one part is covered by the universal health benefit (PUMA), and the complementary part (also called “co-payment”) is at the patient's expense but can be covered by a complementary medical insurance. For example, in 2020, the regulated fee for a psychiatric consultation was €46.7. The universal health benefit system (PUMA) covers 70% of the cost, that is, €32.7. The remaining cost of €14 is charged to the patient. This cost can be a barrier to care when an individual cannot afford complementary medical insurance.

The additional cost can be higher for physicians who do not apply the regulated fee on which PUMA coverage is calculated as some are allowed to charge more than the regulated fees.³ For example, the regulated fee (*tarif conventionnel*) is €30 for a simple gynecological consultation but unregulated physicians in Paris often charge up to €120. In our samples, the average price of a consultation in the unregulated sector is €71 for a gynecologist and €76.4 for a psychiatrist (the regulated price is €46.70 psychiatric consultation). In this case, even complementary insurance may not fully cover the costs and the difference is then charged to the patient.

In consequence, access to healthcare for disadvantaged households is facilitated by covering their health expenses through two types of reimbursements: the compulsory part is covered by the universal health benefit (PUMA), the complementary part (co-payment) is covered by the universal complementary health coverage (CMU-C) or partially covered by the complementary health assistance (ACS). The two types of health insurance coverage reduce the financial barriers to healthcare for more than 7 million poor people as of the end of May 2019 (5.64 million for the CMU-C and 1.7 million for the ACS). These forms of health insurance coverage are means-tested. Most OECD countries also provide government-funded basic primary health coverage. Universal coverage covers a defined “basket” of benefits, often with some cost-sharing, which usually includes consultations with general physicians and specialists, tests and examinations, and surgical and therapeutic procedures (OECD, 2017).

People residing in France on a stable and regular basis with a monthly income of less than €746 are entitled to the CMU-C introduced in 1999. In addition to coverage of the complementary part (co-payment) of health expenses, the CMU-C also includes packages for dental care, glasses and hearing aids. People whose monthly resources are slightly higher, between €746 and €1007, are entitled to ACS, created in 2004 to reduce the threshold effect at the end of the CMU-C. This aid makes it possible to reduce, and, in some cases, cover the cost of an annual contribution to a complementary medical insurance. The amount of the ACS increases with the age of the beneficiary to compensate for the increased cost of complementary medical insurance with age.

Both CMU-C and ACS programs preclude the charging of surplus fees by physicians. This means that even physicians who are normally allowed to charge more than the regulated fees cannot do so to a patient benefitting from CMU-C or ACS. Another particularity of these two programs is that they do not require the patients to pay upfront for medical acts, whereas patients usually pay for their care before being refunded by the PUMA and the complementary medical insurance.

Finally, another important financing mechanism in the French healthcare system is the controlled pricing practice option called OPTAM. This program is mainly aimed at unregulated physicians and participation is voluntary. The signatory physicians undertake to respect the average surplus charge for their specialty with a ceiling of 100% of the regulated fees. For example, if the regulated fee is €25, the physician cannot charge more than €50. Participating physicians also commit to providing a certain percentage of consultations with no surcharge for medical emergencies or CMU-C or ACS beneficiaries. In return, they benefit from an increased valuation of their activity carried out at the agreed rates and an annual bonus.

2.2 | Mechanisms

First, we test the presence of discrimination against patients of African origin in the access to healthcare. Discrimination could exist due to a physician's preference for patients from the same ethnic group (M1a). As indicated by Alsan et al. (2019), taste-based discrimination (Becker, 1957) on the part of the patient or doctor could imply that individuals are averse to interacting with those who do not share their racial background. Discrimination may also occur for statistical reasons (Arrow, 1971): physicians may discriminate patients of African origin because, in the context of imperfect information, they use the patient's ethnicity to infer her poverty level or ability to pay the surcharge of the physician (M1b).

Second, we want to test whether means-tested patients are penalized in their access to care compared to patients without such coverage. A first potential mechanism (M2a) is that means-tested coverage acts as a signal of poverty and leads the physician to prefer better-off patients. Physicians might expect richer patients to be healthier and to have fewer comorbidities, which would imply shorter treatments. A second potential mechanism (M2b) is that means-tested patients are disadvantaged because of perceived additional administrative costs for the physicians. Patients with means-tested coverage do not pay the fees upfront. To be paid, physicians have to undertake administrative procedures producing a delay between the medical act and payment.⁴ Physician payment submissions are similar for both programs and, in fact, are no more burdensome than for patients without these forms of health insurance coverage. However, physicians may perceive these costs as higher due to a lack of information about these programs: tasks take longer when they are unfamiliar and they may overestimate the number of them. The last potential explanation (M2c) is that beneficiaries are penalized because of the reduced remuneration for the physician given that these health insurance coverages preclude a fee surcharge.

3 | EXPERIMENTAL PROTOCOL

Access-to-care tests were carried out using the most common means of requesting a medical appointment, by telephone.⁵ The experiment was conducted between February and April 2019. Only the appointment booking stage was tested, that is, the response of the medical scheduling staff or physician after becoming aware of the tester's insurance status. Our methodology, an audit field experiment, is widely used in research on discrimination (Bertrand & Duflo, 2017), particularly in employment or housing.

3.1 | Two criteria: Means-tested health insurance coverage and ethnic origin

The protocol for this research aims to measure the prevalence of refusal of care by ethnic origin and health insurance coverage. In this study, as in the study by Wisniewski and Walker (2020), all patients are women, allowing for a similar experimental protocol in all three medical specialties. We consider two ethnic origins: a patient who implies French origin through her first and last name and a patient whose African origin is implied by her first and last name. We chose a patient from a West African country because of their prevalence in France. As this population is composed of Christians and Muslims, we alternate first names to suggest Christian and Muslim religions. Thus, the first name of the patient with an African surname suggests either a Muslim (e.g., Fatou, Aïcha, Aminata) or a non-Muslim identity (e.g., Grace, Philomene, Honorine), the selection of the first name being random. To avoid detection, we used a total of 44 different first and last names. Common West African surnames were chosen. Table A1 in the appendix presents first and last names used in our test. The ranking is based on the total number of female first names given in France in 1985 and on surnames common in 1981–1990. All surnames and all but one of the first names used in the test are in the first quartile of names for the period under consideration.

3.2 | Scripts and preliminary testing

Three fictitious patients call each physician to request an appointment. One is the reference patient who keeps the same characteristics for each call. Some characteristics of the other two patients are randomly assigned.

- i) The reference patient has a French-sounding first and last name and does not have means-tested health insurance coverage.
- ii) A patient with a French-sounding first and last name indicates that she benefits from either the CMU-C (50% of the time) or the ACS (50% of the time).

- iii) A patient with an African-sounding first and last name indicates half of the time that she benefits from means-tested health insurance coverage (alternating between CMU-C and ACS). For each physician, patient (iii) announced the same type of means-tested health insurance coverage (CMU-C or ACS) as patient (ii).

