

# Labour Discrimination as a Symptom of HIV

## Experimental Evaluation: The Greek Case

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**Abstract:** *In the present study, we conducted the first ever Correspondence Test in order to test whether job applicants who voluntarily disclose their HIV infections face prejudices in the selection process in Greece. Resumes differing only in an applicant's health status were faxed to advertised job openings. The outcomes imply that employers use health conditions as a factor when reviewing resumes. The rate of net discrimination against HIV-positive males was between 82.6% and 97.8%. Similarly, net discrimination against HIV-positive females was between 81.6% and 98.8%. Interestingly, the degree of discrimination was randomly assigned and unrelated to an applicant's education level and job status. The current study develops a new methodology that could promote researchers worldwide to conduct similar surveys. As efforts to address HIV discrimination grow, so does the need for a set of standard discrimination indicators that have been tested and validated.*

**Key words:** Correspondence Test, Labour Discrimination, Probit Model, AIDS/HIV.

**JEL classification:** I10, J15, J81, K31, M54.

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## 1. Introduction

HIV infection fits the profile of a condition that carries a high level of stigmatization: it is perceived as a great danger and often arouses fear of contagion (Herek [1999]). Since the earliest days of the AIDS epidemic, people carrying the infection and those suspected of being infected with HIV have been subjected to social ostracism and employment discrimination (Gostin and Webber [1998]). Worldwide, there are documented cases of job discrimination related to HIV/AIDS: job applicants are passed over for recruitment, and workers are dismissed, denied promotions, excluded from social benefits and other entitlements, and refused entry into foreign territories for employment purposes on account of their HIV status (Barragan [1992], Omangi [1997]). Nevertheless, a firm that refuses a job or terminates employment must show that an individual poses a direct threat to the performance of routine job duties [1].

Sociological and psychological surveys of public opinion revealed a widespread fear of the disease, and a lack of accurate information about its transmission (Herek [1999]). Economists, on the other hand, have not yet explored the relationship between labour market outcomes and HIV status. In the current study, we develop for the first time an experiment to determine if known HIV-positive applicants are treated differently in the hiring process from their equally skilled, but uninfected, counterparts in Greece. The *Correspondence Test* approach, so named for its simulation of the communication between job applicants and employers, involves sending carefully matched pairs of written job applications in response to advertised vacancies to test for discrimination in hiring during the initial stage of selection for an interview (Bertrand and Mullainathan [2004]).

Methodologically, based on Riach and Rich (2002), health conditions can be identified by a paragraph in the applicant's curriculum vitae explaining the applicant's special health status. For the purposes of this study disclosure of an applicant's HIV status is necessary; otherwise, the practice of hiding one's HIV status is likely to reduce the measurable impact of

discriminatory behavior. Since people living with HIV are generally reluctant to reveal their condition; collecting data about them is difficult and analysis of the potentially obtained data presents additional challenges [2]. As experimental economists, we wish to explain real-world issues and to provide knowledge and insight that are relevant to improving our understanding of the world as it is and to help solve the problems faced by individuals.

The data were gathered from June 2007 through February 2008 in Athens, the capital of Greece, as part of the Athens Area Study (AAS) conducted by the University of Crete. The 2007 AAS is one component of the Multi-City Study of the Scientific Center for the Study of Discrimination (SCSD). Our estimations suggest that HIV discrimination is a real issue in the Greek labour market: discrimination against HIV-positive applicants exists and is significant. Meanwhile, the degree of discrimination is unrelated to an applicant's education level and job status.

The rest of the paper is organized as follows. In the next section we describe our methodology, the structure of the investigation, and the model used to capture the relevant relationships. In the third section, we present our estimations and analysis of these results, and the last section presents our conclusions.

## **2. Methodology**

### *2.a HIV-Disclosure*

There have been numerous Correspondence Tests evaluating health and disability discrimination in the hiring process [3]. The scope of these tests is to estimate to what extent employers are prone to adapt their recruitment and selection criteria, their job assignments and classifications, and their employee assistance programs when an applicant has a chronic health limitation. While much progress in the discrimination literature has been made through these studies, they have often neglected the issue of unequal treatment on the basis of HIV-status.

In our experiment, an applicant's health condition was directly denoted by a reference in a special information part of the line, *"Driven by deontological considerations I inform you that I am seropositive, that is, an HIV (+) carrier. I am healthy, productive, and fully capable of performing all the duties of the position. Recommendations upon request"*<sup>2</sup>. On the other hand, for half of the applicants, no explicit information on health status was provided. These were classified as the uninfected applicants [4].

