

# Doctors applying for Danish postgraduate medical specialist training are getting younger

Niels Kristian Kjaer<sup>1</sup>, Lise Wejlby Clausen<sup>2</sup> & Dorte Qvesel<sup>2</sup>

## ABSTRACT

**INTRODUCTION:** It was previously shown that applicants for postgraduate medical specialist training in Denmark were old. In order to prevent potential shortage of specialists, the Danish health authorities have passed legislation to speed up the output of new specialists. The aim of this study was to highlight the present characteristics of young doctors who entered specialist training.

**MATERIAL AND METHODS:** Data include 443 doctors who were enrolled in a formalized postgraduate medical training programme in the Region of Southern Denmark from 2009 to 2011.

**RESULTS:** 41% of the recruited young doctors were men and 59% were women. The average age for doctors recruited for residency training was 35 years and the average time from graduation to initiation of specialist training (candidate age) was 70 months. If foreign graduates were excluded, the average age was 34 years and average candidate age was 58 months. 6% of the recruited doctors had a PhD. 61% of the doctors were graduates from the University of Southern Denmark. 14% graduated from the University of Copenhagen and 12% from Aarhus University. Finally, 13% graduated from a foreign university.

**CONCLUSION:** Applicants accepted for specialist training are becoming younger at a faster rate than the new legislation can explain. The gender distribution seems to have been stable for more than a decade. The number of doctors who had a PhD seemed low; however, there was a variation between specialities.

**FUNDING:** not relevant.

**TRIAL REGISTRATION:** not relevant.

It has previously been shown that applicants for postgraduate medical specialist training in Denmark were relatively old. In 1999-2003, doctors applied for specialist training 104 months after their graduation at an average age of 37.4 years [1].

Scientific qualifications are regarded as important selection criteria for specialist training in several specialities, but scientific activities often prolong the length of the period from graduation to initiation of specialist training [2]. However, it has also been shown that there is much variation in the applicants' scientific qualifications [2].

At the turn of the millennium, 60% of the applicants for specialist training were women [3]. Since gender may



The Ether Monument, also known as The Good Samaritan. In Boston's Public Garden.

influence the choice of speciality [4], a further change in the gender distribution may affect recruitment to several specialities [1]. Given the age distribution of Danish specialists, it is expected that a significant number will retire within the next five years [5]. In order to avoid shortage of medical specialists, the Danish health authorities intend to speed up the creation of new specialists by reducing the time lapse from graduation to initiation of specialist training. The authorities have requested a greater focus on the applicants' trainability than on their documented prior qualifications [6] and legislation has been introduced that could exclude doctors with more than four years of postgraduate experience from applying for specialist training in Denmark [7]. Applicants who graduated before the summer of 2008 are not covered by this legislation.

The Danish National Board of Health regulates the annual number of educational positions for each speciality. Denmark has 38 approved specialities. In recent years, several of these specialities have experienced difficulties in recruiting new doctors. In the years 2009, 2010 and 2011, there was a 29%, 22% and 9% vacancy rate in Region of Southern Denmark, respectively [8].

## ORIGINAL ARTICLE

- 1) Research Unit of General Practice, Institute of Public Health, University of Southern Denmark
- 2) Department for Postgraduate Medical Education, Region of Southern Denmark

Dan Med J  
2012;59(7):A4476

The aim of this study was to highlight the present characteristics of young doctors who entered specialist training in the Region of Southern Denmark. We examined their gender distribution, age, time lapse from graduation to initiation of specialist training, which universities they had graduated from, choice of speciality and number of PhD degrees.

## MATERIAL AND METHODS

The data include all applications accepted for residency training from young doctors who were enrolled in a formalised postgraduate medical training

programme in the Region of Southern Denmark from the second half of 2009 to 2011. Applications from all 38 medical specialities were included in the study. All applications were sent to the Department for Postgraduate Medical Training in the Region. Applications for residency were all submitted and stored electronically. From 1 June 2009 to 31 December 2012, a total of 443 applicants were accepted for specialist training. The data from these 443 junior doctors were included in this study.

Statistical analysis was performed with the STATA programme. Comparison between groups was made by t test or multivariate test of means. Statistical significance was defined as a p value below 0.05. Since we expected data to stem from a large, homogenous group of applicants and a small group of late applicants, exclusion of extreme values was allowed before data were tested for normality (skewness/kurtosis test). All values were included in all other calculations.

