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Recommendations 2021-2024

Advisory Committee on Medical Manpower Planning

Main report

Concerning the intake in medical, clinical technological, dental, mental healthcare, FZO (Hospital Training Programmes Fund), physician assistant, nurse practitioner and related initial degree and postgraduate programmes.

Utrecht, December 2019

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Objectives pursuant to the Articles of Association:

a. to draw up capacity forecasts relating to the future need for healthcare professionals, based, among other things, on the projected demand for healthcare;
b. to provide advice and information to the healthcare sector and the government concerning the need for and the associated intake in training programmes and postgraduate programmes.

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Contents

1 Introduction

This document contains the main report on the 2021-2024 Recommendations. It comprises a consideration of the capacity and intake recommendations for the professional field and the government on 79 healthcare professions. Each profession is discussed in detail in separate sub-reports, which can be read separately from each other and from this report.

- Sub-report 1 relates to 28 clinical specialties, two clinical profiles and three clinical technological specialties. This sub-report was previously published in March 2019 at the request of the Ministry of Health, Welfare and Sport
- Sub-report 2 examines general medical practice
- Sub-reports 3a and 3b cover the initial dental programmes (dentists and oral hygienists) and the two dentistry specialties, namely dental surgeons and orthodontists
- Sub-report 4 describes the desired capacity and intake in three social medicine specialities and eight social medicine profiles
- Sub-report 5 relates to the geriatric medicine specialty
- Sub-report 6 contains an analysis of intellectual disability medicine
- Sub-report 7 contains an analysis of five BIG-registered mental healthcare professions and was already published in November 2018 at the request of the Ministry of Health, Welfare and Sport. An initial indicative recommendation for addiction specialists had already been published earlier that year
- Sub-report 8, describing the fifteen FZO professions,[1] is still published biennially in contrast to the other professions. Forecasts for the professions of extramural paediatric nurse, oncology nurse and ambulance nurse are now also included. The most recent version dates from November 2018
- Sub-reports 9a and 9b concern the physician assistant and nurse practitioner, respectively. This year marks the first inclusion of forecasts for these two professions

Appendix 4 contains summaries of the eleven sub-reports.

1.1 Objectives of the Advisory Committee on Medical Manpower Planning (ACMMP)

The ACMMP was established in 1999 by parties in the healthcare sector to put an end to the decades-long cycle of doctor shortages and surpluses. The ACMMP has been issuing recommendations and forecasts on the desired intake in the various medical profile training programmes and in the postgraduate medical training programmes as well as the desired intake in the postgraduate dentistry programmes since 2000. In addition, the ACMMP issues a recommendation and a forecast on the intake deemed necessary in the initial degree programme in Medicine. These forecasts generally cover a certain bandwidth and serve as a basis for recommendations to both the government and professional field.

[1]The term 'professions' is factually incorrect in that they are job roles/positions rather than professions. However, because the term is used so frequently, it is also used in this report.

The ACMMP also provides the government and professional field with independent and reliable information in support of wide-ranging policy issues, such as: intake of medical doctors and medical specialists with foreign qualifications, scale and progress of horizontal and vertical substitution, available labour market capacity, expected growth of the supply of and demand for healthcare and expected effects of efficiency measures or developments in the professional field. From mid-2013 to mid-2016, in response to a request by the Ministry of Health, Welfare and Sport, the ACMMP contributed to a European Union initiative aimed at gaining access to and enabling comparison with the methodology and forecasting instruments used in various other countries. The results of the project can be found in a number of publications.[2,3] The ACMMP also participates in symposia, invited expert meetings and focus group sessions.

The Governing Board of the ACMMP comprises 27 seats, 9 of which are held by representatives of the professional groups, 9 by the educational institutions and 9 by the health insurers. All forms of consultation within the ACMMP are composed of equal numbers of representatives from the above three parties. The ACMMP has been fully funded by the Ministry of Health, Welfare and Sport since 1999.

The Articles of Association were amended in 2015 for the purpose of updating a number of sections on the one hand, and to broaden the target group(s) on the other. The current objectives of the ACMMP as set out in the Articles of Association are:

a. to draw up capacity forecasts relating to the future need for healthcare professionals, based, among other things, on the projected demand for healthcare;
b. to provide advice and information to the healthcare sector and the government concerning the need for and the associated intake in training programmes and postgraduate programmes.

1.2 Developments in the tasks of the ACMMP

The ACMMP utilised the first ten years of its existence to build knowledge and experience within the area of its original objectives, which were limited to the recognised postgraduate programmes in Medicine and Dentistry and the initial degree programme in Medicine. The ACMMP subsequently proceeded to gradually apply its knowledge and experience to related areas, following requests from the Ministry of Health, Welfare and Sport.

- The ACMMP applied the experience gained in the area of monitoring and participatory policy development in the postgraduate dental health professions to analyse supply and demand in the primary oral healthcare sector. At the request of the Ministry of Health, Welfare and Sport, following a recommendation by the Oral Healthcare Innovation Committee, from 2008 to 2014 the ACMMP analysed the dentist and oral hygienist professional groups (both initial degree programmes in Oral Healthcare). The ACMMP resumed this activity in 2018 at the request of the Ministry of Health, Welfare and Sport.
- In 2009, the ACMMP began to analyse the desired and actual capacity developments for the five mental healthcare professions registered in the BIG register (clinical psychology and neuropsychology, psychotherapy, health psychology and mental healthcare nurse practitioners). In 2011, 2013, 2015 and 2018, the ACMMP issued recommendations on the desired intake in the corresponding degree programmes. These forecasts have been drawn up on a regular basis since 2014.

[2]Malgieri, A. et al: Handbook on health workforce planning methodologies across EU countries (EU Joint Action on Health Workforce Planning and Forecasting, 2015)
[3]Health Workforce Policies in OECD countries; right jobs, right skills, right places (OECD, 2016)

The Ministry of Health, Welfare and Sport considers these recommendations during decision-making on the number of intake places in these professions eligible for funding. The profession of addiction specialist was added in 2018.

- In 2012, in response to a request by the Ministry of Health, Welfare and Sport, the ACMMP agreed to examine whether the capacity for professions, the training programmes for which are funded by the Hospital Training Programmes Fund (FZO), could be analysed using the available methodologies. This concerned 15 professions for which no national capacity figures were available. A special aspect of this request entailed producing not only the national overarching forecast, but also forecasts for the twelve FZO regions in the light of the limited geographic mobility of these professional groups. The initial indicative recommendation including accompanying projections for the FZO professions was submitted in mid-2014. The following professions have since been added: extramural paediatric nurse, oncology nurse and ambulance nurse.
- An initial indicative recommendation on community pharmacists was prepared in 2017 on an ad-hoc basis. The ACMMP is currently preparing recommendations on the professions of abortion specialist and confidential child abuse specialist.

1.3 Structure of this report

Chapter **2** describes the development of the **supply side** of the various professions covered in these Recommendations. This includes a number of professions for which no intake recommendation has been provided in these recommendations, but which are relevant in terms of the recommended intake level, for example on account of the potential substitution of activities by these professions.

The ACMMP endeavours to provide guidance on the future capacity of the professional groups by issuing recommendations on the desired intake in the relevant initial degree programmes and/or postgraduate programmes. These recommendations will only yield results in the long term. The history of previous **intake recommendations**, decision making on the recommendations and the actual intake in each profession are examined in Chapter 3, concluding the review of capacity developments in relation to the intake recommendations.

The projected development of healthcare demand is crucial for our forecasts**. Chapter 4** looks at the projected development of healthcare demand until the year of equilibrium 2037, expressed as full-time equivalents (FTEs) and in the percentage change. Projections on demographic, epidemiological and socio-cultural developments are used for this purpose. These projections are supplemented with assessments of changes in the work process arising from job-related, technological, logistical and interprofessional developments as well as developments in the terms of employment. Various scenarios outlining the required capacity in the year of equilibrium are assessed. Two scenarios for each profession were ultimately selected by the ACMMP.

In Chapter 5, based on the development of healthcare demand described in Chapter 4 and the development of supply described in Chapter 2, the ACMMP provides a recommendation on the required **intake in** the relevant degree programmes. The intake recommendation normally applies to the intake between 2021 and 2024. For sub-reports 1, 7 and 8, the recommendation applies from 2020. The intake recommendation is formulated on the basis of the two most likely healthcare demand scenarios underlying the bandwidth. A point estimate was exclusively applied in the case of clinical specialists.

A separate Chapter **6** covers the desired intake in the **initial degree programme in Medicine**. The recommendation on the intake in the initial degree programme in Medicine has been formulated to maintain the pool of medical graduates (MDs) who are available for a postgraduate programme at the required level. This pool has been growing larger since 2013.

Chapter 7 sets out the key future policy focus areas, not all of which are included in the cover letter. However, they can be found in this report and in the sub-reports.

These reports regularly refer to various terms and abbreviations that require further explanation. For this reason, the ACMMP requested the Netherlands Institute for Health Services Research (NIVEL) to develop and maintain a thesaurus (available only in Dutch), which can be found on www.capaciteitsorgaan.nl.

The appendices contain the forecasting model (Appendix 1), which remains unchanged since 2000, the composition of the Governing Board and the Bureau staff (Appendices 2 and 3) and summaries of the corresponding eleven sub-reports (Appendix 4).

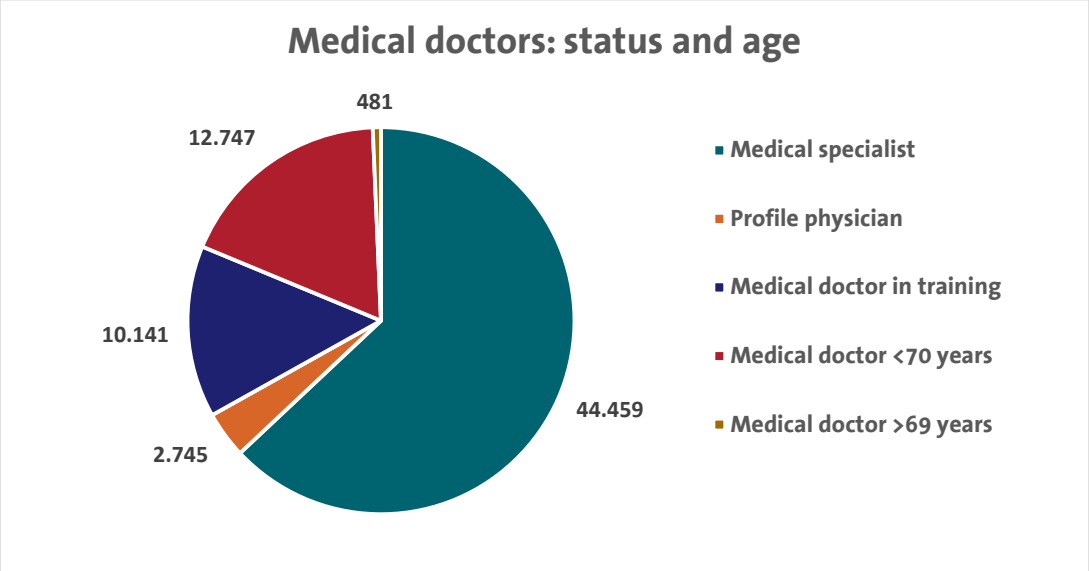
2 Current supply: quantitative developments from 2008 to 2019

This chapter discusses the existing supply for the various clusters of professional groups. The medical professions, broken down into medical specialists and other professions, are addressed in Section 2.1. Section 2.2 describes the quantitative developments relating to physician assistants and nurse practitioners. Healthcare assistants in GP practice are also discussed. The following section sets out the developments in primary and secondary oral healthcare. Section 2.4 describes the quantitative developments in the mental healthcare professions, which only became available in 2010. Lastly, the quantitative developments in the so-called FZO professions are discussed in Section 2.5.

2.1 Medical professions

The medical professions are divided into medical specialists and other professions, comprising profile physicians (profielartsen) and the clinical technological professions. Medical specialists are medical doctors who are registered in the specialists register maintained by the Medical Specialists Registration Committee (RGS), a public register laid down by law. Medical specialists are also listed in the BIG register. In addition to the profession of 'medical doctor', the title of the speciality under which they are registered is also included in the BIG register. Profile physicians are medical doctors who have completed a (usually shorter) 'profile' training programme in accordance with the regulations of the Board of Medical Specialties (CGS) and have subsequently registered in the private RGS profile register (profielregister), Clinical technological professions may have a medical background. Figure 1 shows the status of all 70,573 medical doctors registered in the BIG register on 1 January 2019.

Figure 1: Breakdown of doctors based on status and age – 01 January 2019



Sources: RGS, CIBG

The BIG register was updated for the first time in 2018, to delete all medical doctors who do not or no longer work in patient care. The majority of doctors over the age of 69 lost their registration as medical doctors as a result of this update.

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2.1.1 Number of registered medical specialists

Table 1 shows the number of registered medical specialists as of 1 January 2005, 2010, 2015 and 2019, including the percentage of women in each specialty.

Table 1: Number of registered medical specialists and the percentage of women as of January 1th

Specialty / Year	2005		2010		2015		2019	
	Number	% Women	Number	% Women	Number	% Women	Number	% Women
Anaesthesiology	1,279	23	1,605	28	1,825	33	2,097	38
Cardiology	737	9	912	15	1,094	21	1,266	24
Cardio-thoracic surgery	116	6	136	12	147	10	154	12
Dermatology and venereology	404	34	472	43	555	50	663	56
General surgery	1,122	11	1,218	17	1,389	21	1,536	24
Internal medicine	1,818	28	2,006	36	2,197	42	2,588	48
Otorhinolaryngology	462	12	489	12	524	26	610	30
Paediatrics	1,225	45	1,401	58	1,518	63	1,708	67
Clinical genetics	77	68	110	74	148	79	172	81
Clinical geriatrics	137	61	174	64	240	70	320	75
Respiratory medicine	438	19	524	26	626	35	766	42
Gastroenterology	239	15	364	23	493	29	631	36
Medical microbiology	222	35	249	37	284	42	332	46
Neurosurgery	119	2	136	10	159	13	183	14
Neurology	725	21	826	31	950	39	1,110	44
Nuclear medicine	111	30	152	35	188	37	209	38
Obstetrics and gynaecology	908	34	978	46	1,082	57	1,228	63
Ophthalmology	641	35	671	38	722	45	818	48
Orthopaedics	539	4	633	8	798	11	895	13
Pathology	350	35	391	37	440	44	511	48
Plastic surgery	217	13	270	20	329	28	382	35
Psychiatry	2,534	35	2,966	42	3,432	47	3,781	52
Radiology	916	15	1,059	21	1,217	28	1,427	32
Radiotherapy	198	30	256	45	299	55	357	57
Rheumatology	198	37	248	44	319	52	371	57
Rehabilitation medicine	369	46	455	55	531	61	644	66
Sport medicine	-	-	106	29	136	33	152	38
Urology	332	5	372	13	441	22	508	28
Total clinical specialties	**16,433**	**26**	**19,073**	**34**	**22,083**	**40**	**25,435**	**44**
General Medical Practice	10,061	35	11,121	42	12,464	50	13,710	57
Specialist in geriatric medicine	1,256	59	1,475	61	1,571	64	1,743	68
Physician for intellectual disabled	170	56	175	65	214	73	251	78
Occupational physician	1,906		2,154	34	1,885	34	1,683	36
Insurance doctor	972		1,065	38	989	38	963	42
Community medicine	1,157	55	838	59	72*1	60	674	70
TOTAL	**32,006**	**32**	**35,901**	**38**	**39,927**	**44**	**44,459**	**49**

Source: RGS

Table 1 clearly shows a varying trend in the number of specialists per medical specialty from 2010.

This is attributable to the following factors:

- Our recommendations for each specialty, the subsequent decisions of the Ministry of Health, Welfare and Sport and the actual intake in the professional field
- The changing retirement ages for medical specialists
- The inflow and outflow of medical specialists with a Dutch or foreign qualification

The number of registered specialists across all medical specialties rose between 2005 and 2019, with the exception of the three medical specialties in social medicine. Average annual growth over this period amounted to 2.8%, but the growth percentages vary considerably: 3.9% for all clinical specialties aggregated (2005–2015: 3.5%), 2.6% for general practitioners (2005–2015: 2.4%), and -1.3% for public and occupational health physicians (2005–2015: -1.3%). Compared with 2015, growth in the number of registered clinical specialists and number of registered general practitioners is set to increase. This reflects ACMMP expectations based on the fact that intake for the relevant training programmes also significantly increased 6 and 3 years ago, respectively. The continued decline in the number of registered public and occupational health physicians over 2015 had already been predicted as well.

Among the clinical specialties, gastroenterologists recorded the highest annual growth over the past 11 years (11.7%), followed by clinical geriatrics specialists (9.5%) and clinical genetics (8.8%). The composition of the top three has not changed since 2016, with second and third place merely changing positions. Ophthalmology (2.0%), followed by otorhinolaryngology (2.3%) and cardio-thoracic surgery (2.3%) recorded the lowest growth figures. Having previously come in third at 2.5%, obstetrics and gynaecology is now 26th in the ranking of ascending specialties.

The higher intake recommendations 2008 with effect from 2010 account for the relative increase in the number of registered general practitioners in 2019 compared to 2015 (+ 3.1%). In 2005 and 2008, the ACMMP advocated a lower intake level in light of the increased reserve capacity for GP locums. Following a re-examination of this phenomenon in 2010 and 2013, the level of reserve capacity was found to be acceptable. The recommendations issued after 2010 also take account of the shift from secondary care to primary care, as a result of which a higher number of general practitioners were being trained from this moment onwards. The ACMMP expects relative growth to increase further still over the coming 3 years due to the continued growth in intake at general practitioner training programmes.

Percentage increase over the 2005-2016 period: 2.3% for specialists in geriatric medicine and 3.1% for physicians specialised in persons with intellectual disabilities. These percentages were as follows for the 2005–2019 period: 2.8% and 3.4%, respectively.

The continued decline in the number of registered practitioners in public and occupational health had already been predicted in the 2013 Recommendations. In all three specialties, the number of doctors in training as specialists was too low to meet the demand for substitution. Based on the current number of trainee specialists, the decline in the number of registered occupational physicians and insurance company medical advisers is set to continue over the next five years. The number of

registered community medicine physicians has continued to decline over the past few years. However, this decline has been gradually slowing since intake levels at the community medicine programme started to rise slowly in 2012. The number of community medicine physicians is not expected to show any significant further decline over the coming three years.

The growth in the number of registered doctors has in part been brought about by the feminisation of the professional groups. Women work less than men, creating a need for more (female) doctors. 49% of all medical specialists are currently female. Feminisation is visible across the whole spectrum of specialties, as depicted in table 1. Feminisation occurs at an average annual rate of 1.2% and has been continuing at that rate for fourteen years. Between 2005 and 2019, the percentage of women in clinical specialties rose by 18%, with a 22% increase in general practitioners, a 22% increase in physicians specialised in people with intellectual disabilities and a 15% increase in community medicine physicians. The rate of feminisation is lower among specialists in geriatric medicine (9%) and in the main area of Occupational Medicine (6%). This is probably due to the extremely low intake in the degree programme. Some 70% of medical doctors in training as specialists are currently female. The number of registered women in each specialty will thus continue to rise over the coming years.

In addition to the recognised medical specialties, since 2008 the ACMMP has also provided forecasts for three clinical technological specialties, which do not necessarily require prior medical education. The ACMMP has also been providing forecasts for so-called profile physicians since 2008. The Board of Medical Specialties (CGS) has recognised a number of profiles since 2006, which after a two- to four-year training programme give incumbents the right to a protected title under civil law. The number of profiles has increased in recent years. Table 2 shows the quantitative data for the clinical technological specialists and the profile physicians for all profiles recognised on 1 January 2019. No forecast has yet been made of the most recently recognised profiles. The oldest profile training programmes have only existed for thirteen years. Consequently, the average percentage of women in these professions is higher than in the medical specialist training programmes. Youth healthcare physicians stand out due to an exceptionally high percentage of women. The number of registrations of profile physicians is higher than the actual number of profile physicians. In the field of social medicine (public and occupational health), physicians may simultaneously hold two, or in highly exceptional cases, three profiles.

Table 2: Number of registered clinical technological specialists, profile physicians and the percentage of women as of January 1th

Clinical technological specialty/profile Year	2005		2010		2015		2019	
	Number	% Women	Number	% Women	Number	% Women	Number	% Women
Clinical chemistry	251		236	29	302	35	305	43
Clinical physics	245	9	321	16	383	24	437	27
Clinical pharmacy	337	40	416	48	521	52	570	57
Emergency medicine physician			137	63	404	67	582	69
Hospital medicine							41	72
International Healthcare							298	60
Addiction medicine					196	38	199	40
Policy and advice			178	46	170	46	185	53
Donor medicine							49	75
Forensic medicine			183	24	137	28	111	28
Infectious disease management			73	45	108	53	141	57
Youth healthcare			795	91	978	92	1,053	93
Medical environmentology			11	44	15	67	19	68
Health and social care needs assessment and advice			63	54	54	44	42	50
Tuberculosis prevention and control			19	53	25	52	26	42
Total number of doctors*			**1,459**	**70**	**2,087**	**70**	**2,746**	**71**

*** not including the three clinical technological professions**
Source: RGS

2.1.2 Number of practising medical specialists, profile physicians and medical doctors

In determining the required medical staff capacity, medical doctors have also been taken into account in this section and in the next section, as they represent a substantial portion of available labour capacity. Most of the data are clustered into main groups. More detailed data can be found in the separate sub-reports.

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Table 3: Number of practising medical professionals: number and percentage of practising doctors compared with number of registered doctors.

Profession	2005		2010		2015		2019	
	Number	%	Number	%	Number	%	Number	%
Clinical specialists*	14,283	87	17,350	91	20,447	91	24,067	88
General practitioners	8,850	88	10,371	93	12,070	92	12,766	93
Specialist in geriatric medicine	1,177	94	1,368	93	1,485	95	1,672	97
Physicians for the intellectual disabled	186	100	160	92	225	95	243	98
Public and occupational health physicians	3,100	77	3,812	92	3,145	91	2,774	97
Clinical technological specialists	833		925	93	995	93	1,284	98
Profile physicians			612	99	773	94	1,444	95
Medical doctors under 65**	19,500		14,837	82	19,565	80	23,260	98
Total	**47,929**	**84**	**49,435**	**89**	**58,705**	**88**	**67,510**	**93**

Source: RGS/SSB/NIVEL

*** Excluding the clinical technological professions, including profile physicians in emergency medicine**

**** In 2005, the percentage of these medical doctors who were practising was unknown**

An average of 93% of all registered doctors are currently practising, representing a major increase compared with 2005, 2010 and 2015. This increase is mainly cosmetic in nature. As a result of the effort to update the BIG register in 2018, all medical doctors who provided less than 2,000 hours of individual patient care over the past five years have been struck from the BIG register. As a result, the percentage of not practising medical doctors who are still registered despite being retired has significantly declined. The percentage of medical doctors who are currently practising has increased from 80% in 2015 to 98% in 2019.

The percentage of profile physicians who are currently practising is dropping to a rate commonly associated with more established occupations as these professions begin to stabilise. As in previous years, high percentages of practising physicians were registered as specialists in geriatric medicine and as physicians for the intellectual disabled in 2019. There are far fewer job opportunities for these professions outside the Netherlands (which means they will no longer be registered as practising in the Netherlands) compared with the other medical specialties. Frictional unemployment is also low, due to the current shortage of medical specialists in these two professions.

Of the 23,260 practising medical doctors, 11,020 are medical doctors training to become either profile physician or medical specialist and 6,009 are medical doctors who wish to pursue a postgraduate training programme. The remaining 6,231 medical doctors are practising, but do not intend to undergo any further training. More detailed information can be found in a recent survey of medical doctors.[4]

[4] For the medical doctors: Van der Velde, F.; Wierenga, M.: Loopbanen en loopbaanwensen van basisartsen; Prismant 2016

The net number of medical doctors working in patient care in the Netherlands has risen by 7,450 in the past 3 years. However, this should not be taken to mean that actual capacity has also increased by 7,450 FTE.

2.1.3 Average medical specialist FTE

For forecasting purposes, the ACMMP is primarily interested in capacity expressed as the number of FTEs employed in the workforce. Table 4 provides an overview of these figures for practising specialists and profile physicians.

Table 4: Practising medical specialists and medical doctors: numbers practising and FTE percentage

Profession / Year	2005		2010		2015		2019	
	Number	FTE	Number	FTE	Number	FTE	Number	FTE
Clinical specialists*	14,283	0.90	17,350	0.90	20,447	0.92	24,067	0.89
GPs	8,850	0.82	10,371	0.71	12,070	0.74	12,766	0.74
Specialist in geriatric medicine	1,177	0.76	1,368	0.83	1,485	0.87	1,672	0.86
Specialists for the intellectual disabled	186		160	0.84	225	0.87	243	0.86
Social medicine specialists	3,100	0.83	3,812	0.82	3,145	0.82	2,774	0.97
Clinical technological specialists	833		925	0.94	995	0.94	1,284	0.92
Profile physicians			612	0.49	773	0.49	1,444	0.66
Medical doctors under 65 years	19,500		14,837	0.82	19,565	0.82	23,260	0.83
Total*	**47,929**		**49,435**	**0.82**	**58,705**	**0.84**	**67,510**	**0.84**

Source: RGS/SSB/NIVEL/Prismant

*** Excluding the clinical technological professions, including emergency medicine physicians and hospital medicine**

An increase in the total medical staff capacity can be seen from 2005, although 2005 is not complete in terms of FTEs. When looking only at the complete figures for the 2010 – 2019 period, the number of FTEs rose from 40,537 to 56,644. This is a slightly smaller increase than the increase in absolute figures (18,075) due to fact that the average percentage of FTEs compared with 2010 increased in 2015 and 2019. On average, more FTEs began working mainly in the social medicine professions. This increase (+0.15 FTE) may be attributable to the fact that these professions are currently experiencing major shortages. The profile physicians - who also largely work in social medicine - (+0.17FTE) were recently surveyed for the first time and asked about working hours.

