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# The importance of information on enrollment in a health insurance system: an employee survey in Senegal

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## Abstract

Using a unique database of 204 employees in Senegal, this paper seeks to understand the determinants leading to the choice to enroll (or not) in a health insurance plan. To answer this question, we created three surveys to test certain preferences (time preference and risk aversion) and the role of information. In this paper, we show that Senegalese employees have a very strong preference for the present and a low aversion to loss, which could cause them to not take out insurance. We find that access to information on health insurance plays an essential role in the willingness to enroll. While 12% of employees who received no information about health insurance said they would not want to be insured if they could choose, this proportion dropped to 2% among employees who received positive information about health insurance. These results are econometrically confirmed when controlling for other factors such as gender, age and education. These results show the importance of information on people's perception of health insurance. It is therefore essential to communicate on the functioning of health insurance and the benefits of being covered in order to strengthen adherence to a health insurance system.

**Key words:** Health insurance; Risk aversion; Time preferences; Information; Africa;

**JEL Classification:** I13 ; C93 ; O12.



## 1. Introduction

Governments around the world have set the goal of achieving universal access to health insurance by 2030 (Sustainable Development Goal 3.8). Indeed, the importance of health in economic development is no longer in question. Health shocks cause not only direct losses (health expenditure costs) but also indirect losses (income losses due to a shorter labor supply and lower productivity). In the absence of government-provided health insurance, a significant part of health expenditure is borne by households. Each year, nearly 100 million people fall into poverty due to health problems. Financial constraints are often considered as significant barriers to accessing care in developing countries (Xu *et al.*, 2003). With the support of international organizations and donors, many programs have been implemented to reduce these financial barriers and provide more universal access to care. Despite these efforts, insurance enrollment rates remain low in most developing countries, particularly among the most disadvantaged households (Acharya *et al.*, 2013).

While studies have focused mainly on price elasticity (Cole *et al.*, 2013 ; Cohen et Dupas, 2010 ; Kremer et Miguel, 2007), it seems clear that financial constraints are not the only reason for the low demand for health insurance since even free access does not lead to a 100% enrollment rate. Through an employee survey, the originality of our study is to show that Senegalese employees have a strong preference for short-term over long-term gain and a low aversion to loss, which is in contrast to the mechanism of health insurance. Employees may prefer to use current income to cover future health expenses. Individual characteristics, such as gender, age and education, do not have a significant influence on preferences for the present and loss aversion. On the other hand, our study shows the essential role information plays on perceptions of health insurance and on individuals' willingness to join. While 12% of employees who received no information about health insurance would not want to be insured if they could choose, this proportion dropped to 2% among employees who received positive information about health insurance.

This is one of the few studies providing evidence on health insurance in a developing country. Thornton *et al.* (2010) studies in Nicaragua and King *et al.* (2009) in Mexico are among the only studies that have focused on health insurance in developing countries, but more on price elasticity and the impact of subsidies on take-up rates. To our knowledge, one of the only studies that comes close to ours is that of Asuming (2013). Through an experiment conducted in Ghana, he shows that an awareness and information campaign can significantly increase the rate of participation in a health insurance system. Our conclusions contribute to these results and confirm the importance of the role of information in the implementation of a health coverage system. To our knowledge, our study is the first to focus on the case of a French-speaking country in sub-Saharan Africa. The situation in Senegal is perfectly

adapted to this question since only 14% of employees are covered by health insurance in Senegal (see Appendix 1 for more information on the Senegalese context).

Another contribution we make to the literature is to carry out the survey directly on the target population, namely employees. In the economic literature, surveys are often conducted on students. However, in a survey exploring risk aversion, Haigh and List (2002) have shown that loss aversion is higher among traders than students. Surveying the target population rather than students thus strengthens the interest of the results.

This paper is organized as follows. Section 2 presents a review of the existing literature. Section 3 describes the data and methodology used to administer the survey. Section 4 displays the results, showing the importance of the role of information and people's perceptions of a health insurance system. The final section concludes.

