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Just a question of time? Explaining non-take-up of a public health insurance program designed for undocumented immigrants living in France

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Abstract

State Medical Aid is a public health insurance program that allows undocumented immigrants with low financial resources to access health care services for free. However, the low take-up rate of this program might threaten its efficiency. The purpose of this study is therefore to provide the determinants of such a low take-up rate. To this end, we rely on the Premier Pas survey. This is an original representative sample of undocumented immigrants attending places of assistance to vulnerable populations in France. Determinants of State Medical Aid take-up are analyzed through probit and Cox modeling. The results show that only 51% of those who are eligible for the State Medical Aid program are actually covered, and this proportion is higher among women than among men. The length of stay in France is the most important determinant of take-up. It is worth noting that State Medical Aid take-up is not associated with chronic diseases or functional limitations and is negatively associated with poor mental health. There is, therefore, mixed evidence of health selection into the program. Informational barriers and vulnerabilities experienced by undocumented immigrants are likely to explain this low take-up.

1. Introduction

Public health care coverage of vulnerable populations is a long-standing tradition in France (Dourgnon, *et al.*, 2019; Wittwer, *et al.*, 2019). In 1893, France introduced Free Medical Aid providing health care to all low-income individuals, regardless of their legal status. A century later, in 1993, the so-called second *Pasqua* laws (24 August 1993) added a condition of legal residency in the French territory to receive any public health coverage. This had removed the right for undocumented immigrants to access health care for free. In 2000, a public free health insurance program, the State Medical Aid (SMA), has been designed for vulnerable individuals residing permanently but illegally in France. Initially SMA also covers documented immigrants residing in France for less than three months (then, they are eligible to the regular public health insurance program). Since January 2004, documented immigrants are eligible for the regular public health insurance program regardless of their length of stay in France. Since then, SMA covers only undocumented immigrants (Gabarro, 2012, 2017). To benefit from SMA, undocumented immigrants have to provide official documents proving that they have low financial resources (i.e., less than 756 euros per month for a single person) and that they have resided continuously in France

for at least three months.[1,2] Once covered, undocumented immigrants can access most health care provided by the regular French health system (hospitalization, emergency care, ambulatory care, prescribed drugs) for free, for one renewable year. It is important to keep in mind that SMA does not cover statutory refugees or asylum seekers. Asylum seekers and statutory refugees are not illegal aliens. Both are entitled to public health insurance, which covers the French population and legal immigrants. Asylum seekers whose application is rejected keep the public insurance coverage for a year, but this has been reduced to six months in 2020. Immigrants who have never applied, and the ones who overpassed their visa legal stay are eligible to SMA. The existence of this public health insurance program does not, however, guarantee that all eligible individuals will be covered. Addressing non-take-up is of first importance for four reasons (Jusot *et al.*, 2019). First, for ethical reasons, individuals in poor health should receive appropriate and adequate treatment, regardless of their legal status. Second, for public health reasons, protecting undocumented immigrants' health is likely to reduce the spread of communicable diseases to the rest of the population.[3] Third, for allocative efficiency reasons, treating diseases at the early stages can prevent or reduce future costly hospital stays. SMA is also expected to reduce overuses of emergency services by improving access to primary and secondary care (European Union Agency for Fundamental Rights, 2015). Finally, the existence of SMA ensures that hospitals get paid for the care they provide to undocumented immigrants. Ensuring that more undocumented immigrants get covered by SMA ensures that hospitals are reimbursed for the care they provide.

It is worth noting that non-take-up is a recurring problem for most social services, particularly for subsidized and free health insurance programs, in France and in the United States (US) (Chernew *et al.*, 1997; Aizer, 2003, 2007; Currie, 2006; Baicker *et al.*, 2012; Odenore, 2012; Bitler and Zavodny, 2014; Guthmuller *et al.*, 2014a; Bhargava and Manoli, 2015; Collins *et al.*, 2016; Wright *et al.*, 2017; Finkelstein *et al.*, 2019). In the US, the take-up rate is always below 100%, ranging from 50% to 90% depending on the scheme and the state. Consequently, millions of Americans eligible for free or highly subsidized insurance remain uncovered (Wright *et al.*, 2017). In France, non-take-up observed for the CMU program, which is a free, complementary health insurance program dedicated to poor people living legally in France, is estimated to range from 34% to 45% and from 41% to 59% for the ACS program, which is a subsidized complementary health insurance program for poor people having an income above the CMU threshold living legally in France (Guthmuller *et al.*, 2014a; Fonds CMU-C, 2019).

Conceptually, non-take-up can be explained by a trade-off between perceived costs and perceived benefits. Individuals with a poor health status, who anticipate subsequent health expenses, or with a higher preference for health care may be more prone to apply to SMA programs. Conversely, individuals in good health may consider their perceived benefits to be too low compared to the costs required to be covered. In particular, immigrants who had chronic or severe diseases diagnosed in their country of origin and who need regular treatment may apply more often or earlier to this free health insurance program, according to the health selection hypothesis highlighted in the literature on health insurance. In the US, individuals with a lower income and with a poorer self-assessed health status, with more days impaired by poor health, and those consuming more health care than others, have been shown to apply more often to the Oregon

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[1]This document might be rental contracts, flight tickets, or sworn declarations of free accommodation made by a relative.

[2]Gabarro (2012) shows that the new public management occurring in the places delivering SMA has negative consequences on undocumented immigrants. Public agents are no longer paid according to their seniority, but according to their productivity (i.e., number of complete SMA applications, the error rate per application, the respect of interviews timeline). Therefore, public agents might prefer to not valid an application and ask for additional proofs to minimize their error rate and not be penalized. It therefore increases the application time and makes it difficult to obtain.