*Trial registration:* not relevant.

## RESULTS

The data showed a normal distribution of candidate data according to skewness/kurtosis tests for normality  $p < 0.05$  if values  $> 100$  were excluded.

### Gender

In 2009-2011, 41% of the recruited young doctors were men and 59% were women. In 64% of the specialities, the majority of those accepted were women. This did not change between 2009 and 2011 (**Table 1**).

### Biological age and candidate age

The average biological age of doctors recruited for residency training in 2009-2011 was 35 years and the average candidate age was 70 months. Graduates from universities outside Denmark had a higher candidate age than doctors graduating from Danish universities. If the 56 foreign graduates were excluded from the data, the average biological age was 34 and average candidate age was 58 months. 87% of the applicants graduated before the summer of 2008.

In the period from 2009 to 2011, the candidate age was significantly reduced by 6 months from 62 to 56 months (**Table 2**).

Biological age on entering the specialist training varied between specialities (**Table 3**).

### Choice of speciality

100% of the applicants for Occupational Medicine, Public Health Medicine, Immunology and Infectious Diseases were women. 100% of the applicants for Neurosurgery and Microbiology were men.

 TABLE 1

Gender distribution by speciality 2009-2011. The values are n (%).

| Speciality                      | Women    | Men      |
|---------------------------------|----------|----------|
| Family Medicine                 | 74 (69)  | 34 (31)  |
| Anaesthesiology                 | 9 (31)   | 20 (69)  |
| Occupational Medicine           | 2 (100)  | 0        |
| Child and Youth Psychiatry      | 10 (91)  | 1 (9)    |
| Dermatology                     | 3 (38)   | 5 (63)   |
| Radiology                       | 10 (56)  | 8 (44)   |
| Gynaecology and Obstetrics      | 12 (75)  | 4 (25)   |
| Endocrinology                   | 7 (88)   | 1 (13)   |
| Gastroenterology                | 4 (44)   | 5 (56)   |
| Geriatrics                      | 4 (57)   | 3 (43)   |
| Haematology                     | 4 (80)   | 1 (20)   |
| Infectious Diseases             | 5 (100)  | 0        |
| Cardiology                      | 7 (47)   | 8 (53)   |
| Lung Diseases                   | 3 (43)   | 4 (57)   |
| Nephrology                      | 6 (86)   | 1 (14)   |
| Rheumatology                    | 5 (63)   | 3 (38)   |
| Vessel Surgery                  | 2 (67)   | 1 (33)   |
| Surgery                         | 10 (50)  | 10 (50)  |
| Biochemistry                    | 2 (67)   | 1 (33)   |
| Pharmacology                    | 1 (33)   | 2 (67)   |
| Physiology and Nuclear Medicine | 3 (60)   | 2 (40)   |
| Genetics                        | 5 (100)  | 0        |
| Immunology                      | 1 (100)  | 0        |
| Microbiology                    | 0        | 2 (100)  |
| Oncology                        | 12 (67)  | 6 (33)   |
| Neurosurgery                    | 0        | 2 (100)  |
| Neurology                       | 9 (53)   | 8 (47)   |
| Ophthalmology                   | 3 (43)   | 4 (57)   |
| Orthopaedic Surgery             | 3 (13)   | 20 (87)  |
| Otorhinolaryngology             | 2 (22)   | 7 (78)   |
| Pathology                       | 6 (86)   | 1 (14)   |
| Plastic Surgery                 | 2 (67)   | 1 (33)   |
| Psychiatry                      | 17 (68)  | 8 (32)   |
| Paediatrics                     | 10 (71)  | 4 (29)   |
| Forensic Medicine               | 0        | 0        |
| Public Health Medicine          | 2 (100)  | 0        |
| Thorax Surgery                  | 1 (33)   | 2 (67)   |
| Urology                         | 4 (50)   | 4 (50)   |
| Total                           | 260 (59) | 183 (41) |

n = number of accepted applicants from 2009-2011 for all 38 specialities.

### Scientific qualifications

6% of the recruited doctors had a PhD. Other scientific activities (number of published papers, abstracts, posters etc.) were not recorded in the official database.