## 2. Literature review

The existing literature in developing countries has often focused on the impacts and benefits of health insurance. Finkelstein and Taubman (2012) show that health insurance increases the use of health centers, provides better health indicators and reduces the share of health expenditures borne by Ghanaian households. Asuming (2013) shows that health insurance reduces the number of days a person is sick by 42%. Health insurance also provides protection against what Flores (2008) calls "transient" poverty, that is to say, when households are forced to sacrifice part of their basic consumption in order to finance health care expenditures. Woode (2016) shows that health insurance significantly improves the children's attendance at school in Rwanda. During a major health shock, children are generally used as a substitute to compensate for the reduced labor supply and lower productivity, , serving as a safety net to compensate for loss of income. Health insurance will then allow the children to continue their education. This positive role of health insurance in education has been proven by several studies (Liu, 2016; Edmonds, 2006).

However, demand for health insurance products is particularly low in developing countries. An experiment by Banerjee, Duflo and Hornbeck (2014) showed that, when microfinance clients are required to take out health insurance in order to subscribe to a new loan, a large percentage of them prefer to forego the loan in order to avoid having to take out health insurance. Many researchers have tried to explain this lack of willingness to join a health insurance system, focusing mainly on price elasticity (Cole *et al.*, 2013).

However, price does not appear to be the only barrier to enrollment in health insurance coverage. A study by Chemin (2017) shows that a significant subsidy can significantly increase insurance coverage.

Nevertheless, a 100% subsidy will only have generated a 45% subscription rate! In other words, even when access to health insurance is free, 55% of individuals still refuse health insurance. The reasons given by participants were lack of trust and knowledge of these financial products. A similar study in India also shows that even free access to health insurance would not lead to a 100% enrollment rate due to a lack of trust. (Cole *et al.*, 2013). *Berhane et al.* (2015) reach the same conclusion when studying the case of Kenya. The low demand for health insurance therefore does not appear to be solely related to financial constraints, hence subsidy programs alone will not achieve universal access to health insurance.

The interest of our study is therefore to extend these reflections to better understand the role of individual preferences, such as risk aversion and preference for the present, in the choice to enroll (or not) in a health insurance program. In this paper, we show that Senegalese employees have a very strong preference for the present and a low aversion to loss, which could encourage them not to take out insurance. While many studies have shown that the choice to take out health insurance is influenced by socio-demographic characteristics, such as age, gender or income (Nandakumar *et al.*, 2000 ; Deb *et al.*, 2006), we show that these factors do not significantly change our results. In other words, individual characteristics do not affect the choice to take out (or not) health insurance. In this context, one may wonder how to increase enrollment rates. To go further, we demonstrate the importance of information in the choice of whether or not to become insured. Reminding people of the protective role of health insurance and its benefits significantly increases the willingness to participate in a health insurance system.

### 3. Data and Methodology

#### 3.1. Data

The survey we administered in Senegal was embedded in a study carried out between August and September 2018. It was designed to assess individual preferences regarding health insurance in order to better understand why some people prefer to be insured while others do not. To explore this subject further, we had subjects take part in a survey that consisted of two parts: (i) background questions, including socio-economic characteristics such as age, education and job occupation; and (ii) three surveys to test their time preferences, risk aversion and the role information plays in the decision of whether or not to become insured.

The order in which the surveys were conducted was deliberate. We began with the survey on time preferences, then the one on risk aversion and finally the survey on the role of information. Following Holt et Laury's (2005) method, the idea was to start with the most abstract survey, which did not directly refer to the insurance system so that participants could answer without having any

preconceptions and without any positive or negative connotations related to the term “insurance”. The information survey by definition consists of providing information on health insurance, so it was placed at the end.

We surveyed 204 employees in Senegal within 6 partner companies of *Investisseurs & Partenaires* (I&P), a family of impact funds fully dedicated to the African continent. I&P is a pioneer in the impact investing sector in Africa and strives to maximize the economic, social and environmental impacts of its partners and to actively contribute to African development. The partnership with I&P provided access to their partner companies and allowed us to directly survey their employees. In a country where private employment is not well developed, it was quite a rare opportunity to have access to employees in order to better understand how they view employment-related health insurance.

Senegal was chosen because of the diversity of I&P’s partner companies there, which allowed us to have a comprehensive sample. Employees came from several sectors such as agribusiness, health, energy ,and services, were at different hierarchical levels and had different types of contracts. This gave us a fairly large and representative sample that included employees with an employment contract and those without, as well as workers in intermediate situations of semi-informality (or semi-formality), such as workers with service contracts, for example.