[3]The coronavirus disease highlights the importance of collective actions (e.g., quarantine, wearing a mask, respecting social distancing) to protect the most vulnerable individuals. Protecting undocumented immigrants follows the same approach. In France, undocumented immigrant women are more likely than the general population to develop a severe form of coronavirus (Marsaudon *et al.*, 2020). Protecting them may, therefore, prevent further contaminations.

Medicaid program (Allen *et al.*, 2010; Finkelstein *et al.*, 2019). In France, the take-up to the ACS health insurance voucher program has been shown to be higher among individuals with a disability, with chronic diseases or facing high out-of-pocket payments for their previous health expenses or anticipated expenses (Guthmuller *et al.*, 2014a, 2014b) than others. Symmetrically, a study conducted in France among HIV- or hepatitis B- and C-infected sub-Saharan immigrants showed that the probability of obtaining health insurance coverage was higher for men who had been hospitalized during the last year and for pregnant women (Vignier *et al.*, 2018).

The seminal literature on the non-take-up of public programs, in general, has extensively explored the role of costs that have been characterized by Craig (1991) as information costs (the difficulty or complexity of the tasks needed to become enrolled, reporting requirements, and lack of knowledge), process costs (out-of-pocket costs, time required to become enrolled, or to provide required documents), and outcome costs, such as stigma, as proposed by Moffitt (1983). Empirical studies in the literature on the US and France public health services show the important role of access to information on non-take-up of health insurance programs, whether about the existence of the scheme, the conditions of eligibility, or the complexity of the application processes, the role of stigma being negligible (Remler and Glied, 2003; Currie, 2006; Guthmuller *et al.*, 2014a; Bhargava and Manoli, 2015; Wright *et al.*, 2017; Handel *et al.*, 2019). In the US, the remaining high rates of uninsurance, despite the Affordable Care Act (ACA) reform, are partly explained by less awareness of the marketplaces dedicated to selecting health insurance contracts in some sociodemographic groups and concerns about plan affordability, the uncertainty of subsidy eligibility, difficulty selecting plans during the enrollment process, and lack of assistance in selecting plans (Collins *et al.*, 2016). In France, the reasons most frequently identified for non-take-up of ACS were also perceived ineligibility and lack of information about the program, eligibility conditions, enrollment processes, and the complexity of the procedures (Guthmuller *et al.*, 2014b). Recent literature additionally pointed to the role of cognitive biases and behavioral barriers in the uptake of public provisions (Baicker *et al.*, 2012; Bhargava and Manoli, 2015; Van Mechelen and Van Der Heyden, 2017; Wright *et al.*, 2017). Consistently, a lack of knowledge about Medicaid eligibility rules and perceived Medicaid enrollment barriers is lower for individuals who had prior experience in Medicaid and in states where more policies had been enacted to simplify Medicaid enrollment procedures (Stuber and Bartley, 2005). Finally, individuals reporting physical and mental health problems, with less education, and non-Hispanic Black individuals were more likely to be misinformed or to perceive Medicaid enrollment barriers, suggesting the importance of the design of enrollment processes in the insurance coverage of vulnerable populations (Stuber and Bartley, 2005).

Immigrants may have particular difficulty obtaining information about programs, completing host language application forms, and navigating the complex administrative system (Bertrand *et al.*, 2000). In the US, legal immigrants' take-up of Medicaid increases with their language proficiency (Liou, 2018). Information and administrative costs are important barriers to enrollment, especially for Hispanics and Asians, and bilingual application assistance effectively increases Medicaid enrollment among Hispanic and Asian families (Aizer, 2007). Immigrants may have given up applying because of their low capacity to access and process information or seek support for completing the procedures. In the case of SMA in France, it may additionally be impossible for some of them to provide the proper documents requested by the administration, such as proof of the length of stay in France or their level of income. Last, non-take-up may be transitory when the persons who have applied for SMA have not yet received it or the persons' entitlements have recently been suspended. This phenomenon may be particularly important in the case of SMA, since it is only given for one year and immigrants have to reapply every year.

Beyond informational and administrative barriers, non-take-up may be explained by a poor perception of the value the program by potential recipients. The benefits may be considered too few by those who anticipate they will have difficulty accessing the care despite the help, particularly if they anticipate stigmatization and care refusal by health care professionals (Desprès,

2009; Hahn, 2013). Eligible individuals may also abandon the process out of fear of being denounced and deported (Watson, 2014; Vargas, 2015; Vargas *et al.*, 2017).

Finally, the most vulnerable persons may apply less often if they consider their health problems minor compared to other priorities driven by the precariousness of their situation, such as food, housing, and security. This may explain the high rate of individuals who remain uninsured in the US even among those who are aware of the marketplaces, particularly among the very poor and those who point to affordability concerns as a reason for not signing up (Collins *et al.*, 2016). Consistently, access to health insurance coverage of undocumented Mexican immigrants in the US has been found to be higher for those living in a residence with fewer other adults, a higher level of linguistic acculturation, higher levels of formal income, higher levels of social support, and poor health (Nandi *et al.*, 2008).