Although individuals with HIV are not usually required to disclose their HIV status to employers, they may still face issues in the labour market as a result of their infection. Here we mention two examples of HIV-status-related events that frequently take place during the hiring stage. In the first place, it is a very common practice in Greece to request pre-employment medical history questionnaires. These questions trouble applicants from a moral standpoint regarding disclosure of their HIV status. To be precise, we present some factual questions from a relevant questionnaire that goes something like that: *"During the past years: a) Have you ever or are you being treated for, or have you been told that you have any sickness or injury? If yes, describe b) Have you ever consulted or been examined or treated by a physician? If yes, provide the name and address of the physician"*. Second, the dominant applicants must undertake psychical examinations performed by the firm's medical centres [5]. Such centers return applicants' examination files to firms' corporate headquarters before hiring becomes official. In both cases, if an applicant is identified as HIV-positive it is left to the firm's discretion to decide whether she/he should be hired. In our case, we choose to voluntarily disclose HIV status in order to capture some trends and to help formulate an unbiased estimate of the degree to which an applicant's health condition may contribute to her/his chances of being hired.

Apart from the above mentioned reasons for HIV-status disclosure, we argue that there are particular reasons why an applicant may voluntarily disclose her/his health conditions. In

our experiment we suggest that an HIV-positive applicant may disclose information in this way in order to identify whether firms are prone to providing any reasonable adjustments to the recruitment and interview process or to evaluate how the successful candidate will function following employment. Employers have a legal duty to provide HIV-positive individuals with any special adjustments or services such individual might need in order to help them do their job as long as no unjustifiable hardships in doing so are experienced by the firms (ILO [2007]).

Based on Riach and Rich (2002), it is necessary to be careful in ascertaining, in each field experiment that detects health discrimination, whether or not that the relevant health condition encounters discrimination when human capital and employment cost differences are either non-existent or negligible [6]. Based on the United Kingdom's Disability Discrimination Act of 2005, HIV is a condition that requires only minor changes in firms, and most of those changes carry no additional cost [7].

More importantly, following the AIDS Legal Council of Chicago (2006), most people who disclose their HIV status at work want to protect their rights, such that a discriminatory employer cannot claim ignorance of an employee's HIV status, for instance, in the event of an occupational accident, after which an employee must apply for compensation.

Non-disclosure might reflect an internalization of societal stigma by people with HIV, and such internalization can lead to self-loathing, self-blame, and self-destructive behaviors (Johnston *et al.* [1995]). Many HIV-positive individuals reveal their status because hiding one's health condition is likely to cause anxiety and stress, which further deteriorate their condition (Herek [1999]). Coming out at work enables HIV-positive workers to feel more confident, to have a happier work experience, and fosters openness and interactions with colleagues that can often improve productivity (Klitzman [1997]). It seems that secrecy can characterize relationships not only between the patient and the doctor, but also between the employer and the employee (Maile [2003]).

Last, but not least, the right of access to particular information allows information on an employee's HIV status to be available to third parties, and this information is oftentimes repeated to unauthorized persons. From a management point of view, it is difficult to control data stored in offices from filtering out during processing. Some people living with HIV take the initiative to inform their employers of their condition before this information leaks from other sources. Qualitative data show that HIV-positive individuals typically regard coming out at the start of employment as a way of avoiding potential dilemmas in the future and of gaining self-recollection (Brown *et al.* (2001), Natrass *et al.* [2005]).

## *2.b Application Structure*

In order to measure occupational access discrimination toward HIV-positive applicants, we fabricated imaginary pairs of individuals, the members of each pair being equal in human capital, who applied to the same job by sending curriculum vitae using different fax devices or mail addresses. The two pairs included: A pair of 30-year-old single Greek male applicants and a pair of 30-year-old single Greek female applicants.

We applied to vacancies where there was a demand for male (or female) full-time employment. These vacancies were identified through a sample of advertisements appearing in website newspapers.

The occupational categories were selected with the purpose of creating a sample that is representative of the Greek private labour market. The sample included occupations that required different levels of education. Two types of applicant pairs were mobilized. Those having higher education levels applied to the primary segment: *accountants, clerks, economists, lawyers, managers, psychologists, teachers, and technicians*. Those having basic education applied to the secondary segment: *clerks, salesmen, and workmen* [8]. This resulted in a total of

four pairs of applicants and 8 curriculum vitae. For obvious reasons, for each job opening, we sent either a pair of male applicants or a pair of female applicants [9].