Table A2 in Appendix 3 shows the probabilities of obtaining the different patient profiles. The reference patient calls all the physicians and is therefore present in one third of the observations, whereas a Christian patient of African origin with ACS coverage calls only one physician out of eight and is present in 1/24th of the observations. The call order of the three patient profiles is random, except for the reference patient. The reference patient calls last every time. This was requested by one of the partners in the experiment. This may lead an underestimate of discrimination since the last position is generally associated with the lowest probability of a positive response in labor market correspondence tests. However, in the case of medical appointments, there is no reason why the order of the call should be systematically related to the probability of a positive response since there are almost always appointment times available, even if they are far out. Using the random change in the call order of the first two patients, we provide evidence in Section 6 that fixing the call order of the reference patient does not bias the results.

The appointment request scripts are both simple and neutral. In the event of a request for clarification from the medical scheduling staff on the reason for the appointment, the most common medical reason for consultation in each specialty was indicated (toothache for the dentist, suspicion of pregnancy for the gynecologist, suspicion of long-term depression for the psychiatrist), without mentioning any medical urgency in order to avoid biasing the results due to the unavailability of the physician. The reasons for consultation were written to be equivalent in nature from one patient to another. Scripts are the same length when spoken over the phone. Notably, they suggested a similarly moderate level of urgency. The scripts were written to be realistic with sufficient detail to limit the risk of the caller having to respond to unexpected queries. The scripts were also planned not to result in a formal appointment to avoid cluttering the practices with false appointment requests. When the patient is offered an appointment, she tries to give a reason not to book it (e.g., too much time before the appointment). If necessary, patients book an appointment but cancel it later.

We tested the appointment request scripts in two different ways. First of all, two medical secretaries with extensive experience in the medical specialties being tested were interviewed to validate the credibility of the scripts. In particular, they confirm that it is realistic for patients to announce their distinctive characteristics from the outset, for example, specifying at the outset that they are beneficiaries of CMU-C or ACS. Then, the scripts were validated over 1 day of preliminary testing for each of the three specialties. This test phase confirmed that it was realistic to announce having means-tested health insurance coverage when making a telephone appointment. It is not mandatory to report this, but since people with ACS and CMU-C health insurance coverage are often turned down because of their health insurance coverage, they usually mention it during their first contact. We introduced minor modifications to the contact style at the end of this test phase. The scripts are included in Appendix 2.

As can be seen in Appendix 2, for each of the medical specialties, each of the three patients has a specific script. Furthermore, the patient of African origin has two different scripts depending on whether she benefits from means-tested health insurance. As the scripts are fixed for each type of patient, it is particularly important that they differ in the wording to avoid detection without influencing the probability of being offered an appointment. Therefore, we have been particularly careful to change only the wording and order of the information from script to script. In Appendix 2, we also include a table comparing the scripts of the French patient and the African patient without means-tested health insurance coverage in the specialty of psychiatry. The table shows that all the information is the same for both patients. Some information may be more verbose for one of the patients, but the overall length of the message is similar for both patients.

Finally, to avoid any bias due to differences in caller characteristics, we randomly assigned the scripts to the three callers who performed the tests and we randomly switched the scripts between them throughout the testing.

3.3 | Sample of physicians

An original feature of this study is that it provides a nationally representative measure of the level of discrimination in each medical specialty. The random selection of physicians from an exhaustive list of physicians in France guarantees the representativeness of the sample. The testing is therefore representative of the overall diversity of the medical specialties targeted by the study.

The test covers three specialties: gynecology, dentistry and psychiatry. We decided to test 500 physicians in each of the three specialties. We randomly selected three samples of physicians from the reference database of the public health insurance website available to the public (Ameli.fr), which provides an exhaustive list of gynecologists (about 6000 physi-

cians), psychiatrists (about 6000 physicians) and dentists (about 35,000 physicians). The files include the name, address and telephone number of each physician. We also collected the information on regulation/unregulation of physicians' fees from Ameli.fr.

4 | DATA

4.1 | Data collection process

We conducted the audit test over 3 months, from early February to late April 2019. The receptions of physicians are frequently saturated and it was often necessary to call several times to reach the medical secretary or physician. The first caller made up to three attempts to obtain contact. Once the first call was successful, the second call was made, followed by the call by the reference patient. Calls were spaced at least 1 day apart and the time between the first valid call and the last was at most 4 days. When the first call is successful, the two last callers make several attempts to get an answer. A test is valid when all three calls are answered.

Callers reported no instances of the experiment being detected by the scheduling staff. In most of the situations where we do not get three calls, it is because the initial call is not answered. We believe that this situation corresponds to temporary unavailability, vacation or closure of the physician and is likely to be random. In 85% of the cases, when the initial call is taken, all three calls are successfully made. At the end, we got 1513 valid tests: 505 for gynecologists, 500 for dentists and 508 for psychiatrists.

4.2 | Sample characteristics

Selection of which physicians to call was random, but because we only retain tests where all three phone calls were answered, the characteristics of the sample may differ from the characteristics of the total population. Table 1 presents the characteristics of the three samples and those of the total population of the three medical specialties concerned for a few major geographical areas (i.e., the three most populous French cities, Paris, Lyon and Marseille, and the most populous region, Île-de-France, the greater Paris area). The geographic distribution and the fee regulation of the physicians in these samples are similar to those of the total population. The standardized differences between the prevalence of the variables in the sample and in the population are all but one <10 in absolute value, which is the commonly used level (Austin, 2009).⁶

Table A2 in the Appendix shows the number and proportion of calls made for each patient profile. These are very close to the proportions expected from the experimental design. Patients of French origin represent two-thirds of the calls, patients covered by ACS, 26.1% and patients covered by CMU-C, 24.5%.

Depending on the comparison made, the number of observations per group changes and the statistical power varies. For our two main comparison criteria, ethnicity and health insurance coverage, the statistical power is as follows. The probability of detecting a 4.5-percentage point (resp. 6-percentage point) difference in positive response between the reference patient and the patient of African origin (resp. the patient benefiting from CMU-C) is >85%, assuming a positive response rate to the reference patient of 70% and considering a risk α of 5%.

TABLE 1 Representativeness of the samples.