The average part-time factor for clinical specialists appears to have dropped. The declining average number of FTEs compared with 2015 is attributable to the fact that both men and women have been working slightly less since 2015. In 2013, the average FTE was not expected to increase to more than 0.92. This forecast turned out to be accurate. The average part-time factor stood at 0.91 FTEs in 2016 and 0.89 FTEs in 2019. This exclusively concerns the part-time factor for practising clinical specialists. No data is available on clinical specialists operating as independent practitioners. However,

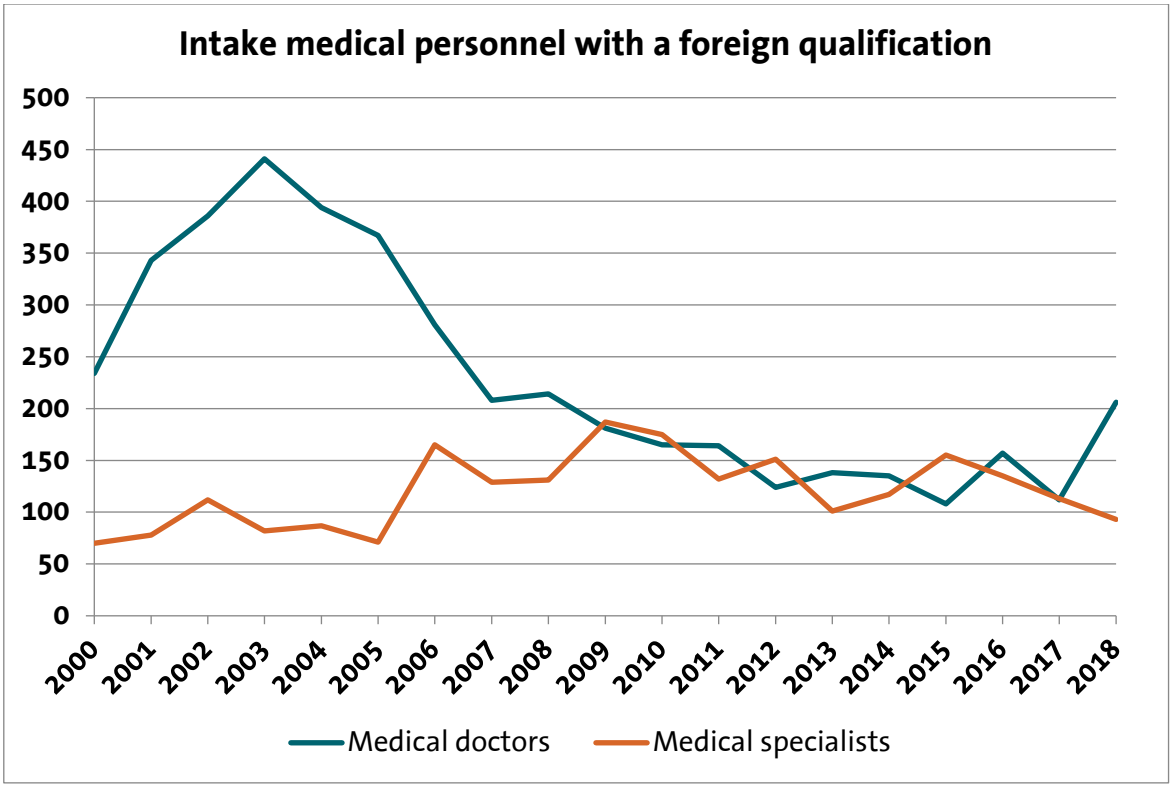
the part-time factor for practising clinical specialists is increasing annually. The percentage of clinical specialists partially or fully practising as employees grew from 59.5% to 62.5% between 2014 and 2017, an increase of 1% per year.

Since 2015, the number of available FTEs has increased by 7,332, or 14.9%. This is significantly higher than the increase over the 2010-2015 period. However, there are major differences between the various professions. The available FTEs for clinical specialists rose by 13.9% in the past four years, whereas general practitioner FTEs rose by 5.8%. The labour capacity for general practitioners has increased at a comparatively slower pace in the past four years than the labour capacity for clinical specialists. This trend is expected to change over the coming years. On the one hand, because of the growing intake at training programmes for general practitioners. On the other hand, because of the higher than average intake at clinical specialist programmes in the period between 2012 and 2015 as a result of efforts to ensure full self-sufficiency in terms of specialised clinical care.

2.1.4 Intake of medical specialists with a foreign qualification

The available capacity is determined by inflow in and outflow from the profession. The inflow is largely generated through the combined efforts of trainers and educational institutions. However, there also is a certain intake of medical specialists with a foreign qualification. Incoming medical specialists and medical doctors holding a qualification from abroad, to the extent their qualification is mutually recognised, can start working on the Dutch labour market immediately after successfully completing a language test. The intake of these medical doctors and specialists has been monitored on a regular basis since 2000. Since 2011, between 100 and 150 medical specialists with a specialist qualification from abroad have been entered in the RGS registers each year. In 2018, this concerned 93 medical specialists, including 73 clinical specialists.

Figure 2: Intake of medical doctors and medical specialists with a foreign qualification



Source: RGS/CIBG

In 2009, the European Union published a 'green paper' on the projected doctor shortages in Europe,[5] predicting a shortage of around 200,000 doctors by 2020 at the European level. Developments in the neighbouring countries, Belgium and Germany, are particularly relevant to the Netherlands. These countries similarly expect to experience shortages. A more recent Eurostat publication showed that, in 2011, 40% of the doctors in both Belgium and Germany were older than 54 and were therefore due to retire in the near future.[6] Consequently, these countries will face shortages. The ACMMP trained additional medical specialists in the period from 2012 to 2015 to address this issue. This additional intake at the various programmes was subsequently discontinued when it became clear that the shortages abroad were barely curbing the intake of foreign medical specialists. Here in the Netherlands, the percentage of registered medical specialists over the age of 54 stood at 34.7% on January 1th 2019.

Monitoring has also shown that the intake of medical doctors with a foreign qualification dropped between 2002 and 2010. The annual intake of medical doctors with a foreign qualification has fluctuated between 100 and 150 since 2011. It should be pointed out that there were 206 incoming medical doctors with a foreign qualification in 2018. It is currently still too soon to draw any conclusions from these figures.

[5] Sermeus, W.; Bruyneel, L. :Investing in Europe's health workforce of tomorrow: scope for innovation and collaboration; European observatory on health systems and policies
[6] http://ec.europa.eu/eurostat/statistics-explained/index.php/Healthcare_personnel_statistics_-_physicians

The intake of medical specialists with a specialist qualification has been gradually declining. Medical specialists still seem to find the Netherlands an attractive country in which to practice, even though employment opportunities in their own country are increasing. This downward trend may be due to the fact that there are currently sufficient medical specialists with Dutch credentials, making it harder for foreign specialists to find a job in the Netherlands.

2.2 Nurse practitioners (NP), physician assistants (PA) and healthcare assistants in GP practice (POH-S/ POH-GGZ).

2.2.1 Number registered and practising

The above three professions support various medical specialties and are, in part, able to substitute professionals in these areas. Training programmes for nurse practitioners were launched in 1997 and they have been active on the labour market since 2000. Since 2009, nurse practitioners who successfully complete their studies can register directly in the nurse practitioners register. Those who graduated prior to that year were given an opportunity to register in the register on the basis of an assessment. Table 5 includes the number of registered nurse practitioners for the years 2005 and 2010. Registration in the register only took effect in 2009, and the registration figures in 2010 lagged behind the actual number of practising nurse practitioners. Ninety-nine per cent of nurse practitioners practising in the profession are now registered in the register.

The Dutch Association of Physician Assistants only has a public quality register, in which 96% of the physician assistants practising in the profession are actually registered. The number of practising professional nurse practitioners and physician assistants has risen sharply since 2008, partly due to the higher intake in the degree programme.

There is no quality register for somatic healthcare assistants in general practice (POH-S). The nature of the association register is too non-obligatory to be able to project capacity. For this reason, additional research was carried out in this area. However, a quality register for mental healthcare assistants in general practice (POH-GGZ) was established in 2016. The expectation in recent years was that the number and required capacity for these mental healthcare assistants would rise rapidly in light of the reform of the mental healthcare system in 2014, and the introduction of the role prior to that with effect from 2008. Patients suffering from minor psychological complaints increasingly receive assistance within general practice. Mental healthcare assistants in GP practice are increasingly assuming care for these patients. The number of general practitioner patients who have had at least one consultation with a mental healthcare assistant amounted to 200,000 in 2013 and to 390,000 in 2014. The demand for these healthcare assistants is rising sharply. With effect from 2016, care providers and health insurers may make agreements on the deployment of no more than one FTE for a mental healthcare assistant in general practice per standard practice, although no funds have been released by the Ministry of Health, Welfare and Sport for this purpose.

In 2019, the ACMMP conducted another survey of all four professional groups[7,8] the results of which are shown in table 5.

Table 5: Number of registered and practising physician assistants, nurse practitioners and somatic and mental healthcare assistants in general practice

Profession	2005		2010		2012		2016		2019	
	Registered	Practising	Registered	Practising	Registered	Practising	Registered	Practising	Registered	Practising
PA**	16	15	251	218	409	347	724	762	1,047*	1,058
NP		177	801	883	1,316	1,442	2,783	2,638	3,643	3,494
POH-S		2,900		4,200		5,160		5,900		3,300
POH-GGZ *		0		0		690		2,500		1,800
Total	**16**	**3,092**	**1,052**	**5,301**	**1,725**	**7,639**	**3,507**	**11,800**	**4,690**	**9,652**

Source: NIVEL, Prismant

*** Minimum number practising based on NIVEL assumptions**

**** 1-9-2019: the registration is incomplete and does not include physician assistants in clinical obstetrics**

The number of physician assistants is still rising. The number of registered nurse practitioners is also rising across all fields of care: acute care, intensive care, chronic care, preventive care and mental healthcare. The highest increase since 2012 was recorded in the second-largest cluster, nurse practitioners in mental healthcare (+277%), where 1,083 people are currently registered.

2.2.2 Average professional practitioner FTE

Average FTE figures according to gender have only been available for nurse practitioners and physician assistants since the 2012 measurements. The 2012 figures were applied retroactively to the rough 2005 and 2010 data. Expressed as FTE, this produces table 6.

Table 6: Total FTE and average FTE for practising physician assistants, nurse practitioners and somatic and mental healthcare assistants in general practice

Profession	2005	2010	2012			2016			2019		
	Total	Total	Total	Male	Female	Total	Male	Female	Total	Male	Female
Physician assistants	14	203	323	0.97	0.90	704	0.98	0.90	951	0.96	0.87
Nurse practitioners	148	737	1,119	0.91	0.84	2,333	0.94	0.87	3,066	0.94	0.86
POH-S*	1,131	1,638	2,282		0.39	2,977			3,300		
POH-GGZ **						1,295			1,800		
Total	**1,293**	**2,578**	**3,724**			**7,309**			**9,117**		

Source: NIVEL, Prismant

*** Minimum number practising based on NIVEL assumptions**

**** 1-9-2019: the registration is incomplete and does not include physician assistants in clinical obstetrics**

[7] Van de Leemkolk, B. ;Van der Velde, F.: Alumni van de masteropleidingen tot verpleegkundig specialist (Alumni of the nurse practitioner master's degree programmes; Prismant (2019)

[8] Aalbers, W.; Van de Leemkolk, B.; Van der Velde, F.: Alumni of the Physician Assistant Master's degree programme. Prismant (2019)

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Table 6 shows that the number of professional practitioner FTEs who are able to assume the tasks of medical specialists is rapidly increasing. The available pool of physician assistants, nurse practitioners and healthcare assistants in general practice has continued to grow over the past three years, by a total of 25% compared with 2016. Healthcare assistants in general practice only work within the field of general medical practice, whereas physician assistants and nurse practitioners work mainly in hospitals, primary care and nursing homes. The ratio of healthcare assistant in general practice FTEs to general practitioner FTEs was 0.54 as of 1 January 2019 (2016: 0.48; 2013: 0.28). Should all nurse practitioner and physician assistant FTEs be allocated to the medical specialists, the ratio of nurse practitioner FTEs and physician assistant FTEs to medical specialists would be 0.11 (2016: 0.09; 2012: 0.04). This ratio is higher in mental healthcare, where 40% of nurse practitioners work. General practitioners have more extensive and longer experience in vertical substitution than the other medical specialties. In addition to somatic healthcare assistants in general practice and mental healthcare assistants in general practice, this year also marks the introduction of practical nurses in general practice. This is examined in greater detail in Chapter 6,

2.2.3 Retirement age and intake from abroad

Little information is available on the retirement age of physician assistants, nurse practitioners and healthcare assistants in general practice. The first surveys on this topic were conducted in recent years. However, as a professional group, physician assistants and nurse practitioners are too young to be able to generate usable figures on the retirement age for this report. Intake from abroad scarcely occurs among these professional groups in practice.

2.3 Dental professions and dental specialists

The ACMMP has been drawing up intake forecasts for the two dentistry specialties, Orthodontics and Oral Diseases, and Oral and Maxillofacial Surgery (OMS), since 2000. Qualified orthodontists have completed the degree programme in Dentistry and have subsequently successfully completed the recognised postgraduate training programme in Orthodontics. Qualified OMS surgeons have completed both the degree programme in Dentistry and the degree programme in Medicine and have subsequently successfully completed the recognised postgraduate training programme in OMS. From 2010 to 2013, at the request of the Ministry of Health, Welfare and Sport, the ACMMP produced forecasts for the dentist and oral hygienist professions in primary oral healthcare. The ACMMP resumed these forecasts in 2018. As a result, there is a hiatus in the information gathered on these two professional groups between 2013 and 2019.

2.3.1 Number of registered and practising professional practitioners

Table 7 shows the number of registered and practising dentists, oral hygienists, orthodontists and OMS surgeons. The number of registered professional practitioners was sourced from the information provided by the Dutch Dental Hygienists' Association (NVM), the BIG register and the specialists register maintained by the Royal Dutch Dental Association (KNMT). Additional research was conducted in 2019 in order to determine the number of oral hygienists. The number of practising professional practitioners was derived from a survey among all registered professional practitioners.

Table 7: Number of registered and practising dentists, oral hygienists, orthodontists and OMS surgeons

Profession	2005		2010		2013		2016		2019	
	Regis-tered	Prac-tising	Regist ered	Prac-tising	Regist ered	Prac-tising	Regis-tered	Prac-tising	Regis-tered	Prac-tising
Dentists	9,467	-	10,700	8,881	11,783	8,854	-	-	11,201	9,697
Oral hygienists	1,775	-	2,288	2,425	-	3,216	-	-	2,736	3,569
OMS surgeon	206	192	234	233	393	260	417	294	326	303
Orthodontists	292	268	315	275	506	304	512	343	333	318

Source: KNMT, CIBG, NIVEL

The 2017 effort to update the BIG register for dentists had a clearly noticeable impact on the number of registered dentists. A large number of dentists were struck from the register, largely dentists with a foreign qualification. It would thus be more effective to assess the number of practising dentists and focus on developments within this group. In 2019, the number of practising dentists had increased by only 816 compared with 2010, an annual growth of 1.1%.

A similar comparison could not be made in the case of oral hygienists. There is no legally required register for this professional group, which means that the number of practising oral hygienists can only be estimated. As a result of fluctuations in the percentage of oral hygienists registered as NVM members between 2010 and 2013, the figures for 2019 provide the only reliable source of information.

Compared with 2005, the number of practising OMS surgeons has risen by 58%, or 4.2% on an annual basis. This growth is somewhat slower when compared to the overall group of medical specialties over the same period (+4.9% per year). Orthodontics grew by 18.6% in 14 years, or +1.3% per year. Annual growth is also lower than that of the group of medical specialists.

2.3.2 Average professional practitioner FTE

Not all practising dentists, dental hygienists, OMS surgeons and orthodontists work full-time. Table 8 shows the average FTE by profession. This data was derived from surveys within the relevant professional groups. This is why table 8 features 2007 instead of 2005.

Table 8: Average FTE and total capacity in FTEs per dental profession and specialty.

Profession Year	2007		2010		2013		2016		2019	
	FTE	Total	FTE	Total	FTE	Total	FTE	Total	FTE	Total
Dentist	-	-	0.83	7,371	0.84	7,437	-	-	0.87	8,471
Oral hygienist	-	-	0.71	1,721	0.72	2,315	-	-	0.77	2,739
OMS surgeon	0.88	169	0.88	205	0.83	216	0.83	244	0.87	264
Orthodontist	0.90	241	0.89	245	0.83	249	0.82	281	0.84	267

Source: NIVEL/Prismant

The average FTE for dentists and oral hygienists in 2019 exceeded any previous annual measurement. As a result, the total capacity for oral hygienists and dentists increased more dramatically than one would initially expect on the basis of the figures.

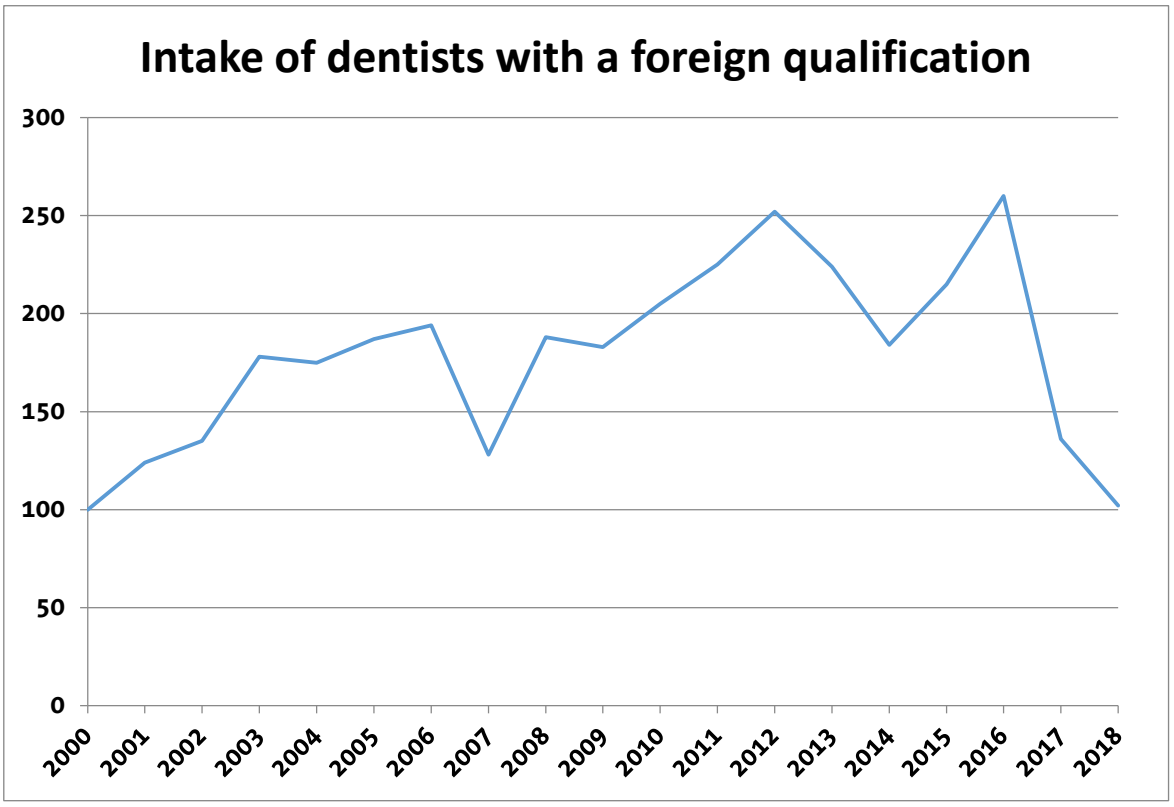
The average FTE for OMS surgeons has returned to its 2010 level after a period of nine years. Both male and female practitioners saw their average FTE increase. The average FTE for orthodontists has barely changed since 2013.

Naturally, movements in the average FTE have a significant impact on the available capacity. For example, the increase in the number of practising orthodontists in the period between 2007 and 2013 is barely sufficient to offset the FTE movements. Available capacity only started increasing gradually from 2016 onwards (+1.0% per year compared with 2010). In the case of OMS surgeons, capacity started noticeably increasing in 2010 (+3.2% per year).

2.3.3 Intake of dentists and dental specialists with a foreign qualification

The intake of dentists, OMS surgeons and orthodontists with a foreign qualification is relatively high. This has been the case for a considerable period of time. The intake of dentists with a foreign qualification is worrying in light of current European guidelines for the intake of foreign doctors. Figure 3 shows the intake of dentists with a foreign dentistry qualification as registered by BIG.

Figure 3: Intake of dentists with a foreign qualification



Source: BIG register

The intake of dentists with a foreign qualification continued to rise in the period between 2006 and 2017. Intake levels dropped significantly in 2017. This trend continued throughout 2018. This decline is attributable to moderate push factors such as the recovering economies in southern Europe on the one hand and moderate pull factors such as the mandatory language test introduced as a part of registration in the Netherlands in 2017. Studies have shown that over half of these registered dentists do not end up working in the Netherlands; the majority of the remaining dentists leave the country within 5 years.

In the past decade, 4 OMS surgeons with a foreign qualification entered the dental specialists register on an annual basis, versus 13 OMS surgeons trained in the Netherlands. Of the intake, 20% currently have a foreign background, the majority of whom are Belgians and Germans. Of the total current OMS surgeon population, 7% were trained abroad. These percentages are relatively high in comparison with other medical specialties.

The percentages are even higher in orthodontics. In the past decade, an average of eight orthodontists with a foreign qualification entered in the orthodontists register annually, versus nine orthodontists trained in the Netherlands, which means that 45% had a foreign background. 22% of the current pool of orthodontists was trained abroad. As in the case of OMS surgeons, over 80% of the orthodontists with a foreign qualification hold the Dutch nationality. This concerns the so-called U-bend construction, whereby Dutch students pursue orthodontics programmes abroad.

2.4 Mental healthcare professions.

The ACMMP has also been providing forecasts for the five BIG-registered mental healthcare professions since 2010 at the request of the Ministry of Health, Welfare and Sport. A considerable amount of quantitative research has been conducted among these professional groups since that time. The ACMMP finalised Sub-report 7 in November 2018. Consequently, the tables in this section always show the period 2010 – 2018.

2.4.1 Number of registered and practising professional practitioners

The fact that one individual can have multiple registrations was taken into account when determining the number of registered and practising professional practitioners. The decisive factor in the count was the registration in the register with the longest cumulative study programme duration. An individual was only included in the basic professions (mental health psychologist or psychotherapist) if they were not additionally registered as a specialist (clinical psychologist or clinical neuropsychologist). Table 9 shows the number of registered and practising BIG-registered professional practitioners in mental healthcare.

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Table 9: Number of registered and practising BIG-registered mental healthcare professionals (excluding dual registrations)

Profession Year	2010		2012		2013		2015		2018	
	Registered	Practising	Registered	Practising	Registered	Practising	Registered	Practising	Registered	Practising
Mental health psychologists	9,051	6,035	10,262	7,500	10,915	8,100	11,981	8,474	11,106	10,649
Psychotherapist	2,781	1,560	3,227	1,950	3,341	2,020	3,528	1,882	2,055	1,913
Clinical psychologists	2,333	1,965	1,969	1,900	1,980	2,008	2,105	1,854	2,145	2,069
Clinical neuropsychologist	75	75	102	90	115	113	134	123	145	139
Mental health NP	0	150	273	240	398	438	667	622	974	954
Total	**14,240**	**9,785**	**15,833**	**11,680**	**16,749**	**12,679**	**18,415**	**12,955**	**16,425**	**15,724**

Source: CIBG

Although the number of registered professional practitioners increased by 15.2% compared with 2010, the number of practising practitioners increased by 60.7%. This is largely due to the BIG register update. In the case of psychiatrists/psychotherapists, the two titles are no longer automatically re-registered. The number of practising mental health psychologists, clinical neuropsychologists and mental health nurse practitioners saw sharp proportional increases, by 76%, 85% and 636% respectively. In terms of absolute capacity, mental health psychologists saw the greatest increase by a wide margin.

2.4.2 Average FTE for BIG-registered mental healthcare professions

Table 10 features data on the average FTE and available capacity for each profession.

Table 10: Average FTE and available capacity since 2010

Profession	2010		2013		2015		2018	
	Average FTE	Capacity	Average FTE	Capacity	Average FTE	Capacity	Average FTE	Capacity
Mental health psychologists	0.77	4,617	0.83	6,755	0.87	7,349	0.84	8,983
Psychotherapist	0.79	1,229	0.81	1,631	0.80	1,512	0.83	1,579
Clinical psychologist	0.80	1,583	0.92	1,445	0.92	1,698	0.92	1,906
Clinical neuro-psychologist	0.77	58	0.91	114	0.95	117	0.85	119
Mental health NP	0.77	116	0.94	412	0.93	581	0.92	877
Total capacity		**7,603**		**10,357**		**11,257**		**13,464**

Source: NIVEL

The mental healthcare professions have clearly experienced a far more pronounced growth than the medical professions. However, the trends do vary depending on the professional group. The total

number of FTEs for practising psychotherapists and clinical psychologists saw far less growth between 2010 and 2018 than the number of FTEs for mental health psychologists and nurse practitioners. This is mainly due to the slower increase in the number of people practising. The total capacity in the five professions surveyed rose by 5,861 FTEs in an eight-year period, or 9.6% per year compared with 2010.

2.5 FZO Professions

From 2014, the ACMMP has been providing forecasts on the required intake for professions that receive training funded by the Hospital Training Programmes Fund (FZO). This originally concerned a total of 15 professions: seven medical support professions and eight specialised nursing professions. Over time, three professions were added to the forecast list at the request of the Ministry of Health, Welfare and Sport. See table 11. In 2014, the first, preliminary forecast was drawn up for these 15 professions based on the data available at that time. The amount of information on these professions had significantly increased by 2016. The third national forecast was prepared in 2018.

The forecasts for the FZO professions are unique to the ACMMP because, in addition to the national forecast, regional forecasts have also been produced for the professional field: twelve forecasts based on the FZO regions, and 25 based on the regional ambulance service (RAV) regions. The forecasts are also made available at individual hospital level. The geographical mobility of these professional practitioners is far more restricted than that of doctors, dental specialists or most BIG-registered professional practitioners in mental healthcare.

Number of practising professional practitioners and FTE

Registration in the BIG register or in a quality register does not apply to the majority of the professions within the FZO group. For this reason, only the number of practising professional practitioners and FTEs are shown in table 11. One national forecast every two years is sufficient for the Ministry of Health, Welfare and Sport. However, the ACMMP also prepares regional forecasts for each region at the request of the professional field. Table 11 shows the number of practising professional practitioners and FTEs from the 2019 forecasts on behalf of the professional field. These figures are thus not included in sub-report 8, which ends with a description of the figures as at January 1th 2018.

