Mateus Ferraz Dias
111 Taylor Court
Princeton, NJ 08540
(609) 865 3391
mdias@princeton.edu

National Bureau of Economic Research
1050 Massachusetts Avenue
Cambridge, MA 02138-5398

Application for the NBER Health Economics Research Boot Camp

Dear Sir or Madam,

I am writing to apply for the NBER Health Economics Research Boot Camp in Cambridge, MA, from December 3-5, 2019. I am a third year PhD Student in Economics at Princeton University and my recommendation letter will be written by Ilyana Kuziemko. Thank you for your time and consideration.

With best regards,



Mateus Ferraz Dias

Attached: Curriculum Vitae, Application Essay

Mateus Ferraz Dias

Curriculum Vitae

PERSONAL DETAILS

Birth	December 16, 1991
Address	111 Taylor Court, Princeton, NJ
Phone	(609) 865-3391
Mail	mdias@princeton.edu

EDUCATION

PhD. Economics 2017-present

Princeton University

Completed Courses: Health Economics I, Economics of Development I, Public Finance I & II, Industrial Organization and Public Policy I, II & III

MSc. Economics 2015-2017

Sao Paulo School of Economics - FGV

Baccalaureate. Molecular Sciences 2010-2015

University of Sao Paulo

EXPERIENCE

Research Assistant 2019 Summer

For Professor David Silver – Princeton University, Economics Department

Research Assistant 2018 Summer

For Professor Stephen Redding – Princeton University, Economics Department

Research Assistant 2016

For Professors Cristine Pinto and Vladimir Ponczek – LEARN (Lab for Evaluation, Analysis and Research in Learning), Sao Paulo School of Economics

Teaching Assistant 2012

For Professor Manuel Garcia – Mathematics I, University of Sao Paulo

GRANTS AND SCHOLARSHIPS

PhD Scholarship 2017-

From Princeton University

M.A. Scholarship 2015-2017
From CNPq

Scientific Initiation Scholarship 2013-2014
From FAPESP

Project: Stability Properties of Dynamical Systems – Supervisor: Fabio Armando Tal

Scientific Initiation Scholarship 2012-2013
From CNPq

Project: Model of a Biological Motor System Acting in an Articulation with One Degree of Freedom – Supervisor: Arturo Forner Cordero

WORK IN PROGRESS

Impacts of Glyphosate Use in Agriculture on Birth Outcomes of Surrounding Populations
Joint with Rodrigo Soares and Rudi Rocha

Psychossocial Care Centers and Mental Health

SKILLS

Languages	Portuguese (native)
	English (fluent)
	Spanish (basic)
	French (basic)
Software	MATLAB, Julia, Stata, Python, LaTeX

Essay – NBER Health Economics Research Boot Camp for Graduate Students Application

Mateus Ferraz Dias

October 3, 2019

Issues about public health and health care systems have always been part of my life. Being the son of two doctors, one of them with more than 25 years of experience as a general practitioner in the public sector in Brazil, I grew up hearing about the upsides and the limitations of health care systems. Having become increasingly interested in health care issues, the NBER Health Economics Research Boot Camp for Graduate Students seems to be a incredible opportunity for me to develop my knowledge about the economic forces that shape health care systems and to become able to contribute to the literature that study these questions.

During my master's degree, I realized I could use all the economic machinery I was learning to study health-related issues. As a follow up to my dissertation, Professor Rodrigo Soares, Professor Rudi Rocha, and I started a work currently in progress that analyzes the impact a pesticide, glyphosate, has on infant health. This is particularly important from a policy point of view, since it is the most used herbicide and there is relatively little causal evidence about its effects on human health. Recently, glyphosate has come under the spotlight, with some evidence (mainly suggestive) that it might be more prejudicial than what was initially claimed by glyphosates producers. Also, a jury in San Francisco recently convicted the largest glyphosate producer, Monsanto, to pay $289 million to a former school groundskeeper, considering that the pesticide caused his non-Hodgkin lymphoma. Our work, relying on the modern identification strategies used in applied microeconomics, is able to credibly estimate a causal impact of glyphosate on infant mortality in

Brazil, providing a piece of evidence that can help in this debate.

Recently, I started to study the impacts of the Psychossocial Care Centers (*Centros de Atenção Psicossocial – CAPS*) in Brazil, a major change in the way the country organizes its mental health care system. I also have become increasingly interested not only in health-related issues in general, but also in applying economic tools to understand how the health care market is organized and what can be done in order to increase access to people that most need it and improve the quality of the services offered in a financially sustainable way. Not only this is an end in itself, given that health is an important component of welfare, but this is also likely to reduce inequality, since the poor people are the ones who can benefit the most from it given the current state of the health care market.

Among the myriad of possible directions our knowledge of the organization of health care markets can be extended to, one that is particularly interesting for me is how to incorporate physicians in the models of the market. While some work has been done considering physicians, they look only at the concentration of markets (Dunn and Shapiro 2014, Kleiner, Lyons, and White 2012). With more and better data sets becoming available, there is an opportunity to investigate in more detail how physicians interact with insurers and hospitals or between themselves, considering that not only they can compete, but they can also have different specializations.

Another issue that may be better understood with better data is the regional variation of health care spending. Although important progress has been made (e.g., Finkelstein, Gentzkow, and Williams 2016), much can still be done to uncover the mechanisms through which these differences arise, both from the supply side and from the demand side. A better knowledge about the determinants of this variation can help us understand the possible inefficiencies that may exist and design policies to mitigate them, increasing welfare.

Taking into account my interests and the type of questions I would like to study in my future research, I firmly believe that the NBER Health Economics Research Boot Camp for Graduate Students would be a unique opportunity for me to learn more about Health Economics, to become better equipped to address the research topics I am interested in, and to think about new exciting questions in the field.