	Test sample	Total population	Standardized difference
	%	%	
Dentists			
Île-de-France	19.2	16.5	7.1
Paris	6.8	6.4	1.6
Lyon	4.4	3.1	6.8
Marseille	4.2	4.2	0.0
Unregulated	Almost 0	Almost 0	0.0
OPTAM	0		
Observations	500	35,848	

TABLE 1 (Continued)

	Test sample	Total population	Standardized difference
Gynecologists			
Île-de-France	26.3	20.5	13.7
Paris	12.9	10.0	9.1
Lyon	3.4	4.8	-7.1
Marseille	7.1	6.6	2.0
Unregulated	60.8	59.0	3.7
OPTAM	33.6		
Observations	505	5974	
Psychiatrists			
Île-de-France	27.0	28.4	-3.1
Paris	17.1	18.8	-4.4
Lyon	3.5	5.1	-7.9
Marseille	7.1	7.5	-1.5
Unregulated	37.4	33.0	9.2
OPTAM	10.0		
Observations	508	6895	

Note: The proportion of unregulated physicians in the total population is obtained from the database on the website (<http://www.ecosante.fr>). Standardized difference is computed as: $d = 100 \times \frac{(p_s - p_p)}{\sqrt{\frac{p_s(1-p_s) + p_p(1-p_p)}{2}}}$ where for each variable, p_s is the prevalence of the dummy variable in the sample and p_p the prevalence in the population.

Source: TEPP-CNRS, Testing TRICERATOPS.

5 | STATISTICAL METHOD

Since the data are from an experimental setting where scripts were randomly assigned to the callers and were randomly switched between them, descriptive statistics can give a first reliable insight into the results. Nevertheless, modeling the probability of obtaining a positive response allows us to explore the different mechanisms previously formulated. Controlling certain factors such as call date and caller can also increase the precision of the estimates. The main specification is:

$$\text{Appt}_{ip} = \alpha + \beta_1 \text{Afr}_i + \beta_2 \text{CMU}_i + \beta_3 \text{ACS}_i + \delta X_{ip} + \tau_s + \phi_p + \varepsilon_{ip} \quad (1)$$

where Appt_{ip} is a dummy variable indicating whether or not physician p offers an appointment to patient i . Afr_i , CMU_i and ACS_i are the variables of interest which indicate whether the patient is of African origin and benefits from CMU-C or ACS health insurance coverage, respectively. X_{ip} is a set of control variables indicating the time of the call of patient i to physician p (date and time of the day [morning, noon, afternoon]) as well as the gender of the scheduling staff, the role of the scheduling staff (scheduling staff or physician) and a caller fixed effect. τ_s are medical specialty fixed effects. Finally, we introduce physician fixed effects ϕ_p in the last specification to replace the medical specialty fixed effects. We cluster standard errors at the physician level.

Regarding the mechanism of cream-skimming, $\beta_2 < \beta_3$ would suggest that the means-tested health insurance coverage allows the physician to cream-skim poor patients (M2a) since, in this case, the program for poorer individuals (CMU-C) is more penalized than the program for less poor people (ACS). On the contrary $\beta_2 > \beta_3$ would suggest that physicians cream-skim to reduce administrative tasks (M2b), since the newest and least known program (ACS) that may lead the physician to expect high administrative cost is more penalized than the older one (CMU-C). However, these explanations are not mutually exclusive and it is only possible to observe whether one dominates the other.

The addition in Equation (1) of interaction terms between the ethnic origin of the patient and her health insurance coverage allows us to explore the mechanisms of discrimination against the patient of African origin.

$$\text{Appt}_{ip} = \alpha + \rho_1 \text{Afr}_i + \rho_2 \text{CMU}_i + \rho_3 \text{ACS}_i + \varphi_1 \text{Afr}_i \times \text{CMU}_i + \varphi_2 \text{Afr}_i \times \text{ACS}_i + \delta X_{ip} + \tau_s + \phi_p + \varepsilon_{ip} \quad (2)$$

$\rho_1 + \varphi_1 < 0$ or $\rho_1 + \varphi_2 < 0$ would suggest the presence of taste-based discrimination (M1a) because, even when both patients signal having means-tested health insurance coverage, there are differences in response to patients of African and French origin: discrimination remains even without information asymmetry.

$\varphi_1 > 0$ or $\varphi_2 > 0$ would suggest that part of the discrimination against patients of African origin is statistical (M1b). This would mean that physicians infer from the patient's African origin a higher probability of being poor or being a beneficiary of means-tested health insurance coverage. Reducing information asymmetry by indicating the benefit of means-tested health insurance coverage then reduces discrimination toward patients of African origin compared to patients of French origin who indicate the benefit of the same health insurance coverage.

We also estimate extended specifications to explore the possibility of cream-skimming due to a loss of earnings by physicians when treating means-tested patients. Because this loss of earnings concerns unregulated physicians who can apply a surcharge on top of regulated fees, but not for patients benefitting from CMU-C or ACS, we include interaction terms between the variable of interests and a dummy indicating that the physician is unregulated.⁷

$$\begin{aligned} \text{Appt}_{ip} = & \alpha + \lambda_1 \text{Afr}_i + \lambda_2 \text{CMU}_i + \lambda_3 \text{ACS}_i + \eta \text{Unreg}_p + \gamma_1 \text{Afr}_i \times \text{Unreg}_p + \gamma_2 \text{CMU}_i \times \text{Unreg}_p \\ & + \gamma_3 \text{ACS}_i \times \text{Unreg}_p + \delta X_{ip} + \tau_s + \varepsilon_{ip} \end{aligned} \quad (3)$$

$\gamma_2 < 0$ or $\gamma_3 < 0$ would indicate that unregulated physicians penalize means-tested patients more than regulated physicians, and thus that some of the cream-skimming phenomenon is due to physicians' opportunity cost (M2c).

In some specifications, we also include interactions with the physician being in OPTAM, which should incentivize them to accept a means-tested patient. Some specifications also include interaction terms between the three variables of interest and the physician's medical specialty to control for unobserved differences in cream-skimming between specialties.

6 | RESULTS

6.1 | Graphical results

Figure 1 presents the positive response rate obtained by patients by origin and health insurance coverage.⁸ The positive response rates for patients of French and African origin appear similar for both health insurance coverages. As can be seen in Table A3 in the appendix, the proportion of positive responses does not vary significantly by patient origin. However, there is a lot of variation by patients' health insurance coverage: patients with CMU-C or ACS have significantly lower positive response rates than patients without means-tested health insurance coverage. This is true for the patients of both African and French origin. Although the difference is only significant at the 10% level, patients with ACS also seem to get a lower positive response rate than patients with CMU-C.

Figure A1 in the appendix presents the results separately for each medical specialty. The general pattern observed in the pooled sample appears to be consistent across specialties. Two main variations between specialties are nevertheless visible. First, the positive response rate is much lower for psychiatrists than for dentists and gynecologists. Second, the gap between patients without means-tested health insurance coverage and means-tested patients is more pronounced for psychiatrists and to a lesser extent, gynecologists.