Each of the fictitious applicants/testers was allocated a male (female) Greek distinctive first and last name, a telephone number, an e-mail, and a postal address. Addresses were selected such that they would be recognized to be as similar as possible, i.e., they were chosen to indicate the same social class.

Each application was designed to equally convey the type of experience that might make an applicant attractive. Higher education applicants had finished universities or technical schools approximately eight years ago. Alternatively, applicants having basic education had finished high school approximately twelve years ago. For both sexes, applicants having higher (basic) education had six (ten) years of work experience at a post similar to each vacancy applied to for employment. To avoid detection, the applicants' high schools, universities, technical schools, and previous workplaces were located in different areas of Athens. In addition, male applicants had carried out military service in different areas [10]. Each pair of applicants had similar hobbies [11] and personal characteristics [12], including similar degrees of masculinity or femininity.

In our experiment the applicants living with HIV mentioned no pause in her/his employment career. They also mentioned that they were fully capable of performing all the duties associated with their jobs. Noticeable, our HIV positives were prone to provide employers recommendations. By doing so, these applicants give employers an opportunity to identify their productivity [13].

The curriculum vitae were faxed or mailed simultaneously, within one day of the advertisement appearance and, if the firms were interested in any of the applicants, the applicants could be reached either through available postal addresses [14], by telephone [15] (voice mail), or by e-mail.

For obvious reasons, the styles of the curriculum vitae were different for each pair. Yet, in order to control for the possibility that the style of an application influenced an employer's response, those stylistic differences in application forms were equally allocated between the paired applicants [16].

### 2.c The Model

The most common econometric approach for capturing the effects of discrimination is to ask if people who are similar in all observable and economically relevant ways experience similar labour market outcomes. In the current study, the probability of an applicant receiving a job interview was estimated according to the Probit model:

$$Y_i^* (\text{callback}=1) = \alpha + \beta X_i + e_i, \quad (1)$$

where  $Y^*$  is the regression explaining the probability of receiving a job interview;  $\alpha$  is a constant;  $X$  refers to *health status*, which equals one (zero) if the applicant is HIV-positive (in all other cases);  $e$  is the disturbance; and  $i$  denotes an individual. In Correspondence Testing (see Neumark *et al.* [1996], Bertrand and Mullainathan [2004]), all applicants must be matched with regard to all characteristics other than health status. Since we controlled for all characteristics except health status for the two applicants representative of each pair, the latter was not expected to correlate with the error term in each equation.

Equation (1) was estimated simultaneously for all types of jobs and for each type of applicant, and we reported marginal effects [17]. For completeness, two models were estimated. The first model controlled only for differences in health status between applicants. The second model controlled additionally for the curriculum vitae type, sending order, and for common



time effects (nine dummies). Notice, however, that the use of occupation and education controls was appropriate in average estimations.

#### *2d. Research Limitations*

This study left many questions unanswered. The Correspondence Test can be effective only in demonstrating discrimination during the initial stage of a selection process and in measuring the results of the selection process (Bertrand and Mullainathan [2004]). In this context, however, it is important to know whether an applicant will eventually obtain a job.

Researchers in this field consider employers, managers, and human resource departments as a single unit: “the employer”. Hence, a usual drawback that arises is the obscurity of how many employers are targeted. The industries and levels in the occupational hierarchy may very well impact labour market invitations for interviews. Unfortunately, this information cannot be acquired given the design of the Correspondence Test. Additionally, this study by no means represents the entire Greek labour market.

Experimental economists might initially feel distaste for the deception involved in these kinds of field experiments. Researchers may also worry about inconvenience to employers. In the Correspondence Test, nevertheless, the unit of study is the firm, not a human subject (Pager [2007]). The general lack of veracity in the market place, the social harm inflicted by discrimination, and the superior accuracy and transparency of the Correspondence Test justify deceiving the subjects of the experiments (Riach and Rich [2004]). The reasons for lack of deception in the field of experimental economics is maintain pure subject pools and to ensure that behavior is not changed based on worries about deception (Pager [2007]).

