

Towards more Diversity in Neuro-Oncology Leadership

– The DivINe Initiative

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1 In the past decade, there has been an increasing awareness for career disparities based on gender,
2 ethnic, socioeconomic and other diversities. While the proportion of female medical students in
3 Germany has steadily increased to 67% (<https://de.statista.com>), less than 50% of practicing physicians
4 and only 19-35% of full professors in the medical profession are women.¹ A recent study on gender
5 disparity in the neurosurgical specialty reported that women represent 35% of neurosurgery residents
6 and 34% of board-certified neurosurgeons at academic medical centers in Germany but hold only 9% of
7 neurosurgery leadership positions.² The term “leaky pipeline effect” has been coined for the
8 observation that there is a disproportionately higher drop-out rate of females as opposed to males over
9 the course of an academic medical career. This phenomenon has been described in various medical
10 disciplines, including neuro-oncology.³

11
12 In a 2018 survey by the European Association of Neuro-Oncology (EANO) and European Organization for
13 Research and Cancer (EORTC), women were underrepresented in leadership roles as well as in reaching
14 professorship, obtaining third-party funding, establishing research collaborations with pharmaceutical
15 companies, and in serving as principal investigators on clinical trials.⁴ Similar data emerged in a survey
16 conducted by the “Young Neuro-Onkologische Arbeitsgruppe” (Young NOA) of the German Cancer
17 Society (Deutsche Krebsgesellschaft, DKG) in 2021.⁵

18
19 In another survey distributed among members of the Society for Neuro-Oncology (SNO) in 2019, women
20 reported to feel passed over for a professional opportunity, to be discriminated in their workplace, and
21 to lack effective mentorship⁶, issues that are also reported in racial and ethnic groups in medical
22 professionals.⁷

23

24 With the objective to evaluate the gender distribution in leadership positions among neuro-oncology
25 centers in German speaking countries (Germany, Austria and Switzerland; acronym: D-A-CH) we
26 conducted a web-based study. We included DKG-certified neuro-oncology centers (www.oncomap.de)
27 and non-DKG-certified centers with a regular interdisciplinary tumor board. One neuro-oncology leader
28 per center was identified. Leadership positions were defined as 'departmental chair', 'leader of neuro-
29 oncology subdivision', and 'other neuro-oncology leader'.

30

31 Out of 72 D-A-CH neuro-oncology centers, 52 (72%) were located in Germany, 10 (14%) in Austria, and
32 10 (14%) in Switzerland. There were 55 DKG-certified and 17 non-certified centers.

33 Overall, 14 (19%) centers were led by women and 58 (81%) centers were led by men (**Figure 1A**). Male
34 neuro-oncology leaders were significantly more likely to be professors and to hold a department chair
35 position (4 females (7%) vs. 51 males (93%), $p < 0.001$). Women were more likely to lead a subdivision or
36 to not hold a formalized leadership position (**Figure 1B**). Gender disparity was particularly pronounced
37 among neurosurgeons (**Figure 1C**).

38

39 While in general these results reflect data from previous surveys⁴⁻⁷, the extent of gender disparity in
40 neuro-oncology leadership within D-A-CH, especially in the top echelon, was remarkable. Not only are
41 the vast majority (80,6%) of leadership positions held by men, but men are also more likely to be of
42 higher academic rank and to have top leadership roles (87,9%).

43

44 We acknowledge that this observational study is limited in that the data were collected from publicly
45 available web pages which could be outdated or inaccurate. Another source of error may arise from
46 possibly interdependent variables, e.g., higher academic rank may correlate with a more advanced
47 leadership role. However, small sample sizes in the subgroups precluded a more detailed statistical

48 analysis. Nevertheless, even with these potential flaws in mind, this study can be perceived as a
49 representative snapshot of the current neuro-oncology leadership landscape in D-A-CH.

50

51 The causes of gender disparity in neuro-oncology are certainly complex and insufficiently understood. As
52 the majority of neuro-oncology leaders within D-A-CH are neurosurgeons, one might argue that the
53 pronounced gender gap seen in our study is caused by the persistent female underrepresentation in
54 neurosurgery in German speaking countries . Indeed, based on the 2022 physician registries in the D-A-
55 CH countries, women represent only 22% and 17% of practicing neurosurgeons in Germany and
56 Switzerland. In contrast, gender distribution appears more balanced in neurology (40-55% females) and
57 radiation oncology (44-58% females, **Figure 1 D**).⁸⁻¹⁰ However, there are about three times more
58 neurologists than neurosurgeons in Germany and Switzerland so that neurologists represent the
59 majority in the pool of physicians from which neuro-oncology leaders are recruited. Even if we assume
60 that neurosurgeons may be more likely to specialize in neuro-oncology, the predominance of male
61 neurosurgeons in neuro-oncology leadership roles is still remarkable. While further studies will have to
62 provide additional insights into the intricacies underlying this observation, our results are in line with
63 previous research, and they point to the apparent fact that women experience implicit and explicit
64 biases in the workplace and are lacking effective mentorship and sponsorship from the outset of their
65 careers.⁵⁻⁷

66

67 To address these disparate career opportunities and professional inequities for women in neuro-
68 oncology within D-A-CH, the “Diversity in Neuro-oncology” (DivINe) initiative was implemented as a
69 regular NOA commission in 2021. Through tailored programs, we offer mentorship, peer support, and
70 professional collaborations to female members of the neuro-oncology community. Most recently, we
71 launched DIAMOND, a structured mentorship program with the goal to effectively counterbalance the

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72 disparities that women face in their early careers. We envision to establish an effective professional
73 network that supports diversity in neuro-oncology and empowers women to reach their full professional
74 potential. The current data will serve as a baseline to assess progress in these ongoing endeavors in D-A-
75 CH in the future.