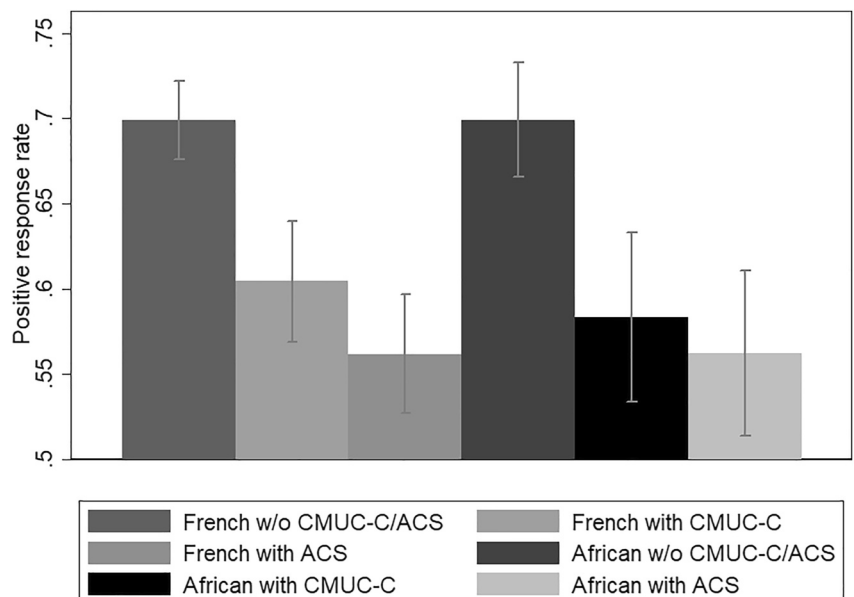


FIGURE 1 Positive response rate by patient origin and health insurance coverage. Bars indicate confidence intervals at the 95% threshold. Results obtained across all medical specialties (dentistry, gynecology and psychiatry). Source: TEPP-CNRS, Testing TRICERATOPS.

6.2 | Overall results

Table 2 presents the results of the econometric analysis that highlight the effect of a patient's characteristics on her probability of obtaining an appointment. The table gives the OLS estimates of the linear probability models related to Equation (1). The controls are introduced progressively in columns (1)–(4). Introducing controls in column (2) for medical specialty, gender of the scheduling staff, role of the scheduling staff and identity of the caller does not substantially change the results. The introduction of time fixed effects in column (3) (date and time of the call), while not qualitatively changing the results, does affect the magnitude of the estimated effects slightly. The date and time each patient calls the physician may influence the probability of getting a positive response (Balfe et al., 2022). Time-fixed effects control for these differences. Finally, results including physician fixed effects in column (4) indicate that the probability of getting an appointment does not vary significantly by patient ethnicity but is significantly affected by being a beneficiary of CMU-C and ACS. As can be seen in Table A4 of Appendix 5, the results from probit and random effects probit models are very similar.

6.2.1 | Effect of African origin

The estimated effect of African origin on the probability of obtaining a positive response of -0.006 (s.e. 0.017) is very small and is not significantly different from 0 at the 5% level. Because of the sample size, standard errors are small and the estimates are relatively precise. An absence of significant results could, nonetheless, be the result of a lack of statistical power. In consequence, we now investigate whether these results can be interpreted as the absence of difference in treatment between patients of French and African origin. To this aim, we compute the minimum detectable effect (MDE), which indicates the smallest change we are able to detect.⁹ We compute the MDE for a two-sided hypothesis test, at the 5% significance level and a statistical power of 80%. The results are presented in Table A5 in the appendix. We can observe that the MDE is about -1.9 points and is always within the 95% confidence interval of our point estimates. In consequence, although we cannot exclude the presence of a difference in positive response between 0% and -1.9 points between patients of French and African origin, looking at the lower limit of the confidence interval, we can reasonably exclude a difference above -3.9 points. With an average appointment rate of 64%, this corresponds to a maximum of -6 % difference in relative terms.

Nevertheless, two elements of the study design could potentially bias the results: the non-random call order of the reference patient and the fact that each patient type has a specific script. Regarding the call order, as noted above, there is no particular reason why this order should affect the probability of getting a positive response, since appointment times are almost always

	(1)	(2)	(3)	(4)
African origin	-0.005 (0.009)	-0.006 (0.009)	-0.014 (0.017)	-0.006 (0.017)
CMU-C	-0.102*** (0.017)	-0.086*** (0.017)	-0.115*** (0.020)	-0.099*** (0.018)
ACS	-0.138*** (0.017)	-0.127*** (0.017)	-0.155*** (0.021)	-0.149*** (0.019)
Specialty FE	NO	YES	YES	NO
Controls	NO	YES	YES	YES
Time FE	NO	NO	YES	YES
Physician FE	NO	NO	NO	YES
Observations	4539	4539	4539	4539
F-test	35.25	40.85	30.80	5.896
Adj. R ²	0.0158	0.139	0.145	0.601

TABLE 2 Effect of ethnic origin and CMU-C and ACS health insurance coverage on obtaining an appointment.

Note: Standard errors clustered at the physician in parentheses. The time fixed effects are: the date and time of the call. The control variables are: the gender of the scheduling staff, the role of the scheduling staff (physician or scheduling staff and the caller (three callers participated in the testing and their role was randomly switched throughout the data collection).

*** $p < 0.01$.

Source: TEPP-CNRS, Testing TRICERATOPS.

available even if they are far away. We verify this by running our estimates on a subsample, excluding the reference patient.¹⁰ Because the call order of the other two patients is random, it is possible to evaluate the effect of call order in this setting. The results are presented in Table A6 in the appendix. We obtain similar estimates of non-significant coefficients for African origin as for the full sample. Second, the call order has no significant effect on the probability of obtaining a positive response. Both of these highlight the fact that the reference patient calling last does not bias the results. As for the fact that each type of patient has a specific script for each medical specialty, although we took special care in writing them, it is possible that they may induce a correlation between the patient's profile and the physician's response. We believe that the similarity of the pattern observed across the three medical specialties (Figure A1), each with different scripts, supports the argument that different scripts do not induce bias in the results.

6.2.2 | Effect of Muslim religion for patients of African origin

Since 50% of the first names of the patients with surnames of African origin are Christian-sounding and 50% are Muslim-sounding, the estimated level of discrimination toward the patient of African origin is an average of both Muslim and non-Muslim patients. Adding a dummy variable to Equation (1) indicating whether the first name of the patient of African origin is Muslim or not allows us to assess whether any variation in the level of ethnic discrimination is due to religion. The results in Appendix Table A7 show that there is no significant difference in discrimination toward the patient of African origin based on her religion.