### **3. Estimations**

#### *3a. HIV/AIDS in Greece - Preliminary Facts*

Greece has subscribed to the “International Labour Organization Code of Practice for HIV/AIDS in the Workplace” (2001) [18], the “United Nation Millennium Declaration of (2000)”, the “Declaration of Commitment on HIV/AIDS (2001)” and as joined all coordinate carpentries of the European Union aimed at managing the HIV/AIDS epidemic. In spite of these commitments, however, no national legislation concerning labour protection and HIV/AIDS has thus far occurred. In addition, the European Antidiscrimination Labour Legislation (EC/2000/78) currently does not protect HIV-infected individuals from discrimination.

There are currently no statistics for how many people living with HIV are employed [19], and we do not know their labour characteristics, and industrial relations. One reason we know nothing about the economic effects of HIV status is that there are no representative data matching HIV status with economic outcomes. One main cause of this is that social planners have not taken an interest in evaluating the phenomenon. Nevertheless, one study of Greek firms’ responses to HIV/AIDS, conducted by the World Economic Forum (Executive Opinion Survey [2006]), has been quite illuminating. The vast majority of responders (95%) do not feel that HIV/AIDS currently affects their firm’s operation. The national findings suggest that Greek firms have not attempted to quantify the business risk due to HIV/AIDS.

#### *3.b Descriptive Statistics*

The outcome of the Correspondence Test is presented in a format following McIntosh and Smith (1974) that has since been adopted in field experiments across Europe. Panel A in Table I presents the callback outcomes for male applicants with higher education (Appendix 1). The last row shows the aggregated results and the second column shows that applications were sent to 862 job openings. The third column shows that, in 452 cases, neither individual was

invited for an interview. In the remaining 410 cases (column four), at least one applicant was invited. In 14 cases (column five) both applicants were invited (equal treatment), in 392 cases (column six) only the uninfected was invited, and in 4 cases (column seven) only the HIV-positive applicant was invited. The net discrimination [20] against the HIV-positive applicants, which is presented in the last two columns, was 388 cases, or 94.6%. The statistical significance of any finding of net discrimination was determined according to the chi-squared test (Heckman and Siegelman [1992]). Although the HIV-positive applicants satisfied the jobs requirements, uninfected applicants were systematically favored over infected applicants.

Similarly, turning our attention to male applicants with basic education, the rate of net discrimination against HIV-positive applicants was 112 cases, or 95.7%, for which the decision not to interview can solely be attributed to the applicants' health status (Panel B) [21]. On average, regardless of the education level, the net discrimination against the HIV-positive applicants was 500 cases or 94.8%, as demonstrated in Panel C. By sending equivalent resumes to apply for entry-level jobs, we revealed the presence of strong HIV discrimination.

Call-back outcomes for female applicants are reported in Table II. Panel A shows that the net discrimination against HIV-positive applicants with higher education was 291 cases or 92.9%. Similarly, as shown in Panel B, the net discrimination against HIV-positive applicants with basic education was 156 cases or 97.5% [22]. Finally, Panel C shows the average results for females. The net discrimination against HIV-positive applicants was 447 cases or 94.5%. These outcomes demonstrate a substantial gap in callbacks based on applicants' HIV statuses [23].

### *3.c Health Status-Dummy Estimations*

As shown in Panel A in Table I, the estimated probability of male HIV-positive applicants with higher education to receive an interview is 45.2%, lower than that of the

uninfected applicants, which suggests that HIV-positive applicants do not receive equal chances of access to occupations (Appendix 3). Based on Panel B, the estimated probability of HIV-positive males with basic education to receive an interview is 42.5%, lower than that of the uninfected male applicants. Discriminatory practices severely complicate the job search for applicants living with HIV whenever they take the chance to voluntarily disclose their health condition. On average, as shown in Panel C, the estimated probability of male HIV-positive applicants receiving an interview is 44.6% lower than that of the uninfected applicants.

By comparing across occupations, we find large gaps ranging from 35.6%-55.2% (Tables I and II, Appendix 4). Obviously, the degree of discrimination is randomly assigned across occupations and is unrelated to education level, job status, and segmentation. The estimated probability of HIV-positive applicants receiving an interview is 55.2% lower for teachers and technicians, 50.0% lower for salesmen, 48.1% lower for lawyers, 46.2% lower for economists, 43.0% lower for workmen, 39.5% lower for psychologists, 39.3% lower for accountants, 37.7% lower for clerks with basic education, 36.1% lower for managers, and 35.6% lower for clerks with higher education compared to that of uninfected applicants.

