



The effects of medical school on health outcomes: Evidence from admission lotteries



Edwin Leuven^{a,1}, Hessel Oosterbeek^{b,*,2}, Inge de Wolf^c

^a University of Oslo, Norway

^b University of Amsterdam, The Netherlands

^c Dutch Inspectorate of Education, The Netherlands

ARTICLE INFO

Article history:

Received 11 May 2012

Received in revised form 31 March 2013

Accepted 9 April 2013

Available online 22 April 2013

JEL classification:

I10

I23

I24

Keywords:

Education gradient

Admission lotteries

Medical school

Health outcomes

Organ donation

ABSTRACT

This paper estimates the effects of attending medical school on health outcomes by exploiting that admission to medical school in the Netherlands is determined by a lottery. Among the applicants for medical school, people who attended medical school have on average 1.5 more years of completed education than people who did not. They are also more likely to have been exposed to a health-related education curriculum. The results show only modest impacts on health outcomes. Attending medical school reduces alcohol consumption and being underweight somewhat, and has a small positive impact on self-reported health status. It has, however, a small negative effect on the frequency of physical exercise and no significant impact on smoking, and being overweight or obese. Attending medical school does have a large positive impact on the probability of being registered for donations of organs.

© 2013 Elsevier B.V. All rights reserved.

1. Introduction

This paper estimates the effects of attending medical school on health outcomes. For identification we exploit that admission to medical school in the Netherlands is determined by a lottery. People who win the lottery and attended medical school complete on average 1.5 more years of education than people who lost the lottery and attended some other study. They are also more likely to have been exposed to a health-related education curriculum. We are thus estimating the combined effect on health outcomes of 1.5 more years of post-secondary education and a more health-related curriculum.

Previous studies on the impact of education on health outcomes typically look at the impact of extra education at a lower level, for example by exploiting exogenous variation in years of schooling due to changes in compulsory schooling laws, Lleras-Muney (2005)

for the US, Arendt (2005) for Denmark, Oreopoulos (2007) for the US, the UK and Canada, Albouy and Lequien (2009) for France, and Kemptner et al. (2011) for Germany. Park and Kang (2008) use variation in high school availability and birth order to identify a causal link of education on exercising and getting health checkups among Korean men. Most studies find a positive impact on health outcomes of extra education at this level.³ While it is acknowledged that the content of education might matter for health, there is no causal evidence documenting this (Cutler and Lleras-Muney, 2008).

We use data from persons who applied for a medical study for the first time in the years 1988–1993 and who responded to a survey that was sent out in 2007. This means that most respondents are between 32 and 38 years old when information on health outcomes was collected. Since lottery losers can reapply in subsequent years and since some lottery winners choose not to

* Corresponding author. Tel.: +31 205254242.

E-mail address: h.oosterbeek@uva.nl (H. Oosterbeek).

¹ Leuven is also affiliated with CEPR, CESifo, IZA and Statistics Norway.

² Oosterbeek is also affiliated with TIER, Tinbergen Institute, CESifo and FLACSO-Ecuador.

³ Webbink et al. (2010) use variation in the schooling levels of twins to establish an impact of education (average over different levels of education) on overweight and obesity of Australian men (but not women). Studies failing to find an impact of education on health include Tenn et al. (2010) and Braakmann (2011). See Grossman (2006) and Cutler and Lleras-Muney (2008) for reviews of the literature, including early studies that used less convincing identification strategies.

enroll in medical school, the correlation between the lottery result and medical school attendance is not perfect. We therefore use the result of the first lottery in which someone participated as an instrumental variable for medical school attendance.

Winning the first lottery increases the probability of attending medical school by 47 percentage points. Attending medical school, in turn, increases the length of formal education by 1.5 years, and increases the probability to enroll in a health-related program by 72 percentage points. The results show, however, only modest impacts on health outcomes. Attending medical school reduces alcohol consumption and being underweight somewhat, and has a small positive impact on self-reported health status. It has, however, a small negative effect on the frequency of physical exercise and no significant impact on smoking, and being overweight or obese. Finally, we also document that attending medical school has a substantial positive effect on individuals' altruistic health behavior, namely the probability that someone registers as a donor of organs.

Attending medical school may affect health outcomes directly through the length of education and the education content, but also indirectly through its effect on intermediate outcomes such as occupation, working hours, income, status and family situation. In the context of our study there are for example concerns about how well doctors care for themselves.⁴ Like other studies that consider the effect of education on health, disentangling mechanisms is however not possible with one source of exogenous variation. We therefore have only limited possibilities to investigate the relative importance of the various channels.