6.2.3 | Effect of means-tested health insurance coverages

On the other hand, we observe in Column (4) of Table 2 that the positive response rate to patients with CMU-C or ACS is 10 and 15% points lower, respectively, compared to patients not covered by these schemes. This corresponds to differences of 15% and 23%, respectively. A test of equality of coefficients shows that the penalty associated with the ACS is significantly higher than the penalty associated with the CMU-C at the 5% level (p -value = 0.016). This result supports the mechanism M2b of non-monetary costs since $\beta_2 > \beta_3$.¹¹

In the specifications above, we assumed that the effect of CMU-C and ACS coverage is the same for patients of French and African origin. We can test this assumption by adding interaction terms between the origin of the patient and her benefitting from means-tested health insurance coverage, as in Equation (2). The results presented in Table 3 indicate that there is no significant interaction effect between ethnic origin and the benefit of means-tested health insurance coverage: the penalties for having CMU-C or ACS are not significantly higher for patients of African origin than for those of French origin at the 5% level.¹²

6.3 | The role of physician's pricing practice

In this section, we explore the M2c mechanism, that one of the reasons physicians cream-skim patients based on means-tested health insurance coverage is a belief that they will suffer a loss of earnings. Furthermore, we check evidence of the effectiveness of OPTAM.

Table 4 shows the estimates of Equation (3). Column (1) presents the results without interaction terms, which correspond to those in column (3) of Table 2. Column (2) (resp. column (3)) includes interaction terms between the variables of interest and a dummy variable for the physician applying unregulated fees (resp. had signed the OPTAM). Column (4) includes both interactions. Columns (5)–(7) repeat these specifications but include, in addition, interaction terms between the variables of interest and the physician's medical specialty. Physician fixed effects are not included in these estimates. Results including physician fixed effects, presented in Table A9 in Appendix, are similar.

Adding interactions with the medical specialty of the physician does not change the value of the CMU-C or ACS estimated coefficients.¹³ We observe in column (5) that unregulated physicians penalize patients with ACS significantly more than regulated physicians. This higher penalty is partly hidden by the fact that signing OPTAM, which decreases the penalty for ACS and CMU-C patients as can be seen in column (6), is more common for unregulated physicians.¹⁴ When both interactions are included in column (7), we see that unregulated physicians who do not sign OPTAM penalize CMU-C and ACS patients significantly more than regulated physicians not signed up to OPTAM: the increase in the penalty is 9.5% and 15.7% points, respectively, compared to regulated physicians. However, regulated physicians who do not sign OPTAM also significantly penalize CMU-C and ACS patients. Signing OPTAM reduces the penalty for CMU-C and ACS patients by 17.3% and 20.4%

	(1)	(2)	(3)	(4)
African origin	0.000 (0.016)	0.009 (0.015)	-0.027 (0.027)	-0.037 (0.026)
CMU-C	-0.095*** (0.017)	-0.072*** (0.017)	-0.125*** (0.025)	-0.122*** (0.025)
ACS	-0.138*** (0.017)	-0.120*** (0.017)	-0.170*** (0.026)	-0.176*** (0.025)
African origin × CMU-C	-0.021 (0.031)	-0.037 (0.030)	0.014 (0.036)	0.037 (0.032)
African origin × ACS	0.000 (0.030)	-0.019 (0.028)	0.031 (0.034)	0.051* (0.029)
Specialty FE	NO	YES	YES	NO
Controls	NO	YES	YES	YES
Time FE	NO	NO	YES	YES
Physician FE	NO	NO	NO	YES
Observations	4539	4539	4539	4539
F-test	24.80	35.67	30.07	5.634
Adj. R ²	0.0154	0.138	0.144	0.601

TABLE 3 Interacting ethnicity and the benefit of a means-tested health insurance coverage.

Note: Standard errors clustered at the physician in parentheses. The time fixed effects are: the date and time of the call. The control variables are: the gender of the scheduling staff, the quality of the scheduling staff (physician or scheduling staff) and the caller (three callers participated in the testing and their role was randomly switched throughout the data collection).

*** $p < 0.01$.

Source: TEPP-CNRS, Testing TRICERATOPS.

points, respectively. This means that an unregulated physician who signs OPTAM does not penalize ACS and CMU-C patients significantly more than a regulated physician not signed up to OPTAM. In addition, the OPTAM offsets much (i.e., 65% and 81%, respectively) of the penalty that unregulated physicians apply to CMU-C and ACS patients. Overall, these results support the M2c opportunity cost mechanism.

Table A8 in Appendix displays the estimated coefficients related to the physician's medical specialty. There is no significant difference in the penalty experienced by means-tested patients in the medical specialties once the physician's pricing practice is taken into account.

7 | CONCLUSION

A first finding of this study is that there is no evidence of significant ethnic discrimination in access to healthcare. This is different from the labor market or housing market, where the minority candidate generally suffers a penalty of over 20% (Acolin et al., 2016; Chareyron et al., 2022). This could be because physicians are governed by the Hippocratic tradition that focuses on the patient's wellbeing in decision-making (Kesternich et al., 2015). These results are consistent with those of Brinbaum et al. (2018), who found less reported ethnic discrimination in healthcare in France than in other areas, such as the labor market. This may indicate a relatively specific behavior with respect to ethnic discrimination by physicians in France, contrary to the United States where some studies, but not all, found evidence of ethno-racial discrimination in access to healthcare.

The study also shows the existence of cream-skimming based on the means-tested health insurance coverage of the patients. The results support two reasons for this behavior. First, we confirm that physicians are sensitive to monetary incentives (Schmitz, 2013) and opportunity costs. We show that the penalty for CMU-C and ACS is higher for unregulated physicians than regulated physicians and that signing OPTAM reduces it: OPTAM offsets 65% and 81% of the penalty that unregulated physicians apply to CMU-C and ACS patients, respectively. This result is consistent with the findings of Brosig-Koch et al. (2017) and shows that changing the pricing format can be effective in improving patient treatment. However, although we provide some elements justifying the effectiveness of OPTAM, it should be kept in mind that opting in to OPTAM is not necessarily exogenous. It is possible that a preference exists at entry into OPTAM and that physicians who wish to cream-skim do not enroll

TABLE 4 Heterogeneity according to the physician's pricing practice.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
African origin	-0.014 (0.017)	-0.037* (0.020)	-0.031 (0.019)	-0.039* (0.020)	0.009 (0.051)	0.014 (0.051)	0.016 (0.051)
CMU-C	-0.115*** (0.020)	-0.117*** (0.024)	-0.151*** (0.023)	-0.125*** (0.024)	-0.119*** (0.039)	-0.119*** (0.039)	-0.120*** (0.039)
ACS	-0.155*** (0.021)	-0.136*** (0.025)	-0.187*** (0.023)	-0.145*** (0.025)	-0.155*** (0.041)	-0.155*** (0.041)	-0.156*** (0.041)
Unregulated		0.015 (0.031)		0.024 (0.033)	0.017 (0.031)		0.020 (0.033)
African origin × unregulated		0.003 (0.024)		0.008 (0.027)	0.012 (0.025)		0.017 (0.027)
CMU-C × unregulated		-0.048 (0.040)		-0.103** (0.045)	-0.047 (0.044)		-0.095** (0.048)
ACS × unregulated		-0.086** (0.039)		-0.149*** (0.042)	-0.110** (0.043)		-0.157*** (0.046)
OPTAM			0.000 (0.037)	-0.017 (0.039)		-0.006 (0.037)	-0.015 (0.039)
African origin × OPTAM			-0.003 (0.029)	-0.010 (0.032)		-0.001 (0.029)	-0.010 (0.032)
CMU-C × OPTAM			0.121*** (0.046)	0.171*** (0.054)		0.134*** (0.050)	0.173*** (0.055)
ACS × OPTAM			0.138*** (0.047)	0.212*** (0.053)		0.148*** (0.051)	0.204*** (0.054)
Specialty FE	YES	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES	YES
Time FE	YES	YES	YES	YES	YES	YES	YES
Spe. Med. × var. interest	NO	NO	NO	NO	YES	YES	YES
Observations	4539	4029	4029	4029	4029	4029	4029
F-test	30.80	23.96	20.97	21.81	22.58	18.16	19.39
Adj. R ²	0.145	0.138	0.141	0.144	0.137	0.140	0.143