This paper proposes to contribute to this literature. In particular, the purpose of this study is to provide the determinants of SMA take-up. It aims to analyze whether undocumented immigrants' health status, living conditions in France, or socioeconomic characteristics are more likely to influence SMA take-up. By doing so, it would provide valuable information that policy makers could rely on when designing health interventions. To do so, we use a representative sample of undocumented immigrants – the *Premier Pas* dataset – attending places of assistance to vulnerable populations living in Paris and Bordeaux in 2019.[4] We designed this survey specifically for our study. It contains information on socioeconomic characteristics, migration history, health status, and health care utilization of undocumented immigrants. Undocumented immigrants are a particular and difficult to reach population for at least two reasons. First, due to their unauthorized status, they are not recorded in any public records. Second, they are a very marginalized population (e.g., cannot access both the regular job market and housing) which make them difficult to reach. In addition, visible undocumented immigrants might not want to divulgate their unauthorized status for avoiding possible deportation from France. Our study is the first that tries to provide a representative sample of undocumented immigrants attending places of assistance to vulnerable populations in France. By doing so, it improves upon the existing French datasets that mostly rely on undocumented immigrants attending health care services (either in hospitals or in NGOs) (Medecins du monde, 2008; Gosselin *et al.*, 2021).

We report that SMA covers 51% of all eligible individuals, with women being more likely to be covered than men. Relying on probit and Cox estimations, our results show that the main determinant of SMA take-up is the length of stay in France. That is, the longer individuals stay in France, the higher the probability of being covered. Homeless individuals, and those who entered France illegally.

Even if those coming to France for health-related reasons are more likely to be covered, it is worth noting that having a chronic disease, even if diagnosed in the country of origin, or reporting functional limitations is not significantly associated with the probability of being covered. These results partly support the health selection hypothesis (i.e., individuals in poor health are more covered). The findings show that take-up remains low even after a long period of residence, reflecting a long and complex integration process. Informational barriers and vulnerabilities faced by undocumented immigrants are likely to explain this low take-up. Improving support for SMA application and better communication of health professionals on the benefits of the program might be effective strategies to increase take-up and to reach a better targeting of those with

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[4]The 'Premiers Pas' survey was part of a multidisciplinary project run by a research consortium that brought together researchers in anthropology, sociology, and the health economy, as well as a GP, from the University of Bordeaux, the University of Paris-Dauphine, and the Institute for Research and Information in Health Economics (Institut de Recherche et Documentation en Économie de la Health, or IRDES). 'Premiers Pas' was funded by the National Research Agency (Agence Nationale de la Recherche, ANR) in 2016, the Fondation des Amis de Médecins du Monde and the Regional Health Agency (Agence Régionale de Health, ARS) in the Nouvelle Aquitaine region. The survey was conducted in accordance with data protection regulation, under the control of the French data protection authority (CNIL, declaration MR004, registration number 2203002 v 0).

the highest needs of health care. The rest of the paper is organized as follows. The next section describes the dataset and the methods. Section 3 presents the results. A discussion and a conclusion are provided in the last section.

2. Data and methods

2.1 Premier Pas survey

The data used for our empirical analysis come from the *Premier Pas* survey (Dourgnon, *et al.*, 2019). It provides a representative sample of undocumented immigrants attending places of assistance to vulnerable populations. We designed and conducted the survey from February to April 2019 in *Paris* and in the greater *Bordeaux* area.

The survey protocol follows a two-stage procedure (Dourgnon, *et al.*, 2019). First, we select places of assistance to vulnerable populations (attended, e.g., by immigrants regardless of their legal status or by low-income French individuals). These places offer various assistance services: administrative supports, food distribution, hygiene, health, educational, or cultural services. Among these places, 113 mentioned that at least 20 undocumented immigrants came in a typical week, and 63 agreed to administer our questionnaire. Second, interviewers (speaking French, English, plus at least one language spoken by the undocumented immigrants[5]) collected questionnaires in the places of assistance. They also completed, in a separate document, the characteristics of the place (i.e., detailing its organization and any other information that might affect data collection). In each place, respondents were randomly selected. Forty-nine percent of these respondents were not within the scope of the survey (because they were French citizens, documented immigrants, or refugees), 5% did not speak any of the languages spoken by the interviewer, 21% refused to participate, and 25% agreed to do so. Questionnaires were displayed in 14 languages, collected using touch pads and uploaded on an ongoing basis. A large majority of individuals responded in French (75%), followed by Arabic (8%), English (7%), Spanish (4%), Russian (2%), and Portuguese (2%). The questionnaire addressed the themes relating to the person's motives and their migratory route, their living conditions in France, the person's health status, and access to SMA and health services.

We calculated survey weights taking into account the facility type, attendance, and type of services provided. Our results are representative of undocumented immigrants attending places of assistance in Paris and Bordeaux's conurbation. More precisely, we collect the weekly average number of undocumented immigrants attending each of these places. For each place, we then weight undocumented immigrants according to this average number. That is, we compensate a deviation from this average in giving higher (lower, respectively) weights for those that are below (above, respectively) the weekly average. For this study, we restricted our analysis to the 1,080 eligible individuals who have been in France for at least three months, which is the residence time requested to apply for SMA.

2.2 Variables

We rely on two outcome indicators to measure SMA take-up. First, we use a dummy variable equals to one if individuals are SMA beneficiaries and 0 otherwise. Non-beneficiaries are not covered by any other health insurance. Second, we use a continuous variable indicating how long it took for undocumented immigrants to be covered by SMA. To do so, we calculate the difference between the year of coverage and the year of arrival in France. For example, if those arriving in France in 2010 got covered in 2015, then it took them five years to be covered. It is worth noting that, if undocumented immigrants get covered the year they arrived in France, then this difference is equal to 0.