Female applicants living with HIV appear to receive more callbacks than males. However, this gender gap seems to be negligible compared to any of the other HIV-related gaps. Panel A in Table I shows that the estimated probability of HIV-positive applicants with higher education receiving an interview is 37.2% lower than that of uninfected applicants (Appendix 3). Furthermore, Panel B shows that the estimated probability of female HIV-positive applicants with basic education receiving an interview is 40.5% lower than that of uninfected applicants. On average, Panel C shows that the estimated probability of female HIV-positive applicants receiving an interview is 38.3% lower than that of uninfected applicants.

As shown in Tables I and II, the exclusion rate for female applicants varied between 29.6%-48.8% as compared to uninfected applicants (Appendix 4). The estimated probability of

HIV-positive applicants receiving an interview compared to the probability of the uninfected group was 48.8% lower for lawyers, 45.6% lower for saleswomen, 41.0% lower for economists, 40.0% lower for technicians, 39.3% lower for teachers, 38.8% lower for workwomen, 35.2% lower for clerks with basic education, 34.5% lower for clerks with higher education, 32.9% lower for accountants, 29.6% lower for psychologists, and 27.8% lower for managers. Similar to the estimations obtained for males, the degree of discrimination was randomly defined across occupations and was extraneous to education level and job status.

For all cases, we re-estimated *Model 1* including the following control variables: the type of curriculum vitae, sending order, occupation applied to and time effects: the impact of these variables on the outcome was negligible (*Model 2* - Columns 2 and 4). Since experimental conditions are equally assigned, these controls do not substantially affect the estimated effect of health status, but they make the estimate more precise.

Current estimations suggest that discrimination against individuals living with HIV at work is a matter of importance in Greece. The estimations reveal that firms do not seem to understand that protecting staff through workplace activities is a natural first priority of programs, followed by looking to the wider community. More importantly, Greek firms do not offer HIV-positive applicants the opportunity to discuss any health-related issues.

In this section, we briefly review the two main strands of the theoretical literature on labour market discrimination: *distaste* for the minority (Becker [1957]) and *statistical* discrimination (Arrow [1973]).

The basic argument of Becker's discrimination theory suggests that individuals living with HIV can potentially face occupational access discrimination. The taste hypothesis describes discrimination as a preference or taste for which the discriminator is willing to pay. In particular, the employers' taste for discrimination is based on the idea that they want to maintain a physical or social distance from certain groups or that they may fear that their

customers or co-workers dislike interacting with minorities. Instead of making common assumptions that employers consider only employees productivity, that workers ignore the characteristics of those with whom they work, and that customers care only about the quality of the goods and services provided, Becker suggests that discrimination coefficients incorporate the influence of characteristics unrelated to productivity on tastes and attitudes, such as HIV status.

The statistical theory of discrimination is also potentially useful for interpreting the results. The statistical discrimination theory suggests that unequal treatment is a result of a profit-maximizing response of employers to uncertainty about the quality of individual workers. In a world of imperfect information, employers face risks when hiring workers, and specific characteristics become inexpensive screening devices. If employers believe that there is a systematic differential between HIV-positive and uninfected applicants in their reliability aptitude and job stability, then these concerns might be sufficient to create a permanent differential in access availability. In this situation, discrimination is not the consequence of exogenous preferences, but of profit-maximizing behavior of risk-averse employers.

Keep in mind, however, that more complicated formulations of the human capital approach have suggested a wider range of factors responsible for determining unemployment rates between majority and minority applicants. For instance, Segmentation Theory made an attempt to demonstrate the role of practices at the workplace and of organizational levels in creating inequalities and leaving productive potential underutilized [24] (Rubery and Wilkinson [1994], Rubery [1995]). The issue of HIV discrimination is then complicated by the wide variety of firm-specific labour markets forms, the strong influence of occupational factors in determining employment practices and their impact on HIV-positive workers' employment positions and prospects, as well as problems associated with making comparisons at the sectoral level across markets.

#### **4. Conclusion**

The current study applies for the first time an experimental design in a real-world setting that allows for the evaluation of whether actual employers discriminate against persons living with HIV in the employment search process. The outcomes show that applicants who voluntarily disclose their HIV-status face great difficulty in obtaining an interview regardless of their education level and job-status. Citing either employer distaste and/or employer perception that HIV status signifies lower productivity, job applicants living with HIV get substantially fewer callbacks for each resume sent out. The estimations suggest that discrimination continues at alarming levels and that we need to more closely examine the effects of HIV discrimination and labour market characteristics on employment for the HIV-positive population in Greece.