Note: Standard errors clustered at the level of the physician in parentheses. The time fixed effects are: the date and time of the call. The control variables are: the gender of the scheduling staff, the role of the scheduling person (physician or scheduling staff) and the caller (three callers participated in the testing and their role was randomly switched throughout the data collection). Medical specialties fixed effects are always included.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: TEPP-CNRS, Testing TRICERATOPS.

in the program, similar to the evaluation of the anonymous CV experiment, a device against discrimination in hiring (Behaghel et al., 2015). This may slightly overestimate the real effect of OPTAM. Nevertheless, even if some unregulated physicians signed up to OPTAM are more inclined than others to accept patients based on their health insurance coverage, the existence of OPTAM at least rewards this behavior and makes it sustainable.

Second, physicians face non-monetary costs in accepting means-tested patients. Beneficiaries of ACS, a more recent scheme and less known to doctors, are penalized more than CMU-C beneficiaries, even though the latter are poorer. We believe that the higher penalty faced by ACS patients may be due to physicians having less knowledge of the system and expectations of administrative constraints, delays and rejections of payments by primary health insurance funds. This argues for simplification of the schemes designed to cover the poor and creating awareness among physicians of these schemes. In practice, this may mean limiting the number of schemes and merging CMU-C and ACS, which was done at the end of 2019 with the creation of the CSS. Further work is needed to verify whether the CSS penalty is less than its predecessors.

The main limitation of the experimental protocol is that each patient type has a specific script for each medical specialty. Nevertheless, we provided elements to support that the non-random assignment of this part of the experiment is unlikely to

bias the results. This experiment also has the usual limitations of this type of study. It measures differences in the initial access to the physician, but does not capture differences in treatment that may occur later in the medical management process, from diagnosis to provision of care.

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CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflicts of interest.

DATA AVAILABILITY STATEMENT

Data and estimation codes are freely available on Mendeley Data (<https://doi.org/10.17632/m26ckwyypx.1>).

ETHICS STATEMENT

The authors declare that they comply with the ethical criteria of the journal. The data set is anonymized (e.g., physician names have been removed). Accepted appointments have been canceled.

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ENDNOTES

- ¹ Cream-skimming is the action of physicians of selecting patients that they deem more desirable. Although cream-skimming is a more general concept than discrimination since cream-skimming is not necessarily discriminatory, cream-skimming and discrimination are often used interchangeably in the literature (Werbeck et al., 2021). In this article, we use the word discrimination to refer to the refusal of patients based on their ethnicity and cream-skimming to refer to the refusal of patients based on their health insurance coverage.
- ² Figures from <http://www.ecosante.fr/index2.php?base=DEPA&langh=FRA&langs=FRA>.
- ³ Not all physicians are free to set their fees, only those denoted unregulated can do so. In order to charge unregulated fees, physicians must meet certain prerequisites. The prerequisites are, for example, to have been a former head of a university clinic, a hospital assistant or a military physician. The choice of pricing sector is made at the beginning of the private practice and cannot be changed afterward.
- ⁴ Administrative costs are frequently mentioned by physicians themselves when interviewed (Desprès, 2017).
- ⁵ At the time of the test, in early 2019, it was very common to make medical appointments by telephone, despite the increase in the use of online tools for planning and scheduling appointments. In the French medical system, it is the patient’s doctor, a general physician, who must refer the patient to a specialist but it is the patient herself who must make the appointment.
- ⁶ The standardized difference is computed as: $d = 100 \times \frac{(p_s - p_p)}{\sqrt{\frac{p_s(1-p_s) + p_p(1-p_p)}{2}}}$ where for each variable, p_s is the prevalence of the dummy variable in the sample and p_p the prevalence in the population. The advantage of the standardized difference is that it is not influenced by sample size, unlike t-tests and other statistical tests of hypothesis (Austin, 2009). The approach has been used by several authors, for example, in the clinical literature since the work of Rosenbaum and Rubin (1985).
- ⁷ With a few exceptions, a regulated physician who accepts a means-tested patient suffers no loss of revenue.
- ⁸ A response is considered positive if the patient is offered an appointment. This is not conditioned by the time until the appointment, which is another variable and subject to separate analysis. We included physicians that state “We are not taking new patients” as a reason for refusal. This reason was given 631 times to our patients, which corresponds to 39.3% of refusals. However, it was often not given consistently to all three patients, so we included physicians giving this reason for refusal in our analysis. We explore potential indirect refusals in the Appendix (Tables A11–A13).
- ⁹ If $\hat{\beta} > 0$, the MDE is calculated as: $2.80 \times SE(\hat{\beta})$. If $\hat{\beta} < 0$, the MDE is calculated as: $-1.12 \times SE(\hat{\beta})$. See Bozio et al. (2021) for details.
- ¹⁰ We also exclude patients of African origin who do not mention benefiting from any means-tested health insurance coverage to obtain a sample of means-tested patients only.

- ¹¹ One may wonder whether the signals attached to African origin and the means-tested coverage of the patient are correlated with another factor associated with the probability of obtaining an appointment. For example, age may be correlated with the likelihood of getting an appointment and receiving a means-tested benefit. However, we think that it is unlikely that the ACS or CMU-C signal is correlated with age. First, because the message is transmitted by phone, we believe that the patient's voice is probably the most important indicator of age. In this respect, the actors had similar ages and were randomly swapped between patient profiles. Second, benefitting from these programs is only weakly correlated with age. The average age of ACS beneficiaries in 2019 is not far from the average age of the general French population (44 vs. 41 years old). As for the CMU-C, young people are slightly overrepresented (40% of beneficiaries are under 20 vs. 24% of individuals under this age in the general French population). Figures from 2021 DREES reports no. 16 and 17 (<https://drees.solidarites-sante.gouv.fr/sites/default/files/2021-03/16-11.pdf>).
- ¹² Since we do not find the presence of substantial discrimination against the patient of African origin, it is unlikely to observe evidence of statistical or taste-based discrimination. Nevertheless, since the test of the mechanisms M1a and M1b is based on Equation (2), the results of these tests are presented in Table 3. As expected, we find no significant evidence of taste-based discrimination or robust evidence of statistical discrimination, although $\hat{\varphi}_2$ is significant at the 10% level.
- ¹³ Since dentists are almost never unregulated, the results are primarily driven by the other two specialties. In Appendix Table A10, we run the same estimates on a sample excluding dentists and obtain results that are very similar to the main results.
- ¹⁴ Some regulated physicians with a permanent right to exceed the regulated fees may also sign the OPTAM. However, this corresponds to <4% of the regulated physicians in our sample.