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Figure Legend

Figure 1. Female vs male neuro-oncology leadership in D-A-CH. (A) Seventy-two neuro-oncology (NOC) centers were identified in D-A-CH and examined in regards to male vs female leadership. (B) Academic rank and leadership roles in male vs female leaders. (C) Gender distribution based on primary specialty. (D) Gender distribution in the most common medical specialties from which neuro-oncologists are recruited.

Footnote: **Doctor medicinae* (Dr. med.) and ***Doctor habilitatus* (Dr. habil.) or *Privatdozent* (PD) refer to postgraduate degrees at European universities and are necessary to obtain professorship. They represent important steps of the academic ladder in medicine, similar to the academic ranks of assistant professor, associate professor, and full professor at universities in the United States.

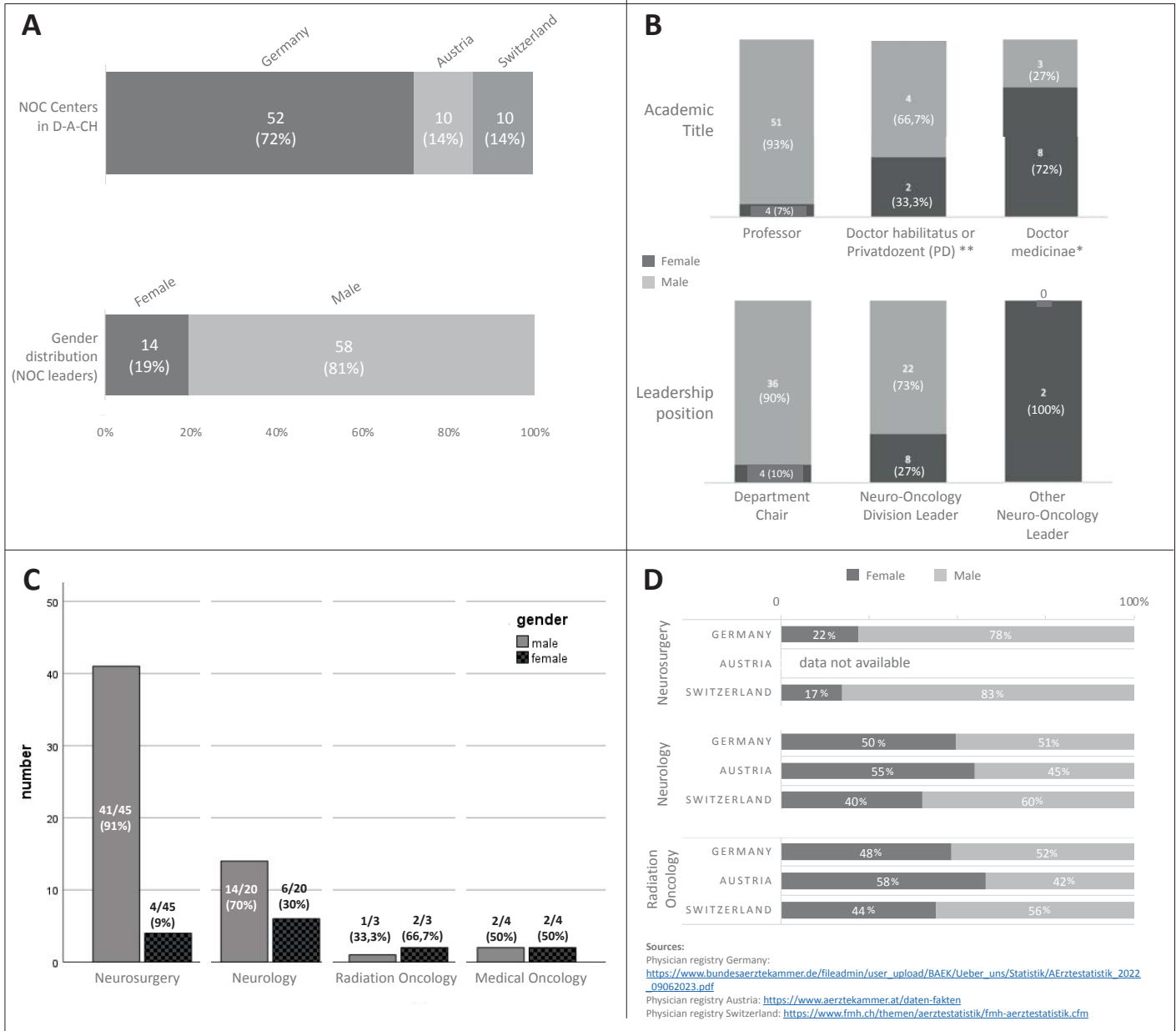


Figure 1