To assess the possible role of different channels, we estimate the impact of attending medical school on variables that potentially mediate the influence of medical school on health outcomes. By and large, the results indicate that the differences in health outcomes cannot be due to the family situation; attending medical school has no impact on marital status and the number of children. Attending medical school does, however, have an impact on labor market outcomes. People who attended medical school work 8% more hours, but are not more likely to work more than 60 h per week. They also have 7.4% higher wages. Given that attending medical school has only a small effect on health outcomes, these results imply that the net effects of the mediating variables on health outcomes are also small. This may be due to mediating variables like work hours and wages, operating in opposite directions.

The remainder of this paper is organized as follows. The next section provides further details on the lottery for medical schools in the Netherlands and the institutional context. Section 3 describes the sources of data used in this paper. Section 4 outlines the estimation procedures and discusses identification issues. Section 5 presents and discusses the effects of attendance of medical school on health outcomes and behavior. It also discusses the evidence regarding possible channels. Section 6 summarizes and concludes.

2. The lottery and institutional context

University education in the Netherlands is provided by 13 universities. These universities are all publicly funded, offer programs of very similar contents and quality, and charge uniform tuition fees that are set by the government. Eight of these universities offer programs in medical education. Medical studies at the university level

consist of a basic track of 4 years of pre-clinical training, followed by 2 years of clinical clerkships in hospitals. Graduates from this 6 years program get a first medical qualification (comparable with Doctor of Medicine) with which they can enter the labor market. After obtaining this degree students can also choose to continue their medical training. To become a general practitioner requires 3 extra years of training, whereas medical specializations like ophthalmology, radiotherapy or urology require 4–6 additional years. In order to get a place in one of the medical specialization tracks it is common to first get a PhD degree. In total, the complete medical study can take between 6 and 15 years. These specialization tracks are mainly on-the-job and those who partake in them have a work contract and receive a salary. About 80% of the specialization for general practitioner for example is on-the job.

Normally, all graduates from the pre-university track in secondary education can enroll in university in the field of their wish provided that their subject specialization in secondary school matches the chosen field of study. Only a limited number of university studies, medical studies being the most prominent one, have a fixed number of places available.⁵ This leads to a shortage of places if the number of qualified applicants exceeds this fixed number. For all other fields of study, supply is supposed to accommodate demand.

With excess demand for a certain study program, available places are in most countries assigned through some form of selection based on merit. Instead of this, highly demanded seats in Dutch medical schools are assigned through a weighted lottery. While one may criticize this allocation system for ethical reasons or an alleged lack of efficiency, from a research perspective it has the advantage of creating a design that provides the opportunity to assess the effects of health education on various outcomes.⁶

Before the actual lottery takes place, applicants to medical studies in the Netherlands are assigned to lottery categories. The categories differ by the probability to be awarded a place (to win the lottery). For regular applicants with a Dutch pre-university diploma, six categories are distinguished. These categories are indicated by letters A to F and differ in the grade point average (GPA) applicants obtained for their final exams in secondary school. These exams are nation-wide and externally graded. Grades in Dutch secondary school are given on a scale from 1 to 10, where 6 and above indicate a pass. Non-passes in some subjects are allowed given sufficient compensation (above 6) on other subjects. The classification is as follows: A if $GPA \geq 8.5$; B if $8.0 \leq GPA < 8.5$; C if $7.5 \leq GPA < 8.0$; D if $7.0 \leq GPA < 7.5$; E if $6.5 \leq GPA < 7.0$; F if $6 \leq GPA < 6.5$.

The ordering from A to F reflects differences in ability (probably including motivation). Because ability may have an independent effect on health outcomes, it is important that the analysis takes into account that assignment to medical school is only random conditional on lottery group.

Table 1 shows for each of the year cohorts included in our analysis, the proportions that have been admitted from each of the groups and the numbers of applicants per group. In each year around 85% of the applicants belongs to one of the groups D, E and F. Groups A and B are quite small. The probability to be admitted is close to 1 for applicants in category A, close to 0.90 for applicants in category B, and diminishes monotonically when going to C, D, E and F. In group F the odds are around 0.50. Hence, the probability to be admitted depends positively on GPA in the pre-university track. The year-to-year variation in fractions of admitted applicants (per

⁴ Baldwin et al. (1997) for example argue that doctors do not take sick leave when ill and do not seek and receive proper medical treatment when needed. The authors supplement anecdotal accounts of this phenomenon with results from a longitudinal study of a class of young doctors, but since the study does not include a proper comparison group it is difficult to give a causal interpretation to the findings.

⁵ Besides medical studies, fixed numbers of places are also present for dentistry, veterinary medicine and (in some years) technical business studies.

⁶ Ketel et al. (2012) merge data from the admission lotteries to administrative income data to estimate the financial returns to medical school.

Download English Version:

<https://daneshyari.com/en/article/10476470>

Download Persian Version:

<https://daneshyari.com/article/10476470>

[Daneshyari.com](https://daneshyari.com)