Three sets of variables are considered to explain SMA take-up.

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[5]These languages are English, Spanish, Arabic, Portuguese, and Russian. Interviewers were first- or second-generation immigrants.

Socioeconomic variables include gender (dummy variable equals 1 if individuals are men, 0 otherwise), age groups (categorical variable distinguishing five groups: individuals aged 18–29 years, those aged 30–39 years, those aged 40–49 years, those aged 50–59 years, and those older than 60 years), monthly net household income (categorical distinguishes five categories: 'individuals earning less than 1 euro per day', 'those earning from 1 to 5 euros per day', 'those earning from 5 to 10 euros per day', 'those earning from 10 to 20 euros per day', and 'those earning more than 20 euros per day'[6]), and finally whether individuals are homeless (dummy variable equals 1 if so and 0 otherwise).

Variables describing the migration story of the respondents are the length of stay in France (categorical variable distinguishing five groups: individuals living from three months to less than one year in France, from one year to less than two years, from two years to less than three years, from three years to less than five years, and five years or more), legal status when arriving in France (dummy variable equals 1 if individuals did not have a valid visa and 0 otherwise), the level of reading in French (dummy variable equals 1 for individuals who self-assessed that they read French very well or well and 0 otherwise), the reasons for coming to France (dummy variable equals 1 if individuals came for health-related reasons and 0 otherwise[7]), and the regions of the home country (categorical variable distinguishing individuals coming from Sub-Saharan Africa, North Africa, North or South America, European countries, and Asia).

Health status variables include whether individuals have functional limitations (dummy variable equals 1 if individuals face great difficulties carrying a 5 kg bag or if they cannot carry such a bag at all, and 0 otherwise), whether individuals report having one disease (dummy variable equals 1 if individuals currently have at least one disease and 0 otherwise), whether individuals have mental health issues (categorical variable distinguishing individuals with no mental health issues, those with no severe depression, and those with severe depression[8]), and whether individuals had at least one disease diagnosed in their home country (dummy variable equals 1 if so and 0 otherwise).

Table 1 displays descriptive statistics of the studied sample. Column 1 gives the percentage of individuals in our whole population of analysis, column 2 provides the percentage of individuals covered by SMA, and column 3 gives the difference in coverage with the rest of the population.

Most of the respondents were men (69.2% column 1) and young adults (31.5% were younger than 29 years old) and most came from Africa (60.3% from Sub-Saharan African countries and 25.4% from North African countries). A total of 28.0% of respondents arrived in France two to five years ago, and 26.2% arrived in France more than five years ago. They mostly come in France for economic reasons (51%), followed by political reasons (20.2%), personal reasons (13.7%), and health-related reasons (9.6%) reasons. One-quarter of respondents were homeless, and the majority arrived illegally in France. A total of 65.1% of respondents declared having at least one disease, and 19.6% mentioned that they had at least one disease that had been diagnosed in the home country. A total of 12.9% declared functional limitations, and 22.8% reported severe depression.

The SMA take-up rate of the whole sample amounts to 51.5%, which is quite high but on the same order of magnitude as that for other health insurance programs for poor people in France. We notice that take-up rates sharply increase with the duration of stay in France. We also note that take-up rates are noticeably lower for homeless migrants, and migrants with no income.

Symmetrically, Table 1 also shows that individuals covered by SMA have characteristics different from the uncovered individuals. In particular, covered individuals are significantly more likely

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[6]The value taken by the income variable is similar to the one obtained for homeless individuals living in France (Brousse *et al.*, 2002; Brousse, 2006; Mordier, 2016).

[7]We pick individuals answering health-related reasons (e.g., because they need healthcare for themselves or for a relative, because of the quality of the health system) to the following open question: 'Why did you come to France?' Other answers refer to economic, political, family, education, and personal reasons.

[8]Mental health issues are measured with the depression module of the Patient Health Questionnaire (PHQ-9). The three mentioned categories follow the one proposed by Kroenke *et al.* (2001).

Table 1. Descriptive statistics

Variables		Percent of whole population (1)	% Covered individuals (2)	Difference with the rest of the population (3)
Sex	Female	30.8	60.3	12.8***
	Male	69.2	47.5	
Age categories	18–29 years old	31.5	39.6	−17.3***
	30–39 years old	36.0	55.3	6.1*
	40–49 years old	21.1	62.2	13.6***
	50 years and more	11.4	52.1	0.7
Length of time in France	3 months to less than 1 year	26.6	23.9	−37.6
	From 1 year to less than 2 years	19.2	49.2	−2.8
	From 2 years to less than 3 years	14.2	61.4	11.6***
	From 3 years to less than 5 years	13.8	70.4	22.0***
	5 years and more	26.2	65.7	19.3***
Entered France illegally		56.0	42.8	−18.4***
Did not enter France illegally		44.0	61.2	
Good French-language skills		28.0	53.4	3.4
Poor French-language skills		72.0	50.0	
Came to France for health- related reasons		9.6	71.6	22.3***
Came to France for other reasons than health		90.4	49.3	
Has difficulty or cannot carry a 5 kg bag		12.9	49.5	−2.3
Has no difficulty carrying a 5 kg bag		87.1	51.8	
Has at least one disease		65.1	52.8	3.8
Has no disease		34.9	49.0	
Does not have severe depression		77.2	41.0	−13.1***
Has severe depression		22.8	54.1	
At least one disease diagnosed in home country		19.6	51.2	1.0
No disease diagnosed in home country		80.4	52.2	
Region of origin	Sub-Saharan Africa	60.3	54.6	7.9**
	North Africa	25.4	44.3	−9.6***
	North and South America	6.7	62.4	11.7*
	Asia	3.8	45.5	−6.2
	European countries	3.8	36.3	−15.7*
Is homeless		25.6	30.0	−28.7***
Not homeless		74.4	68.7	