References

Dunn, Abe and Adam Hale Shapiro (2014). "Do Physicians Possess Market Power ". In: *The Journal of Law & Economics* 57(1), pp. 159–193.

Finkelstein, Amy, Matthew Gentzkow, and Heidi Williams (2016). "Sources of Geographic Variation in Health Care: Evidence From Patient Migration". In: *Quarterly Journal of Economics* 131(4), pp. 1681–1726.

Kleiner, Sam, Sean Lyons, and William White (2012). "Provider Concentration in Markets for Physician Services for Patients with Traditional Medicare". In: *Health Management, Policy and Innovation* 1(1), pp. 3–18.



Ilyana Kuziemko
Professor of Economics
239 J.R. Rabinowitz Building
Princeton, New Jersey 08544
kuziemko@princeton.edu

Dear colleagues,

It is my great pleasure to recommend Mateus Dias for the NBER Health Economics "Boot Camp."

Mateus is a talented third-year Ph.D. student at Princeton whom I have the privilege of advising. He took his field exams in Public Finance and Industrial Organization (doing very well on both), but his main research interest is in health. Because of various faculty being on sabbatical last year, a full-year health sequence was not offered, so he could not take a field exam in health. For this reason, he would be an ideal candidate for the Boot Camp.

Mateus already has one completed paper (his Master's Thesis) and one project in an advanced stage, both on questions of public health in Brazil.

In his Master's Thesis, "Glyphosate Use in Agriculture and Birth Outcomes," he examines the effects of the pesticide Glyphosate using a number of very creative quasi-experimental strategies. When he first told me about the project, I assumed that glyphosate was an obscure product and thus that this paper, even if well-executed, would have only niche interest. I could not have been more wrong. Glyphosate is the active ingredient in RoundUp and is the most widely used herbicide in the world. However, almost all the work on its health consequences are merely correlational. The one exception is a paper that examined Colombia's attempt to kill cocaine production by aerial spraying of glyphosate over coca-producing areas of the country, but the levels used were well beyond those of agricultural use and thus it is not informative of whether exposure to the chemical at standard levels of use has harmful effects.

As Mateus explains, glyphosate use rose dramatically in Brazil after the introduction in 2004 of genetically modified soybean, which is resistant to it. Farmers now had a much greater demand for glyphosate, as they could use it liberally in the cultivation of these new soybeans without killing the cash crop itself.

Mateus thus devises the following empirical strategy. He classifies areas of Brazil based on pre-determined topologic characteristics based on how conducive they are to cultivation of the new soybean. Before 2004, these places saw little use of glyphosate, but after the 2004 introduction of the new soybean, the use of glyphosate boomed.

As Mateus demonstrates in convincing event-study analysis, so did negative birth outcomes: infant mortality, low-birth weight, and pre-term birth. Of course, the concern about interpreting these effects as causal consequences of glyphosate is that the introduction of the soybean itself is

a potential confound, as it may have had independent effects on birth outcomes via migration to the area or land-use changes. Mateus provides several pieces of evidence directly connecting the declining health outcomes to the herbicide. First, as glyphosate seeps into rivers, it should effect areas *downstream* of soybean production, but not upstream, which is exactly what he finds. Second, to introduce a time dimension to this placebo test, he finds that these downstream effects are stronger in periods of higher rain, as soil erosion is the mechanism by which rivers become contaminated and soil erosion is facilitated by heavy rain. Third, he shows that growth of corn production (which is not resistant to glyphosate and thus glyphosate did not increase in areas that saw increased corn production) has no effect on birth outcomes, suggesting that living near or downstream increased agricultural production alone does not alone harm birth outcomes.

I have encouraged Mateus to send this paper to top-five journals. Given that glyphosate is the by far the world's most common herbicide, I find it astonishing how little work there is on such an important question.

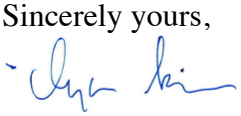
Mateus third-year paper (which I am advising) is also a very promising project, though is at an earlier stage. In the 1990s and 2000s, Brazil "de-institutionalized" its mental-health patients, replacing mental hospitals with outpatient facilities on a larger scale than perhaps any other country. However, no one has looked at the consequences of this massive shift in policy. Mateus finds that the policy indeed has the expected "first stage" effect: once a new outpatient facility is opened in a municipality, he shows via event-study graphs that there is a clear decline in the number of inpatient admissions for mental-health diagnoses.

But did the shift to outpatient care affect patient outcomes? He finds no rise in suicides or hospitalizations for self-inflicted diagnoses, which we might expect if mental-health services were curtailed. However, one of the major concerns related to deinstitutionalization of mental-health patients is public safety (as some mental patients are a danger to themselves and others). Interestingly, Mateus is finding a rise in homicides that in event-study graphs seems temporally related to a municipality's opening of an outpatient facility and closing of inpatient facilities.

As I hope my letter makes clear, Mateus already has two projects on health topics that demonstrate an ability to identify credible policy and natural experiments and an instinct for asking important (but neglected) questions. For reasons beyond his control, a health sequence was not offered at Princeton last year, so I know he would learn a lot from the Boot Camp and knowing his personality would be a dedicated and serious student. He is also an incredibly nice person, so would be helpful to his Boot Camp classmates on problem sets and other collaborative activities and generally contribute to creating a positive atmosphere. I wish all my students were like Mateus!

If I can be of any further help, please let me know. Thank you for providing this resource to students and best wishes with the Boot Camp this year.

Sincerely yours,



Ilyana Kuziemko