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Table 11: FZO professions: number of people practising and number of FTEs plus average FTE

Profession	People practising			FTEs practising			Average FTE		
	2014	2016	2019	2014	2016	2019	2014	2016	2019
Anaesthetics staff	2,674	2,473	2,741	2,245	2,281	2,205	0.84	0.83	0.80
Infection prevention staff	323	351	359	263	262	284	0.81	0.75	0.79
Cast specialists	413	415	429	320	305	330	0.77	0.73	0.77
Clinical perfusionists	125	134	152	115	119	127	0.92	0.89	0.84
Surgical assistants	5,105	5,172	5,117	3,999	4,049	3,981	0.78	0.78	0.78
Radiology lab technicians	4,561	4,686	4,713	3,509	3,669	3,756	0.77	0.78	0.80
Radiotherapy lab technicians	1,229	1,243	1,241	1,040	1,044	1,026	0.85	0.84	0.83
Subtotal support professions	**14,430**	**14,474**	**14,752**	**11,491**	**11,729**	**11,709**	**0.80**	**0.84**	**0.81**
Ambulance nurses			2,246			2,042			0.90
Dialysis nurses	2,573	2,614	2,519	1,903	1,880	1,802	0.74	0.72	0.72
Paediatric intensive-care nurses	422	438	437	341	344	334	0.81	0.78	0.76
Neonatal intensive care nurses	875	945	789	647	688	609	0.74	0.73	0.77
Intensive care nurses	5,738	5,220	4,895	4,418	4,068	3,756	0.77	0.78	0.77
Paediatric oncology nurses			137			104			0.76
Paediatric nurses	4,143	4,020	3,513	2,807	2,732	2,423	0.68	0.68	0.70
Extramural paediatric nurses			374			232			0.62
Obstetric nurses	3,014	3,082	3,067	1,999	2,091	2,140	0.66	0.68	0.70
Oncology nurses	2,303	2,797	3,144	1,682	2,072	2,324	0.73	0.74	0.74
Emergency nurses	2,774	2,810	2,911	2,063	2,051	2,054	0.74	0.73	0.71
Subtotal specialised nurses	**21,482**	**21,926**	**24,032**	**15,860**	**15,926**	**17,820**	**0.73**	**0.73**	**0.74**
Total	**36,372**	**36,400**	**38,784**	**27,351**	**27,655**	**29,529**	**0.75**	**0.76**	**0.76**

Source: NIVEL

As at January 1th 2019, this concerned 29,529 professional practitioner FTEs. However, all growth since 2016 is attributable to the three 'new' FZO professions that have been included in the forecast since 2018. The original 15 FZO professions saw their capacity decline by 504 FTEs compared with 2016. The surgical assistants represent the largest group, and the clinical perfusionists the smallest group. An individual may have taken several FZO training programmes, such as paediatric intensive care nursing as well as paediatric nursing. In this case, only the profession in which the individual is currently working has been included.

Ambulance nurses currently have the highest part-time factor, while extramural paediatric nurses have the lowest. Compared with 2014, the average part-time percentage rose slightly. The medical support professions saw their capacity decrease by 20 FTEs over the past three years, while the capacity for specialised nurses dropped by 484 FTEs. Medical specialists working in hospitals saw their FTEs increase during the same period. Among other consequences, this means the ratio between

surgical assistants/surgeons shifted from 4.50 in 2016 to 4.01 in 2019 (expressed in FTE). This partly explains the warning signals about operating theatre accessibility.

3 Training programme intake: recommendations and actual intake

3.1 Introduction

3.1.1 Recommendations

The ACMMP first began to advise the professional field and the government in the year 2000 on the required intake of medical doctors training to become specialists, in order to strike a balance between supply and demand in the long term (12 to 18 years). With this, the ACMMP only provides guidance on the parameter 'training programme intake'. The ACMPP has no influence on other factors, and only indirectly exercises influence on the annual intake in the various professions in the long term. However, it does carefully examine whether there is any change in other parameters that are linked to the workforce planning of healthcare professionals. This concerns aspects such as the feminisation of professional groups, changes in working hours and/or the average FTE, the retirement age of professional practitioners, intake from abroad, etc. These parameters are assessed for each forecast on the basis of a literature study and the projections of experts.

The ACMMP does not conduct any studies itself, but collaborates with experts to determine which studies are needed to be able to formulate the most reliable recommendations. The studies are conducted by external agencies on the basis of research assignments. This procedure safeguards the independence of ACMMP in formulating recommendations.

Since 2000, the ACMMP has issued comprehensive intake recommendations for the following years: 2000, 2003, 2005, 2008, 2010, 2013 and 2016. In addition, it has issued partial recommendations at the request of parties in the professional field and the government on specific professions, usually in the run-up to a comprehensive Recommendations. These professions include: youth healthcare physicians, infectious disease physicians, sport physicians, the primary oral healthcare professions, mental healthcare professions, community pharmacists and addiction specialists. Lastly, the ACMMP issued interim recommendations on seven occasions in the past 16 years. These recommendations concerned general medical practice (twice), plastic surgery, gastroenterology, the professional intake from abroad, clinical physicists and specialists for the intellectual disabled. An interim recommendation is issued if it becomes apparent from the continuous monitoring of developments in healthcare supply and demand that interim adjustments are required. These recommendations are mostly formulated on the ACMMP's own initiative. No modifications have been made to the method used since the ACMMP was founded. However, the name of the different variants has been changed to scenarios.

3.1.2 Implementation

The implementation of the recommendations has undergone several changes since the establishment of the ACMMP. These relate mainly to the relevant professions. Until 2006, the intake in the medical specialist, specialist in geriatric medicine, physician specialised in people with intellectual disabilities, OMS surgeon and orthodontist training programmes was based on the results of the

budget discussions at organisational level between the educational institutions and the local health insurers. The new Healthcare Insurance Act (Zorgverzekeringswet), which promotes competition among healthcare institutions, was introduced in the Netherlands in 2006. To preclude unfair competition among the educational and other institutions, the training budgets for these professions were transferred from the various health insurers to the Ministry of Health, Welfare and Sport. The intake for training places was therefore no longer controlled locally, but nationally. The ministry initially managed these budgets itself, but later transferred them to the Dutch Healthcare Authority (NZa) with effect from 2013. A separate organisation, BOLS, is responsible for specifying the national intake quota for clinical and dental specialists according to the eight so-called Education and Training Regions (OOR). The various training institutes are responsible for elaborating the national intake quota for GPs, specialists in geriatric medicine and specialists for the intellectual disabled. A separate organisation, SBOH, acts as an employer for medical doctors training to be GPs, specialists in geriatric medicine and physicians for the intellectual disabled.

Parts of social medicine falls outside the scope of the Healthcare Insurance Act. Only the intake in the training programmes that fall directly within the scope of the Public Health Act (Wet publieke gezondheid) are funded through a provisional public healthcare subsidy scheme. This concerns the profile training programmes and the second phase training programmes for youth healthcare physicians, infectious disease physicians, physicians specialised in tuberculosis prevention and control and physicians specialised in environmental medicine. The SBOH is responsible for allocating these training places. The intake in the remaining social medicine training programmes is not funded by the government and is subject to market forces. These are the training programmes for occupational physician, forensic physician, insurance company medical adviser, physician specialised in policy and advice, and physician specialised in health and social care needs assessment and advice. One-off subsidies were made available for the training of forensic physicians in 2019 and 2020. In recent years, the intake in non-funded training programmes has lagged behind the recommended intake (figure 5).

The intake in the initial degree programme in Medicine is regulated by the Ministry of Education, Culture and Science in association with the University Medical Centres (UMCs) and in close consultation with the Ministry of Health, Welfare and Sport. In terms of the intake in the postgraduate medical programmes, the Ministry of Health, Welfare and Sport is dependent on the availability of sufficient medical graduates (MDs).

A wide range of financial resources exists for the intake in the five BIG-registered mental healthcare professions. The training programmes for mental health psychologist, clinical psychologist and psychotherapist are funded by the Ministry of Health, Welfare and Sport, but additional training places are financed through contributions from the individual training programmes, the educational institutions, and by health insurers who fund training places within the primary care practices. Stichting TOP is responsible for the allocation of these training places. Both the Ministry of Education, Culture and Science and the Ministry of Health, Welfare and Sport finance the two- and three-year mental health nurse practitioner and neuropsychologist training programmes.

3.2 Intake into recognised postgraduate programmes: medical professions

An issued recommendation does not immediately lead to a change in the intake. In response to the recommendation, which carries a bandwith, the minister issues a policy intention, which is followed by a decision in principle. This decision in principle is usually taken in the spring of the following year. The financial consequences of the decision are included in the budget for the next following year. This means that, generally, there is a two-year period between the issuing and the implementation of the recommendation. This is taken into account when formulating the recommendation. Table 12 provides an overview of the recommendations issued and the actual intake. The recommendations have generally been moved forward by two - and, in some cases, one - years to clearly illustrate the relationship between the recommendations and the intake. A dash means that no recommendation has been issued until that date, or that there has been no intake.

Table 12: Recommendations and actual intake in recognised postgraduate medical programmes and the clinical technological professions

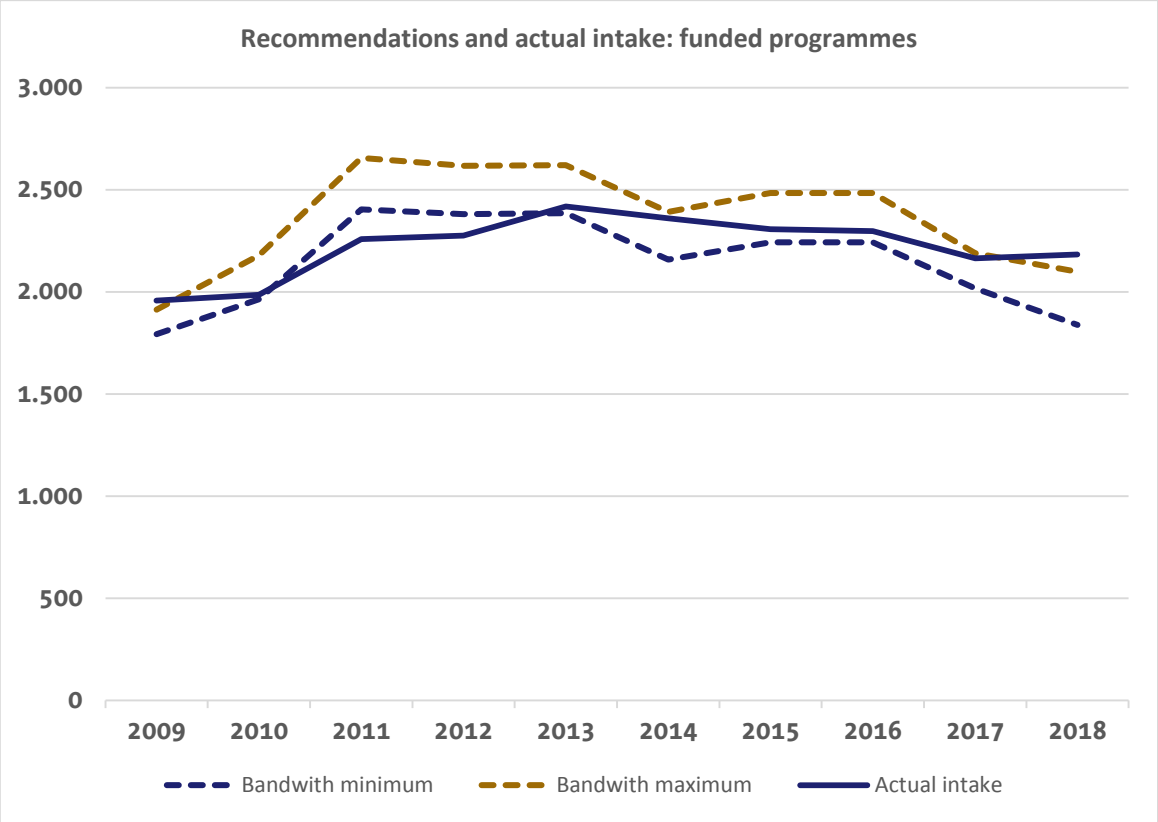
Profession	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Recommendations										
Clinical specialists min.	1,075	1,080	1,337	1,337	1,337	1,129	1,129	1,129	916	916
Clinical specialists max.	1,170	1,271	1,562	1,562	1,562	1,348	1,348	1,348	1,067	1,067
Clin. techn. specialist min.	62	62	56	56	56	62	62	62	49	49
Clin. techn. specialist max.	67	67	63	63	63	69	69	69	55	55
GP min.	540	540	730	720	720	695	695	695	695	555
GP max.	540	540	730	720	720	698	698	698	698	630
Geriatric medicine min.	96	96	96	109	109	109	120	120	120	159
Geriatric medicine max.	112	112	112	109	109	109	128	128	128	186
Specialist int. disabled min.	20	20	20	16	20	20	20	20	20	16
Specialist int. disabled max.	24	24	24	20	24	24	24	24	24	18
Social medicine subsidized	-	165	165	143	143	143	217	217	217	143
Social medicine remainder	125	125	433	433	433	433	362	362	362	220
Minimum total	**1,918**	**2,088**	**2,837**	**2,814**	**2,818**	**2,591**	**2,605**	**2,605**	**2,379**	**2,058**
Maximum total	**2,038**	**2,304**	**3,089**	**3,050**	**3,054**	**2,824**	**2,846**	**2,846**	**2,551**	**2,319**
Actual										
Clinical specialist	1,061	1,153	1,391	1,385	1,485	1,375	1,287	1,246	1,105	1,105
Clinical techn. specialist	85	67	75	62	65	63	65	63*	59	59
GP	594	588	613	638	676	699	720	713	729	722
Geriatric medicine	88	77	88	87	109	118	111	146	135	148
Specialist int. disabled	19	15	14	20	17	18	21	19	17	15
Social medicine funded	110	86	78	84	66	88	103	110	119	134
Social medicine not funded	45	31	37	74	86	58	84	81	129	109
Total	**2,002**	**2,017**	**2,296**	**2,350**	**2,504**	**2,419**	**2,391**	**2,378**	**2,293**	**2,292**

Source: ACMMP/RGS

*** assumption, figure for relevant year is not available**

The actual intake in a recognised postgraduate medical programme depends on a range of factors. Firstly, the Allocation Decree of the Ministry of Health, Welfare and Sport, which converts the ACMMP's bandwidth recommendation into a fixed number of intake places each year. Secondly, actual intake depends on the willingness and funding possibilities of the teaching hospitals/educational institutions in creating professional training placements. Moreover, sufficient trainers should be made available to provide training to new doctors training as specialists. Lastly, the actual intake depends on the preferences of medical graduates with regard to entering the training places at the locations offered. Each of the above factors are monitored by the ACMMP. Since 2016, the training region for trainee general practitioners is the result of an obligatory match between the regions of their preference and the available places in the training regions. Figure 4 illustrates the relationship between the recommended and actual intake in funded training programmes.

Figure 4: ACMMP recommendations and actual intake in funded, postgraduate medical programmes; 2006-2016, recommendations moved forward for 2 years



Actual intake in funded programmes is pursuant to the recommendations. However, the actual intake is not always in line with the recommended bandwidths. The reasons for the discrepancies vary. In some cases, the ACMMP recommends a 'soft landing', in which training institutes and educational institutions are offered additional time to align their intake with the new recommendations.

For comparative purposes, figure 5 shows the recommended and actual intake for the non-funded training programmes. The relevant professions are occupational physician, insurance company medical adviser and the three physician profiles of policy and advice, health and social care needs assessment and advice, and forensic medicine plus the associated specialties.

Figure 5: Non-funded professions: recommended versus actual intake

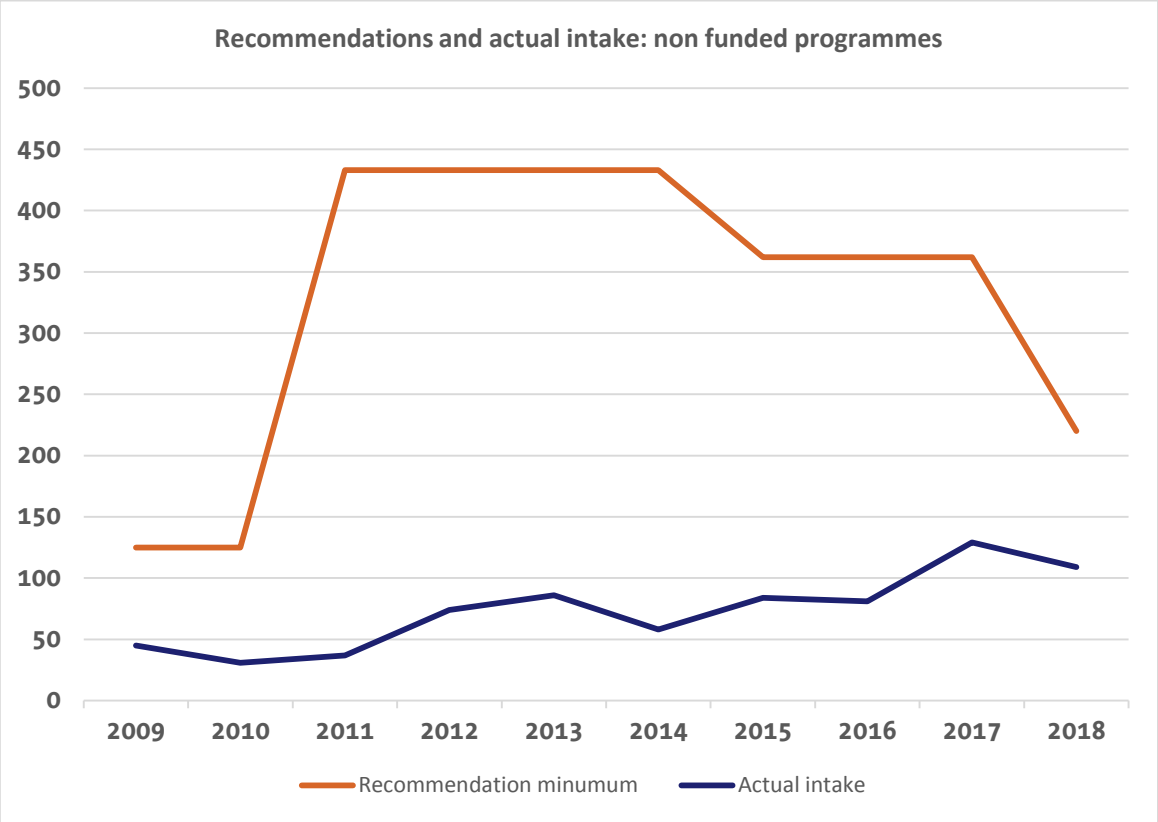


Figure 5 illustrates that these professions are subject to market failure. The intake in these training programmes systematically lags behind the ACMMP's recommendations. Consequently, the lack of labour capacity for these professions is becoming an increasingly substantial problem. In terms of size, the shortages of occupational physicians, insurance company medical advisers and forensic physicians are especially problematic. As figures 4 and 5 illustrate, government funding offers training programmes a certain degree of control over the professions' development.

3.3 Intake in recognised training programmes and postgraduate programmes: dentists, oral hygienists and dental specialists

Table 13 illustrates the relationship between the recommendations and actual intake. Each year since 2006, the Ministry of Education, Culture and Science has funded the intake of 240 dentistry students. In the case of oral hygienists, this figure stands at 300 places. The ACMMP issued three intake recommendations at the request of the Ministry of Ministry of Health, Welfare and Sport in the

period between 2009 and 2013. The Ministry of Education, Culture and Science did not follow these recommendations.

The ACMMP resumed its forecasts for dentists and oral hygienists in 2019. There is currently a relatively large intake of dentists with a foreign qualification. A solution that could be considered is to lower the intake from abroad by increasing the intake in the Dutch training programme.

The ministry, the educational institutions and the trainers has followed the ACMMP's recommendations for the two postgraduate dental programmes since 2006. Intake in the orthodontics programme fluctuates on a cyclical basis. As a result, there is now an appropriate balance between the demand for and the supply of healthcare by these professions. The only aspect that must be addressed for these two training programmes is the comparatively high intake of specialists with a foreign qualification. Here, too, the intake of specialists from abroad could be reduced by increasing the intake in the Dutch training programme.

Table 13: Recommendations and actual intake in initial and postgraduate dental programmes

Profession Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Recommendations										
Dentists			314	314	314	314	287	287	-	-
Oral hygienists			333	333	333	333	309	309	-	-
OMS minimum	15	13	13	14	14	14	5	5	5	13
OMS maximum	15	13	13	16	16	16	15	15	15	14
Orthodontists minimum	9	9	9	7	7	7	5	5	5	8
Orthodontists maximum	9	9	9	9	9	9	13	13	13	9
Actual										
Dentists	246	246	246	244	250	255	260	289	284	281
Oral hygienists	325	305	310	313	318	308	310	299	308	
OMS	13	13	17	17	17	16	14	11	10	13
Orthodontists	13	5	13	5	13	5	12	11	13	6

3.4 Intake in the initial and postgraduate programmes: mental healthcare professions

The intake of BIG-registered mental healthcare practitioners has only been monitored to a sufficiently reliable degree since 2009 for the purpose of inclusion in the Recommendations. Central training programme registers had not existed prior to that. The intake from sources other than the funded intake also played a role. Table 14 shows the data on recommendations and actual intake since 2009. Recommendations for these professions have only been issued since 2011. The first recommendation was merely for indicative purposes.

Table 14: Recommendations and actual intake in the mental healthcare professions

Profession	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Recommendations										
Mental health psychologists					960	960	585	585	723	723
Psychotherapist					160	160	271	271	130	130
Clinical psychologist					230	230	245	245	270	270
Clinical neuropsychologist					8 - 16	8 - 16	20	20	21	21
Mental health NP*					160	160	87	87	160	160
Recommendations total					**1,526**	**1,526**	**1,208**	**1,208**	**1,304**	**1,304**
Actual										
Mental health psychologists	789	760	742	780	768	755	617	716	666	
Psychotherapist	125	83	115	135	107	93	100	113	104	
Clinical psychologist	97	36	91	51	104	109	174	126	132	
Clinical neuropsychologist	0	17	0	13	0	12	0	20	19	
Mental health NP*	59	61	64	77	54	60	69	158	154	
Total actual intake	**1,070**	**957**	**1,012**	**1,056**	**1,033**	**1,029**	**960**	**1,133**	**1,075**	

Sources: CONO, LOGO, Psychologists and Psychotherapists in Healthcare (FGzPt)

*** Only the three-year mental health nurse practitioner training programme**

The first indicative recommendation shows that the intake in the mental health psychologist professions should be increased by 200 places to maintain a long-term balance between supply and demand. Similarly, the intake for clinical psychologists is too low to remain in balance in the long term. The intake in the other programmes likewise is too low to strike a balance between healthcare supply and demand in the long term. The actual intake has shown a status quo since 2009, with no more than a slight drop or rise in actual intake. Regarding the period up until 2011, this is attributable to the fact that intake was largely based on historical data. Other relevant factors include: the ministries' ambitions and financial leeway, the educational institutions' budgetary capacity and the training programmes' own initiatives. The first indicative forecast dating from 2011 highlighted that mainly the intake in the mental health psychologist and clinical psychologist programmes were trailing behind the actual intake. The second forecast dating from 2013 focused more on psychotherapists and clinical psychologists. This recommendation contained more quantitative data, making the bandwidth in the recommendation narrower than that of the 2011 recommendation. The 2015 recommendation offered training programmes the opportunity to increase intake in the mental health psychologist programme and three-year mental health nurse practitioner programme. However, the recommendation also specified a lower intake in the psychotherapist programme.

3.5 Intake in the FZO professions

Table 15 features both the intake data on the FZO professions made available by the Board for Healthcare Training and Education (CZO) and our own recommendations on the desired intake. While the recommendation for 2018 is featured here, this will not affect actual intake until 2019. It should be pointed out that 2018 intake figures for these programmes are not yet available. The intake recommendation for 2018 (1,700 places, not including the new professions) is higher than the

recommendation for 2016, due to the fact that recommended intake levels were not realised in the previous years. However, it is clear that the hospitals responded to the 2016 intake recommendation in 2017 and 2018. While the 2018 intake had increased by almost 1,300 places compared with 2016, it still fell short of the recommended levels.

Table 15: Recommendations and actual intake: annual intake in FZO professions

Profession Recommendation	2014		2016		2018
Ambulance nurses					310
Anaesthetics staff	242		303		492
Infection prevention practitioners	26		34		51
Cast specialists	22		32		76
Clinical perfusionists	10		26		37
Surgical assistants	331		643		1,068
Radiology lab technicians	98		292		505
Radiotherapy lab technicians	36		50		86
Dialysis nurses	141		247		371
Paediatric intensive care nurses	32		36		144
Neonatal intensive care nurses	45		78		175
Intensive care nurses	351		649		796
Paediatric oncology nurses					13
Paediatric nurses	190		328		510
Extramural paediatric nurses					
Obstetric nurses	168		177		369
Oncology nurses	250		309		397
Emergency nurses	230		262		545
Total	**2,172**		**3,949**		**5,945**
Profession Actual intake	**2014**	**2015**	**2016**	**2017**	**2018**
Ambulance nurses	121	120	142	169	1,749
Anaesthetics staff	133	135	178	231	253
Infection prevention practitioners	37	34	27	31	34
Cast specialists	6	6	11	34	39
Clinical perfusionists	0	11	8	8	11
Surgical assistants	177	198	249	313	321
Radiology lab technicians	67	48	70	79	92
Radiotherapy lab technicians	16	15	20	19	13
Dialysis nurses	79	100	94	127	126
Paediatric intensive-care nurses	39	20	36	41	34
Neonatal intensive care nurses	44	49	54	42	48
Intensive care nurses	203	225	246	405	432
Paediatric oncology nurses				41	27
Paediatric nurses	106	161	175	267	313
Extramural paediatric nurses		32	58	21	31
Obstetric nurses	111	131	153	173	199
Oncology nurses	349	409	251	410	425
Emergency nurses	162	204	141	343	399
Total	**1,529**	**1,746**	**1,713**	**2,754**	**2,976**

The hospitals indicated in the 2018 Outline Agreement that they aim to completely follow the recommendations of the ACMMP from 2021 onwards.

3.6 Intake in the initial degree programme in Medicine

Recommendations on the intake in the recognised postgraduate medical specialist programmes are only meaningful if changes in the recommended intake can be implemented within a short period of time. This implies that a pool of medical doctors should be available to absorb fluctuations in the outflow to postgraduate programmes over a longer period. If the recommended intake for the postgraduate training programmes goes up, more medical doctors from the pool should be admitted to the programmes. The pool can only be supplemented after a three- to six-year period, due to changes in the intake of transfer students in the Master's phase or regular intake in the initial degree programme in Medicine. If the recommended intake in the postgraduate programmes is reduced, there will be more medical graduates in the pool and it would be advisable to reduce the intake in the pool. Against this background, the ACMMP also supplements each Recommendation on the intake in postgraduate programmes with a recommendation for the desired intake in the initial degree programme in Medicine.

Adoption of the recommendations on intake in the initial degree programme in Medicine is a complex matter. The Ministry of Education, Culture and Science and the eight UMCs are the principal actors. The ministry determines the number of medical students who are eligible for funding. In the event of any expected quality issues, under the Higher Education and Research Act (WHW), the eight UMCs can establish a capacity quota. Table 16 shows the ACMMP's recommendations since 2006 and the actual intake based on data provided by the Association of Universities in the Netherlands (VSNU). The time frame for implementing these recommendations was set at one year.

Table 16: ACMMP recommendations and actual intake in the initial degree programme in Medicine

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Min.	2,215	2,215	2,215	2,545	2,545	2,850	2,850	2,850	2,400	2,400	2,400	2,200	2,200
Max.	2,540	2,540	2,540	2,700	2,700	3,100	3,100	3,100	2,700	2,700	2,400	2,700	2,700
Actual	2,950	2,876	2,897	2,830	2,832	2,877	2,901	2,942	2,926	2,927	2,918	2,918	2,937

Source: Association of Universities in the Netherlands (VSNU)

As table 16 clearly shows, the ACMMP's recommendations have fluctuated over time to stabilise the level of the training pool. Overall, the intake until 2011 was slightly higher than the recommended intake. As of 2011, recommended intake was increased by 305 to 400 places, to eventually break up any dependency on foreign intake. Actual intake increased in parallel with these changes, ending up somewhere between the recommended minimum and maximum.