### 3.2. Time preferences

The first survey focused on time preferences. Since an insurance system aims to provide security against possible future risk, the more a person values the present, the less they may want insurance. People could prefer to benefit from their immediate income rather than contributing to cover themselves against possible future expenses. Thus, we gave participants a choice between two theoretical options:

*Option A) receive CFAF 5,000 today;*

*Option B) receive CFAF 20,000 in a number of months.*

*The question was repeated several times with different durations: one month, three months, six months and a year.*

In any case, it was made clear that the gains would be certain, whether they chose option A or B. The employees surveyed had to choose between a lesser immediate gain and a larger future gain . The money proposed was hypothetical: regardless of the person's choice, they did not receive any money. Some authors feel it is necessary to remunerate subjects in order to ensure that they project themselves into a hypothetical situation and answer what they would really have done in the face of such a choice. However, remuneration introduces another factor into the survey, namely the perceived

credibility of the researcher. The very nature of the first survey involves finding out whether participants preferred to wait for a payment if they chose option B. It would no longer be clear whether option B was chosen because of a participant's preference for delayed gratification or simply because of mistrust of the investigator. We therefore chose to avoid using remuneration. In an attempt to help make the hypothetical question seem as realistic as possible to participants, real banknotes were shown to the employees during the interviews. They could therefore visualize the immediate gain of CFAF 5,000 on the one hand and on the other hand the future gain of CFAF 20,000.

### 3.3. Risk aversion

The second survey was designed to test participants' risk aversion. Several studies have addressed risk aversion issues. However, these studies have generally focused on gains in investment choices which is a different context than that of health insurance since the choice to become insured does not correspond to a gain situation but rather a loss situation. Participants were given a choice between one of the following two scenarios: the individual decides to take out insurance and loses a certain amount of money in contributions (Lottery A) or the individual does not wish to be covered. If he does not get sick, he has lost nothing since he has not paid any contributions or health expenses; however, if he does get sick, he will have to pay for his health expenses alone (Lottery B). It is clear that risk aversion is not the same when it comes to gains or losses, hence the interest in testing loss aversion to determine whether it is an important element in the decision to take out insurance or not.

*“Imagine having a choice between these two options. Which option would you choose?”*

*Lottery A: certain loss of CFAF 5,000*

*Lottery B: one chance in two to lose either CFAF 0 or CFAF 20,000”*

Lottery amounts have been determined to reflect this choice as accurately as possible, without individuals being able to directly know that they have to choose between taking out insurance or not. In the case of Lottery A, the certain loss corresponds to the average amount of social contributions for a person earning around the minimum wage (CFAF 5,000). In the case of Lottery B, if he does not become ill, the individual has no loss (CFAF 0). On the other hand, if he does become ill, the loss corresponds to the average health expenditure observed in Africa (CFAF 20,000). As with time preference, the scenarios in the questions were fictitious and no money was really at stake, especially since these were losses.

The main challenge of this type of experiment is to ensure that the survey is well understood by the participants. To this end, the protocol was enhanced by two important elements. Firstly, a poster was created to visualize the choices and the amounts (see Appendix 3). We considered that it could be difficult to remember the choice and amounts if they were only mentioned orally. Understanding



probabilities, in our case a 50:50 chance, is also often difficult for people with little education. An image of both sides of a coin was therefore added to the poster to illustrate the concept of one chance in two. Secondly, a test was set up to ensure that the survey was well understood (see Appendix 2). Individuals who did not understand the instructions or the concept of probabilities could be encouraged to choose Lottery A, which is easier to understand. We therefore asked participants to first choose between a guaranteed winning of CFAF 5,000 (Lottery A) or one chance in two to win either CFAF 5,000 or CFAF 20,000 (Lottery B). Since Lottery B winnings are always higher than Lottery A winnings, all participants should answer Lottery B. In practice, some participants chose Lottery A because they did not understand the concept of probability. We would then repeat the explanations until the choice was understood and the right answer was given. The implementation of a test to ensure that the choice was understood was therefore essential to increasing the reliability of

#### 3.4. Information

The third survey seeks to assess the role information plays in the decision of whether or not to become insured. The choice of whether or not to be insured may depend on one's understanding and perceptions of the health insurance system. During our interviews, it became quite clear that the insurance system was not always understood by all participants. The idea of making a monthly contribution to be covered against certain risks was not always understood, especially since many drugs are not reimbursed in practice and several health care centers are not included in the scope of the insurance. Thus, people in Africa do not always see the benefits of the insurance coverage they have access to. Whether or not they want to be insured may therefore change depending on the information and perceptions they have about health insurance. The surveys we adapted were initially developed to determine the propensity of people to pay for certain food items and the role information played on this level of propensity (Noussair, 2014). On the other hand, these surveys have rarely been adapted for health insurance. The researchers assume that health insurance is always perceived as a positive social benefit that everyone would want to benefit from. We will see in the rest of this study that this is not always the case and that a significant percentage of employees would prefer not to be insured.