(*Continued*)

Table 1. (*Continued.*)

Variables		Percent of whole population (1)	% Covered individuals (2)	Difference with the rest of the population (3)
Has children		50.4	51.4	−0.3
Does not have children		49.6	51.7	
Income (per month)	less than 1 euro per day	31.4	39.7	−17.1***
	1–5 euros per day	15.4	51.0	0.5
	5–10 euros per day	20.1	63.8	3.0
	10–20 euros per day	15.5	61.3	11.6***
	20 euros per day or more	17.6	61.4	12.1***
Covered by State Medical Aid		51.5	100	

There are 30.8% of women in our weighted sample (column 1), among whom 60.3% are covered by State Medical Assistance (column 2). Females are significantly more likely to be covered than males (column 3). ***p < 0.01, **p < 0.05, *p < 0.1.

to be female, to have stayed longer in France, to have come for health-related reasons, and are significantly less likely to be homeless or to be severely depressed than uncovered individuals.

In the following, we propose to explore how SMA take-up is associated with explanatory variables using multivariate regressions, which we detail in the next section.

2.3 Methods

To elicit the determinants of SMA take-up, we rely on the following probit (equation 1) and Cox models (equation 2), with i being the subscript for the individual:

$$SMA_{*i} = \alpha_0 + \beta_1 X_1' + \beta_2 H_2' + \beta_3 I_3' + \in_i. \tag{1}$$

In the first equation, SMA_{*i} is the latent variable underlying the dummy variable equal to 1 if individual i is covered by SMA and 0 otherwise. The vector X' corresponds to the full set of socio-economic characteristics previously presented, the vector H', the full set of health status, I' the vector corresponding to immigration history, and ϵ_i is an error term normally distributed.

$$h(t/Z) = h_0(t) \exp(\delta Z). \tag{2}$$

In equation 2, $h(t)$ is the hazard function of the Cox regression, which models time to the first SMA take-up since arrival in France. Only the set of time-invariant exploratory variables Z is selected to avoid reverse causality issues.[9]

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[9]We distinguish between two sets of control variables. The first set refers to fixed (i.e., variables that are unlikely to change due to SMA coverage) whereas the other set refers to varying (i.e., variables that might change due to SMA coverage). The first set includes gender, age, reasons for migration, region of origin, disease diagnosed in home countries. The second set includes the health status variables: having mental health issues, reporting at least one disease, and having functional imitations.

Table 2. Determinants of SMA take-up (probit model)

Variables		State Medical Aid		
		(1)	(2)	(3)
Female		0.146*** (0.026)	0.154*** (0.020)	0.129*** (0.0156)
Age categories (ref. being 18–29 years old)	30–39 years old	−0.077 (0.041)	0.095 (0.041)	−0.081 (0.051)
	40–49 years old	−0.086 (0.076)	0.111 (0.071)	−0.094 (0.072)
	50 years and more	−0.051 (0.059)	−0.006 (0.068)	−0.003 (0.069)
Length of time in France (ref. 3 months to 1 year)	More than 1 year to 2 years	0.260*** (0.041)	0.238*** (0.047)	0.239*** (0.049)
	More than 2 years to 3 years	0.361*** (0.046)	0.359*** (0.052)	0.346*** (0.060)
	More than 3 years to 5 years	0.481*** (0.018)	0.474*** (0.020)	0.469*** (0.024)
	More than 5 years	0.441*** (0.040)	0.467*** (0.035)	0.466*** (0.032)
Entered France illegally		−0.102*** (0.034)	−0.172*** (0.023)	−0.129*** (0.027)
Level of French-language skill		0.007 (0.015)	0.029 (0.020)	0.024 (0.024)
Came to France for health-related reasons		0.215*** (0.091)	0.225*** (0.095)	0.203** (0.099)
Mental health (ref. do not have depression)	Non-severe depression	−0.004 (0.052)	−0.014 (0.050)	−0.011 (0.030)
	Severe depression	−0.178*** (0.042)	−0.180*** (0.037)	−0.154*** (0.058)
Have difficulty carrying or cannot move a 5 kg bag		0.023 (0.047)	0.026 (0.046)	0.039 (0.057)
A least one disease		0.047** (0.017)	0.019** (0.014)	0.046 (0.007)
Diseases diagnosed in home country		0.010 (0.044)	0.009 (0.056)	0.015 (0.055)
Region of origin (ref. North Africa)	Sub-Saharan Africa		0.197** (0.096)	0.189* (0.097)
	North or South America		−0.017 (0.038)	−0.021 (0.040)
	European countries		−0.056 (0.081)	−0.012 (0.056)
	Asia		−0.064 (0.078)	−0.084 (0.084)

Income (ref. from less than 1 euro per day)	Earning from 1 to 5 euros per day			−0.119 (0.073)
	Earning from 5 to 10 euros per day			0.079** (0.034)
	Earning from 10 to 20 euros per day			0.123** (0.038)
	Earning more than 20 euros per day			−0.097* (0.042)
Homeless				−0.128*** (0.056)
Observations		1075	1075	1075