There were four reasons for recommending lowering the intake in the initial degree programme in the 2013 Recommendation by some 400 places compared with the 2010 recommendation. First, it became clear in 2013 that the UMCs had managed to raise the success rate for the 6-year Bachelor's-Master's programme from 81% to almost 90%. Second, they were largely filling the additional places with transfer students in the Master's phase, causing the effects to become visible three years earlier. Third, the total internal success rate rose on account of the 95% success rate for the transfer students. Fourth, the intake primarily in the non-funded postgraduate programmes trailed behind the recommended intake, causing the pool of MD's waiting for training to grow. The Ministry of Education, Culture and Science chose not to implement the lower intake recommendation. As predicted, the size of the pool awaiting training has increased as a result. Table 17 shows the results of four

studies on the size of of MD's the pool awaiting training and unemployment among medical doctors.

Table 17: Size of pool of MD's awaiting training and involuntary unemployment among medical doctors

	2009	2012	2016	2019
Size of pool of MD's awaiting training	3,719	4,670	5,102	6,765
Unemployed medical doctors	116	227	431	159
Rate of unemployment among medical doctors	0.64%	1.07%	1.76%	0.67%

Source: Prismant

Table 17 shows that around 3,046 medical doctors have joined the training reservoir over the last 10 years. The size of the reservoir envisaged by the ACMMP is one and half times larger than the recommended annual intake (2019 recommendation: 2,920), or approximately 4,380 medical doctors. The training reservoir currently consists of the intake of two complete year cohorts in the recognised postgraduate programmes. Unemployment among medical doctors remains low. In addition to curative healthcare, medical doctors are also starting to take up positions in the preventative healthcare sector, mental healthcare institutions and intramural institutions. However, intake in the corresponding - less popular - programmes is not increasing proportionally. In other words, medical doctors are taking up positions at these institutions but failing to make use of their training programmes. As a result, the continuity of their care in these institutions is limited.

In terms of numbers, the training pool should have expanded more than illustrated in table 17 over the past few years. This means that there are medical doctors who have withdrawn from the Dutch education system and are pursuing a postgraduate programme abroad. A study has been conducted to determine the scale of this phenomenon. In 2016, around 250 young medical doctors with Dutch nationality left the country to work and/or follow a postgraduate training programme abroad. This number has been gradually rising since 2011.

3.7 Intake in the nurse practitioner and physician assistant training programmes

ACMMP forecasts consider the likelihood that activities may be divided differently between the various professional groups in future. A good example would be dentists, who may 'take on' activities previously conducted by OMS surgeons and orthodontists, but can also 'hand over' activities to oral hygienists, prevention assistants or periodontal prevention assistants and dental assistants. The ACMMP takes these future developments into consideration in its forecasts.

The intake in the nurse practitioner and physician assistant training programmes should be taken into account in forecasting the required intake in the recognised postgraduate medical programmes. The ACMMP provided an indication of the number of nurse practitioners and physician assistants who should gain admission to these training programmes until 2018. The ACMMP will start issuing forecasts for these two professions in 2019, integrating projections on vertical substitution from all other medical specialties to nurse practitioners and physician assistants with the forecasts for both nurse practitioners and physician assistants and the various medical specialties. The ACMMP has

been issuing forecasts on the three-year training programme for mental health nurse practitioners for some time now. See section 3.4. The group of nurse practitioners in mental healthcare (n=1.076) has been included in table 18. Table 18 shows the intake in both training programmes, the number of registered and practising nurse practitioners and physician assistants and the number of FTEs practising.

Table 18: Nurse practitioners and physician assistants: intake in the training programme, number of registered and practising persons and FTEs practising

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Intake of NP	281	346	390	384	458	338	382	407	462	500	552	620
Registered NP			801		1,316				2,783			3,643
Practising NP	517	667	883	1,147	1,442	1,775	2,046	2,384	2,638	2,895	3.194	3,494
NP FTE	**432**	**557**	**737**	**887**	**1,316**	**1,566**	**1,809**	**2,107**	**2,333**	**2,572**	**2,823**	**3,066**
Intake of PA	110	128	132	132	156	118	116	140	184	193	230	271
Registered PA			251		409				724			1,047
Practising PA	78	149	218	271	348	448	547	641	762	858	953	1,058
PA FTE	**73**	**139**	**203**	**251**	**323**	**414**	**505**	**592**	**704**	**775**	**863**	**951**
Total FTEs	**505**	**696**	**940**	**1,138**	**1,438**	**1,980**	**2,314**	**2,699**	**3,037**	**3,347**	**3,686**	**4,027**

Source: HBO raad/Prismant

Table 18 shows that the ACMMP's previous projections on the rapid increase in nurse practitioners and physician assistants have proven to be correct. The ACMMP advised the Ministry of Health, Welfare and Sport and the Ministry of Education, Culture and Science in its 2016 recommendations that the number of training places for the two professions should not exceed the 780 that had been subsidised since 2013. The actual intake in 2019 was 782. This means the professional groups will reach their maximum intake level theoretically in 2019.

The increase in the number of available FTEs can primarily be accounted for by the fact that demand for replenishment in these two professional groups is still low. The intake of new nurse practitioners and physician assistants has largely been added to the number of FTEs practising. Demand for replenishment among nurse practitioners may well grow more significantly over the coming forecast period compared with demand among physician assistants.

The number of practising nurse practitioner FTEs and physician assistants has increased eightfold over a ten-year period. In the past three years, 1,000 nurse practitioner and physician FTEs have been added to the available labour capacity. In the next three years, another 1,000 FTEs net are expected to be added to the available capacity. Given that the majority of these professional practitioners are or will be practising in hospitals, the vertical substitution scenarios are becoming more realistic for the medical specialties.

Capaciteits orgaan

An ongoing focus area is the creation of sufficient training places. Nurse practitioners and physician assistants are working in a growing number of sectors. Although these numbers are currently still low, the ACMMP has managed to include separate forecasts for nurse practitioners working in the specialised medical care, primary care and elderly care sectors. The other sectors have been aggregated in a residual group. Regarding physician assistants, forecasts were prepared for the specialised medical care and primary care sectors as well as a residual group.

4 Future healthcare demand

4.1 Introduction

The current demand for healthcare calculated in professional practitioner FTEs constitutes the starting point for the ACMMP's forecasts. A correction is then applied to account for any unfulfilled demand. The ACMMP then calculates the expected development of this healthcare demand based on the following parameters: demographics, epidemiology and socio-cultural developments. The ACMMP's calculations also factor in policy initiatives by the professional field and government. Experts in the Divisions of the ACMMP establish parameters to this end. These experts all have backgrounds at health insurers, UMCs, other teaching hospitals and professional practitioners. They are usually able to make a point estimate on the basis of the available data, but in a number of situations, if there are too many uncertainties, they will establish a bandwidth or range.

The ACMMP calculates future healthcare demand for a specific professional group and adjusts these calculations to reflect the expected developments in the work process. These include: efficiency gains as a result of organisational changes, developments in the professional field, changes in terms of working hours and horizontal and vertical substitution. Horizontal substitution refers to shifting tasks to another professional practitioner with the same level of training. Vertical substitution refers to shifting tasks to another professional practitioner with a lower level of training.

Lastly, the development of the professional group currently practising and the medical doctors currently in training as specialists is projected against labour capacity over a 12- and 18-year period. This concerns intake and outflow to and from other countries, intake and outflow in and from the profession and changes to the number of FTE hours worked.

Nine different scenarios are then calculated on the basis of the chosen parameters to determine required intake in the programme. These scenarios involve various degrees of policy intensity. For example, the demographic scenario is the least policy intensive, while the scenario involving developments in the area of policy, epidemiology, the professional field, efficiency, changes in terms of working hours and horizontal and vertical substitution is the most policy intensive. Experts from the ACMMP's Divisions establish the two most likely scenarios. The corresponding intake in the training programme that has been calculated is presented as a bandwidth in the ACMMP's recommendation to the professional field and the government.

The ACMMP's forecasting model has been evaluated several times, by various organisations in the Netherlands (Regioplan Policy Research, Netherlands institute for health services research (NIVEL), CPB Netherlands Bureau for Policy Analysis, SEO Amsterdam Economics research agency and Tilburg University). Since 2013, the model has also been evaluated within the European Union and compared with other forecasting models used in the EU. The Dutch model was assessed as one of the best models in the comparative analysis.

Capaciteits orgaan

4.2 Future healthcare demand: medical professions

Table 19 shows the current and future demand for healthcare for each medical specialty based on the two scenarios selected for the year 2034. For a more detailed description, please consult the available sub-reports.

Table 19: Medical specialties: healthcare demand for 2019, minimum and maximum healthcare demand for 2037 in FTE, unfulfilled healthcare demand for 2019 and changes by 2037 in percentages.

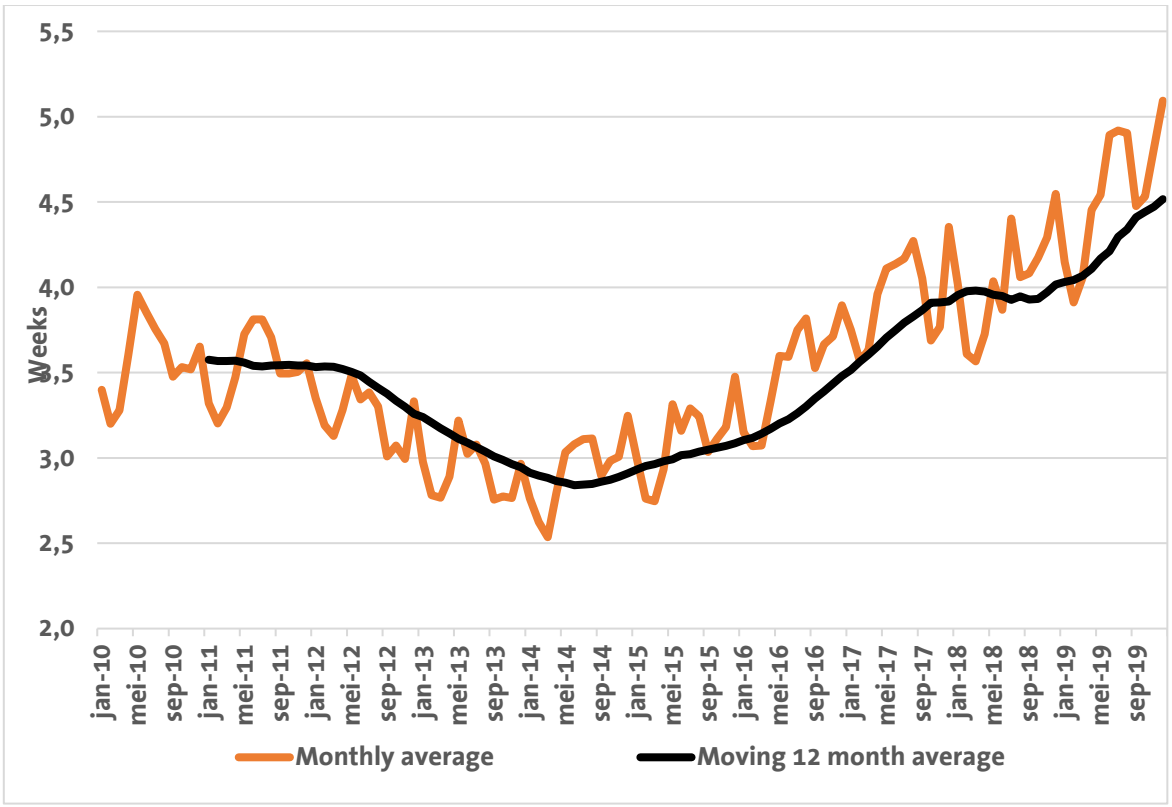
T	Healthcare demand 2019	Unfulfilled healthcare demand in 2019	Minimum healthcare demand in 2037	Changes per year compared with 2019	Maximum healthcare demand in 2037	Changes per year compared with 2019
Anaesthesiology	1,544	0.5	2,000	1.64	2,000	1.64
Cardiology	1,038	0.0	1,400	1.94	1,400	1.94
Cardio-thoracic surgery	132	0.5	160	1.18	160	1.18
Dermatology and venereology	462	0.5	570	1.30	570	1.30
General surgery	1,280	0.0	1,575	1.28	1,575	1.28
Internal medicine	2,038	0.5	2,580	1.48	2,580	1.48
Otorhinolaryngology	460	0.0	505	0.54	505	0.54
Paediatrics	1,227	0.0	1,445	0.99	1,445	0.99
Clinical genetics	134	1.0	185	2.11	185	2.11
Clinical geriatrics	233	5.0	530	7.08	530	7.08
Respiratory medicine	612	1.0	830	1.98	830	1.98
Gastroenterology	494	5.0	775	3.16	775	3.16
Medical microbiology	273	0.5	370	1.97	370	1.97
Neurosurgery	146	0.0	180	1.29	180	1.29
Neurology	875	1.0	1,130	1.62	1,130	1.62
Obstetrics and gynaecology	943	0.5	1,165	1.31	1,165	1.31
Ophthalmology	558	5.0	735	1.76	735	1.76
Orthopaedics	708	0.0	885	1.39	885	1.39
Pathology	386	-0.1	450	0.92	450	0.92
Plastic surgery	273	2.5	400	2.58	400	2.58
Psychiatry	2,913	9.0	3,620	1.35	3,620	1.35
Radiology	1,262	0.5	1,540	1.22	1,540	1.22
Radiotherapy	283	0.0	395	2.20	395	2.20
Rheumatology	264	5.0	380	2.44	380	2.44
Rehabilitation medicine	441	0.5	545	1.31	545	1.31
Sport medicine	118	0.0	150	1.51	150	1.51
Urology	395	0.5	495	1.41	495	1.41
Subtotal clinical specialties	**19,492**	**2.1**	**24,995**	**1.57**	**24,995**	**1.57**
General Medical Practice	9,496	3.0	14,654	3.02	15,590	3.57
Specialist in geriatric medicine	1,454	10.5	2,197	4.26	2,617	4.44
Physicians specialised in people with intellectual disabilities	209	20.0	422	8.49	466	10.25
Occupational health physician	2,217	2.3	2,444	0.85	2,465	0.62
Community medicine physician	490	8.0	1,089	10.19	1,139	7.36
Total/weighted average	**33,358**	**2.9**	**45,801**	**2.43**	**47,272**	**2.60**

Regarding the clinical specialties, the average annual growth in FTEs slowed down compared with 2016: from a minimum of 1.39% to a maximum of 1.78% from 2016 onwards to a 1.57% annual increase. In 2013, annual growth still fluctuated between a minimum of 2.10% and a maximum of

2.61%. Only six clinical specialties achieved an average annual growth in excess of 2%. However, there are significant differences between the various specialties.

Figure 6 shows the average waiting time for the first outpatient clinic visit for all medical specialties combined. It should be noted that a waiting list can have multiple users and fulfil multiple functions, such as informing the patient and referring GP about the waiting time for the outpatient clinic visit, in support of treatment by the specialist, as working stock for the specialist and a selection mechanism/policy instrument for a hospital.

Figure 6: Waiting time in weeks for first outpatient clinic visit, all medical specialties.



Source: Mediquest

The average waiting time for the first outpatient clinic visit has been rising since 2014 and is currently higher than it was at the start of measurements in 2010. This partly explains why unfulfilled demand forecasts for various clinical specialties are now higher in comparison with 2016.

Regarding GPs, growth increased both compared with 2016 (1.38% to 2.09%) and the overall growth of medical specialties. This is also due to the targets set by the general practitioners in their policy plan. The growth among specialists in geriatric medicine and physicians specialising in people with intellectual disabilities is greater than the growth among GPs. In the case of specialists in geriatric medicine, this is mainly due to demographic changes. The higher growth among physicians specialising in people with intellectual disabilities is mainly attributable to the growing demand for extramural care, especially from patients with both intellectual disabilities and behavioural problems.

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By 2037, there will be 1 clinical specialist FTE per 724 citizens. This figure currently stands at 1 clinical specialist FTE per 887 citizens. In 2019, there was 1 GP FTE per 1,819 citizens. By 2037, this will have changed to 1 GP FTE per 1,234 citizens. GP capacity is growing more rapidly than clinical specialist capacity. There are currently 2.05 clinical specialist FTEs per GP FTE, which will have dropped to 1.71 FTEs per GP FTE by 2037.

The social medicine (public and occupational health) sector is more dependent on government policy than the cure and care sectors. The average growth in the main area of Community Medicine is relatively high and reflects the current political agenda for public health and the appropriate shifts in funding arising from the decentralisation of tasks. Capacity in the main area of Occupational Medicine is expected to grow slightly, having still been on a downward trend in 2016.

Regarding the ranking of ascending specialties, the ACMMP expects specialists for the intellectual disabled to experience the greatest relative rise in healthcare demand, followed by community medicine physicians and clinical geriatricians. Table 20 contains the same data as table 19 but now for the three clinical technological professions and for the profile training programmes.

Table 20: clinical technological professions and profiles: healthcare demand for 2019, minimum and maximum healthcare demand for 2037 in FTE, unfulfilled healthcare demand for 2019 and changes by 2037 in percentages.

Clinical technology profession/ profile physician	Healthcare demand in 2019	Unfulfilled healthcare demand in 2019	Minimum healthcare demand in 2037	Changes per year compared with 2019	Maximum healthcare demand in 2037	Changes per year compared with 2019
Clinical chemistry	253	-1.5	285	0.7	285	0.7
Clinical physics	403	1.0	475	1.0	475	1.0
Clinical pharmacy	531	0.5	750	2.3	750	2.3
Physician for policy and advice	44	0.0	46	0.4	46	0.4
Physician for assessment and advice	18	0.0	24	2.8	24	2.8
Physician for infectious diseases	29	2.1	45	4.6	47	5.2
Physician for tuberculosis prevention and control	1	0.0	1	0.0	1	0.0
Donor physicians	98	0.0	141	3.7	148	4.3
Forensic physician	78	1.0	108	3.2	112	3.6
Youth healthcare physician	473	31.4	717	4.3	753	4.9
Physicians for environmental medicine.	4	1.0	7	6.3	8	8.3
Emergency medicine physician	529	12.5	905	3.9	905	3.9
Addiction specialists	153	3.0	188	1.9	195	1.5
Total/weighted average	**2,614**	**8.7**	**3,692**	**2.87**	**3,749**	**3.0**

Social medicine again has the highest unfulfilled demand, notably in the youth healthcare physician profile. This is mainly due to the departure of retiring youth healthcare physicians over the past few years and disappointing intake numbers in the training programme. Although a large number of youth healthcare physicians who are needed to meet the unfulfilled demand are now already in the training programme pipeline, the current outflow continues unabated. Horizontal and/or vertical substitution will only go so far towards addressing the expected shortages.

There is also a high unfulfilled demand for emergency medicine physicians. However, newly registered emergency medicine physicians can be added to current available capacity due to the fact that this group of profile physicians has a relatively low average age. Accordingly, intake levels for the training programme will only be increased slightly. If intake levels were set too high, capacity would become saturated before the emergency medicine physicians leave the profession. This would then lead to the temporary closure of training institutions. Training efforts may have to be intensified nonetheless, due to the possible introduction of a quality standard for emergency departments. Such a development will then be presented to the ministry and professional field in the form of an interim recommendation.

4.3 Future healthcare demand: dentists, oral hygienists and dental specialists

The developments relating to dentists, oral hygienists and dental specialists are shown in table 21.

Table 21: Dentists, oral hygienists and dental specialists: healthcare demand for 2019, minimum and maximum demand for 2037 in FTE, unfulfilled healthcare demand for 2019 and changes by 2037 in percentages.

Profession	Demand in 2019	Unfulfilled demand in 2019	Minimum demand in 2037	Annual change compared with 2019	Maximum demand in 2037	Annual changes compared with 2019
Dentists	8,471	1.0	8,027	-0.29	8,108	-0.24
Oral hygienists	2,739	2.0	4,582	3.74	4,821	4.22
OMS surgeon	264	0.5	296	0.67	316	1.09
Orthodontists	267	1.0	297	0.62	316	1.02
Total/weighted average	**11,741**	**1.2**	**13,202**	**0.04**	**13,561**	**0.06**

Regarding dentists, capacity will decline very gradually over the coming period rather than rise. The most important category of care recipients - people in the 40-60 age group - will not grow significantly. The available capacity of dentists will not change significantly. Regarding oral hygienists, the population groups that make up their healthcare demand - children and in particular the elderly - are set to grow slightly and significantly, respectively, over the coming years.

This Recommendation also forecasts highly limited growth in the case of dental specialists. For orthodontists, intake in the programme has been adjusted for the drop in required capacity as a result of the smaller number of 12-year-olds, and capacity is seeing a cautious increase.

4.4 Future demand for healthcare: mental healthcare professions

Confidence in the effects of vertical substitution within the mental healthcare sectors remains high. Whether the currently observable trends will continue for another decade, however, is questionable. As far as this is concerned, nothing has changed compared to the previous forecast. Table 22 shows the developments in the mental healthcare professions. In view of the fact that this forecast was prepared in 2018, the featured growth percentages are based on a period 1 year earlier.

Table 22: Mental healthcare professions: healthcare demand for 2019, minimum and maximum healthcare demand for 2036 in FTE, unfulfilled healthcare demand for 2019 and changes by 2037 in percentages.

Profession	Demand in 2018	Unfulfilled demand in 2018	Minimum demand in 2036	Annual change	Maximum demand in 2036	Annual change
Mental health psychologist	8,983	9.9%	11,934	2.74	12,332	3.11
Psychotherapist	1,579	4.1%	2,017	2.31	2,018	2.32
Clinical psychologist	1,906	13.4%	2,950	4.56	3,393	6.50
Clinical neuropsychologist	119	19.0%	225	7.42	326	14.50
Mental health NP	877	17.6%	1,304	4.06	2,271	13.25
Total/weighted average	**13,464**	**10.3%**	**18,430**	**3.07**	**20,340**	**4.26**

Unfulfilled healthcare demand grew across the board compared with 2016, pointing to insufficient intake and/or an unexpected increase in healthcare demand. The total increase in healthcare demand is slightly higher than the 2016 projections. The total minimum increase in healthcare demand was 2.28% at that time, and the total maximum increase in healthcare demand was 4.39%. This appears to be more indicative of insufficient intake in the programmes over the previous period.

Demand for healthcare from clinical psychologists increased further from 2.9% (2013) and 8.7% (2016) to 13.4%. This professional group has aged considerably and the intake in the training programme is lagging behind demand. The unfulfilled demand is rising as a result.

Clinical neuropsychologists and mental health nurse practitioners are expected to see the greatest annual adjustments in terms of healthcare demand growth. The demand for healthcare is set to rise by 4% to 15% for these professions. For clinical neuropsychologists, this is due to the trend increasingly seen among neurologists, psychiatrists, geriatricians and rehabilitation physicians to refer patients for further neuropsychological examination. The higher level of vertical substitution is the main cause of the increase in healthcare demand for nurse practitioners.

4.5 Future healthcare demand: FZO Professions

A different approach has been used to forecast the development of healthcare demand for the 15 FZO professions than was used for the preceding groups. The forecast not only has a regional focus, but also uses fewer parameters. The development of healthcare demand is based on demographic developments on the one hand, and the aggregated projections of regional and national experts on the other. One of the underlying reasons for this is the short duration of the training programme, as a result of which the epidemiological and socio-cultural developments can easily be factored into the following forecast. Overall, the experts project that the development of healthcare demand will

be higher than expected on the basis of demographic developments. This is due to the fact that the experts are in a better position to incorporate more changes in the healthcare organisations into their projections than just demographic developments. Table 23 shows that the projected growth in the FZO professions is generally low. Among the group of medical support staff, it is striking that the projected development of healthcare demand for the infectious disease prevention practitioners and the clinical perfusionists has risen comparatively strongly in the maximum scenario. Among the specialised nurses, the same trend is visible for the paediatric intensive-care nurses. Incidentally, these are the same professions for which growing demand was projected in 2016.

Table 23: FZO professions: current healthcare demand, unfulfilled demand (%) and annual increase in healthcare demand in FTE and percentages, respectively

Profession	Healthcare demand (FTE)	Unfulfilled demand	Annual change in demand until 2022 (%)	
	2018	2018	Minimum	Maximum
Anaesthetics staff	2,204	7.0	1.0	2.4
Infection prevention practitioners	282	7.5	0.8	6.0
Cast specialists	324	5.3	0.4	2.8
Clinical perfusionists	132	8.4	1.7	4.7
Surgical assistants	4,036	5.0	1.0	1.8
Radiology lab technicians	4,004	1.7	1.1	1.6
Radiotherapy lab technicians	1,063	0.8	1.6	1.4
Subtotal medical support professions	**12,045**	**4.0**	**1.07**	**1.97**
Ambulance nurses	1,991	5.6	1.5	3.7
Dialysis nurses	1,877	3.7	2.0	1.5
Paediatric intensive-care nurses	307	14.0	0.8	4.5
Neonatal intensive care nurses	676	10.2	1.0	2.3
Intensive care nurses	3,838	7.3	1.1	2.0
Paediatric oncology nurses	176	27.0	0.3	3.1
Paediatric nurses	2,562	5.4	0.1	1.7
Extramural paediatric nurses	58	0.6	-0.1	1.1
Obstetric nurses	2,148	4.4	0.4	0.9
Oncology nurses	2,292	5.9	1.8	4.2
Emergency nurses	2,011	9.1	0.9	1.5
Subtotal specialised nurses	**17,936**	**6.5**	**1.06**	**2.25**
Total/average	**29,981**	**5.5**	**1.06**	**2.13**

While projected growth is limited, unfulfilled demand is extremely high, especially in the case of - mainly specialised - nursing professions. Nurses specialised in care for children and neonates tend to score high on the unfulfilled demand ranking. Intake levels for these programmes will thus be increased to meet the unfulfilled demand as quickly as possible.

4.6 Future healthcare demand: Physician Assistant and Nurse Practitioner

Nurse practitioner and physician assistant are still young professions. However, unfulfilled demand for physician assistants is already at 6.6%. Unfulfilled demand for general healthcare nurse practitioners is lower. The growth of both professions as featured in table 24 is based on aggregate projections on the extent to which vertical substitution can help fill the required capacity to meet healthcare demand. This concerns projections on: medical specialists providing specialist medical care, GP-related care and social medicine. In this sense, the growth in demand for nurse practitioners and physician assistants is conclusively linked to the parameters of vertical substitution for each individual medical specialty.

The sub-reports on nurse practitioners and physician assistants feature separate parameter values on changing healthcare demand for medical specialist care and elderly care. The sub-report on nurse practitioners also reliably defines the parameter for general medical practice. The other sectors have been aggregated in a residual group. This is the first time future capacity for the substitute professions of nurse practitioners and physician assistants has been forecast based on data from the substitute medical specialties. This forecast for NP and PA is broadly supported, due to the fact that the data is also used to calculate capacity forecasts for the medical specialties.