The highest percentages of recruited doctors with a PhD were found in Pharmacology (33%), Cardiology (27%) and Paediatrics (21%).

### University

61% of the doctors were graduates from the University of Southern Denmark. 14% had graduated from the University of Copenhagen and 12% from Aarhus University. 13% had graduated from a foreign university. There was no change in this distribution from 2009 to 2011.

### DISCUSSION

We have found a considerably lower candidate age compared with earlier studies [1]. The decrease in age shown is potentially larger than the figures indicate, since we included only accepted applicants. Nøhr et al included all applicants. Our data show that the decreasing trend continued from 2009 to 2011.

Since the vast majority of applicants in this study graduated before the summer of 2008 and therefore were not covered by the new legislation. The legislation cannot explain the decreasing trend in candidate age. Other factors, such as easier access to educational positions and more focused young graduates may also play a role.

We showed that there was no change in gender distribution compared with earlier studies [3]. The 40/60 male/female distribution seems to have been stable over the past decade. However, there is a remarkable variation in gender distribution among the various specialities as show in Table 1.

Scientific activity before entering specialist training is low in most specialities and lower than previously shown [2], but we only included accepted PhDs. We did not include PhDs awaiting acceptance or scientific articles. Overall scientific activities are therefore higher than our figures indicate. It would have been feasible to include scientific papers and ongoing PhD studies in order to obtain a more nuanced picture of the applicants' scientific qualifications. The differences between specialities may be due to different traditions across specialities and different recruiting conditions. The graduates with a PhD seem to be more focused in their choice of career. It has been argued that the new legislation will negatively influence doctors' scientific profile [9]. Further studies are needed to confirm or reject this assumption, but it is interesting to note that even though a PhD study extends the time period from graduation to start of specialist training, the extension is shorter than the time used on the scientific activities.



TABLE 2

Candidate age of Danish applicants 2009-2011.<sup>a</sup>

|                                   | 2009      | 2010      | 2011      |
|-----------------------------------|-----------|-----------|-----------|
| Candidate age, months, mean*(±SD) | 62 (± 36) | 59 (± 37) | 56 (± 32) |
| n                                 | 72        | 157       | 158       |

n = number of doctors; SD = standard deviation; \*) Multivariate test of means, p = 0.032

a) Doctors who graduated from foreign universities are excluded.



TABLE 3

Age and candidate age in all specialities.<sup>a</sup>

| Speciality                      | n   | Biological age, years, mean | Candidate age, months, mean |
|---------------------------------|-----|-----------------------------|-----------------------------|
| Family Medicine                 | 101 | 32.7                        | 46.6                        |
| Anaesthesiology                 | 29  | 34.1                        | 59.5                        |
| Occupational Medicine           | 2   | 43.5                        | 74.0                        |
| Child and Youth Psychiatry      | 9   | 36.1                        | 62.8                        |
| Dermatology                     | 7   | 34.1                        | 58.2                        |
| Radiology                       | 11  | 33.9                        | 39.8                        |
| Gynaecology and Obstetrics      | 13  | 35.5                        | 79.6                        |
| Endocrinology                   | 7   | 32.2                        | 54.4                        |
| Gastroenterology                | 9   | 33.9                        | 56.1                        |
| Geriatrics                      | 6   | 37.2                        | 114.0                       |
| Haematology                     | 5   | 34.6                        | 62.4                        |
| Infectious Diseases             | 5   | 31.8                        | 39.6                        |
| Cardiology                      | 11  | 35.6                        | 76.9                        |
| Lung Diseases                   | 4   | 30.3                        | 33.8                        |
| Nephrology                      | 7   | 31.7                        | 43.0                        |
| Rheumatology                    | 6   | 32.3                        | 40.3                        |
| Vessel Surgery                  | 2   | 37.5                        | 68.0                        |
| Surgery                         | 19  | 34.4                        | 49.9                        |
| Biochemistry                    | 3   | 33.3                        | 64.0                        |
| Pharmacology                    | 3   | 34.0                        | 72.3                        |
| Physiology and Nuclear Medicine | 5   | 40.6                        | 70.8                        |
| Genetics                        | 5   | 36.2                        | 68.6                        |
| Immunology                      | 1   | 51.0                        | 23.0                        |
| Microbiology                    | 2   | 32.5                        | 57.0                        |
| Oncology                        | 18  | 34.3                        | 67.9                        |
| Neurosurgery                    | 2   | 32.5                        | 45.0                        |
| Neurology                       | 8   | 34.7                        | 64.3                        |
| Ophthalmology                   | 7   | 33.1                        | 55.4                        |
| Orthopaedic Surgery             | 20  | 34.1                        | 54.5                        |
| Otorhinolaryngology             | 9   | 34.7                        | 60.0                        |
| Pathology                       | 6   | 33.7                        | 48.0                        |
| Plastic Surgery                 | 3   | 31.0                        | 48.3                        |
| Psychiatry                      | 18  | 37.5                        | 78.6                        |
| Paediatrics                     | 14  | 35.6                        | 78.6                        |
| Forensic Medicine               | 0   | —                           | —                           |
| Public Health Medicine          | 2   | 35.0                        | 91.5                        |
| Urology                         | 6   | 33.5                        | 73.7                        |