Column 3 provides the results of equation (1). Individuals are more likely to be covered if they are women, if they have been in France for a long time, and if they came in France for health-related reasons. They are less likely to be covered if they arrive illegally in France and if they are severely depressed. Note: Standard errors in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. The initial sample contains 1,080 individuals, but the estimated sample contains 1,075 individuals due to the five missing variables on the SMA variable.
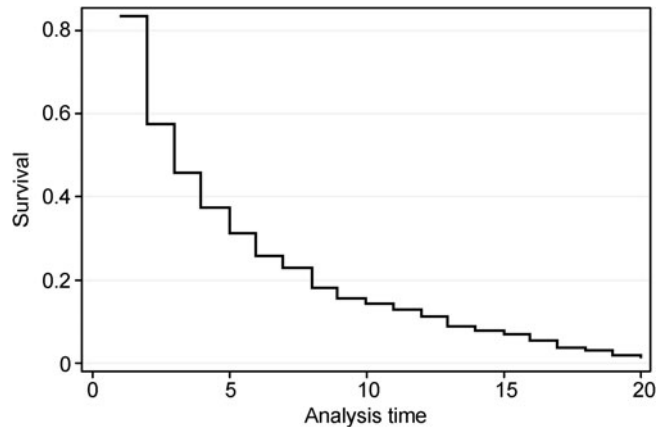
Figure 1. Kaplan–Meier survival curve.

3. Results

3.1 SMA take-up

Table 2 displays the results of three probit regressions. Model 1 selects covariables with regard to their expected impact on SMA take-up: gender, age, having children or not,[10] migration story variables (length of time in France, whether individuals entered France illegally, whether individuals came for health-related reasons), proficiency in French, and all health status variables. It is worth noting that we collected information about migrants' age of graduation. It appears to have no impact on SMA take-up. We suspect that the question poorly captured the real levels of migrants' education and then poorly captured their health literacy levels. We then decided to remove the education variable from the regressions.[11]

Model 2 adds the migrants' regions of origin to the regression to capture the impact of any common explanatory factors among migrants coming from the same region. Model 3 introduces variables relative to migrants' living conditions (monthly net household income and whether individuals are homeless) to evaluate to what extent SMA take-up is associated with current migrants' situations.

We notice that marginal effects are very similar across the three regressions between regressions 1 and 2. All models show that individuals living in France for a longer period of time are more likely to be covered. More precisely, in model 3, those living in France for one to two years are 23.9 percentage points (pp, hereafter) more likely to be covered than those living in France for more than three months but less than one year. This goes up to 46.6 pp for those living in France for more than five years. Additionally, individuals coming to France for health-related reasons and females are also more likely to be covered (20.3 and 12.9 pp, respectively) than those who came to France for other reasons and male. Conversely, individuals with severe depression and those who entered France illegally were both less likely to be covered (15.4 and 12.9 pp, respectively) than others. Finally, being homeless also reduces the probability of being covered by 12.8 pp by comparison with those having ordinary housing or those living in hosting structures.

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[10]SMA is an individual right not a family right. Nevertheless, we expect that having children increases the probability of having contact with the health system and then to obtaining SMA.

[11]Combes *et al.* (2019) and Ichou and Walllace (2019) show that educational attainment and the country level of development are important factors explaining health disparities between immigrants coming in France and non-immigrants staying in home country. We tested, therefore, whether controlling for both the home country's HDI and their related level of secondary completion rate. We do not find any significant association between the probability of being covered by SMA and both the home country's HDI and the level of secondary completion rate

Table 3. Time to take-up (Cox model)

Variables		State Medical Aid	
		(1) Coefficients	(2) Hazard ratio
Female		0.386** (0.154)	1.472** (0.227)
Age at migration (ref. 18–29 years old)	30–39 years old	0.0648 (0.0905)	1.067 (0.0966)
	40–49 years old	0.0716 (0.130)	1.074 (0.140)
	50–59 years old	0.0278 (0.160)	1.028 (0.164)
	60 years and older	0.252 (0.407)	1.286 (0.524)
Illegally entered French territory		−0.289** (0.118)	0.749** (0.0882)
Came for health-related reasons		0.588*** (0.0695)	1.800*** (0.125)
Region of origin (ref. North Africa)	Sub-Saharan Africa	0.294* (0.160)	1.341* (0.214)
	North and South America	0.0659 (0.231)	1.068 (0.247)
	European Union countries	−0.659*** (0.153)	0.517*** (0.0789)
	Europe non-European Union	−0.0443 (0.285)	0.957 (0.273)
	Asia	−0.348*** (0.116)	0.706*** (0.0818)
Diseases diagnosed in the home country		−0.0269 (0.123)	0.973 (0.119)
Observations		1024	1024

Column 2 reports the results of equation (2). The duration to be covered is shorter for women and for those coming in France for health-related reasons. Women are 47 more likely to take-up SMA. Note: Standard errors in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. The 1,024 observations refer to the number of eligible individuals who mentioned the first year they had SMA.

3.2 Time to first take-up

The probit models provide information on the determinants of SMA take-up at the time of the interviews. As respondents could have been covered in the years before the interview, it is interesting to explain the time to the first SMA take-up after arrival in France. It allows us to analyze to what extent the time to take-up is associated with migrants' characteristics upon arrival in France. We only keep time-invariant variables in the Cox regression to avoid reverse causality issues (in particular, we remove health status variables from the regression).