Table 24: PA and general health care NP's: healthcare demand for 2019, demand for 2031 in FTE, unfulfilled demand for 2019 and changes by 2031 in percentages.

Profession	Healthcare demand in 2019	Unfulfilled healthcare demand in 2019	Healthcare demand in 2031		Changes per year compared with 2019	
			Minimum	Maximum	Minimum	Maximum
Physician Assistant	1,058	6.6	2,499	2,895	11.4	14.5
General health care NP	2,121	6.9	4,634	5,868	9.9	14.7
Total/weighted average	**3,179**	**4.1**	**7,133**	**8,763**	**10.4**	**14.6**

5 Recommended intake

5.1 Introduction

The existing supply is described in Chapter 3. The projections on the development of healthcare demand were discussed in Chapter 4. The ACMMP focuses on healthcare demand under the two most likely scenarios. Based on Chapters 3 and 4, plus data on the probability of departure, the ACMMP can calculate the required annual intake in the training programmes corresponding to the two scenarios selected. The probability of departure is based on the age structure and the outflow to and intake from abroad. This chapter presents the results of these calculations for all professions for which the ACMMP issues intake recommendations. **If the ACMMP has a preference for one of the two scenarios, the intake concerned is shown in** bold.

5.2 Medical professions

This section begins with the 2016 intake recommendation for the clinical technological professions and profiles. Table 25 compares the 2016 and 2019 intake recommendations.

Table 25: clinical technological professions and profiles: recommended intake bandwidth for 2013 and 2016

Clinical technology profession/	Bandwidth 2016		Bandwidth 2019	
Profile physician	Minimum	Maximum	Minimum	Maximum
Clinical chemistry	12	**13**	**10**	10
Clinical physics*	15	**17**	**20**	20
Clinical pharmacy	22	**25**	**27**	27
Physician for policy and advice	6	**7**	**15**	15
Physician for assessment and advice	2	**3**	**7**	7
Physician for infectious diseases	11	**16**	**15**	17
Physician for tuberculosis prevention and control	2	**2**	**2**	2
Donor physician			**17**	18
Forensic physician	13	**20**	**41**	43
Youth healthcare physician	80	**102**	**111**	125
Physician for environmental medicine	2	**2**	**3**	3
Emergency medicine physician	28	**31**	**40**	40
Addiction specialist			16	18
Total	**193**	**238**	**319**	**340**

* clinical physics intake recommendation was raised from 15 to 20 on July 24th ,2019

The minimum and maximum amounts of the bandwidth in 2019 are both larger than in 2016. In 2013, the bandwidth ranged from 286 to 346 (not including donor physicians). The bandwidth of the 2019 recommendation is smaller compared with both 2016 and 2013. The ACMMP only recommends significantly higher intake levels (compared with 2016) in the case of physicians specialised in policy and advice, forensic physicians and emergency medicine physicians. In the case of physicians specialised in policy and advice and forensic physicians, this decision is based on the fact that both professions will see high outflow rates over the coming decade, resulting in a high demand for substitution. This does not apply in the case of emergency medicine physicians, where the higher

recommended intake levels are mainly based on current bottlenecks in the field. This intake recommendation does not factor in the potential implementation of a quality standard for emergency wards. The need to issue an interim recommendation will be assessed in due time.

Table 26: Medical specialties: recommended intake bandwidth for 2016 and 2019

Specialty	Bandwidth 2016		Bandwidth 2019	
	Minimum	Maximum	Minimum	Maximum
Anaesthesiology	59	71	79	79
Cardiology	48	57	62	62
Cardio-thoracic surgery	7	8	6	6
Dermatology and venereology	19	22	25	25
General surgery	61	70	67	67
Internal medicine	86	105	116	116
Otorhinolaryngology	16	19	20	20
Paediatrics	55	61	59	59
Clinical genetics	8	9	8	8
Clinical geriatrics	32	35	33	33
Respiratory medicine	29	33	39	39
Gastroenterology	25	31	27	27
Medical microbiology	13	14	18	18
Neurosurgery	5	6	6	6
Neurology	44	51	48	48
Obstetrics and gynaecology	39	46	44	44
Ophthalmology	29	35	35	35
Orthopaedics	34	38	35	35
Pathology	16	17	18	18
Plastic surgery	11	13	14	14
Psychiatry	122	150	176	176
Radiology	50	56	63	63
Radiotherapy	13	15	14	14
Rheumatology	16	18	17	17
Rehabilitation medicine	26	28	31	31
Sport medicine	7	7	7	7
Urology	18	21	23	23
Total clinical specialties	**888**	**1,036**	**1,090**	**1,090**
General Medical Practice*	555	**630**	823	935
Specialist in geriatric medicine	159	**186**	235	**260**
Specialist for the intellectual disabled	16	**18**	48	**57**
Occupational physician	121	**140**	**250**	260
Insurance company medical adviser	48	**57**	**70**	75
Community medicine+ infectious disease prevention	11	**16**	**12**	14
Community medicine+ youth healthcare	30	**40**	**43**	48
Community medicine+ medical environmentology	2	**2**	**2**	2
Community medicine+ tuberculosis prevention and control	2	**2**	**2**	2
Community medicine remainder	18	24	**42**	44
Total	**1,850**	**2,151**	**2,617**	**2,787**

*** The preference recommendation for general medical practice is 879 places**

Table 26 shows the recommendations for the medical specialties. Table 26 shows that the minimum and maximum intake recommendations are higher for the medical specialties than they were in

2016. Regarding the clinical specialties, the ACMMP has chosen a single value for 2019 with no bandwidth. This value was determined on the basis of extensive discussions with the Medical Specialists Division, and is also the preference recommendation for these medical specialties.
The ACMMP has specified preferences for all other medical specialties in this recommendation. This preference lies somewhere in the mid-range (general medical practice) or upper end of the bandwidth spectrum (specialists in geriatric medicine and specialists for the intellectual disabled). Regarding general practitioners, the ACMMP has expressed a preference for phased implementation - the so-called 'soft landing' - of the new recommendation.

Specialists for the intellectual disabled and specialists in geriatric medicine have experienced capacity shortages for six years now, and the shortages are gradually worsening. In order to address this issue, the ACMMP has chosen to recommend an approach in which the shortage is eliminated in 12 years rather than 18. In view of the fact that the adjustment period is 6 years shorter, the intake levels in this recommendation are considerably higher compared with 2013 and 2016. The ACMMP takes the view that more ambitious intake targets are appropriate for both training programmes.

Regarding postgraduate public and occupational health programmes, the ACMMP recommends taking the lower end of the bandwidth spectrum as a starting point. Intake targets for the postgraduate medical specialist programmes will then be almost 200 intake places higher than the actual intake in 2018. Meeting these higher intake targets will require a major effort on the part of the training institutes and educational institutions.

These professions are currently already lacking capacity, especially in the case of insurance company medical advisers. Even if the current recommendations are adopted, the capacity for occupational physicians and insurance company medical advisers will continue to decline over the next three years. Regarding professions in the main area of Community Medicine, the current focus on vertical substitution justifies the minimum bandwidth value. As in the case of occupational physicians and insurance company medical advisers, the lower end of the bandwidth takes vertical substitution into consideration. Currently, there is still a shortage of infectious disease physicians, youth healthcare physicians and forensic physicians in particular. In the case of the infectious disease physicians and youth healthcare physicians, these shortages will be gradually eliminated over the coming period. There is currently still no structural solution in sight in terms of addressing the demand for substitution among forensic physicians. However, an incidental subsidy has been made available for a period of two years to fund 30 intake places.

5.3 Dentists, oral hygienists and dental specialists

Table 27 contains a summary of the recommendations on the basic dental professions and dental specialities. The ACMMP did not issue any recommendations on dentists and oral hygienists in 2016. The total in table 27 thus exclusively concerns dental specialists. Regarding dentists, an annual intake of 240 places in the initial degree programme in dentistry was subsidised in 2019. A total of 320 places were made available for oral hygienists.

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Table 27: Dentists, oral hygienists and dental specialties: recommended intake bandwidth for 2016 and 2019 and preference recommendation (2019 in bold)

Profession	Bandwidth 2016			Bandwidth 2019	
	Mini-mum	Maxi-mum	Prefer-ence	Mini-mum	Maxi-mum
Dentists				308	**320**
Oral hygienists				**330**	370
OMS surgeon	12	14	13	10	**12**
Orthodontists	9	11	9	9	**10**
Dental specialists total	**21**	**25**	**22**	**19**	**22**

The bandwidths for the new recommendations are small. The bandwidth for the new recommendation lies within the bandwidth of the previous recommendation. The ACMMP's preference for the annual intake is one place lower for OMS surgeons than in 2016. The intake for orthodontists is one place higher than in 2016. Although the required capacity for orthodontists will drop slightly over the coming years as a result of a decline in the number of 12-year-olds, this downward trend will have almost ended by the time the first additional orthodontist is registered in the orthodontists' register. Despite the large intake of foreign orthodontists, this figure is partly made up of Dutch nationals who have pursued the training programme abroad due to the limited number of training places in the Netherlands (the so-called U-bend construction).

5.4 Mental healthcare professions.

The intake recommendation for the five mental healthcare professions was already formulated in November 2018. Table 28 shows the intake recommendations for 2016 and 2019.

Table 28: Mental healthcare professions: recommended intake bandwidth for 2016 and 2019

Profession	Bandwidth 2016		Bandwidth 2019	
	Minimum	Maximum	Minimum	Maximum
Mental health psychologists	**524**	610	**723**	787
Psychotherapist	**198**	224	**130**	139
Clinical psychologist	**226**	255	239	**270**
Clinical neuropsychologist	**22**	27	**21**	26
Mental NP (three-year training programme)	48	**86**	**160**	199
Total	**1.018**	**1.202**	**1,273**	**1,421**

Compared with the 2016 recommendation, the ACMMP recommends further increasing intake in the mental health psychologist programme in 2019. The recommended bandwidth for this programme is now somewhat smaller. Most of the other bandwidths are also somewhat smaller, underpinning the growing reliability of the recommendations. However, the report does recommend increasing intake in the clinical psychologist and nurse practitioner programmes and reducing intake in the psychotherapist programme. The latter recommendation was partly prompted by the abolition of automatic re-registration for psychotherapists re-registering for a follow-up registration as a

mental health psychologist or clinical psychologist. The higher intake recommendations for the clinical psychologist and mental health nurse practitioner programmes are the result of insufficient intake in the clinical psychologist programme. Another factor was the aggregation of the two-year and three-year mental health nurse practitioner programmes.

In 2019, a number of extra placements were made available for mental health psychologists, as a result of provisions in the outline agreement. These measures are part of a fast-track effort to eliminate the shortage of mental health psychologists. The ACMMP is currently assessing the need for an interim forecast for the Mental Healthcare Professions. Among other developments, the introduction of new quality standards could prompt such an interim forecast. Akwa GGZ submitted over 30 new guidelines in mid-2019, four of which have potential staffing implications. The generic module for acute psychiatry submitted in 2019 may also have staffing consequences.

5.5 FZO Professions

Table 29: FZO professions: recommended intake bandwidth for 2016 and 2018

Profession	Bandwidth 2016			Bandwidth 2018		
	Minimum	Maximum	Recommendation	Minimum	Maximum	Recommendation
Anaesthetics staff	303	384	303	492	625	492
Infection prevention practitioners	15	34	34	31	70	51
Cast specialists	32	39	32	53	76	76
Clinical perfusionists	21	30	26	31	46	37
Surgical assistants	643	697	643	1,068	1,240	1,068
Radiology lab technicians	202	292	292	468	542	505
Radiotherapy lab technicians	26	50	50	89	82	86
subtotal medical assistants	**1,242**	**1,526**	**1,380**	**2,232**	**2,681**	**2,315**
Ambulance nurses				272	348	310
Dialysis nurses	255	247	247	383	361	371
Paediatric intensive-care nurses	13	59	36	144	192	144
Neonatal intensive care nurses	78	107	78	158	192	175
Intensive care nurses	649	670	649	796	985	796
Paediatric oncology nurses				9	13	13
Paediatric nurses	277	378	328	449	572	510
Extramural paediatric nurses				2	8	
Obstetric nurses	164	189	177	327	411	369
Oncology nurses	190	309	309	397	548	397
Emergency nurses	224	262	262	507	583	545
subtotal specialised nurses	**1,850**	**2,221**	**2,086**	**3,172**	**3,865**	**3,320**
Total	**3,092**	**3,747**	**3,466**	**5,676**	**6,984**	**5,945**

Table 29 features the intake recommendations for medical support professions and specialised nursing professions. Three specialised nursing professions were added over the course of 2018. Preference recommendations were issued for two of these professions. The ACMMP does not have sufficient data on the extramural paediatric nurses to set a preference within the given bandwidth.

The ACMMP's preference recommendations are featured in separate columns, as some of these preferences were between the recommended minimum and recommended maximum. In a clear trend, the recommendations suggest raising the desired annual intake for almost all professions up from 2016 levels. These increases are motivated as follows: failure to achieve intake levels from the previous recommendation and growing healthcare demand.

This recommendation specifies a 62% increase in intake levels at the various programmes compared with 2016. 2016 projections with regard to shortages in the medical support professions and specialised nursing professions have now proven accurate. The ACMMP's projections with regard to the retirement age for professionals and internal yield of the training programmes thus appear to have been correct. The hospitals currently also support the higher intake suggested by the ACMMP, and aim to adopt our recommendations in full starting in 2021.

5.6 Physician Assistant and Nurse Practitioner

This marks the first time an intake forecast has been used to determine intake levels for the nurse practitioner and physician assistant programmes. The recommended values for both professions have been closely aligned with substitution forecasts for the medical specialties. Table 30 shows the bandwidth for nurse practitioner and physician assistant intake recommendations. The preferred annual intake for physician assistants has been set at 250 trainees, the figure closest to current intake levels on the basis of historical data. This is the first recommendation on this professional group. Any major deviations from the current intake level would not seem appropriate on the basis of this recommendation. A similar argument applies in the case of nurse practitioners. Here, too, the value of 429 is close to the average value realised over the past three years.

Table 30: Physician assistant and nurse practitioner: recommended intake bandwidth for 2019 and preference recommendation

	Bandwidth 2019	
Profession	**Minimum**	**Maximum**
Physician assistant	181	**250**
General health care Nurse practitioner	**429**	656
Mental health care Nurse practitioner	**160**	199

Sub-reports 9a and 9b contain a further breakdown for various individual sectors.

6 Recommended intake in the initial degree programme in Medicine

6.1 Introduction

The ACMMP also issues recommendations on the required intake of students in the initial degree programme in Medicine. The purpose of the recommendation is to ensure that sufficient medical doctors are available to be able to achieve the recommended intake in the recognised postgraduate medical training programmes. The difficulty is that the intake recommendations for the initial degree programme in Medicine and the recognised postgraduate medical training programmes (collateral inflow) are issued simultaneously and in both cases are implemented within two years. The intake recommendation for the recognised postgraduate medical training programmes will impact the demand for medical doctors from that moment on, whereas the number of newly available medical doctors can be expected to start changing 3 to 6 years after issue of this recommendation at the earliest. The 'training pool' for medical doctors serves as a buffer between the initial programme and postgraduate programmes. Recommendations on intake in the initial programme help to keep this buffer at the required level. Ideally, the size of this buffer should equal the intake of one- and a half year cohort in the recognised postgraduate medical training programmes. The fluctuations in actual intake at the recognised postgraduate medical training programmes can then be offset by fluctuations in the size of the pool over a period of six to seven years.

Figure 7: 2019 Recommendations: flows of medical doctors

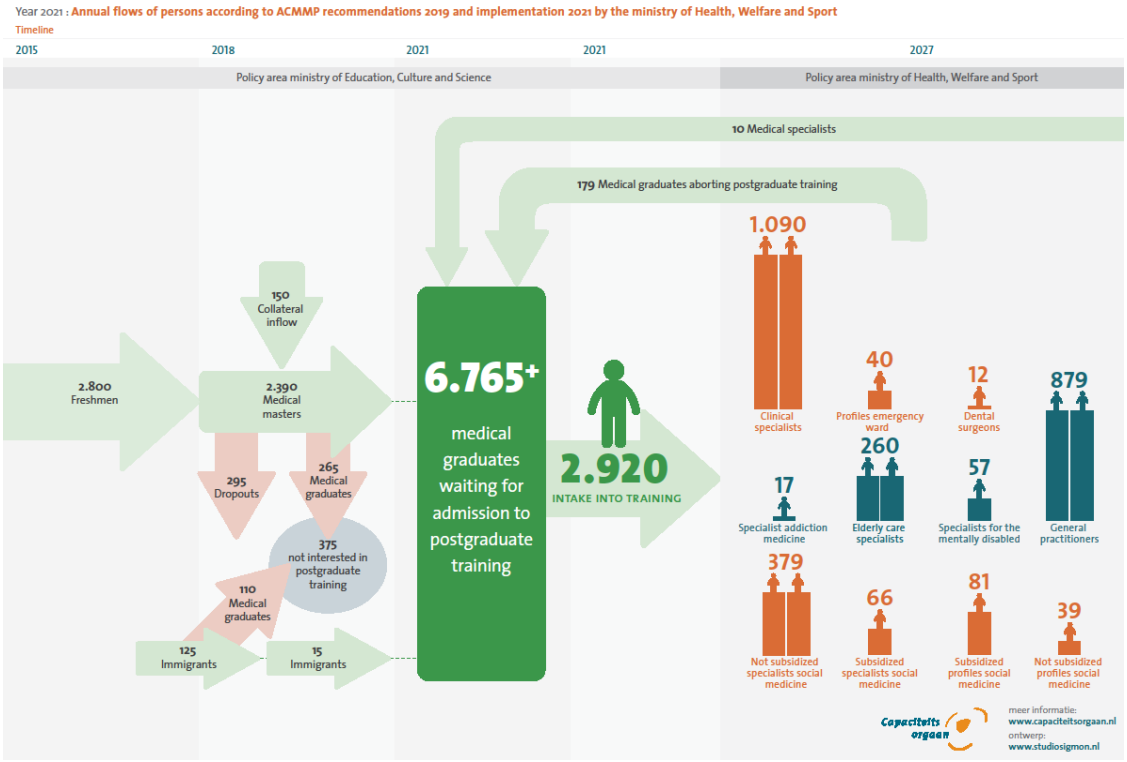

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Figure 7 factors in the time needed to realise desired intake in the initial training programme and outflow into the postgraduate training programmes. The figure thus contains a mix of actual medical student intake levels over the past few years - which partly determine inflow into the pool - and the future intake levels for postgraduate medical training programmes recommended in this report. Some of the data can be found in previous chapters of this report. A cohort of 2,800 medical students entered the Bachelor's in medicine in 2015 (and 2016 through 2019). A number of UMCs allow transfer students to enrol in the Master's in medicine. In practice, the training programme has a duration of between 3 and 4 years. These Master's students are highly motivated. Based on the average, 143 of the 150 transfer students to start in 2017/2018 will obtain their Doctor of Medicine degree in 2021. A total of 295 will students drop out prematurely. 2,655 medical students from this cohort will ultimately complete their Master's in medicine and obtain their Doctor of Medicine degree around the year 2021, subsequently opting to enter the training pool.

In total, this concerns a group of 2,655 medical doctors in 2021, who started their initial programmes in both 2015 and 2017/2018. Of this group, a maximum of 265 medical doctors will not be interested in pursuing a recognised postgraduate training programme in the Netherlands, because they will either be pursuing a non-recognised postgraduate programme, not pursuing any postgraduate programme, or going abroad. Of the group of doctors who successfully complete the Bachelor's and/or Master's in medicine, 2,390 will be interested in pursuing a recognised postgraduate training programme. Furthermore, around 150 medical doctors with a foreign Doctor of Medicine degree register in the BIG register every year. See figure 7. Approximately 15 of these medical doctors will subsequently be interested in pursuing a recognised postgraduate training programme. This brings the total intake of new medical doctors to a total of 2,405.

The training pool is also replenished by intake from the opposite side: a small intake of registered medical specialists who wish to change specialties at some point in their career and pursue another recognised postgraduate programme to this end. This currently concerns a total of around 10 medical specialists per year. The group of medical specialists is the largest group of medical doctors, at a total of 47,205 people. However, this group has difficulty starting a new training programme in practice due to certain bottlenecks. The greatest intake into the training pool for medical doctors is not from medical specialists, but from the current pool of doctors training to become specialists (some 11,000 persons). Some 10% of this group drop out of their recognised postgraduate training programme prematurely. Among this group, in the years ahead around 180 trainee specialists will again embark on another recognised postgraduate medical training programme. This means that the ACMMP's forecasts should take account of a total autonomous inflow of 189 former trainee specialists and medical specialists.

In 2021, a total of 2,390 medical doctors will then enter the training pool along with 189 trainee specialists and medical specialists seeking to change programmes. See figure 7. This represents a total intake of 2,579 medical doctors, while 2,920 medical doctors in training as specialists will be able to start on a training programme in 2021. It appears the size of the training pool will therefore decrease at an annual rate of around 393 trainee specialists over the coming years. However, the pool will continue to grow by around 7,700 medical doctors over the period from 2019 to 2021, so the

number of medical doctors in the pool can continue to decline for a period of 7 years before reaching the ACMMP target of 4,350 places.

However, this does not consider the fact that the field of Social Medicine did not come close to achieving the recommended intake in the non-funded programmes (267 recommended places in 2018, 418 recommended places as of 2021) in 2018 (109 in 2018). Intake in the programmes for general medical practice, physicians specialising in people with intellectual disabilities and specialists in geriatric medicine also failed to reach the recommended levels (885 of the 960 recommended places in 2018, 1,196 recommended places starting in 2021). Actual 2018 intake in the programmes described in this section fell some 619 places short of the recommended levels for 2021. Recommended intake in the postgraduate programmes - designed to ensure a net outflow into the training pool of 480 trainee specialists - will definitely not be achieved in the first few years.

6.2 Recommended intake in the recognised postgraduate medical training programmes

Chapter 5 features the ACMMP's preference recommendation on the required intake in the various recognised postgraduate medical training programmes. Table 31 contains the aggregated intake recommendations. The intake in the training programmes compared with 2016 has been increased for both the minimum level (872 places) and the maximum level (715 places). The recommendations result in a total bandwidth of 2,365 to 3,080 intake places.

Table 31: Bandwidth of intake recommendations for recognised postgraduate medical training programmes; 2016 and 2019

Medical specialty	Bandwidth 2016		Bandwidth 2019	
	Minimum	Maximum	Minimum	Maximum
Medical specialist	888	1,036	1,090	1,090
GP	555	630	823	935
Specialist in geriatric medicine	159	186	235	260
Specialist for the intellectual disabled	16	18	48	57
OMS surgeon	12	14	10	12
Social medicine specialist – eligible for funding	45	60	59	66
Social medicine profiles – eligible for funding	95	132	131	147
Emergency medicine physician	28	31	40	40
Addiction specialists			16	18
Social medicine specialist – ineligible for funding	187	221	362	379
Social medicine profiles – ineligible for funding	21	37	80	94
Total	**2,006**	**2,365**	**2,894**	**3,098**

The market will need to finance the training programmes for public and occupational health physicians that are ineligible for funding, i.e. the training programmes for occupational physician, insurance company medical adviser, community medicine physician without a profile and the physician specialised in policy and advice, physician specialised in health and social care needs assessment and

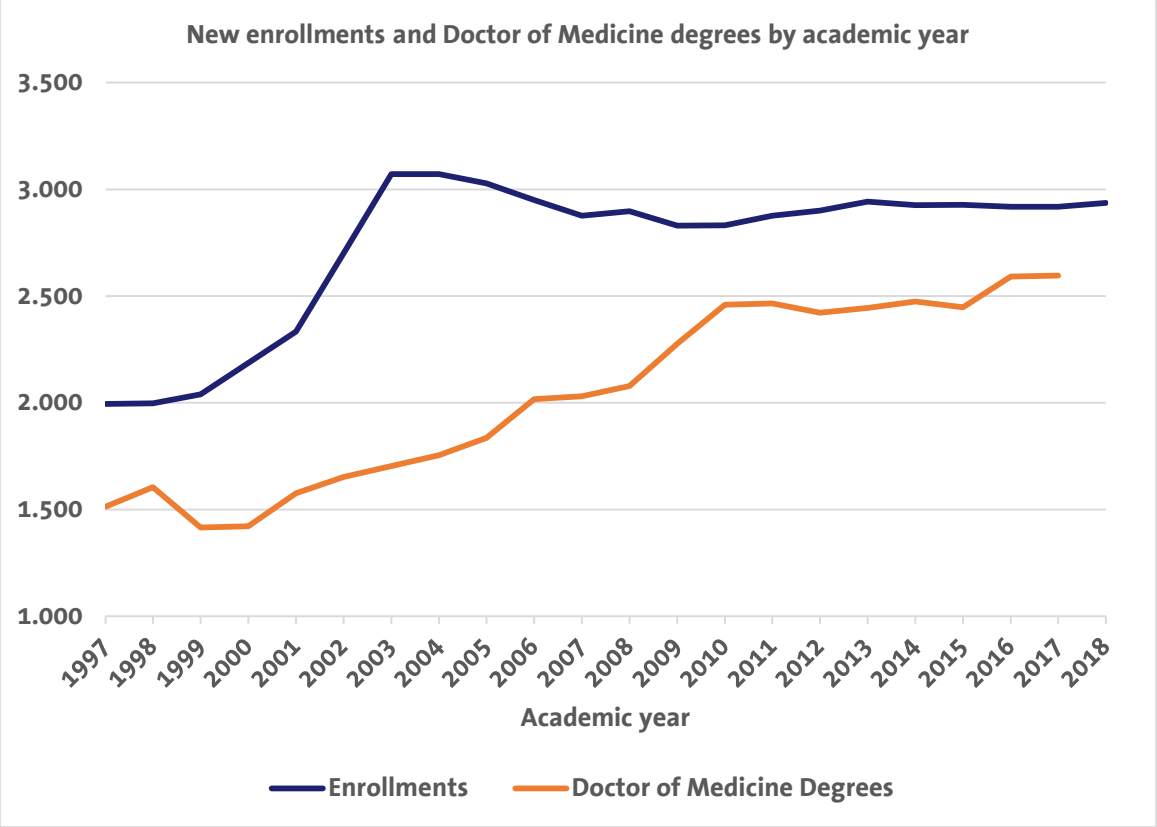
advice, donor physician and forensic physician profile training programmes, plus the associated second-phase community medicine physician programmes. The number of intake places per year is 442 to 473. There is considerable uncertainty about whether these places will be filled. The 2010 Recommendations already pointed out the disruptive potential that social medicine can exert in the non-funded sector on the intake in the training pool and the other postgraduate training programmes. In recent years, the market has failed to fill hundreds of training places, bringing about an extra increase of around 1,600 medical doctors in the training pool. At the same time, the number of registered occupational physicians and insurance company medical advisers is declining.