#### **Endnotes**

[1] Based on the Directive 2000/54/EC of the European Parliament and the Council of September 18, 2000, HIV presents a limited risk of infection for workers since it is not transmittable by any airborne route.

[2] There will be considerable undercounting in any official survey due to privacy issues, suspicions about the usage of results, and controversies over definitions.

[3] Fry (1986), as well as, Graham *et al.* (1990), tested for disability (being confined to a wheelchair) in secretarial areas. In France, Ravand *et al.* (1992) found evidence for differential treatment against disabled persons seeking employment. In the Netherlands, Gras *et al.* (1996) tested for various types of disability (being confined to a wheelchair, epileptic, or deaf) among professionals in administrative, commercial, and secretarial areas. More recently, MacRae and Lavery (2006) evaluated disability (being confined, cerebral palsy, or registered blind) in Scotland. All studies found statistically significant outcomes against the disabled during the hiring stage.

[4] Of course, disclosure is a personal decision that an individual is entitled to make autonomously and privately (ILO Code [2001]).

- [5] Pre-employment screening takes place in many industries, particularly in countries where testing resources are readily available and affordable (UNESCO [2007]).
- [6] Discrimination in employment seems to be allowed in situations in which a person, for various reasons, is unable to perform the inherent requirements and where no reasonable accommodation can be made to allow them to perform those inherent requirements.
- [7] A reasonable adjustment is a change to the workplace or work practices that removes a substantial disadvantage that a HIV positive person might experience because of her/his status.
- [8] In this study, we did not investigate discrimination trends regarding sensitive occupations, such as beauticians, doctors, nurses, physiotherapists, chefs, waiters, and personal care providers.
- [9] In actuality, our experiment would have been revealed if we had sent both a male and female applicant living with HIV to the same vacancy.
- [10] In Greece, the attribute of having carried out military service typically boosts a male's probability of being hired.
- [11] Male (female) applicants were fascinated by travel (travels) and sports (cinema).
- [12] Both applicants pointed out that they were productive and industrious.
- [13] Nevertheless, we received no calls regarding provision of recommendations.
- [14] However, no firms responded in writing.
- [15] For each phone, we use the content of the message left by the employer to match the response to the response for the corresponding resume pair.
- [16] For an extensive study of control variables and random events, see Heckman and Siegelman (1992).
- [17] Since the explanatory variable was a dummy variable, its marginal Probit reported the discrete change in the probability of an interview offer:  $\partial \text{prob}(\text{Callback} = 1) / \partial X_i$ .
- [18] The ILO Code contains principles that should guide government, employee, and employer organizations in member States on policy and practice in specific areas, including the adoption of legislation to cover HIV/AIDS in the workplace.
- [19] In 2007, the cumulative number of reported HIV infections in Greece ( $n \approx 10.6$  millions), including AIDS cases, was 8584 (Hellenic Center for Disease Control and Prevention [2007]).
- [20] The most common way to measure the overall incidence of discrimination is to count the number of times a minority applicant is treated less favorably in a single type of firm behavior than the majority



applicant and then subtract the number of times the majority applicant is treated less favorably, mainly with regard to random incidents. The result is a net measure of the number of acts of discrimination a minority applicant can expect to encounter during each application to a firm (Heckman and Siegelman [1992]).

[21] The differences between Panel A and Panel B are statistically insignificant when tested by the z-test. HIV applicants' education levels played no role in their occupational access.

[22] The outcomes in Tables A and B (Appendix 2) illustrate how the discrimination rates differ between occupations.

[23] The differences between Panel A and Panel B (Table B) are statistically insignificant when tested by the z-test. HIV applicants' education levels played no role in their access to occupations.

[24] In the estimation portion, we considered the influence of Segmentation Theory. We included education level dummies, as well as occupation dummies; hence, basic trends were controlled for. In addition, we performed separate regressions for male and female applicants. Notice also that we present paired observation for each occupation. By doing this, we gained partial control over idiosyncratic differences in employers' evaluations based on common characteristics that plague ordinary observational studies.