A survey to test the role of information consists in our case of disclosing to a random group certain information related to health insurance. In other words, a text was read to some employees and not to others. We then asked the employee if he had a choice, would he prefer to contribute to health insurance or not be insured. The objective was to compare the responses between a treated group (employees who received positive information about health insurance) and a control group (who received no information about health insurance). The choice of who was read the text was decided

randomly over a series of ten interviews. A function in Excel gave five numbers randomly drawn to designate the five employees who would have the text read to them. This same approach was then extended as necessary depending on the number of people surveyed.

	Text read
Employee #1	No
Employee #2	No
Employee #3	No
Employee #4	Yes
Employee #5	Yes
Employee #6	No
Employee #7	Yes
Employee #8	No
Employee #9	Yes
Employee #10	Yes

The main question when building a survey on the role of information is to determine what type of information to give to participants. We included statistical information as well as information with moral considerations referring to the importance of contributing to a health insurance system. The information provided was intended to provide a positive and useful vision of health insurance to determine whether awareness and communication campaigns can increase the uptake of health insurance. In order to ensure that the information provided was well understood, the text was read in French or Wolof according to the respondent's linguistic preferences (see Appendix 4 for the Wolof version). The question asked was whether or not people would prefer to contribute to health insurance if they had a choice. They were therefore asked to put themselves in a hypothetical situation where contributions were not necessarily linked to the employment contract but could be refused.

*“Health care costs can be very high, especially during hospitalization. One in three individuals must borrow or sell items to finance their health expenses. Each year, this leads 100 million people to fall into extreme poverty. However, many studies have shown that health insurance can provide coverage against these risks and limit high emergency expenses. Health insurance thus represents an effective solution to fight poverty and improve health.”*

*Question asked: “If you had a choice between contributing to health insurance or not having insurance, what would you choose?”*

## 4. Results

### 4.1. Time preferences

We found that time preferences play an important role in the decision to become insured. Choosing to become insured entails an immediate expense in order to benefit from health coverage that will reduce health expenses in the future. When an individual has a strong preference for the present, he may prefer not to become insured in order to fully enjoy their immediate income. Health expenses covered by health insurance may ultimately be higher but they occur in the future. When employees had to choose between a smaller but immediate gain or a larger future gain, they overwhelmingly preferred the immediate gain since three-quarters of respondents chose Lottery A.

This preference for the present may vary according to individual characteristics. We looked at time preferences according to a number of individual characteristics, such as gender, age and education (Table 1). None of these factors appears to influence individuals' time preferences. More surprisingly, while the existing literature tends to show that the poorest people prefer immediate gratification over delayed gratification than wealthier ones (Barr and Packard, 2000), we show that income level has little influence since employees with higher incomes had an equally strong preference for a present gain. Correlation coefficients are not significant and confirm these descriptive statistics (Table 2, column 1). Econometric results are also coherent since a simple OLS regression also shows that there is no significant impact of these different individual characteristics on the preference for the present (Table 3, column 1). Results are robust to different time durations since all these results are similar whatever the time duration (one month, three months, six months or a year). In other words, Senegalese employees have a very significant preference for the present, regardless of individual characteristics and the specific situation of each individual. It would then not be surprising if some individuals chose not to become insured against future risks and preferred to keep their salary rather than pay social contributions. However, time preferences are not the only parameter that can influence the choice of whether or not to become insured. Risk aversion also plays an essential role in the decision to hedge against risks.