Of the places that were ineligible for funding in 2019, 109 were filled, mainly due to the increased training efforts undertaken by the Employee Insurance Agency (UWV). If we assume that these 109 places will also be achieved in the next three years, the annual number of intake places required according to the ACMMP **will only be** 2,545 **to** 2,716. This is 351 to 499 more places than were taken into account in 2016. If the market sector were to launch a campaign to increase intake into the occupational physician and insurance company medical adviser programmes and training programmes in the community medicine sector, this additional intake could be sourced from the training pool for a period of more than 10 years. The pool currently contains a total of 6,765 medical doctors, to which several hundred will be added in the period up to 2021.

6.3 The medical student

Figure 8 shows the intake of medical students and the number that obtains their Doctor of Medicine degree. The figure depicts both the number of first-year and transfer students by academic year. The number of enrolments rose from 2,113 to 2,974 per academic year between 2000 and 2003. The number of new enrolments stabilised at approximately 2,950 per year in the following period. This data was provided by the Association of Universities in the Netherlands (VSNU)

Figure 8: Number of new enrolments and Doctor of Medicine degrees by academic year



Source: Association of Universities in the Netherlands (VSNU)

The number of Doctor of Medicine degrees takes 7 years to stabilise at a new level after enrolment changes. The number of Doctor of Medicine degrees has only stabilised from 2011 onwards at around 2,500 a year, whereas the number of new enrolments had already risen to almost 3,000 in 2003. The internal success rate of the Medicine programme seems to be around 90%. Therefore, this percentage will also be used to calculate the recommended intake in the initial degree programme in Medicine (95% for transfer students, 89.7% for intake in the Bachelor's programme). Total intake in the medical doctor training programme remains stable at 2,950 students, including transfer students.

6.4 The medical doctor

Since 2002, the ACMMP has commissioned surveys on the career and career preferences of medical doctors to gauge whether there is sufficient interest in all the available recognised postgraduate training programmes. This report compares the surveys conducted in 2009, 2012, 2016 and 2019.

In April 2019, there were 23,740 medical doctors in the Netherlands under 65 years of age with a residential address in the Netherlands and a Doctor of Medicine degree obtained before 1 January 2019. Of that number, 10,964 (46.2%) were pursuing a recognised postgraduate medical training programme, while 32 (0.1%) were pursuing an unrecognised postgraduate programme. Another

6,049 medical doctors (25.5%) were searching for a training place. If we apply a correction to account for the medical doctors not included from the year 2019, this means a total of 6,765 medical doctors were searching for a training place. Furthermore, there were 6,296 (26.5%) medical doctors under 65 years of age who had no desire to undergo further training. From this group, 2,482 medical doctors never started training programme and 567 left their programme prematurely. Moreover, 1,993 medical doctors had pursued a profile training programme, and 431 medical doctors an unrecognised postgraduate training programme. Finally, a total of 319 medical doctors are no longer working as such. Some of these medical doctors are currently seeking employment (159), while others are no longer working due to early retirement.

The group of medical doctors who chose not to pursue a recognised postgraduate medical training programme cited workloads during the training programme as the main reason for their decision (43%). The second-largest group of respondents cited the fact that their profession does not require further specialisation (35%). Unappealing working hours (28%) and repetitive working patterns (23%) were the 3rd and 4th most frequently mentioned reasons. The reasons not to pursue a recognised postgraduate programme are clearly shifting, with decisions now more likely to be prompted by the programme and profession's lack of appeal. The group was less likely not to pursue further education for personal reasons than previously (down from 27% to 16%).
Table 32 contains a breakdown of the number of medical doctors in 2009, 2013, 2016 and 2019 based on a number of characteristics.

Table 32: Medical doctors, characteristics

Characteristic	2009	2013	2016	2019
Number of medical doctors < 65 years	18,049	21,110	24,482	23,740
In training	8,112	10,234	10,290	11,020
In training pool*	3,719	4,670	5,102	6,675
No interest in a training place	6,593	6,663	8,246	6,296
Unemployed	122	227	431	159
In the process of obtaining a doctorate	1,119	1,258	1,885	1,349

Source: Prismant
*** corrected to account for exclusion of medical doctors in the current year**

The number of medical doctors declined slightly compared with 2016. This is a direct result of the effort to update the BIG register in 2018, when medical doctors who no longer provided individual patient care were struck from the BIG register. The number of physicians pursuing a training programme has increased in both absolute and relative terms. It is evident that the training pool has grown once again. The number of physicians not interested in a training place decreased, probably as a result of the updated register. Fewer medical doctors are conducting doctoral research compared with 2016, although the numbers are still higher than in 2013 and 2009.

The pool of medical doctors seeking to enrol in a recognised postgraduate training programme is expected to keep growing over the coming years. This is partly due to the fact that recommendations

for public and occupational health physicians and specialists in geriatric medicine have not been implemented and are not expected to be met in the coming years. A large number of medical doctors will also continue to enter the training pool over the coming years as a result of high intake in the Medicine programme over recent years. However, outflow to postgraduate programmes is expected to change as of 2021, slowing the training pool's growth.

6.5 First preference of recently graduated medical doctors

The three cohorts of recently graduated medical doctors were asked to state their first preference for postgraduate training. Table 33 shows their preference for the five years surveyed.

Table 33: First preference for postgraduate medical training among recently graduated medical doctors

Postgraduate training programme	2002	2009	2013	2016	2019
Medical specialties	70.0%	75.1%	74.3%	68.2%	63.9%
General Medical Practice	14.7%	14.2%	16.4%	22.6%	23.9%
Specialist in geriatric medicine	3.7%	1.6%	1.7%	2.6%	3.9%
Public and occupational health physician	6.8%	4.6%	4.3%	2.9%	3.7%
Profile physician in emergency medicine	4.7%	4.6%	3.5%	3.6%	3.5%

Source: Prismant

The interest in the general practice training programme has risen according to the latest measurement. This corresponds to the lower interest in the clinical specialties. Interest in the specialist in geriatric medicine programme also grew, and interest in the public and occupational health physician programme increased slightly compared with 2016. However, public and occupational health is still less popular compared with 2002. Among medical doctors training as occupational physicians, insurance company medical advisers or second phase community medicine physicians, it is surprisingly uncommon for this programme to be their first choice (31%). The social medicine profile programmes, however, are regarded as the first choice in 100% of cases.

The preferences for the medical specialties regrettably do not match the number of available training places. Table 34 features a breakdown of the five most popular medical specialties among men and women.

Table 34: The most popular medical specialties chosen by men and women: 2019

	Men	Women	
General Practice	17%	General Practice	27%
Internal medicine	11%	Internal medicine	7%
General surgery	10%	General surgery	7%
Gastroenterology	6%	Paediatrics	7%
Cardiology	5%	Obstetrics and gynaecology	6%

Source: Prismant

General (Medical) Practice is the first postgraduate training programme of choice among both men and women. Internal medicine and general surgery are next on the list, with a pronounced preference among men and neutral rating among women. Men and women's interests subsequently start to diverge as we move lower down the list. Paediatrics and obstetrics/gynaecology rank 4th and 5th among women, respectively. In the case of men, these places on the ranking are taken up by gastroenterology and cardiology. Incidentally, 67.4% of all medical doctors were women on 1 January 2019. 3.9% of the medical doctors had a foreign qualification, while 52% of this group held the Dutch nationality.

6.6 Search period and time interval until commencing the postgraduate training programme

The pool of medical doctors who are interested in a training place is expanding. This may have consequences for the search period for a training place and the time interval between graduating as a medical doctor and the intake in the postgraduate training programme. The search period is the time between starting to search for a training place and the intake in a postgraduate training programme, and is shorter than the time interval, seeing as not every graduated medical doctor starts searching for a training place immediately. Some medical doctors first wish to gain a better understanding of the profession they are interested in by working in the relevant specialty area, but not as a trainee specialist. This also strengthens their starting position in a job interview. Other medical doctors first wish to conduct doctoral research, prompted by the same reason in some cases. Lastly, there also are medical doctors who take time off in between their medical degree programme and the medical specialist training programme.

Consequently, the search period is a more precise instrument than the waiting time for measuring the pressure arising from an expanding pool. The problem is that the search period is a subjective matter, which trainee specialists are asked to specify retrospectively by means of a survey. However, the time interval is objective information available for all medical doctors in training as specialists thanks to RGS data.

An impression of the reported average search period for a training place can be gained from the four career surveys among medical doctors. These figures are based on the group of medical doctors whose search has ended, the trainee specialists. In table 35, the search period is ranked according to the commencement year of the training programme.

The search period in each survey shows a higher search period for the final (incomplete) year than for the preceding years. This is presumably attributable to the fact that not all of the medical doctors from that year have taken part in the survey yet. Medical doctors from previous years (with longer search periods) are over-represented in the group who succeeded in their search. The data does not reflect a clear trend. However, the actual search period at the time of the second survey in 2013 seems to be shorter than in the earlier and later surveys. This may be connected to the increased intake over this period, especially in the clinical specialist programmes.

Table 35: Average search period for a training place in months, broken down by commencement year of post-graduate programme

Commencement year of postgraduate programme	2009	2013	2016	2019	Average*
2003	16.4				
2004	14.4				
2005	17.8				
2006	20.3				
2007	14.1	16.5			15.3
2008	15.9	12.9			14.4
2009	19.4	12.4			12.4
2010		12.6	10.7		11.7
2011		10.8	16.7		13.8
2012		15.1	16.8	18.6	16.8
2013		18.7	15.1	13.3	14.2
2014			18.7	14.9	16.8
2015			14.7	11.9	13.3
2016			18.5	15.0	15.0
2017				13.3	
2018				19.2	
2019				19.0	

Source: Prismant

*** excluding last measured year**

Data on 2017 and 2018 was exclusively gathered during the most recent survey. The average search period for medical doctors is currently 19 months. The longer search periods as of 2018 may partly be related to the decrease in training places as a result of the 2016 Recommendations, which took effect that year.

The time interval is the period in between the final degree examination in Medicine and the intake in a postgraduate programme. The time interval is known for all 38,329 medical doctors who gained admission to a postgraduate training programme since 2000. Figure 9 shows how the time interval has developed between 2000 and 2019. The time interval decreased gradually by seven months between 2000 and 2010 and stabilised in the following three years. The time interval has been increasing again since 2013. Figure 9 clearly shows that the search period covers only part of the time between the final degree examination in Medicine and the intake in a postgraduate programme. For an average period of two years, a medical doctor is additionally occupied with matters other than searching for a training place, such as further exploring their preferred medical specialty or pursuing a doctorate. There is little difference between men and women in terms of the trajectory from final degree examination in Medicine to intake in a postgraduate programme.

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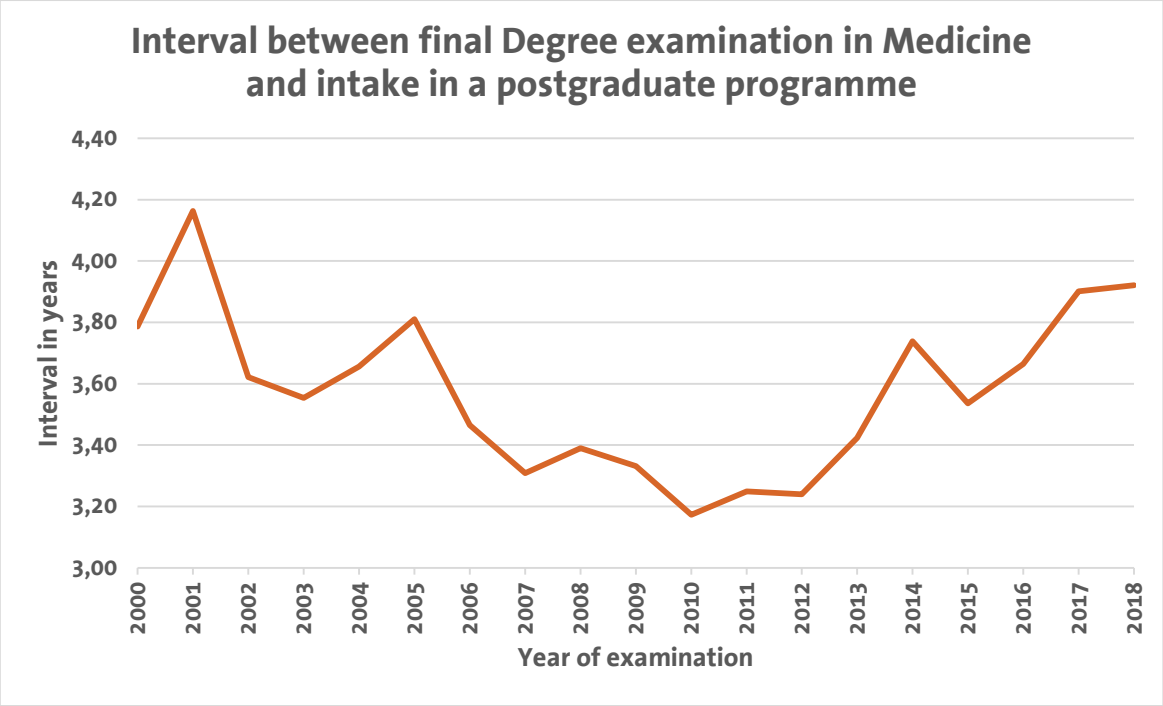
Figure 9: Time interval between the final degree examination in Medicine and the intake in a postgraduate programme (in years)



Source: RGS

This increase in the time interval between final degree examination in Medicine and intake in a postgraduate programme as of 2013 is based on complete data from RGS and supports the observation in the most recent survey of medical doctors, which concluded that the training pool has been growing since 2013.

6.7 Required intake in the initial degree programme

The effects of the recommendation on the required intake in the initial degree programme in Medicine may first be seen in the intake of medical doctors in the training pool from 2022 onwards (through possible restrictions on the number of transfer students). Intake into the training pool is more or less fixed for the period until 2022.

The annual demand for training is not expected to significantly deviate from this recommendation over the next decade. Feminisation is now well underway in all medical professional groups, causing only a marginal decline in the total average part-time factor. The intake of medical students in the first year is stable. The emergence of a number of new physician profiles will at most lead to a shift from unrecognised to recognised training programmes. Vertical substitution has now been implemented across all professions and will only bring about a further reduction in the intake. Changes in terms of working hours have now been incorporated in the two largest clusters of medical specialties.

Recommended intake in the initial degree programme in Medicine has been calculated on the basis of the bandwidths in this recommendation. See table 31. A calculation has also been made of what the intake in the initial degree programmes would be if only 50% of the non-funded programmes were utilised over the coming years. The intake in these programmes is extremely low at present and, despite one-off initiatives, the intake in the years ahead remains highly uncertain. Table 36 shows the results.

Table 36: Required intake in the initial degree programme for 2021-2025

Breakdown of required intake	Bandwidth with 100% intake in all programmes		Bandwidth with 50% intake in programmes ineligible for funding	
	Minimum	Maximum	Minimum	Maximum
Required intake levels as featured in table 31	2,894	3,098	2,460	2,662
Less: 189 incoming trainees/ medical specialists	2,705	2,908	2,271	2,473
Less: 15 medical doctors with a foreign qualification	2,690	2,893	2,256	2,458
Add: interest in postgraduate programme: 90%	2,989	3,214	2,507	2,731
Add: success rate initial degree programme: 90%	**3,321**	**3,571**	**2,785**	**3,035**

Table 36 shows that an intake of 2,800 to 3,570 medical students from 2021 onwards is sufficient to fill the intake in the projected number of training places. Compared with the 2016 recommendation, the minimum recommendation has been increased by 100 places. Incidentally, the maximum recommendation accounts for both the possibility that all training places - both funded and non-funded - may be filled and the possibility that vertical substitution will not continue to gather pace. The minimum recommendation, on the other hand, is based on the assumption that non-funded training places will be partially filled and vertical substitution will continue at the current rate.

With the exception of transfer students, all medicine students have already started on their programmes. As a result, the pool will continue to grow for the coming two years. The ACMMP regards this development as undesirable, as a growing group of medical doctors will now have to wait several years before gaining access to a training place. Based on figures from the past few years, the ACMMP recommends reducing the intake in the initial degree programme in Medicine - including transfer students - to **2,850.** Growth of the training pool will then largely come to a standstill after 2021 if 50% of the training places not eligible for funding are filled. If all training places eligible for funding and the places not eligible for funding are filled as of 2021, the training pool will start shrinking by 382[9] places per year from then onwards.

[9] Based on current assumptions, we will need 3,321 medical students by that year. With a projected intake of 2,850 medical students, this leads to a shortage of 471 students, of which 90% will have completed the Medicine programme and 90% will enter the training pool.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7 Policy focus areas

The key recommendations formulated by the ACMMP are summarised in Chapters 5 and 6. This chapter outlines the future policy focus areas for each forecast, which are then described and elaborated in further detail in the individual sub-reports.

7.1 Clinical specialists

The issue of vertical substitution has been the focus of attention within the field of specialised clinical care since 2008. The recommended minimum bandwidth for the chosen scenario is based on expert projections on the potential of vertical substitution. As of 2016, the maximum bandwidth value is also calculated to factor in a certain degree of vertical substitution: 0.1% per year. Vertical substitution is an equally important factor in both the minimum and maximum bandwidths in this recommendation. The ACMMP now deems it realistic that the phenomenon of vertical substitution will continue to occur in each future scenario.

In 2010, the ACMMP opted for scenarios that no longer took the intake of specialists with a foreign qualification into account. The expectation was that the rising shortages of doctors in the European Union would exert more pressure on foreign doctors to remain their own country. The required intake in the postgraduate medical training programmes rose considerably from 2011 as a result. Monitoring the data on foreign intake has revealed that the intake of medical specialists from abroad has only declined somewhat since that time. This is why the recommendations from 2013 onwards (realisation starting in 2015) apply scenarios on the basis of a somewhat limited foreign intake. In 2011, 2012, 2013 and 2014, the intake in the postgraduate medical training programmes was based on the scenarios excluding foreign intake. Recommended and actual intake in the programmes declined somewhat from 2015 onwards. See table 12.

Factors with a dampening effect on the intake of medical specialists include the rising retirement age, ongoing feminisation and the rejuvenation of available capacity. On the other hand, the ageing population and various socio-cultural factors contributed to rising intake requirements. Changes in the number of hours worked also constitute a key parameter in this forecast. Independent medical specialists are most likely to work fewer hours over the coming years. Future generations of salaried medical specialists are also expected to work less.

Policy measures will only have a limited influence over available capacity. The majority foreign intake is comprised of medical specialists from other EU countries. The retirement age for professional practitioners was recently redefined. However, vertical substitution can be increased or reduced by training more or fewer nurse practitioners and physician assistants, reducing administration burdens and encouraging substitution to primary care. These instruments were barely applied in this forecast. This is mainly due to the fact that medical specialists are barely able to transfer extra patients to GPs, due to the latter's high workloads. This will have to be addressed before the transition to primary care can be effectively improved.

7.2 General practitioners

GPs have seen their workloads increase over the past three years. Monitoring of the number of hours worked by GPs has shown that the average full-time practitioner now works 59 hours a week instead of 57. A similar, albeit somewhat less pronounced increase in the number of hours worked per FTE can also be identified among the other two groups of general practitioners. Non-patient-related hours have increased more dramatically than patient-related hours, in other words: the increased workloads are the result of peripheral activities rather than actual patient care. This can be addressed at a policy level by - for example - further reducing administrative burdens.

In another marked development, the number of GP locums and GPs working under another GP has increased (+1,000), while the number of independent practitioners has dropped by 130. This group of GPs works on an almost entirely part-time basis. Policies aimed at encouraging more own practices would thus probably generate additional capacity. However, young GPs appear to have both financial and practical incentives to work as locums. This could be addressed through various policy measures: incentivising longer working hours, encouraging GPs to start their own practice rather than work as GP locums/GPs working under another GP.

Policy instruments can also be applied to encourage vertical substitution from GPs to somatic healthcare assistants in general practice, mental healthcare assistants in general practice, physician assistants and nurse practitioners. The professional field is currently experiencing a shortage of healthcare assistants in general practice and doctor's assistants. Although substitution by nurse practitioners and physician assistants has been cautiously picking up steam since 2016, the deployment of these professionals tends to lack broad support. Efforts to encourage the training of nurse practitioners and physician assistants in general medical practice could have an impact in this regard. Workloads among GPs will have to be reduced in order to enable further transition to primary care.

7.3 Dentists, oral hygienists and dental specialties

The intake of dentists, OMS surgeons and orthodontists with a foreign qualification is a common theme across the three professions. This intake is high in comparison with the intake of dentists, OMS surgeons and orthodontists in training programmes in the Netherlands. The Dutch government has not developed any policies in this area. The ACMMP takes the view that intake from abroad is only desirable to a certain point. Accordingly, the relevant forecasts only factor in a limited amount of foreign intake.

According to sub-report 3b on dentists and oral hygienists, dentists still carry out a considerable amount of preventive activities that could also be conducted by oral hygienists. Substitution from dentists to oral hygienists can continue unabated over the coming period. The ACMMP does see a need for policies that would clearly define the tasks of prevention assistants and oral hygienists, to accurately calculate the potential for vertical substitution.

Both the OMS surgeons and the orthodontists have a comparatively large foreign intake. Consideration could be given to increasing the intake in the Dutch training programmes to lower the parallel

foreign intake. This could certainly prove effective in the case of orthodontics: 50% of all orthodontists entering the system from abroad hold the Dutch nationality. The situation is somewhat more complex for OMS surgeons. Although they too have a comparatively large foreign intake, few are Dutch nationals. 'Oral surgeons' from Germany in particular can only be deployed to a limited extent.

7.4 Public and occupational health physicians

The training programmes for occupational physician and insurance company medical adviser are funded by employers rather than the government. The intake in these training programmes has been decimated over the past few years, causing a decline in the number of registered occupational physicians and insurance company medical advisers. This downward trend is set to continue in the next four years. Earlier on in the report, it was stated that failure to fill the training places in these non-funded professions has an impact on outflow from the training pool and, by the same token, on the availability of medical doctors for funded programmes. Both types of programmes are drawing from the same pool.

The training programmes for occupational physician and insurance company medical adviser are currently in a vulnerable position. Occupational physicians are struggling with an image problem due to the discussions in recent years on their added value and their independence. The environment in which a young medical doctor enters the occupational healthcare sector is not believed to be challenging.[10] A national committee for the Occupational Care quality is currently examining why the intake level in this speciality continues to be so low. Based on the results of the committee's study, measures may be taken to improve the intake.

The Employee Insurance Agency (UWV) initiated action in 2015 to close the intake gap in insurance medicine. The 2015 intake of medical doctors in training as insurance medicine specialists fell within the bandwidth of recommendations in the 2013 forecast. However, intake in 2016 and 2017 fell short of the recommended bandwidth. As a result, the capacity problems in insurance medicine will not be resolved for the coming four years. Additional policy measures will be needed.

In the main area of Community Medicine, forensic medicine poses a major challenge. The available forensic physicians have continued to age and their numbers continue to drop. As of 2019, the ministries of Health, Welfare and Sport and Justice and Security will provide funds for a period of two years, to train 15 trainee specialists as forensic physicians. While this will not be enough to resolve the expected shortage of forensic physicians, it does represent a step in the right direction.

The other training programmes within the main area of Community Medicine are experiencing less serious intake issues. The funding of four profiles and the associated second phase programmes have proven successful in the public health sector. While intake in these programmes is also falling short, the shortages are not as extreme as those facing the occupational physician and insurance company medical adviser programmes. The capacity shortages are gradually being eliminated. However, the infectious disease prevention sector merits attention. Although the inspection report was

[10] Ape: De instroom van bedrijfsartsen (The intake of occupational physicians); October 2015

cautiously optimistic about the state of infectious disease prevention, the ACMMP has frequently noted capacity shortages in applying the current, highly outdated field standards. Medical environmentology stands out due to the fact that physicians specialised in environmental medicine are unevenly distributed around the country. Youth healthcare is still suffering from a shortage of youth healthcare physicians and - to a lesser extent - community medicine physicians with a youth healthcare profile.

7.5 Specialist in geriatric medicine

Specialists in geriatric medicine launched an image awareness campaign in 2011 to increase the level of interest in the geriatric medicine specialty among recently graduated medical doctors. The educational institutions supported this initiative. The UMCs have gone some ways towards embedding a focus on older patients in their curricula. Greater emphasis has been placed on this specialty area in the professional GP training programme as well. With effect from 2014, medical doctors training to become specialists are also employed by the SBOH, the foundation for general practice professional education. Consequently, trainee GPs and trainee specialists in geriatric medicine now have more contact with each other. The average age of trainee specialists entering the geriatric medicine programme is dropping, and currently stands at 31 years. All of the above factors indicate that the image awareness campaign has proven to be successful.

Despite this image awareness campaign, the available training places have not yet been fully utilised, due to a lack of interest among medical doctors. While there were a total of 189 places available in 2019, 129 trainee specialists entered geriatric medicine programme. Policy measures aimed at increasing intake levels are yet to yield the desired results.

As a result of the extramuralisation of nursing home care, GPs and emergency medicine physicians are being confronted to a greater extent than in the past with requests for assistance from the elderly. What is more, healthcare is becoming more complex. However, GPs barely have the opportunity to consult with specialists in geriatric medicine due to the shortages of these professional practitioners. Specialists in geriatric medicine already lack the intramural capacity to complete all their tasks and set their priorities accordingly. Institutions increasingly recruit medical doctors to ensure sufficient care for their clients through delegated care arrangements.

In the geriatric medicine sector, all of the preconditions for substitution are favourable, except for one, and that is the availability of nurses with a higher professional education background (HBO) who are eligible for the nurse practitioner training programme. Nursing homes have few professionally trained staff at HBO level, which frustrates the development of the professional group of nurse practitioners in chronic care. A total of 421 nurse practitioners currently work in elderly care, an increase of 39% compared to 2016. 32 physician assistants also work in elderly care.

7.6 Physicians for the intellectual disabled

Following the implementation of the Long-Term Care Act (Wet langdurige zorg), people with intellectual disabilities holding an indication for a ZZP VG1 to VG3 in-patient care intensity package are

no longer entitled to accommodation in a healthcare institution. The intramural population is consequently characterised by more complex healthcare issues, as is the case in nursing and care homes.

Policy measures can be taken to ensure that physicians specialising in people with intellectual disabilities are deployed to care for people with intellectual disabilities and intellectually disabled patients living at home. Intake in the training programme could potentially be increased by setting up an additional training institute (or annex thereof) at a second location in the Netherlands. Actual intake has consistently fallen far short of recommended intake levels for the past ten years, with the exception of 2012. Coordinated policy measures in this area therefore seem necessary.

Vertical substitution among physicians specialising in people with intellectual disabilities is stagnating, and has actually been declining. In 2019, 32 nurse practitioner FTEs were active in this sector, down from 34 FTEs in 2016. As with specialists in geriatric medicine, the preconditions for substitution are favourable. However, the number of nurses working in the sector who are willing and able to follow a postgraduate nurse practitioner training programme is insufficient. Measures aimed at steering students in the nurse practitioner programme towards placement in a specific sector deserve further attention in this regard.