Figure 1 displays the Kaplan–Meier survival curve building from the date of arrival of France and the date of the first SMA take-up we collected in the survey. It shows that the probability of being uncovered after staying four years in France is just below 40%.[12]

Table 3 shows the results of the Cox model. The proportional hazard assumption is supported by graphs of the cumulative survival functions, showing parallel trends for each independent variable (supplementary materials provided on demand). Table 3 shows that the duration to be covered is shorter for women (the probability of being covered is 47.2% higher for women than men) and for those coming from Sub-Saharan Africa. In contrast, migrants coming to France illegally and those coming from European non-European Union countries and Asian countries obtain SMA more rapidly. Coming to France for health-related reasons decreases the time to obtain coverage, while no significant association is found with diseases diagnosed in the home country.

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[12]Figure 1 should be interpreted with caution as it represents a dynamic process obtained from cross-sectional data. The underlying assumption that censorship (we do not observe the duration before take-up for each migrant) is not informative, meaning not linked to the probability to be covered, is questionable.

This means that health status at arrival in France does not lead to more take-up when health is not a reason for migration *per se*.

4. Discussion and conclusion

This paper investigated the determinants of take-up to SMA, a free, public health insurance program designed for undocumented immigrants. We made use of an innovative survey – the 'Premier Pas' survey – representative of undocumented immigrants attending places of assistance to vulnerable populations in Paris and Bordeaux in 2019.

One first important result is that only half of the undocumented immigrants who are eligible for the SMA program are actually covered. This take-up rate is in line with the take-up rate observed for health insurance programs dedicated to vulnerable populations in the US and in France (Bitler and Zavodny, 2014; Guthmuller *et al.*, 2014a, 2014b; Wright *et al.*, 2017; Fonds CMU, 2019).

The SMA take-up rate was higher among women, and we did not find any differences according to the family situation. The results in France regarding ACS take-up were the opposite, showing a lower take-up among women (Guthmuller *et al.*, 2014a) and a lower rate among those having children (Guthmuller *et al.*, 2014b). In the US, women were also more likely to experience more enrollment barriers to Medicaid (Stuber and Bradley, 2005) and to have a lower take-up to the Oregon Health Insurance Experiment (Hoffart, 2018), even though a strong impact of Medicaid expansion among women has been shown, in particular for those having children (Margerison *et al.*, 2020). Interestingly, we did not find any impact of pregnancy on SMA take-up whereas a study has shown that among Sub-Saharan African migrants living in France, those infected with HIV, or hepatitis B or C, the probability of obtaining health insurance coverage was higher for women in the case of pregnancy (Vignier *et al.*, 2018).

SMA take-up appears to be a slow and complex process. The main determinant explaining SMA take-up is the length of stay in France. That is, the longer an individual stays in France, the higher the probability of being covered. The magnitude of the marginal effects associated with the number of years of stay in France in the probit model is particularly impressive. In comparison to those who have been in France for less than a year, those in France for more than one year up to two years have an increased probability of being covered by 23.9 pp, by 34.6 pp for those who are in France for more than two years up to three years, and by close to 50 pp for those who have been in France for five years and more. The Kaplan–Meier curve confirms that the probability of never having been covered by SMA strongly decreases with the length of stay in France. It reaches 60% after two years and then linearly decreases until falling below 20% after eight years. After eight years, the probability of never being covered by SMA continues to decrease but with a lower slope. The slowness of the first SMA take-up mechanism is an important explanation of the low take-up rate observed in our sample since a large part of our sample has lived in France for less than two years.[13]

The low SMA take-up appears partly attributable to informational barriers and the administrative complexity of the application, consistent with the large literature on non-take-up (Chernew *et al.*, 1997; Aizer, 2003, 2007; Stuber and Bradley, 2005; Currie, 2006; Baicker *et al.*, 2012; Odenore, 2012; Bitler and Zavodny, 2014; Guthmuller *et al.*, 2014a, 2014b; Bhargava and Manoli, 2015; Collins *et al.*, 2016; Van Mechelen and Van Der Heyden, 2017; Wright *et al.*, 2017; Finkelstein *et al.*, 2019). In our sample, 31.6% of individuals who were eligible but uncovered reported that they had never heard of the program. Of those uncovered eligible individuals who have heard of the program but who have not applied, 30.6% declared that they do not know

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[13] Gabarro (2017) shows that SMA is used by undocumented immigrants as an official document to claim for future regularization. SMA is considered by the prefecture as a strong and reliable official proof of a permanent length of stay in France. Thus, SMA is not only requested for accessing healthcare services, but also as a path toward integration.

of the formal process for receiving applications, 20.1% cannot provide official documents certifying their resources or their length of stay, and 22.4% think they were not eligible. Additionally, 23.4% of uncovered individuals who have heard of the existence of the program report that they have been covered previously. The main reason for why they do not reapply is the complexity of the application process.

Finally, the large impact of length of stay on SMA take-up in our model is likely to capture the influence on SMA take-up of several characteristics related to the integration process: knowledge of the program, better understanding of the complexity of the administrative and medical systems, and more generally, higher health system literacy. More generally, individuals with a very good or good level of reading French are more likely to be covered, in accordance with previous studies suggesting the impact of language proficiency on health insurance take-up (Bertrand *et al.*, 2000; Aizer, 2007; Nandi *et al.*, 2008; Liou, 2018). However, the remaining association between the length of time in France and the probability of being covered after controlling for French proficiency may suggest the impact of other barriers related to lack of integration, such as the fear of stigma or the fear of being sent back to the home country.