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## Appendix 1

**Table I. Correspondence Testing Outcomes  
Male Applicants**

	Jobs	Neither Invited	At least one invited (1)	Equal Treatment	Discrimination Against HIV-Positives (2)	Discrimination Against Uninfected (3)	Net Discrimination		X <sup>2</sup> <sub>test</sub>
							(2)-(3)	[(2)-(3)]/(1) %	
<i>Panel A.</i> Higher Education	862	452	410	14	392	4	388	94.6	380.16*
<i>Panel B.</i> Basic Education	263	146	117	5	112	0	112	95.7	112.00*
<i>Panel C.</i> Total	1125	598	527	19	504	4	500	94.8	492.12*

Notes: The null hypothesis is “Both individuals are treated unfavorably equally often”, that is (2)=(3).  
(\* )Statistically Significant at 1%

**Table II. Correspondence Testing Outcomes  
Female Applicants**

	Jobs	Neither Invited	At least one invited (1)	Equal Treatment	Discrimination Against HIV-Positives (2)	Discrimination Against Uninfected (3)	Net Discrimination		X <sup>2</sup> <sub>test</sub>
							(2)-(3)	[(2)-(3)]/(1) %	
<i>Panel A.</i> Higher Education	787	474	313	18	293	2	291	92.9	287.05*
<i>Panel B.</i> Basic Education	392	232	160	4	156	0	156	97.5	156.00*
<i>Panel C.</i> Total	1179	706	473	22	449	2	447	94.5	443.03*

Notes: The null hypothesis is “Both individuals are treated unfavorably equally often”, that is (2)=(3).  
(\* ) Statistically Significant at 1%

## Appendix 2

**Table I. Correspondence Testing Outcomes  
Male Applicants**

	Jobs	Neither Invited	At least one invited (1)	Equal Treatment	Discrimination Against HIV-Positives (2)	Discrimination Against Uninfected (3)	Net Discrimination		$\chi^2$ test
							(2)-(3)	[(2)-(3)]/(1) %	
<i>Panel A.</i>									
<i>Higher Education</i>									
Accountants	117	70	47	1	46	0	46	97.8	46.00*
Clerks	101	63	38	2	36	0	36	94.7	36.00*
Economists	106	55	51	2	49	0	49	96.0	49.00*
Lawyers	83	37	46	3	41	2	39	84.0	35.37*
Managers	105	66	39	1	38	0	38	97.4	38.00*
Psychologists	48	25	23	0	21	2	19	82.6	15.69*
Teachers	143	62	81	3	78	0	78	96.2	78.00*
Technicians*	159	74	85	2	83	0	83	97.6	83.00*
<i>Panel B.</i>									
<i>Basic Education</i>									
Clerks	122	75	47	1	46	0	46	97.8	46.00*
Salesmen	76	36	40	2	38	0	38	95.0	38.00*
Workmen	65	35	30	2	28	0	28	93.3	28.00*

*Notes: The null hypothesis is “Both individuals are treated unfavorably equally often”, that is (2)=(3).*

*(\*) Statistically Significant at 1%.*

*\*Includes architects, mechanical engineers, electricians, geologists, agriculturists, biologists, chemists, and physicists.*

**Table II. Correspondence Testing Outcomes  
Female Applicants**

	Jobs	Neither Invited	At least one invited (1)	Equal Treatment	Discrimination Against HIV-Positives (2)	Discrimination Against Uninfected (3)	Net Discrimination		$\chi^2$ test
							(2)-(3)	[(2)-(3)]/(1)	
<i>Panel A.</i>									
Higher Education									
Accountants	82	53	29	2	27	0	27	93.1	27.00*
Clerks	133	86	47	1	46	0	46	97.8	46.00*
Economists	73	42	31	1	30	0	30	96.7	30.00*
Lawyers	86	37	49	5	42	2	40	81.6	36.36*
Managers	79	56	23	1	22	0	22	95.6	22.00*
Psychologists	64	42	22	3	19	0	19	86.3	19.00*
Teachers	155	92	63	2	61	0	61	96.8	61.00*
Technicians *	115	66	49	3	46	0	46	93.8	46.00*
<i>Panel B.</i>									
Basic Education									
Clerks	122	78	44	1	43	0	43	97.7	43.00*
Saleswomen	162	87	75	1	74	0	74	98.8	74.00*
Workwomen	108	67	41	2	39	0	39	95.1	39.00*

Notes: The null hypothesis is "Both individuals are treated unfavorably equally often", that is (2)=(3).

(\*) Statistically Significant at 1%.

\*Includes architects, mechanical engineers, electricians, geologists, agriculturists, biologists, chemists, and physicists.