7.7 Mental healthcare professions.

The mental health care system reform and outline agreement have had a distinct impact on the labour market for BIG-registered professions in mental health. Demand for mental health psychologists, clinical psychologists and mental health nurse practitioners has risen, while demand for psychotherapists has declined.

The 2015 recommendation has not resulted in an adjustment of the funded intake, causing the deficits identified at that time to increase further. The 2018 recommendation was the first ACMMP recommendation to be adopted by the Ministry of Health, Welfare and Sport. The ACMMP was also consulted during preparation of the Administrative Outline Agreement, resulting in a higher intake of mental health psychologists over a two-year period.

The mental healthcare sector is yet to stabilise. The National Health Care Institute (Zorginstituut Nederland) is currently reviewing various quality standards and a Budget Impact Analysis under review by the Dutch Healthcare Authority (NZa). The ACMMP is monitoring these developments and will issue an interim recommendation in 2020 if necessary.

7.8 FZO Professions

The ACMMP has established that the introduction of the forecasting model for the FZO professions seems to be working effectively. The healthcare institutions' response to the data collection is still at 100%. The results of the forecasts – the future training capacity required – will be discussed locally and regionally. Organisations can now proceed to translate the forecasts into training places, both for their own organisation and at regional FZO level.

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Healthcare demand currently exceeds the available supply in all professions. This is partly due to the fact that some training institutes failed to implement the 2016 intake recommendations. As a result, the minor shortage identified in 2016 has grown significantly. In fact, training efforts up until 2018 were not even significant enough to meet the demand for substitution. Furthermore, healthcare demand has also increased slightly, creating a need for higher intake. The ACMMP is developing policy measures to ensure greater cohesion between the FZO professions and various clinical specialties and profiles.

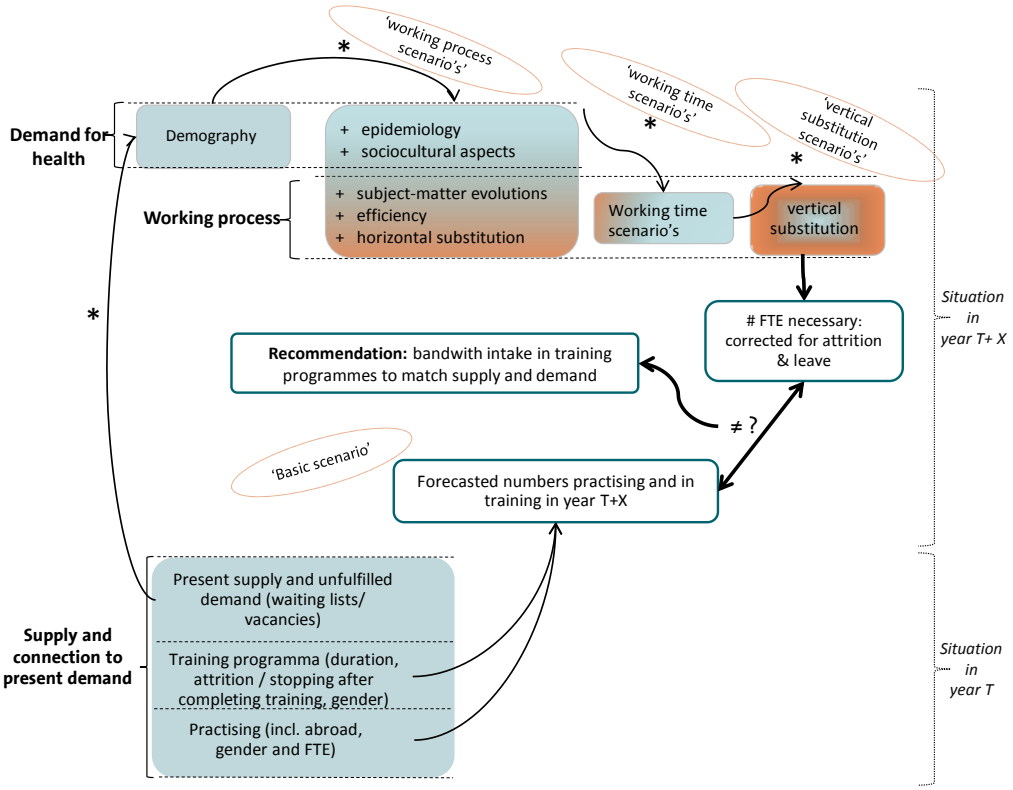
Regarding forecasts for both specialised nurses and nurse practitioners, any projections concerning intake in the various nursing programmes should take the estimated rate of transfer to these professions into account. To this end, the ACMMP liaises with the contracting party charged with estimating the necessary intake in the various nursing programmes by the Ministry of Health, Welfare and Sport.

7.9 Physician Assistant and Nurse Practitioner

The provision of intersectoral training represents the greatest policy challenge for the professions of physician assistants and nurse practitioners. A far greater number of physician assistants and nurse practitioners could currently be deployed to the intramural sector (nursing homes and intellectual disability sector). There is great potential for substitution, partly due to the shortage of medical specialists and rapidly rising demand. However, few nurse practitioners and physician assistants ultimately make the transition from the clinical sector. This may be partly due to the current lack of a retraining programme. The nurse practitioner and physician assistant programmes could be future-proofed more effectively by focusing on intersectoral training. The same applies to general medical practice, where an insufficient number of nurse practitioners and physician assistants are currently in training to meet future healthcare demand. Various financial and logistic bottlenecks will have to be eliminated before this situation can be addressed effectively.

Appendix 1: ACMMP Model

The ACMMP formulates these intake recommendations on the basis of a forecasting model. This model serves to calculate parameter values. These values are determined by experts in the various Divisions. The parameter values reflect current and projected developments relevant to the required training capacity. The graph below is a conceptual representation of the forecasting model.



Appendix 2: Procedure and experts involved

The Governing Board discussed the Divisions' recommendations during its meetings on 9 October and 4 December 2019. This concerned the General Practitioners Division, Dental Specialists Division, Primary Oral Healthcare Division, Public and Occupational Health Physicians Division, Specialists in Geriatric Medicine Division, Physicians for the Intellectual Disabled working group and Nurse Practitioners/Physician Assistants working group.

The Governing Board previously adopted the recommendations issued by the Mental Healthcare Professions Division and FZO Professions Agency on 14 November 2018. The recommendation issued by the Clinical Specialists Division was adopted on 13 March 2019. The remaining recommendations were adopted during the meeting of 4 December 2019.

On 9 October 2019, the composition of the Governing Board was as follows:

Organisations of professional practitioners
Mr L.W.P. van der Beek
Mr J.J.M. Dekker
Mr J.P. Drenth (chair of the Executive Committee and Governing Board)
Mr R.D. Dutrieux
Mr T. Haasdijk
Mr J.M. van Ingen
Ms C. Littooij
Ms C. van Mierlo
Ms A. Rühl

Education and training institutes/educational institutions
Ms D. de Bresser
Ms F. Haak-van der Lely (member of the Executive Committee)
Mr H. Hagoort
Mr N.G.M. Oerlemans
Mr C.H. Polman
Ms L.P. de Rijke
Ms E.A.P.M. Thewessen
Ms T.N. Wijmenga
Mr A. van der Zee
Vacancy

Health insurance organisations (3 votes per seat)
Mr W.J. Adema (member of the Executive Committee)
Mr O. Gerrits
Mr J.W.M.W. Gijzen

Appendix 3: ACMMP Office

The ACMMP Office supports the Divisions and the Governing Board in preparing recommendations for the intake in the initial degree programmes and postgraduate training programmes. The Office prepares all documents for this purpose, formulates and issues research assignments and supervises research. The Office does not conduct any research itself, to safeguard the independence of its staff under all circumstances. On 8 October 2019, the composition of the ACMMP Office staff was as follows:

Name	Position	Focus areas
Ms M. van den Biezenbos	Secretariat	
Ms O. Butterman	Official Programme Secretary	Specialist Medical Care
Ms E.J.C.M. Dankers-de Mari	Official Programme Secretary	Nurse practitioners/Physician assistants
Mr K. Füssenich	Official Programme Secretary	FZO Professions
Mr M.G.M. Heck	Official Programme Secretary	FZO professions, mental healthcare professions
Mr J.J. Janse	Official Programme Secretary	Mental healthcare professions, oral healthcare, physician assistants, nurse practitioners
Mr F. de Roo	Official Programme Secretary	Specialist Medical Care
Mr V.A.J. Slenter	CEO	Public and occupational health physicians
Mr A. Versteegde	Official Programme Secretary	General practitioners
Ms A.E. Zandbergen	Official Programme Secretary	Oral Healthcare
Ms T. Zijlstra	Official Programme Secretary	Specialists in geriatric medicine, Physicians for the intellectual disabled, General practitioners

Appendix 4: Summaries of sub-reports 1, 2, 3a, 3b, 4, 5, 6, 7, 8, 9a, 9b

Sub-report 1: emergency medicine, hospital medicine, clinical technological specialties

Light, slower growth of intake levels

If a balance between the supply and demand of clinical specialists is to be achieved, the training targets in the previous 2016 ACMMP Recommendations will have to be exceeded. This conclusion is based on the preferred scenario formulated by the Clinical Specialists Division, referred to as the 'Working time scenario'. This scenario factors in all policy-intensive parameters, including expected developments in the area of working hours. All experts consulted when preparing the scenario acknowledge that developments in terms of working hours will make it difficult to accurately estimate the number of required medical specialists over the coming forecast period. The number of hours worked by medical specialists is set to change significantly. More medical specialists will have to be trained to prepare the labour market for these changes.

Determining factors underlying this recommendation

The supply of clinical specialists has grown. Maintaining this supply will require higher intake into the training programmes. On the other hand, declining outflow from the profession makes it more difficult to ensure the required programme intake. Outflow will decrease in the coming years as a result of the rising retirement age. However, the group of clinical specialists is also rejuvenating as a result of growing intake from the programmes. As a result, outflow will decrease significantly compared with the previous Recommendations, especially in the case of women.

Healthcare demand continues to rise as a result of the ageing population: demand will increase by 10% over the coming 10 years. Socio-cultural factors, such as the growing empowerment of patients and *shared decision making,* are also contributing to an increase in healthcare demand. These socio-cultural factors will trigger an average growth of 7% over a 10-year period. Projected professional and technical developments, such as bespoke therapy, will also lead to further growth: 3.5% over a 10-year period. These developments are still on the rise, albeit at a slightly lower rate than previous forecasts had assumed.

While the ACMMP does see potential for further efficiency gains in terms of work processes, the yields will be less pronounced than had been assumed in previous forecasts. For example, the ACMMP still expects to see administrative burdens decline. However, the resulting efficiency gains will be lower than previously forecast. Both the vertical and horizontal reallocation of tasks have remained virtually unchanged from the previous forecast. According to experts, the potential for horizontal substitution to primary care is especially limited as a result of high workloads and growing healthcare demand within the primary care sector. Vertical substitution is at a negative value: this means tasks are being reassigned from medical specialists to less highly trained staff. 'Working hour developments' also represent an important factor in the rising demand for clinical specialists. The

specified values are significantly higher in comparison with the previous Recommendations. More clinical specialists will have to be trained to prepare the labour market for these changing working hours.

In practice, the growth of specialist clinical care as a result of all aforementioned developments may be somewhat restricted by political and financial limitations. This has been factored into the parameter values. The nationwide labour market for medical specialists also seems to be less tight in a general sense. For example, the declining vacancy rate may point to smaller staffing budgets. It may also mean we are moving towards a more balanced labour market. Furthermore, the outflow of medical specialists to other countries increased over the 2011-2016 period. Influx in the specialist registers will be especially substantial over the coming two years, due to high programme intake in the 2012-2015 period. The ACMMP will closely monitor all these developments over the coming years.

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Table 37: Recommendation on number of trainee specialists to be trained annually, for each specialty and scenario

Specialty/profile	Demographic scenario	Work process scenario	Working hours scenario (preferred scenario)
Anaesthesiology	52	77	**79**
Cardiology	49	63	**62**
Cardio-thoracic surgery	6	7	**6**
Dermatology and venereology	19	27	**25**
General surgery	47	69	**67**
Internal medicine	86	133	**116**
Otorhinolaryngology	21	22	**20**
Paediatrics	45	64	**59**
Clinical chemistry	10	11	**10**
Clinical physics*	14	18	**20**
Clinical genetics	4	10	**8**
Clinical geriatrics	16	34	**33**
Respiratory medicine	23	38	**39**
Gastroenterology	3	28	**27**
Medical microbiology	11	17	**18**
Neurosurgery	4	6	**6**
Neurology	32	56	**48**
Obstetrics and gynaecology	20	43	**44**
Ophthalmology	33	40	**35**
Orthopaedics	20	36	**35**
Pathology	17	20	**18**
Plastic surgery	2	13	**14**
Psychiatry	135	197	**176**
Radiology	52	68	**63**
Radiotherapy	8	15	**14**
Rheumatology	6	18	**17**
Rehabilitation medicine	21	31	**31**
Emergency medicine	20	39	**40**
Sport medicine	4	7	**7**
Urology	22	24	**23**
Hospital pharmacy	14	26	**27**
Hospital medicine			
Total	**816**	**1,257**	**1,182**

*:intermediate recommendation July 2019

Sub-report 2: General Medical Practice

High intake recommendation

This intake recommendation for the general practitioner programme is considerably higher and broader than the previous recommendation in 2016. The higher required intake is substantiated in chapters 4, 5 and 6 of the sub-report. Forecasts from 2013 onwards were based on the assumption that there was no substantial unfulfilled demand. This parameter has since proven to be volatile, justifying inclusion in this forecast. Compared with previous forecasts, outflow from the profession was calculated using a greater number of sources, which were also more accurate. As it turns out, this outflow was higher than had been calculated with the old method.
The factor of changing working hours has also significantly contributed to the rising demand for GPs. Thanks to innovative research methods, the ACMMP currently has access to reliable data on the activities of GPs. This data shows that GPs are currently working more hours per FTE than was the case five years ago. GPs' working hours did not appear to be changing in previous years, causing the parameter to be set at 0. However, this factor does play a significant role in the current forecast. The effects of developments in the professional field and efficiency developments can now also be gauged more accurately. This information was gained from new studies into and insight from policy-related, professional and social developments. Various developments in the area of horizontal and vertical substitution have also created a greater demand for GP capacity. All in all, pressure on GPs and demand for GP care has clearly increased over the past years to an extent that the 2016 forecast failed to predict. This is reflected in the adjusted parameter values and a significantly higher intake recommendation compared with previous Recommendations. See table 38.

General practitioners collaborate frequently

Social, political and professional developments have had a major impact on general medical practice over the past few years. GP practices' patient populations are ageing, more eager to manage their own care, living at home longer, and coping with increasingly complex care issues and a higher degree of vulnerability. GPs are taking on a growing task load as part of efforts to optimise care and manage costs. GPs play a central role in their capacity as care managers, providing suitable care 'in the right place' (e.g. close to patients) to prevent the unnecessary use of secondary care. GPs strive to prevent health problems through various prevention programmes. A growing number of GPs are operating in cooperatives and seeking to work in and run their practice together with other colleagues. As a result, coordination and joint decision making with patients, other professionals within general medical practice, care providers in other sectors and municipal and national government agencies are becoming increasingly important, intensive, and time-consuming.

Programme intake is growing

Effective from 2015, the Ministry of Health, Welfare and Sport set the permitted annual intake in general medical practice programmes at 750, a figure in excess of the ACMMP recommendation. Despite sufficient interest in the programme, these training places were not fully utilised in the period leading up to 2019, due to a lack of trainers and lecturers. However, intake has been rising over the past few years following adjustments to the selection and placement procedure. These adjustments

included replacing decentralised application for training places with a centralised selection procedure, including a lottery. Intake had been stagnant at around 720 trainee specialists since 2015, and has since increased to a total of 750 in 2019. The resulting effects - in the form of a growing number of general practitioners - will not be visible until the next forecast.
On average, trainee specialists start their training programme at the age of 29. The average age of all medical doctors training for general medical practice has been close to 31 for the past few years. The number of female trainee specialists has declined slightly, from 77.5% in 2016 to 74.6% in 2019.

Working hour developments are leading to greater capacity demand

On 1 January 2019, the total number of registered GPs stood at 13,710. Of this total, around 12,766 (over 93%) worked an average of 0.74 FTE (approximately 45 hours a week). This figure is 0.01 FTE higher compared with 2016. Men worked slightly fewer hours, while women worked slightly more compared with 2016. The portion of working female GPs continues to rise and is now close to 58%. This increase is due to the influx of largely female GPs from the training programme and disproportionally male outflow.
Over half of all registered GPs (57%) are female. Most female GPs are between the ages of 30 and 50, of which a majority fall within the 30-35 age group. 61% of male GPs are 50 or older, as opposed to 27% of female GPs. One-third to just under half of male GPs will leave the profession in the coming 10 to 15 years as a result of retirement. In the case of women, the figure is somewhere between just over one-tenth and a quarter of all female GPs. In view of the fact that men work an average of almost five hours more than their female counterparts, the total supply of general practitioner FTEs - assuming intake remains stable - will decline in the coming years. New GPs also tend to want to work less FTE. As a result, the supply of GPs must be compensated by training a larger portion of junior doctors and medical doctors as GPs.

More time for patients

GPs are also experiencing growing work pressure and workloads. The most recent administrative agreement on general medical practice (2019-2022) contains agreements aimed at ensuring that GPs have more time for their patients. GPs will need more time to ensure that they are able to continue providing effective care, including vulnerable patient groups and patients living in deprived conditions. The various professional bodies have been calling for some time to reduce the number of patients in a benchmark practice to around 1800. Various initiatives have been launched in collaboration with health insurers in an effort to reorganise general medical practice. The aim is to reduce workloads and ensure that GPs have more time for patient care. According to a recent follow-up study on general practitioners' time management and taskloads, GPs have been working more hours per FTE over the last few years. One FTE now represents almost 60 weekly working hours. These additional hours are mainly spent on non-patient-related tasks. GPs are struggling with a growing administrative burden, hampering their efficiency. So far, programmes such as the '(De)regulate Healthcare Action Plan' have failed to adequately reduce the regulatory burden.
Despite initiatives aimed at creating more time for patients and reducing workloads, GP capacity will have to be increased over the coming years to ensure the continued quality and quantity of care.

Vertical substitution is stagnating

A large number of GP practices employ healthcare assistants. The previous capacity forecast (2016) outlined that GPs could make gains by transferring tasks to these professional groups. However, there is now a shortage of both doctor's assistants and somatic healthcare assistants in general practice.

Furthermore, the healthcare sector generally regards the deployment of related disciplines such as nurse practitioners and physician assistants as a potential solution to GP workloads and work pressure. The same applies to general medical practice. The number of nurse practitioners and physician assistants working in general medical practice has increased since 2016. Nevertheless, there are some issues hampering the training and employment of nurse practitioners and physician assistants in general medical practice. Furthermore, GPs do not always support the notion of deploying these healthcare professionals in general medical practice.

It would appear that the development of vertical substitution in GP practice is mainly hampered by shortages in the support professions.

Choice of scenarios and bandwidths

The demand for newly trained GPs is far greater than current training volumes in all scenarios. The aforementioned developments and most probable scenarios under consideration also result in an intake recommendation with broad bandwidths. The scenarios of choice differ from those applied in the previous Recommendations. The 2016 Plan opted for the two vertical substitution scenarios (based around temporary and ongoing trends). This new capacity forecast applies the vertical substitution scenario on the basis of temporary trends as its lower threshold. This scenario accounts for the effects of task reallocation. However, the working hour development scenario on the basis of temporary trends is now applied as the upper threshold. This scenario does not account for vertical substitution. Forecasts on required capacity will vary greatly, depending on whether or not tasks are reallocated to other related disciplines. Programme intake will have to grow in order to bridge the gap between supply and demand over time and prevent future GP shortages. To this end, both scenarios apply 2037 as the second year of equilibrium.

Recommendation

Based on the above developments, the ACMMP's recommendation to the government and the professional field is **an annual minimum intake of 822 trainee specialists and an annual maximum intake of 935 trainee specialists** as of 2021. In view of all the aforementioned developments, the ACMMP recommends a preferred annual intake of **879 trainee specialists**.

Table 38: Recommendations and decisions from 2013 onwards

Year in which forecast and recommendation was issued	2013	2015*	2016	2019
ACMMP recommendation bandwidth	698-720	664-698	555-630	822-935
ACMMP's preference recommendation	**698**	N/A	**630**	**879**
Decision by Ministry of Health, Welfare and Sport on basis of recommendation	750	750	750	t.b.d.

*** interim recommendation**

Capaciteitsorgaan

Sub-report 3a: OMS surgeons and orthodontists

The percentage of women in the various training programmes is growing

The number of orthodontists trained over the past few years is in line with the ACMMP recommendation, while the number of newly trained OMS surgeons slightly exceeds the recommended level. Average annual intake over the last four years totalled 9 in the case of orthodontists and 12 in the case of OMS surgeons. On average, women comprised 43% of the intake into the OMS surgeon training programme over the 2013-2018 period. This figure stood at 56% in the case of the orthodontics programme. The internal success rate of both programmes remains high, at 93% and 99%, respectively.

Longer labour market availability

The supply of OMS surgeons and orthodontists in the Netherlands can be described as follows: On 1 January 2019, 303 OMS surgeons and 318 orthodontists were working in the Netherlands. FTEs for both professions have increased slightly to 0.87 and 0.84 FTE, respectively. 17% of all practising OMS surgeons are women, compared with 43% of all orthodontists; the percentage of women in all age categories under 50 is increasing for both professions. The outflow of practising specialists has declined considerably. In addition to the rising retirement age, this is also attributable to an increase in the number of young specialists. Both developments are extending labour market availability, causing an increase in available supply. Intake from abroad has decreased, especially in the case of orthodontists.

Greater demand for implantology and adult orthodontics

Demand for specialist dental care is mainly driven by socio-cultural developments. Growing disposable income, especially among more elderly citizens, is causing a rise in the amount of implantological procedures carried out by OMS surgeons. A growing number of adults are getting braces, as the phenomenon gains more social acceptance. This development is creating more work for orthodontists. Furthermore, both specialties tend to cater to a young patient population. According to demographic prognoses, the under-40 population group is not expected to grow over the coming decades. Demographic healthcare demand for OMS surgery is set to rise by an additional 2.2% in the coming 10 years, a figure lower than the previous forecast. Demand for orthodontic care is expected to decline by over 5% in the coming 10 years, and will subsequently rise again. There is still some unfulfilled demand for both specialties. Overall healthcare demand for both specialties is on the rise.

More technological possibilities and a more balanced distribution of working hours

Demand for OMS surgeons and orthodontists is set to rise over the coming forecast period, partly as a result of developments in the work process. Professional and technological capabilities will increase by 2% and 1%, respectively. Various developments are also affecting these specialists' efficiency for better and worse. These developments appear to be balancing each other out, resulting in a zero-sum outcome. Developments in terms of task substitution are expected to be minimal, with the exception of substitution from dentists to orthodontists. This will lead to minor increase in the demand for orthodontists.

Changing working hours represent an important development in the area of work processes. Part-time work is set to increase as the focus shifts to ensuring a good work-life balance. The deployment of specialists in both specialties will increase by 1% over a 10-year period as a result.
Crucially, all these developments are offset by the margin for investment at hospitals and orthodontics practices ensuing from relevant agreements and outline agreements and economic conditions.

Recommendation

Based on the above developments, the ACMMP recommends the substitution scenario incorporating all parameters.

Table 39: Intake recommendation

	Year of equilibrium 2031		Year of equilibrium 2037	
	Temporary trend	Continuous trend	Temporary trend	Continuous trend
OMS surgeons	8.6	9.8	9.5	11.8
Orthodontists	9.2	10.1	11.5	13.6

The bandwidth of outcomes for OMS surgeons ranges from 8.6 to 11.8 training places. **Regarding OMS surgery, the ACMMP recommends opting for the second year of equilibrium at an intake of 10-12 per year, with a preferred intake of 12.** This preference for the second year of equilibrium was prompted by the relatively long duration of the training programme. The more distant time horizon offers training institutions a sufficient adjustment period to achieve equilibrium.

The bandwidth of outcomes for orthodontists ranges from 9.2 to 13.6 training places. **Regarding orthodontics, the ACMMP recommends opting for the first year of equilibrium with an intake of 9-10 per year and a preferred intake of 10.** The demographic development of the patient population - which will have changed in 18 years - is set to slump in 10 years' time, prompting the decision to opt for the first year of equilibrium. The recommendation will be readjusted in three years' time.

Sub-report 3b: Dentists and oral hygienists

Preface

This forecast was conducted by the ACMMP in 2019 at the request of the Ministry of Health, Welfare and Sport. This advisory report calculates the dentistry and oral healthcare programme intake needed to ensure future labour market equilibrium. The reporting process involved commissioning external studies, gathering and analysing data and interviews with a large number of experts on the most likely future scenarios. The most relevant developments are described below.

The working patterns of dentists and oral hygienists have changed over time.

A total of almost 9,700 dentists and over 3,500 oral hygienists are currently working in the Netherlands. The number of FTEs has increased for both groups, potentially foreshadowing future shortages. Oral hygienists work a total of 0.77 FTE, while dentists work 0.87 FTE. The two professions have a different age structure. The majority of dentists fall in the older age groups, resulting in higher future outflow levels. Oral hygienists constitute a younger professional group where demand for substitution will be less pressing in the short term. In a notable development, young professionals now seem less inclined to start their own practice. In order to account for these changes, two different working hour development scenarios have been calculated for both oral hygienists and dentists: one based on unchanged working hours and one based on changing working hours.

Declining intake of foreign dentists

A growing number of dentists have entered the Dutch labour market from abroad over the past years. However, this intake has been declining relatively steeply since 2017. While it is hard to predict how this intake will develop over the coming years, dependency on this factor is risky in terms of ensuring labour market equilibrium. Two scenarios were thus formulated on the basis of this parameter with higher and somewhat lower intake from abroad.

A greater focus on children and the elderly

Oral health and healthcare among children and the elderly is falling short in comparison with other age groups. The professional groups are highly focused on reaching children and elderly patients who currently receive little oral healthcare. These efforts are expected to lead to a growing demand for oral healthcare, from both dentists and oral hygienists. This largely concerns the epidemiological and socio-cultural factors. Demand growth as a result of demographic factors was calculated using more detailed methods, resulting in a slightly lower growth factor compared with the last forecast. Both dentists and oral hygienists are experiencing mild unfulfilled demand, at 1% and 2% respectively.

Despite the short amount of time since the interim forecast in 2018, developments could be assessed in greater detail this time around. Any developments that could not be explored in full will be included in the following forecast.