Table 1: Descriptive statistics, Choice of time preferences, 6 months, by individual characteristics

		<b>Option A (present)</b>	<b>Option B (future)</b>
<b>Gender</b>	Men	78%	22%
	Women	74%	26%
<b>Age</b>	Young (under 25)	77%	23%
	Over 25 years old	75%	25%
<b>Family with child</b>	No child	72%	28%
	Have a child	77%	23%
<b>Education</b>	Primary school or no education	78%	22%
	Middle school or high school	77%	23%
<b>Unemployment</b>	Already experienced unemployment	76%	24%
	Never experienced unemployment	75%	25%
<b>Employment contract</b>	Formal	75%	25%
	Informal	75%	25%
<b>Income</b>	Under median income	80%	20%
	Above median income	73%	27%
<b>FULL SAMPLE</b>		<b>75%</b>	<b>25%</b>

Table 2: Coefficient correlation between the result of a survey and individual characteristics

	<b>(1) Time preferences <i>y = present</i></b>	<b>(2) Risk aversion <i>y = lottery A</i></b>	<b>(3) Information <i>y = to be insured</i></b>
Gender	-0.036	-0.009	0.062
Age	-0.042	-0.044	0.024
Children	0.029	0.062	-0.087
Education	-0.019	-0.042	0.069
Unemployment	0.018	-0.154**	-0.110
Informal	-0.008	-0.125*	-0.113
Wage	-0.084	0.077	-0.039
Information			0.180***

The result of the survey is to prefer the present (1), to choose Lottery A, corresponding to the choice to become insured (2) and to choose to become insured (3). \*, \*\*, \*\*\* indicate significance at 10%, 5%, and 1%, respectively.

Table 3: OLS estimation between the result of a survey and individual characteristics

	(1) Time preferences <i>y = present</i>	(2) Risk aversion <i>y = Lottery A</i>	(3) Information <i>y = to be insured</i>
Gender	-0.330 (-0.44)	0.020 (0.25)	-0.017 (-0.39)
Age	-0.000 (-0.02)	0.000 (0.05)	0.003 (1.48)
Children	0.051 (0.60)	0.084 (0.89)	-0.038 (-0.74)
Education	-0.171 (-0.22)	-0.131 (-1.50)	0.051 (1.08)
Unemployment	0.025 (0.37)	-0.181** (-2.38)	-0.071* (-1.74)
Informal	-0.022 (-0.22)	-0.192* (-1.69)	0.075 (1.22)
Wage	-0.062 (-0.92)	0.118 (1.57)	0.000 (0.01)
Information			0.093*** (2.44)
Obs.	204	204	204
R <sup>2</sup>	0.02	0.09	0.08

The dependent variable is to prefer the present (1), to choose Lottery A, corresponding to the choice to become insured (2) and to choose to become insured (3). T-statistics are reported in parentheses. \*, \*\*, \*\*\* indicate significance at 10%, 5%, and 1%, respectively.

#### 4.2. Risk aversion

To test risk aversion, employees had to choose between Lottery A (reflecting the choice to become insured) or Lottery B (reflecting the refusal to become insured). Across the entire sample, nearly 54% of employees preferred Lottery B. In other words, a majority of individuals have low risk aversion to loss. These results can be interpreted as the fact that they would prefer to take the risk of not being covered and having to pay health expenses if they fall ill (larger but uncertain losses), rather than pay monthly contributions (certain losses). As seen in the previous survey, employees have a significant preference for the present. It is therefore not surprising that they prefer to postpone spending in a more or less near future, even if it means that these expenses can represent larger amounts. Paying a monthly health insurance premium, while the potential benefits are uncertain and in the future, is therefore not preferred by many employees surveyed.

However, it is questionable whether this low loss aversion varies according to the characteristics of individuals. The existing literature usually shows that individual characteristics significantly influence risk aversion. Hartog et al (2002) show that women are more risk adverse than men and Harbaugh et al (2002) show that younger people prefer less risky lotteries than older people. If we simply look at the descriptive statistics (Table 4), we have not found any differences between men and women, nor any different behaviors according to age. While one would expect differences according to income level, the results are ultimately quite similar, just as the level of education has only a marginal influence on outcomes. On the other hand, other characteristics seem to lead to more marked differences. Having a family seems to change employee preferences: people without children are even less prone to loss and even more likely to choose Lottery B corresponding to the preference to not becoming insured. When an individual has a child, he or she will then favor less risky options. Informal employees are much less averse to loss and more strongly prefer Lottery B (not to get insurance). The precariousness of their status probably leads them to becoming used to these uncertainties and to accepting the risks that this entails. This view is also true for people who have already experienced unemployment since they are less risk averse and prefer the riskier Lottery B, while people who have never experienced unemployment will prefer Lottery A, which appears more secure.