REFERENCES

- Acolin, A., Bostic, R., & Painter, G. (2016). A field study of rental market discrimination across origins in France. *Journal of Urban Economics*, 95, 49–63. <https://doi.org/10.1016/j.jue.2016.07.003>
- Agan, A., & Starr, S. (2017). Ban the box, criminal records, and racial discrimination: A field experiment. *Quarterly Journal of Economics*, 133(1), 191–235. <https://doi.org/10.1093/qje/qjx028>
- Alsan, M., Garrick, O., & Graziani, G. (2019). Does diversity matter for health? Experimental evidence from Oakland. *American Economic Review*, 109(12), 4071–4111. <https://doi.org/10.1257/aer.20181446>
- Ameri, M., Schur, L., Adya, M., Bentley, F. S., McKay, P., & Kruse, D. (2018). The disability employment puzzle: A field experiment on employer hiring behavior. *ILR Review*, 71(2), 329–364. <https://doi.org/10.1177/0019793917717474>
- Angerer, S., Waibel, C., & Stummer, H. (2019). Discrimination in health care: A field experiment on the impact of patients' socioeconomic status on access to care. *American Journal of Health Economics*, 5(4), 407–427. https://doi.org/10.1162/ajhe_a_00124
- Arrow, K. (1971). *The theory of discrimination*. Princeton.
- Austin, P. C. (2009). Balance diagnostics for comparing the distribution of baseline covariates between treatment groups in propensity-score matched samples. *Statistics in Medicine*, 28(25), 3083–3107. <https://doi.org/10.1002/sim.3697>
- Balfe, C., Button, P., Penn, M., & Schwegman, D. J. (2022). Infrequent identity signals, multiple correspondence, and detection risks in audit correspondence studies. *Field Methods*, 35(1), 1525822X211057623. <https://doi.org/10.1177/1525822x211057623>
- Becker, G. S. (1957). *The economics of discrimination*. The University of Chicago Press.
- Behaghel, L., Crépon, B., & Le Barbanchon, T. (2015). Unintended effects of anonymous résumés. *American Economic Journal: Applied Economics*, 7(3), 1–27. <https://doi.org/10.1257/app.20140185>
- Bertrand, M., & Duflo, E. (2017). Field experiments on discrimination. In A. V. Banerjee & E. Duflo (Éds.), *Handbook of economic field experiments* (Vol. 1, pp. 309–393). Elsevier B.V.
- Bisgaier, J., & Rhodes, K. V. (2011). Auditing access to specialty care for children with public insurance. *New England Journal of Medicine*, 364(24), 2324–2333. <https://doi.org/10.1056/nejmsa1013285>
- Bozio, A., Garrouste, C., & Perdrix, E. (2021). Impact of later retirement on mortality: Evidence from France. *Health Economics*, 30(5), 1178–1199. <https://doi.org/10.1002/hec.4240>
- Brinbaum, Y., Safi, M., & Simon, P. (2018). Discrimination in France: Between perception and experience. In C. Beauchemin, C. Hamel, & P. Simon (Eds.), *Trajectories and origins: Survey on the diversity of the French population. INED population studies* (Vol. 8, pp. 195–222). Springer International Publishing.
- Brosig-Koch, J., Kairies-Schwarz, N., & Kokot, J. (2017). Sorting into payment schemes and medical treatment: A laboratory experiment. *Health Economics*, 26(S3), 52–65. <https://doi.org/10.1002/hec.3616>
- Button, P., Dils, E., Harrell, B., Fumarc, L., & Schwegman, D. (2020). *Gender identity, race, and ethnicity discrimination in access to mental health care: Preliminary evidence from a multi-wave audit field experiment* (p. w28164). National Bureau of Economic Research.
- Chareyron, S., Challe, L., L'Horty, Y., & Petit, P. (2022). Can subsidies paid directly to employers reduce residential discrimination in employment? An assessment based on serial field experiments. *Urban Studies*, 59(6), 1202–1218. <https://doi.org/10.1177/00420980211006033>
- Chou, S.-C., Deng, Y., Smart, J., Parwani, V., Bernstein, S. L., & Venkatesh, A. K. (2018). Insurance status and access to urgent primary care follow-up after an emergency department visit in 2016. *Annals of Emergency Medicine*, 71(4), 487–496.e1. <https://doi.org/10.1016/j.annemergmed.2017.08.045>
- Clemens, J., & Gottlieb, J. D. (2014). Do physicians' financial incentives affect medical treatment and patient health? *American Economic Review*, 104(4), 1320–1349. <https://doi.org/10.1257/aer.104.4.1320>
- Decker, S. L. (2015). Acceptance of new Medicaid patients by primary care physicians and experiences with physician availability among children on Medicaid or the Children's Health Insurance Program. *Health Services Research*, 50(5), 1508–1527. <https://doi.org/10.1111/1475-6773.12288>