### Appendix 3

**Table I. Probit Estimations**  
**Marginal Effects**

	Males		Females	
	<i>Model 1</i>	<i>Model 2</i>	<i>Model 1</i>	<i>Model 2</i>
	(1)	(2)	(3)	(4)
<i>Panel A.</i>				
Higher Education	-0.452 (0.017)*	-0.456 (0.045)*	-0.372 (0.021)*	-0.370 (0.054)*
<i>Observations</i>	1724	1724	1574	1574
<i>Panel B.</i>				
Basic Education	-0.425 (0.031)*	-0.417 (0.055)*	-0.405 (0.030)*	-0.419 (0.043)*
<i>Observations</i>	526	526	784	784
<i>Panel C.</i>				
Total	-0.446 (0.019)*	-0.456 (0.023)*	-0.383 (0.019)*	-0.396 (0.036)*
<i>Observations</i>	2250	2250	2358	2358

*Notes: Standard errors are indicated within parentheses.*

*Standard errors are adjusted for intraclass correlation.*

*(\*) Statistically significant at 1 %.*

## Appendix 4

**Table I. Probit Estimations**  
**Marginal Effects by Occupation; Higher Education**

	Male Applicants		Female Applicants	
	<i>Model 1</i>	<i>Model 2</i>	<i>Model 1</i>	<i>Model 2</i>
	<i>(1)</i>	<i>(2)</i>	<i>(3)</i>	<i>(4)</i>
Accountants	-0.393	-0.399	-0.329	-0.334
	<i>(0.046)*</i>	<i>(0.086)*</i>	<i>(0.055)*</i>	<i>(0.064)*</i>
<i>Observations</i>	234	234	164	164
Clerks	-0.356	-0.350	-0.345	-0.359
	<i>(0.050)*</i>	<i>(0.078)*</i>	<i>(0.042)*</i>	<i>(0.057)*</i>
<i>Observations</i>	202	202	266	266
Economists	-0.462	-0.464	-0.410	-0.424
	<i>(0.050)*</i>	<i>(0.046)*</i>	<i>(0.059)*</i>	<i>(0.065)*</i>
<i>Observations</i>	212	212	146	146
Lawyers	-0.481	-0.500	-0.488	-0.510
	<i>(0.059)*</i>	<i>(0.062)*</i>	<i>(0.060)*</i>	<i>(0.062)*</i>
<i>Observations</i>	166	166	172	172
Managers	-0.361	-0.362	-0.278	-0.286
	<i>(0.048)*</i>	<i>(0.053)*</i>	<i>(0.052)*</i>	<i>(0.057)*</i>
<i>Observations</i>	210	210	158	158
Psychologists	-0.395	-0.390	-0.296	-0.286
	<i>(0.077)*</i>	<i>(0.084)*</i>	<i>(0.064)*</i>	<i>(0.076)*</i>
<i>Observations</i>	96	96	128	128
Teachers	-0.552	-0.560	-0.393	-0.389
	<i>(0.042)*</i>	<i>(0.048)*</i>	<i>(0.040)*</i>	<i>(0.053)*</i>
<i>Observations</i>	286	286	310	310
Technicians*	-0.552	-0.556	-0.400	0.412
	<i>(0.040)*</i>	<i>(0.051)*</i>	<i>(0.048)*</i>	<i>(0.064)*</i>
<i>Observations</i>	318	318	230	230

*Notes: \*Includes architects, mechanical engineers, electricians, geologists, agriculturists, biologists, chemists, and physicists.*

*Standard errors are indicated within parentheses.*

*Standard errors are adjusted for intraclass correlation.*

*(\*) Statistically significant at 1 %.*

**Table II. Probit Estimations  
Marginal Effects by Occupation; Basic Education**

	Male Applicants		Female Applicants	
	<i>Model 1</i>	<i>Model 2</i>	<i>Model 1</i>	<i>Model 2</i>
	(1)	(2)	(3)	(4)
Clerks	-0.377	-0.398	-0.352	-0.364
	(0.044)*	(0.058)*	(0.044)*	(0.062)*
<i>Observations</i>	244	244	244	244
Salesmen/women	-0.500	-0.512	-0.456	-0.467
	(0.060)*	(0.087)*	(0.039)*	(0.054)*
<i>Observations</i>	152	152	324	324
Workmen/women	-0.430	-0.427	-0.388	-0.397
	(0.065)*	(0.090)*	(0.044)*	(0.071)*
<i>Observations</i>	130	130	216	216

*Notes: \*Includes architects, mechanical engineers, electricians, geologists, agriculturists, biologists, chemists, and physicists.*

*Standard errors are indicated within parentheses.*

*Standard errors are adjusted for intraclass correlation.*

*(\*) Statistically significant at 1 %*