Beyond these descriptive statistics, it is important to consider whether these factors have a significant influence on risk aversion choices in a more rigorous way. Correlation coefficients display similar results (Table 2, column 2). An OLS regression is then used to verify the influence of these factors in an econometric way (Table 3, column 3). As might be expected from the small differences in descriptive statistics, most individual characteristics (gender, age, income) do not have a significant impact on a participant lottery choice. Only having already been unemployed or working informally seems to have a significant impact on lottery choices.

Whether in terms of time preferences or risk aversion, individual characteristics play a small role in behavior. When individuals are confronted with experiences that simulate the decision to take out insurance, a majority prefers the option of not becoming insured, regardless of the of the individual's characteristics. The choice to become insured and join a social security system therefore does not seem to be based mainly on individual preferences, but rather will be linked to the information available to individuals and their perception of health insurance, as shown by the latest experiment.

Table 4: Descriptive statistics, Lottery responses on risk aversion, by individual characteristics

		<b>Lottery A</b>	<b>Lottery B</b>
		<b>(be insured)</b>	<b>(uninsured)</b>
<b>Gender</b>	Men	46%	54%
	Women	45%	55%
<b>Age</b>	Young (under 25)	45%	55%
	Over 25 years old	46%	54%
<b>Family with child</b>	No child	39%	61%
	Has a child	47%	53%
<b>Education</b>	Primary school or no education	49%	51%
	Middle school or high school	39%	61%
<b>Unemployment</b>	Already experienced unemployment	41%	59%
	Never experienced unemployment	57%	43%
<b>Employment contract</b>	Formal	49%	51%
	Informal	27%	73%
<b>Income</b>	Under median income	43%	57%
	Above median income	50%	50%
<b>FULL SAMPLE</b>		<b>46%</b>	<b>54%</b>

#### 4.3. Information

The last survey was designed to test the role of information: are employees more likely to get insured when they have positive information about health insurance? Since individual characteristics seem to play a minor role in the various preferences and the choice to take out insurance, it is necessary to check whether or not the choice to get insured is a result of individuals' perceptions of health insurance. These perceptions may vary depending on the information to which individuals have access. In our case, we read a text explaining the benefits and interests of health insurance to half of the Senegalese employees surveyed in order to compare their answers with the other half who had not received any specific information. While 12% of employees who received no information about health insurance would not want to be insured if they could choose, this percentage dropped to 2% among employees who received positive information about health insurance (Table 5). It therefore appears that access to information can change people's perception of health insurance and their willingness to pay for it.

These results are confirmed both through correlation coefficients (Table 2, column 3) and through an OLS estimation (Table 3, column 3). When controlling for other factors, such as gender, age or education level, econometric results confirm the importance of access to information. Indeed, individual characteristics do not have a significant impact on the choice of whether or not to become insured. On the other hand, hearing the text and obtaining positive information about health insurance had a significantly positive impact on the willingness to get health insurance.

Table 5: Descriptive statistics, survey on the role of information

	Text read	Text unread
<b>Be insured</b>	98%	88%
<b>Uninsured</b>	2%	12%
	100%	100%

5. Conclusions

Thanks to an original database of more than 200 Senegalese employees, our study shows that Senegalese employees have a very strong preference for the present. This may lead them to prefer immediate income over making contributions to cover future health expenses. Employees also have low loss aversion, which means they are willing to take the risk of not being covered and having to bear the full cost of health care in the event of illness. This preference for the present and low risk aversion does not depend on individual characteristics since gender, age and education do not have a significant influence on the outcome of our surveys. One may wonder what might motivate employees to take out health insurance. Our study shows that information plays a key role in the willingness to join a health insurance system. While 12% of employees who received no information about health insurance would not want to be insured if they could choose, this figure dropped to 2% among employees who received positive information about health insurance.

Our study makes an important contribution to the existing literature, which has focused mainly on price elasticity issues. While the majority of studies have shown that large subsidies significantly increase the rate of health insurance subscriptions, these studies do not explain why, in the case of 100% subsidies, some refuse to subscribe to free health insurance. Price is therefore not the only factor influencing the decision to become insured. Our study recalls the important role of information and perception in the willingness to join a health insurance system.