n = number of doctors; a) Doctors who graduated from foreign universities are excluded.

Our data set was complete with no missing data and it gives an exact picture of the present situation in the Region of Southern Denmark. But, since the data cover only one out of three Danish regions, it does not

necessarily provide a precise picture that may be applied at the national level. It has previously been shown that graduates from the University of Southern Denmark more often choose Family Medicine than candidates from the other Danish medical schools [10] and since 61% graduated from this university, caution should be exercised when applying our findings at the national level.

Research is needed to detect how the new focus on immediate trainability rather than on gaining prior clinical experience and scientific qualifications will affect future Danish specialists' clinical confidence.

### CONCLUSION

Applicants accepted for specialist training in Denmark are becoming younger at a faster rate than the new legislation can explain. The gender distribution seems to have been stable for more than a decade. Only a few applicants in the Region of Southern Denmark have a PhD. However, there is a large variation in qualifications between specialities. We suggest that the demonstrated change of demography in doctors' career planning be taken into account in connection with the future organization and legislation of specialist training.

We suggest that the demonstrated change of demography be taken into account in connection with the future organization and legislation of specialist training.

**CORRESPONDENCE:** *Niels Kristian Kjaer*, Lindevej 18, 6400 Sønderborg, Denmark. E-mail: niels.kjaer@dadlnet.dk

**ACCEPTED:** May 17 2012

**CONFLICTS OF INTEREST:** Disclosure forms provided by the authors are available with the full text of this article at [www.danmedj.dk](http://www.danmedj.dk).

### LITERATURE

1. Nøhr KB, Andersen BS, Greve J. Gender, qualifications and choice of speciality of younger physicians in Denmark 1998-2003. *Ugeskr Læger* 2007;169:1223-7.
2. Nøhr KB, Andersen BS, Greve J. Scientific qualifications of younger physicians in residency in Denmark 1998-2003. *Ugeskr Læger* 2007;169:1219-23.
3. Sundhedsstyrelsens lægeprognose 1999-2025. Copenhagen: National Danish Board of Health, 2006.
4. Pedersen LT, Bak NH, Dissing AS et al. Gender bias in specialty preferences among Danish medical students: a cross-sectional study. *Dan Med Bul* 2011;58(9):A4304.
5. Lægeprognose for udbuddet af læger i perioden 2010-2030. Copenhagen: National Danish Board of Health, 2010.
6. Lillevang G, Ringsted C. Career counselling and choice of speciality. *Ugeskr Læger* 2008;170:3547-9.
7. Fireårsreglen – grotesk og utidssvarende. *Aktuelt Yngre Læger*. *Ugeskr Læger* 2007;169:3137.
8. Oversigt over opslåede og besatte hoveduddannelsesforløb i Region Syddanmark. [www.videreuddannelsen-syd.dk](http://www.videreuddannelsen-syd.dk) 2012 (10 Feb 20).
9. Djurhuus JC. Forskning og fireårsreglen. *Debat*. *Ugeskr Læger* 2007;169:2454.
10. Siboni K, Hørder M. Medical graduates from the Odense University 1972-1998. Recruitment and employment. *Ugeskr Læger* 2000;162:1547-51.