Living conditions and poverty are significantly associated with SMA coverage, but the magnitude of their impact is lower than that of the length of stay in France. Homeless individuals and those having entered France illegally are less likely to be covered. Consistently, the poorest individuals have a lower probability of being covered in the univariate analysis, but we did not find any significant effect of income in the multivariate analysis due to collinearity between income and housing insecurity. In France, Vignier *et al.* (2018) showed that among Sub-Saharan migrants, those infected with HIV or hepatitis B/C and living in France, the probability of obtaining health insurance coverage was reduced in case of a lack of a residency permit and lack of financial resources for men. In the US, the results of the Oregon Health experiment showed that having a phone increases the probability that a person applies to the OHP (Hoffart, 2018), and access to health insurance of undocumented Mexican immigrants in the US has been found to be higher for those with higher levels of formal income and higher levels of social support (Nandi *et al.*, 2008). These results suggest that economic and social hardships constitute negative predisposing or enabling factors for insurance coverage, in accordance with Andersen's seminal behavioral model for health care utilization (Andersen and Newman, 1973). Individuals who face such difficulties also face other vital priorities outside insurance coverage, such as finding food or stable housing.

Our results do not provide evidence of an effect of education on SMA take-up. The absence of a correlation between education level and SMA take-up may be partly related to the questionnaire. Respondents were asked to report the age at which they left school, which in this case is only weakly associated with job status in the country of origin, as measured from an open question and therefore likely to be poorly associated with the highest education level. Nevertheless, the literature provides mixed results on the link between education and health insurance take-up. In the US, individuals with a lower level of education seemed to perceive higher barriers to Medicaid enrollment (Stuber and Bradley, 2005), but the probability of applying to Oregon health insurance decreased with education and income (Hoffart, 2018). In France, ACS take-up has been found to increase with income, but no association was found with the level of education. Finally, health insurance coverage was found to increase with the education level among Sub-Saharan African migrants infected with HIV or hepatitis B/C, but among women only (Vignier *et al.*, 2018).

Finally, this study provides mixed support for the existence of health selection mechanisms, according to which individuals with higher health care needs may be prone to apply more often or earlier to health insurance programs. Such health selection has been largely demonstrated in the literature on health insurance take-up in the US and in France. In the US, children with higher medical care needs are more likely to be covered by Medicaid than others (Aizer, 2003), and individuals with lower income and with a poorer self-assessed health status, with

more days impaired by poor health and those consuming more health care than others, have been shown to apply more often to the Oregon Medicaid program (Allen *et al.*, 2010; Finkelstein *et al.*, 2019). In France, take-up to the ACS has been shown to be higher among individuals with a disability, with chronic diseases, or facing high out-of-pocket payments for their previous health expenses or anticipated health expenses (Guthmuller *et al.*, 2014a, 2014b) than others. A study conducted in France among Sub-Saharan African migrants infected with HIV or hepatitis B or C has also shown that the probability of obtaining health insurance coverage was higher for men who were hospitalized during the last year and for women in case of pregnancy (Vignier *et al.*, 2018).

Our results show evidence that undocumented immigrants who report having immigrated for health-related reasons have a higher SMA take-up than those having migrated for other reasons and have been covered for the first time more quickly, in accordance with the health selection hypothesis. Undocumented immigrants reporting coming in France for health-related reasons might be in poor health in home country and decide to migrate for being treated. This is unlikely to be the case because undocumented immigrants reporting being diagnosed of at least one disease in their home country are not more covered than others. Therefore, those reporting coming in France for health-related reasons might be more covered because they have high health preferences, not because they are in poor health before arriving in France.

In addition, it is worth noting that SMA take-up is not associated with reports of chronic diseases, even when diagnosed in the countries of origin, or with functional limitations. Moreover, SMA take-up is negatively associated with poor mental health. These findings highlight the poor targeting of the SMA program: it suffers from a very high non-take-up rate and does not select individuals with the highest needs. Less than 60% of undocumented immigrants suffering from very severe diseases such as infectious diseases or diabetes and requiring regular treatment in the long term are not covered (Justo, *et al.*, 2019). This could either jeopardize their access to adequate care or contribute to the debts of hospitals and medical services, providing them with regular treatments. Moreover, this poor rate of coverage of immigrants with severe chronic conditions questions the role of health care providers in assisting immigrants in access to SMA coverage.

We must keep in mind that the survey is representative of immigrants who attend places of assistance to vulnerable populations. Nevertheless, this is a population of interest because they are those that could be easily reached by public dedicated programs and those who are most in need of the program, as opposed to more wealthy immigrants and those taken care of by their community.

As of January 2021, the French government introduced a nine-month waiting time between SMA affiliation and effective coverage for so-called non-urgent care. The restriction aims to reduce suspected abuse uses of SMA by individuals coming for health tourism. In light of our results, tackling abuse use at the price of inducing more non-take-up appears to be a trade-off. Since the existence of abusive use has not been supported by evidence while non-take-up is, this reform appears as a wink aimed at populist voters.

This study can provide, nevertheless, interesting insights for policy makers aiming at improving the SMA take-up rate. One option could be to provide undocumented immigrants more assistance in accessing information on SMA. Another option could be the relocation of SMA application services to places usually frequented by undocumented immigrants. These two options consider outreach activities to circumvent the costs associated with the complexity of the administrative process. In addition, uncovered undocumented immigrants successfully attending health care services may not receive appropriate information on SMA. A last option would be, therefore, to train health care professionals to be more knowledgeable about SMA so they can routinely recommend SMA to their patients. Future research will investigate whether individuals covered by SMA are more integrated into the health care system (i.e., rely more on regular providers than places dedicated to vulnerable populations) than uncovered individuals.

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