Our study has important implications for public authorities in Africa. The willingness of governments to provide universal access to health insurance as stipulated in the Sustainable Development Goals



cannot be achieved simply by setting up subsidy programs. Raising awareness- and running information campaigns on the role and benefits of health insurance are essential to changing people's perceptions and understanding of the benefits of health insurance in order to increase their willingness to participate.

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## Appendices

### **Appendix 1:** Health insurance system in Senegal

The *Caisse de sécurité sociale du Sénégal* (CSS) provides family benefits (prenatal, maternity family and maternity leave allowances, etc.), health benefits in the event of accidents at work and occupational diseases, and provident benefits (compensation in the event of work stoppage, death benefits).

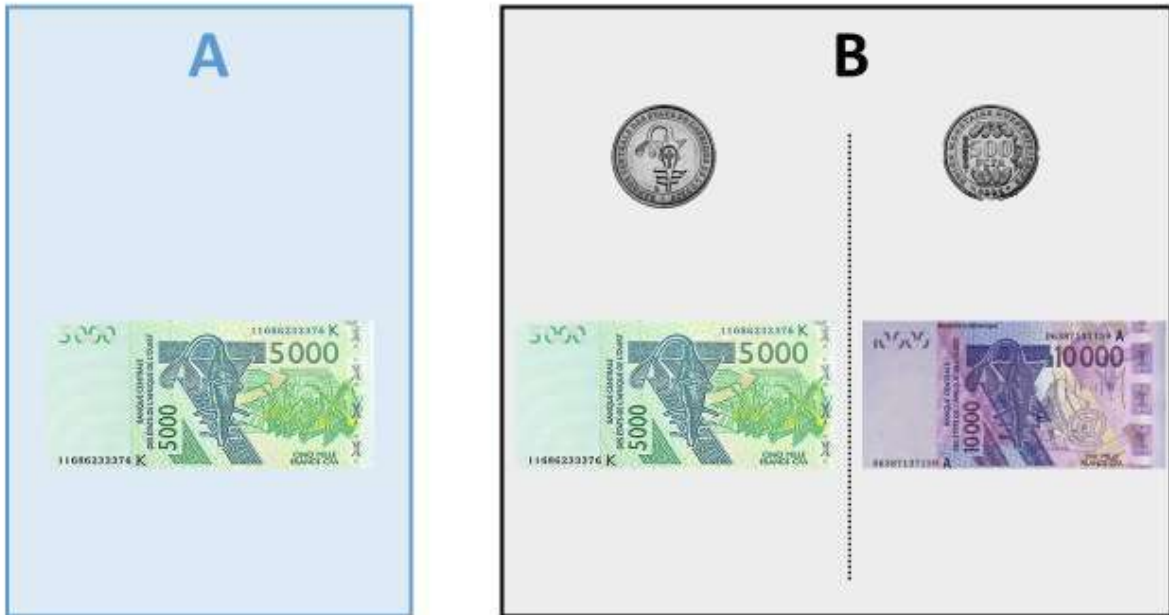
The CSS does not cover health care outside of work. Health insurance in Senegal is managed by other organizations, segmented according to each category of the population:

- Employees of private companies are covered by a company health insurance scheme (*instituts de prévoyance maladie* - IPM), of which employers must be members. The creation of an IPM is mandatory for any company with at least 100 employees. If this number is not reached, the obligation is to join an existing IPM or an inter-company IPM. Once created, the IPM provides partial coverage for the costs incurred by the non-occupational illness of the worker and members of his family. The financing of the IPM is essentially ensured by a monthly employer and employee contribution of 6% applied to a base of CFAF 60,000 maximum.
- Civil servants and their spouses/children: four-fifths of the medical costs are borne by the State. The remaining 20% is at the employee's expense.
- Persons over 60 years of age and children under five years of age are cared for free of charge by a public medical assistance scheme.
- Self-employed workers, as well as other categories of the population (informal sector), are insured through mutual health insurance.

Until recently, membership of a mutual health insurance company was voluntary. Since persons affiliated by a mutual company and the state are in the minority, a large majority of the population was not covered at all. In 2013, Senegal implemented the reform of compulsory health insurance (AMO), introducing universal health coverage, with the objective of covering 75% of the population. This measure mainly targets people in rural areas and the informal sector.