- Desprès, C. (2017). *Des pratiques médicales et dentaires, entre différenciation et discrimination: Une analyse de discours de médecins et dentistes*. Rapport du Fonds CMU-C et du Défenseur des droits.
- Fang, A. H., Guess, A. M., & Humphreys, M. (2019). Can the government deter discrimination? Evidence from a randomized intervention in New York City. *The Journal of Politics*, 81(1), 127–141. <https://doi.org/10.1086/700107>
- Gottschalk, F., Mimra, W., & Waibel, C. (2020). Health services as credence goods: A field experiment. *Economic Journal*, 130(629), 1346–1383. <https://doi.org/10.1093/ej/ueaa024>
- Heinrich, N., Wübker, A., & Wuckel, C. (2018). Waiting times for outpatient treatment in Germany: New experimental evidence from primary data. *Jahrbucher für Nationalökonomie und Statistik*, 238(5), 375–394. <https://doi.org/10.1515/jbnst-2018-0025>
- Hulleig, P., & Klein, T. J. (2010). The effect of private health insurance on medical care utilization and self-assessed health in Germany. *Health Economics*, 19(9), 1048–1062. <https://doi.org/10.1002/hec.1642>
- Kesternich, I., Schumacher, H., & Winter, J. (2015). Professional norms and physician behavior: Homo oeconomicus or homo hippocraticus? *Journal of Public Economics*, 131, 1–11. <https://doi.org/10.1016/j.jpubeco.2015.08.009>
- Kuchinke, B. A., Sauerland, D., & Wübker, A. (2009). The influence of insurance status on waiting times in German acute care hospitals: An empirical analysis of new data. *International Journal for Equity in Health*, 8(1), 44. <https://doi.org/10.1186/1475-9276-8-44>
- Kugelmass, H. (2016). Sorry, I'm not accepting new patients": An audit study of access to mental health care. *Journal of Health and Social Behavior*, 57(2), 168–183. <https://doi.org/10.1177/0022146516647098>
- Kugelmass, H. (2019). "Just the type with whom I like to work": Two correspondence field experiments in an online mental health care market. *Society and Mental Health*, 9(3), 350–365. <https://doi.org/10.1177/2156869318755213>
- Laudicella, M., Siciliani, L., & Cookson, R. (2012). Waiting times and socioeconomic status: Evidence from England. *Social Science & Medicine*, 74(9), 1331–1341. <https://doi.org/10.1016/j.socscimed.2011.12.049>
- Leech, T. G. J., Irby-Shasani, A., & Mitchell, A. L. (2019). "Are you accepting new patients?" A pilot field experiment on telephone-based gatekeeping and black patients' access to pediatric care. *Health Services Research*, 54, 234–242. <https://doi.org/10.1111/1475-6773.13089>
- Lungen, M., Stollenwerk, B., Messner, P., Lauterbach, K. W., & Gerber, A. (2008). Waiting times for elective treatments according to insurance status: A randomized empirical study in Germany. *International Journal for Equity in Health*, 7(1), 1. <https://doi.org/10.1186/1475-9276-7-1>
- Monstad, K., Engesaeter, L. B., & Espeshaug, B. (2014). Waiting time and socioeconomic status-an individual-level analysis: Waiting time and socioeconomic status. *Health Economics*, 23(4), 446–461. <https://doi.org/10.1002/hec.2924>
- Murchie, J., Pang, J., & Schwegman, D. J. (2021). Can information help Lakisha and Jamal find housing? Evidence from a low-cost online experiment of landlords. *Regional Science and Urban Economics*, 90, 103712. <https://doi.org/10.1016/j.regsciurbeco.2021.103712>
- Neumark, D. (2018). Experimental research on labor market discrimination. *Journal of Economic Literature*, 56(3), 799–866. <https://doi.org/10.1257/jel.20161309>
- OECD. (2017). Access to care. In *Health at a glance 2017: OECD indicators*. Éditions OCDE.
- Olin, Su-chin S., O'Connor, B. C., Storfer-Isser, A., Clark, L. J., Perkins, M., Scholle, S. H., Whitmyre, E. D., Hoagwood, K., & Horwitz, S. McC. (2016). Access to care for youth in a state mental health system: A simulated patient approach. *Journal of the American Academy of Child & Adolescent Psychiatry*, 55(5), 392–399. <https://doi.org/10.1016/j.jaac.2016.02.014>
- Polsky, D., Richards, M., Basseyn, S., Wissoker, D., Kenney, G. M., Zuckerman, S., & Rhodes, K. V. (2015). Appointment availability after increases in Medicaid payments for primary care. *New England Journal of Medicine*, 372(6), 537–545. <https://doi.org/10.1056/nejmsa1413299>
- Resneck, J., Pletcher, M. J., & Lozano, N. (2004). Medicare, Medicaid, and access to dermatologists: The effect of patient insurance on appointment access and wait times. *Journal of the American Academy of Dermatology*, 50(1), 85–92. [https://doi.org/10.1016/s0190-9622\(03\)02463-0](https://doi.org/10.1016/s0190-9622(03)02463-0)
- Rhodes, K. V., Kenney, G. M., Friedman, A. B., Saloner, B., Lawson, C. C., Chearo, D., Wissoker, D., & Polsky, D. (2014). Primary care access for new patients on the eve of health care reform. *JAMA Internal Medicine*, 174(6), 861. <https://doi.org/10.1001/jamainternmed.2014.20>
- Rosenbaum, P. R., & Rubin, D. B. (1985). Constructing a control group using multivariate matched sampling methods that incorporate the propensity score. *The American Statistician*, 39(1), 33–38. <https://doi.org/10.2307/2683903>
- Schmitz, H. (2013). Practice budgets & the patient mix of physicians – The effect of a remuneration system reform on health care utilisation. *Journal of Health Economics*, 32(6), 1240–1249. <https://doi.org/10.1016/j.jhealeco.2013.09.013>
- Schwartz, A. E., Ellen, I. G., Voicu, I., & Schill, M. H. (2006). The external effects of place-based subsidized housing. *Regional Science and Urban Economics*, 36(6), 679–707. <https://doi.org/10.1016/j.regsciurbeco.2006.04.002>
- Sharma, R., Mitra, A., & Stano, M. (2015). Insurance, race/ethnicity, and sex in the search for a new physician. *Economics Letters*, 137, 150–153. <https://doi.org/10.1016/j.econlet.2015.11.005>
- Sharma, R., Tinkler, S., Mitra, A., Pal, S., Susu-Mago, R., & Stano, M. (2018). State Medicaid fees and access to primary care physicians. *Health Economics*, 27(3), 629–636. <https://doi.org/10.1002/hec.3591>
- Shin, R. Q., Smith, L. C., Welch, J. C., & Ezeofor, I. (2016). Is allison more likely than Lakisha to receive a callback from counseling professionals? A racism audit study. *The Counseling Psychologist*, 44(8), 1187–1211. <https://doi.org/10.1177/0011000016668814>
- Skaggs, D. L., Lehmann, C. L., Rice, C., Killelea, B. K., Bauer, R. M., Kay, R. M., & Vitale, M. G. (2006). Access to orthopaedic care for children with Medicaid versus private insurance: Results of a national survey. *Journal of Pediatric Orthopaedics*, 26(3), 400–404. <https://doi.org/10.1097/01.bpo.0000217715.87857.24>
- Valin, N., & Girard, P.-M. (2012). 10. Maladies infectieuses. In *Innover contre les inégalités de santé, Hors collection* (pp. 135–148). Presses de l'EHESP.
- Werbeck, A., Wübker, A., & Ziebarth, N. R. (2021). Cream skimming by health care providers and inequality in health care access: Evidence from a randomized field experiment. *Journal of Economic Behavior & Organization*, 188, 1325–1350. <https://doi.org/10.1016/j.jebo.2021.05.028>

- Wisniewski, J., Walker, B., Tinkler, S., Stano, M., & Sharma, R. (2021). Mediators of discrimination in primary care appointment access. *Economics Letters*, 200, 109744. <https://doi.org/10.1016/j.econlet.2021.109744>
- Wisniewski, J. M., & Walker, B. (2020). Association of simulated patient race/ethnicity with scheduling of primary care appointments. *JAMA Network Open*, 3(1), e1920010. <https://doi.org/10.1001/jamanetworkopen.2019.20010>

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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