However, despite the stated intentions and the obligation for companies to subscribe to an IPM, only 14% of private employees are covered by health insurance (ANSD, 2015). Indeed, the extent of informality in Senegal, where nearly 98% of the economic units surveyed are considered informal, makes it very difficult to apply the law and to control whether employees are well covered.

**Appendix 2: Risk aversion - test**



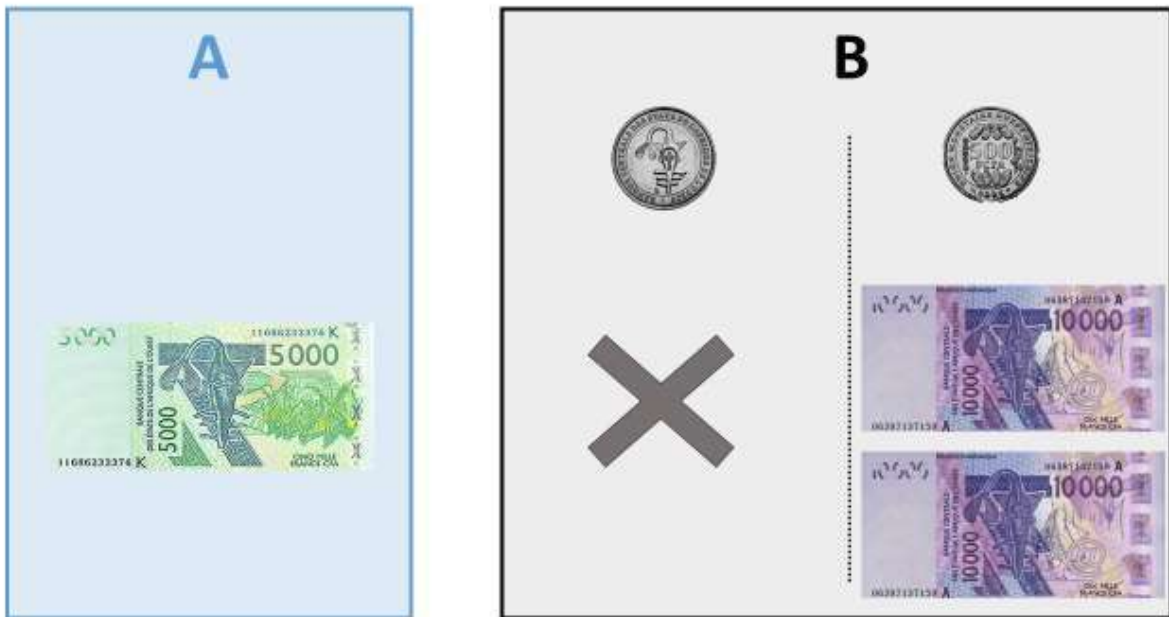
*"Imagine having a choice between these two options. Which option would you choose?"*

*Lottery A: certain gain of CFAF 5,000*

*Lottery B: one chance in two to gain either CFAF 5,000 or CFAF 20,000"*

The test was used to ensure that the choice was well understood. Lottery B necessarily brings a win at least equal or even higher and should therefore necessarily be chosen. Unless the employee does not understand the principle of probability and gambling, he will then favor the Lottery A which he understands. In this case, we will repeat the explanations until the choice is understood.

### Appendix 3: Risk aversion - loss aversion



*“Imagine having a choice between these two options. Which option would you choose?”*

*Lottery A: certain loss of CFAF 5,000*

*Lottery B: one chance in two to lose either CFAF 0 or CFAF 20,000”*

### Appendix 4: Information, text read in Wolof

*“Setlou négn ni xaliss bouy dougou si waloum wérgoum yaram beuri na rawatina si hospitalisation. Sunu dieulé niéti niite, kéne ki dafay diay loumou yorr wala mou lép guir meuneu fadiou. Ateu mou nékeu lou tol ni témeri millions si ayy niite dégni démeu ba doleu. Def négn ay diangate youy wané ni assurance santé meneu nala arr ci lolou bolé si meneu na wagni liguay dépensé si wérgoum yaram. Assurance santé guénéel leu si wagni doleu ak yokou té wergoum yaram”.*



*“Sur quoi la fondera-t-il l'économie du monde qu'il veut gouverner? Sera-ce sur le caprice de chaque particulier? Quelle confusion! Sera-ce sur la justice? Il l'ignore.”*

Pascal



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