A continued focus on task substitution

According to previous forecasts, dentists delegated an estimated 15% of their tasks to oral hygienists and prevention assistants over a 10-year period (7.5% each). Research has since shown these estimates to be relatively accurate, although the exact degree of delegation is difficult to determine. While this development is expected to continue, the tasks carried out by prevention assistants are subject to some scrutiny. The government may have to take a more active role in ensuring tasks are delegated to the most suitable profession. Two scenarios were formulated to reflect different degrees of delegation to oral hygienists.

Recommendation

Based on the above developments, the ACMMP recommends the following scenarios incorporating all parameters.

Table 40: Recommended intake for dentists

Dentists Scenarios for intake from abroad and working hour development		Intake from abroad	
		100	136
Working hour development	0% in 10 years	308	282
	1% in 10 years	320	294

The bandwidth of outcomes for dentists ranges from an annual intake in the dentistry programme of between 282 and 320 entrants. The most probable outcome will depend on the development of foreign intake and working hours. The ACMMP recommends an intake of **308 to 320 trainees** on an annual basis, with a preference for **320**.

Table 41: Recommended intake for oral hygienists

Oral hygienists Task division and working hour development scenarios		Task substitution from dentist	
		7.5% in 10 years	10% in 10 years
Working hour development	0% in 10 years	322	370
	1% in 10 years	330	378

The bandwidth of outcomes for oral hygienists ranges from an annual intake in the oral healthcare programme of between 322 and 378. The most probable outcome will depend on the extent to which national and local policies emphasise task division and working hour development. The ACMMP recommends an intake of **330 to 370 trainees** on an annual basis, with a preference for **330**.

Capaciteits orgaan

Sub-report 4: Public and occupational health physicians

Public and occupational health physicians are an ageing professional group.

The average intake age in the regular and profile programmes for public and occupational health (35 years) is currently almost five years higher than the average intake age in clinical specialist and general practitioner programmes. As a result, public and occupational health physicians - assuming an equal outflow age - work five years less than specialists on average. The professional group is also ageing due to a lack of intake in the programmes between 2000 and 2016. As a result, the demand for substitution of existing public and occupational health physician capacity is relatively high compared with clinical specialists and GPs.

At present, the main area of Occupational Medicine mainly employs men. Most registered male insurance company medical advisers are between the ages of 60 and 65 (180 persons) followed by the 55-60 age group (175 persons). Most occupational physicians are between the ages of 55 and 60 (345 persons), followed by the 60 to 65 age group (270 persons).

The main area of Community Medicine is largely comprised of women. The number of female physicians working in youth healthcare is especially high. Most female physicians are between 55 and 60 years of age, followed by the 50-55 age group. The physicians in this main area are thus somewhat younger than those working in the main area of Occupational Medicine.

The occupational physician and insurance company medical adviser programmes are both experiencing intake shortages.

No specialty or profile has managed to achieve the recommended intake since the previous Recommendations were published in 2016. This failure is reflected in the ageing professional groups. However, there are strong differences between the various specialties and profiles. On average, 37 trainee specialists entered the occupational physician programme each year during the 2014-2018 period. The 2013 and 2016 Recommendations recommended an intake of 140 trainee specialists. This means that a mere 26% of all funded training places were filled. Although intake levels did increase over time, a mere 39% of recommended intake had been achieved by 2018.

Our previous recommendations for insurance company medical advisers have almost been realised. In the period between 2014 and 2018, an average of 42 trainee specialists started the insurance company medical adviser programme each year. Actual intake was thus 82% of the recommended level. In the five years prior, only 19 medical doctors in training as a specialist started the training programme each year. This is probably partly due to the current political focus on the UWV and its dominant position as an employer on the labour market for insurance company medical advisers. As a result, strategic staffing policies are easier to implement than would be the case at the occupational health and safety services.

Difference between funded and non-funded training programmes

The ACMMP identified differences between the intake in funded and non-funded programmes in the main area of Community Medicine. The comparison is based on a somewhat shorter period, between 2015 and 2018. This is due to the fact that the intake places funded by the Ministry of Health, Welfare and Sport will only become available two years after publication of our recommendation. The 2013 recommendation was valid from 2015 up to and including 2017. The 2016 recommendation did not take effect until 2018.

The funded profile and specialist programmes experienced an average annual intake of 115 trainee specialists over the specified period. Average recommended intake over this period stood at 146 trainee specialists, representing an actual intake of 79%. Average intake into non-funded programmes totalled 9 trainee specialists per year, compared with a recommended annual intake of 88. Non-funded profiles thus realised a mere 10% of their recommended intake over the past four years.

Growing shortages over the next 2 to 4 years

Most public and occupational health profiles and professions are currently experiencing shortages. These shortages are expected to increase over the coming three years. This is due to a high demand for substitution rather than any unexpected increases in healthcare demand. This demand will exceed the actual intake between 2016 and 2019 for all specialties and profiles over the coming three years, creating more opportune conditions for vertical substitution. However, this sector is expected to have limited access to additional nurses, nurse practitioners and physician assistants.

Transition to first year of equilibrium

In its 2013 and 2016 recommendations, the ACMMP advocates reaching equilibrium after a period of 18 years. The ACMMP foresees a further increase of labour market shortages. For this reason, the current recommendation specifies an earlier year of equilibrium after a period of 12 years, in 2031. The period covered by this recommendation starts in 2021, by which time initial changes to the intake in funded professions can be implemented. This change will then start visibly impacting the Community medicine profiles from 2023 onwards. The latest intake to affect the 2031 equilibrium will occur two years earlier, in 2029. The 'adjustment period' for an intake recommendation thus spans a six-year period. Any corrections will thus have more impact than would be the case if the year of equilibrium were later. Furthermore, the period affected by labour market shortages will also be reduced by six years.

Intake recommendations

Table 1 features the intake recommendations and bandwidths for each specialty and profile. The policy-intensive scenario including vertical substitution constitutes the lower end of the bandwidth. The policy-intensive scenario not including vertical substitution constitutes the upper end of the bandwidth. As a result of the decision to opt for an earlier year of equilibrium and continued low intake over the past three years, the current recommended intake is considerably higher compared with our 2013 and 2016 recommendations. Experts expect to see some form of vertical substitution in most professions. The recommendations for all professions in this ACMMP Recommendations are thus based on the lower end of the bandwidth.

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Table 42: 2019 ACMMP recommendation bandwidth for each profile and specialty

Specialty/profile	Bandwidth	
	Minimum	Maximum
Occupational physician	**250**	260
Insurance company medical adviser	**70**	75
Community Medicine without a profile	**14**	16
Community medicine + physicians profiled in policy and advice	**13**	13
Community medicine + physicians profiled in health and social care needs assessment and advice	**3**	3
Community Medicine + infectious disease physicians	**12**	14
Community Medicine + physicians profiled in tuberculosis prevention and control	**2**	2
Community medicine + donor physicians	**1**	1
Community Medicine+ forensic physician	**11**	11
Community Medicine+ youth healthcare physician	**43**	48
Community Medicine+ physicians profileded in environmental medicine	**2**	2
Physician profiled in policy and advice	**15**	15
Physicians profiled in health and social care needs assessment and advice	**7**	7
Infectious disease physician	**15**	17
Physician profiled in tuberculosis prevention and control	**2**	2
Donor physicians	**17**	18
Forensic physician	**41**	43
Youth healthcare physician	**111**	125
Physicians profiled in environmental medicine.	**3**	3
Total	**632**	**675**

Other recommendations

The ACMMP has also issued a supplementary recommendation to both the government and professional field, based on the observation that current intake shortages are not limited to the social medicine professions. Intake in the Specialist in geriatric medicine and Physicians for the intellectual disabled programmes is also falling short. This is due to medical doctors' lack of interest in these professions, rather than the declining number of medical doctors seeking a training place. A joint approach to some of the issues underlying the profession's unpopularity might prove beneficial in this regard. This could include more effective positioning in the Framework Plan, image building campaigns, studies on primary working conditions during and after the training programme, the more even regional distribution of training facilities, efforts to encourage transfer students and further academisation of the profession. Joint efforts are already underway to address the lack of interest in Insurance company medical adviser and Occupational physician programmes. The instruments developed as a part of this effort may also prove useful to the other aforementioned professions, either as is or following relevant adjustments.

Sub-report 5: Specialist in geriatric medicine

From nursing home medicine to geriatric medicine

There has been a university chair in geriatrics since 1980. Nevertheless, the geriatric medicine speciality (referred to as nursing home medicine at that time) was only recognised as a medical discipline in its own right in 1989. The specialist postgraduate programme was launched as a two-year programme. In 2007, the duration of the training programme was extended to three years, because the social geriatrician training programme, which had been an independent programme prior to that, was incorporated into the training programme curriculum for nursing home physician. In 2009, the profession acquired its new name: specialist in geriatric medicine. The name is certainly deserved: specialists in geriatric medicine have been providing specialist medical care to vulnerable elderly patients in numerous settings for quite some time now, and are no longer limited to nursing homes.

A growing training programme with a large number of training places

As at 1 January 2019, the number of medical doctors in training as specialists in geriatric medicine totalled 338. The percentage of female trainee specialists has remained at its 2016 total of 81%. In the meantime, the average age at which trainee specialists commence the specialist in geriatric medicine training programme has decreased to 31 years. The average age of all trainee specialists decreased to 32 years in the period through 2018. The fact that trainee specialists are embarking on the programme at a younger age indicates that the profession is becoming more popular, and is more frequently their first choice. The duration of the training programme is becoming longer: On average, trainee specialists take 3.4 years (up from 3) to complete the programme.

Actual annual intake in the Specialist in geriatric medicine programme has averaged 99 persons since 2009. Numbers rose steadily until 2015, after which intake levels started to decline. The number of new trainee specialists has been rising again since 2018. In a hopeful sign, 2019 intake totalled 126 new trainee specialists. However, the current annual total of funded new training places (186) offers room for more prospective specialists in geriatric medicine.

Action needed to generate enthusiasm for training programme

The professional association and educational parties will continue their campaign to promote the profession and increase the appeal of working as a specialist in geriatric medicine, which will be necessary in light of the current shortage of professional practitioners and large number of unfilled training places. The academic medicine programmes are being encouraged to embed geriatric medicine in their curricula more effectively. The multifaceted and complex nature of the profession must be communicated more effectively to potential trainee specialists.
The number of candidates for a training place at the Specialist in geriatric medicine programme increased significantly this year. There is a continual focus on improving the quality of the programme and conducting interim evaluations and assessments. However, the internal yield - the percentage of trainee specialists to successfully complete the training programme each year - has declined since the previous Recommendations (down from 79% to 76%). The causes of this high dropout rate among trainee specialists are currently being investigated.

Demand continues to grow

The geriatric medicine specialty has now evolved into one of the largest specialty areas in the Netherlands: on 1 January 2019, the number of registered specialists in geriatric medicine totalled 1,743. This figure totalled 1,568 in 2016. Another 21 social geriatricians work in elderly care. The movements in the number of registered specialists in geriatric medicine are entirely attributable to registrations in and de-registrations from the register. There is no intake from abroad because this specialty does not exist outside the Netherlands.
Approximately 1,693 of all registered specialists in geriatric medicine and social geriatricians (almost 96%) are practising as such. The average length of employment (0.86 FTE) has barely changed since 2016 (0.87 FTE). Men worked slightly less (0.92 compared with 0.94 in 2016), whereas women remained stable (0.83 in 2016 and 2019). The percentage of female specialists in geriatric medicine has continued to rise to its current total of 68%.
Over half of all specialists in geriatric medicine are over 50 years of age. The percentage of male specialists in geriatric medicine over the age of 50 has grown from 72% in 2016 to 75% in 2019. The percentage of female specialists over the age of 50 has dropped from 44% in 2016 to 43% in 2019. Around one-third to half of all specialists in geriatric medicine are due to retire in the next decade.

The supply and demand market for specialists in geriatric medicine is a demand-driven market: Demand for specialists in geriatric medicine exceeds current supply, as evidenced by the number of vacancies. The vacancy percentage is around 10% and has continued to rise since the previous forecast, which makes the specialty one of the medical professions with the highest unfulfilled demand. This is also borne out by the observation that two-thirds of all vacancies for specialists in geriatric medicine remain unfulfilled for long periods of time. Medical doctors and other professionals are also frequently deployed to nursing homes in order to compensate for the lack of specialists in geriatric medicine.

Long-term care has undergone numerous changes in the period since 2015. These developments have resulted in the introduction of the Long-term care Act and changes to adjacent legislation such as the Healthcare Insurance Act, Social Support Act and Care and Coercion Act. New policies aimed at enabling people to live at home independently as long as possible represent a major change for the elderly population. As a result, fewer elderly citizens are being referred to stay and receive care in a nursing home. These days, the elderly residents admitted to nursing homes generally require more serious and complex care than was formerly the case. Specialists in geriatric medicine are having to spend more time on their care duties as a result. Elderly citizens who live at home longer also require more care. In some cases, this situation is further exacerbated by social problems: the elderly often experience feelings of insecurity, loneliness, lack of formal or informal care and/or a social network. The past few years have seen a rise in the number of elderly residents living at home who required immediate care followed by rehabilitation therapy and/or temporary care in an institution. Specialists in geriatric medicine are spending an increasing amount of time on short-term care stays and geriatric rehabilitation care. There are also an increasing number of small-scale options for the elderly that combine care and independent living. With GPs lacking the necessary time and specific expertise to cater to these needs, demand for specialists in geriatric medicine is growing.

No efficiency improvements and sub-optimal use of extramural deployments

Despite the nationwide '(De)regulate Healthcare Action Plan' programme, which successfully underlined the urgency of reducing administrative burdens across all sectors, the desired results have still failed to materialise. The current shortage of medical assistants (sub-report 8) also appears to be hampering further efficiency gains for specialists in geriatric medicine.

GPs now play a key role in caring for the growing group of elderly patients living at home, including a growing number of patients over the age of 80 who are becoming increasingly vulnerable as a result. In addition to the burdens involved in elderly care, this professional group is also under pressure due to the growing demand for mental healthcare and youth care. Tasks are also increasingly being shifted from secondary to primary care. This development is prompted by the desire to manage costs and provide accessible specialist care through actors closer to the patient. As a result, a growing number of GPs are indicating they cannot take on any additional tasks. They also tend to feel overburdened as they lack the specific expertise needed to adequately address the complex and challenging care needs of elderly patients.

Specialists in geriatric medicine are ideally positioned to address these complex and challenging needs within an extramural care setting. However, their deployment and collaborations within the primary care sector are still not optimal. Although extramural deployments are on the rise, the shortage of specialists in geriatric medicine in nursing homes remains an impediment: intramural care tends to be prioritised over extramural care when capacity is low. It is also taking a long time to eliminate financial bottlenecks in the new system. The Ministry of Health, Welfare and Sport eased the preconditions for extramural treatment in 2016, facilitating the deployment of specialists in geriatric medicine. Extramural treatment will be incorporated in the Healthcare Insurance Act (Zorgverzekeringswet) from 2020 onwards. An independent commercial title for specialists in geriatric medicine should help make the care provided by these physicians more accessible. In future, specialists in geriatric medicine may carry out their tasks on a far more independent basis in both extramural and intramural settings. It remains to be seen how (and how quickly) these developments will impact the unfulfilled capacity for specialists in geriatric medicine

Vertical substitution gradually increasing

Vertical substitution continues to develop. For example, the number of nurse practitioners working in geriatric medicine has increased significantly over the past few years. While the number of physician assistants working in the field grew considerably until 2016, it has not increased any further since then. However, individual healthcare institutions do vary greatly in terms of their policies and overall visions. As a result, the effort to reassign tasks to support professions is not proving equally successful across the board. The intramural elderly care sector has also been having difficulty attracting and retaining staff with a higher professional education background. This is hampering efforts to reassign tasks to nurses with a higher professional education background and undermining the transfer of higher professional education students to nurse practitioner and physician assistant training programmes. Nevertheless, the vertical reassignment of tasks is viewed as an important and potentially effective solution for the shortage of specialists in geriatric medicine.

Recommendation

Resolving the shortage of specialists in geriatric medicine will require time and effort. This is mainly attributable to the following factors:

- The growth of the older segment of the elderly population (80 and over) and resulting growth of the group of vulnerably elderly residents with complex healthcare needs.
- The growing need for specialists in geriatric medicine at intramural and extramural elderly care facilities.
- The ongoing shortfall of programme intake.
- The high projected outflow of the older segment of the professional group.

Table 43 provides an overview of the recommendations and decisions in forecast years from 2010 onwards. More specialists in geriatric medicine will have to be trained if supply and demand are to be balanced in the longer term. The ACMMP therefore recommends **an annual minimum intake of 235 trainee specialists and a maximum intake of 260 trainee specialists with effect from 2021**. This choice is based on two scenarios. The upper end of the bandwidth is determined by scenario 7, the vertical substitution scenario including a continuous trend. In this scenario, all healthcare demand parameters and the work process parameters have been extrapolated at their minimum estimated value. 2031 has been set as the year of equilibrium to bridge the gap between supply and demand as quickly as possible. The lower end of the bandwidth is based on scenario 6, the vertical substitution scenario with temporary trends. This scenario also takes account of the minimum values of all healthcare demand and work process parameters, but is based on the assumption that the effects of the aforementioned trends will have subsided after 10 years. This may impact efforts to achieve equilibrium. This scenario was therefore based around the notion of achieving equilibrium over a longer period, by the year 2037.

The major shortage of specialists in geriatric medicine poses an extremely urgent problem. The ACMMP realises that the further expansion of training capacity will require major efforts across multiple fronts. For example, there are major challenges ahead in terms of recruiting trainee specialists and boosting the profession's image and appeal. The further expansion of training locations and the associated facilities should also be considered as a means of increasing the number of training places and encouraging and facilitating more even distribution around the country. The professional field is confident that the measures needed to rapidly resolve the shortage of specialists in geriatric medicine will prove feasible. **The ACMMP therefore expresses a preference for an annual intake of 260 trainee specialists.**

Capaciteits orgaan

Table 43: Recommendations and decisions in forecast years from 2010 onwards

Year in which recommendation was issued	2010	2013	2016	2019
ACMMP recommendation bandwidth	109-127	120-128	159-186	235-260
ACMMP's preference recommendation	**109**	120-128	**186**	**260**
Decision by Ministry of Health, Welfare and Sport on basis of recommendation (to take effect 2 years from now)	109	128	186	t.b.d.

Capaciteits orgaan

Sub-report 6: Physicians for the intellectual disabled

Physicians for the intellectual disabled provide specialised intramural and extramural care

The field of medicine for people with intellectual disabilities (intellectual disability medicine, IDM) was recognised as an independent speciality by the Minister of Health Welfare and Sport in 2000. Prior to that, mainly experienced GPs or former GPs provided medical care to people with intellectual disabilities. In this sub-report, we will hereinafter refer to registered physicians for the intellectual disabled as intellectual disability physicians (ID physicians). In the first three years after 2000, the number of ID physicians rose rapidly as a result of the retrospective recognition of physicians who were already working in the sector. From 2003, candidates could only gain admission to the intellectual disability medicine (IDM) speciality by taking a recognised postgraduate ID physician training programme. ID physicians have clearly taken on the role of secondary care specialists over the past few years; clients in need of general medical care must refer to their GPs.
ID physicians mainly work in healthcare institutions for people with intellectual disabilities, but are also increasingly caring for people with mild intellectual disabilities and mentally disabled patients living at home through the Intellectual Disability polyclinics. The movements in the number of registered ID physicians are entirely attributable to registrations in and deregistrations from the register. There is no intake from abroad because this specialty is not officially recognised outside the Netherlands.

Intake down

Actual intake in the programme appeared to be growing steadily from 2010, reaching the highest recorded intake in 2015, when 21 medical doctors in training as ID physicians started the training programme. However, intake has since declined to a total of 15 new trainee specialists in 2018. Generating more interest for the profession and finding suitable candidates for the training programme is proving difficult. While the total number of trainee specialists exceeded 50 for several years, the figure has since dropped to 45. On average, trainee specialists start their training programme at the age of 33. The average age of all trainee ID physicians has been 34 for the past few years. The number of female trainee specialists has declined slightly, from 87% in 2016 to 84% in 2019. This percentage is still on the high side.

Small professional group with a large percentage of younger women

On 1 January 2019, the number of registered ID physicians totalled 251, of which around 243 (close to 97%) work on the basis of 0.86 FTE on average. This is 0.01 FTE higher compared with 2016, due the fact that both men and women now work slightly longer hours. The proportion of practising female ID physicians increased by another 4% to a total of 78%. This is due to intake from the ID physicians programme, which largely consists of younger women.
There are over three times more female than male registered ID physicians. Most of these women are between the ages of 30 and 50. 67% of the men are 50 and over, as opposed to 32% of women. Between more than half to two-thirds of all male ID physicians will leave the profession in the coming 10 to 15 years as a result of retirement. In the case of women, the figure is somewhere between a quarter to more than a third.

Large unfulfilled demand

The supply and demand market for ID physicians is a demand-driven market: Demand for ID physicians exceeds current supply, as evidenced by the number of vacancies. The vacancy percentage is extremely high, at an estimated minimum of 20%. This is twice as high as the previously forecasteed percentage. The specialty has ranked among the medical professions with the highest unfulfilled demand for several years. This is also confirmed by the observation that over three-quarters of all ID physician vacancies remain unfilled for long periods of time. GPs and medical doctors are also frequently deployed to healthcare institutions to compensate for the shortage of ID physicians. However, GPs are also experiencing a high degree of unfilled vacancies.

Growing demand for ID physicians

Key factors underlying this forecast include developments at the socio-cultural level and in the area of task reallocation. The restructuring of long-term care and government extramuralisation policy have also had a major impact on the ID sector. Society is increasingly focused on participation, self-determination and performance. People with a mild intellectual disability or handicap are under growing pressure to function independently, but often lack the necessary skills and social networks. ID physicians have noticed a clear increase in healthcare demand from these groups, in terms of both volume and complexity. ID physicians are receiving a growing number of referrals from GPs and paediatricians, as well as the mental healthcare and forensic care sectors. So far, efforts to improve efficiency through the reduction of administrative burdens and introduction of new technologies have not proven effective. Greater support for ID physicians in these areas could yield rapid results.

Vertical substitution development fails to follow through

Vertical substitution plays an increasingly crucial role in the healthcare sector. The intellectual disability care sector feels that it is important that care professionals such as nurse practitioners and physician assistants take on some of the tasks currently carried out by ID physicians. This approach can help resolve capacity problems and improve the quality of care. However, any substantial increases in terms of vertical substitution are being hampered by shortages among the relevant professional groups. The ongoing shortage of healthcare staff with a higher education background is also limiting the number of candidates for and transfers to the physician assistant and nurse practitioner training programmes.

Recommendation

There is currently a serious shortage of ID physicians. Programme intake has been lagging behind the number of available training places for several years. Efforts to improve the profession's image require a great deal of time and effort. A major gap between supply and demand will have to be bridged over the coming decades. The shortage of ID physicians will become even more serious if intake levels do not increase soon. Vertical substitution is not expected to offer any relief in the short term.

The lower end of the intake recommendation bandwidth is based on the assumption that all trends in the area of healthcare demand and work processes - including vertical substitution - will have an effect in the coming 10 years (vertical substitution scenario including temporary trends). The upper

end of the recommendation bandwidth takes account of the fact that these trends will continue to have an effect after this 10-year period, and assumes vertical substitution may not necessarily have a significant impact (work process scenario with continuous trends). Both scenarios apply 2031 as the first year of equilibrium. The ACMMP therefore recommends an annual minimum intake of **48 trainee specialists** and a maximum intake of **57 trainee specialists** with effect from 2021.

The new intake recommendation is significantly higher compared with previous years, as illustrated by table 44. Creating all the necessary preconditions for this expansion of training capacity will require major nationwide efforts. In addition to a strong focus on recruiting trainee specialists for the ID physician programme, the number of teachers and practical trainers will also have to be expanded. It might also prove beneficial to offer the instructional part of the programme at multiple locations throughout the country. This would automatically create a need to appoint more lecturers. All these measures will be crucial in ensuring that the shortage of ID physicians does not increase any further. Despite some caveats in the area of feasibility, the urgency of further capacity expansion has prompted the ACMMP to **issue a definitive recommendation for the annual intake of 57 trainee specialists.**

Table 44: Recommendations and decisions in forecast years from 2013 onwards

Year in which forecast and recommendation was issued	2013	2016	2018*	2019
ACMMP recommendation bandwidth	20-24	16-18	21-29	48-57
ACMMP's preference recommendation	24	18	24	**57**
Decision by Ministry of Health, Welfare and Sport on basis of recommendation (to take effect 2 years from now)	24	18	24	t.b.d.

*** interim recommendation**

Sub-report 7: Mental healthcare professions

This report contains a recommendation by the ACMMP to the Minister of Health, Welfare and Sport and the professional field on the number of entrants in the training programmes for mental health psychologist, psychotherapist, clinical psychologist, clinical neuropsychologist and mental health nurse practitioner required on an annual basis to achieve equilibrium in the labour market. This intake recommendation covers the 2020 - 2024 intake period.

The ACMMP's previous intake recommendation for these mental health professions dates from 2015. There have since been numerous developments in the area of healthcare supply, healthcare demand and work processes. These developments are resulting in higher intake recommendations for mental health psychologists, clinical psychologists and mental health nurse practitioners and a declining number of new entrants in the psychotherapist programmes. The intake recommendation for clinical neuropsychologists has remained stable. The ACMMP has described the developments underlying this recommendation in detail in these Recommendations.

Growing labour market shortages

The labour market for mental healthcare professions and other sectors has seen a major shift since the publication of recommendations in the 2015 forecast. In 2015, healthcare providers were still cautious about opening vacancies due to uncertainty about the effects of mental healthcare system reform and the ongoing (at the time) debate about the profession ultimately responsible for treatment. At present, the labour market is experiencing growing shortages. Demand for clinical neuropsychologists, clinical psychologists, mental health nurse practitioners and mental health psychologist is especially high in comparison with the current supply. The discrepancy between labour market supply and demand is less pronounced in the case of psychotherapists. It should be pointed out that demand for psychotherapists, clinical psychologists and clinical neuropsychologists is set to outpace supply over the coming years. This is mainly due to the fact that intake in these training programmes has fallen short of the number of places recommended by the ACMMP and the number of training places funded by the Ministry of Health, Welfare and Sport. The situation is especially urgent in the case of clinical psychologists, where 33% of practising practitioners are over the age of 60 and labour market shortages are already quite urgent. Intake in the clinical neuropsychology programme has increased since the allocation of availability contribution in 2016. The resulting effects will be visible on the labour market in several years.

Healthcare sector-wide increase in healthcare demand

Healthcare demand is rising as a result of growing prosperity, technological developments and demographic changes. Some prognoses estimate that current healthcare expenditures will have doubled by 2040. Two-thirds of this increase can be attributed to developments in medical technology and growing material prosperity: one-third can be attributed to the ageing population and overall population growth. Demand for clinical neuropsychologists is growing due to the ageing population and growing number of elderly dementia sufferers. Psychotherapists are treating fewer patients due to the declining number of 20-65-year olds, which constitute a relatively large portion of their pa-

tient group. Healthcare expenditures are rising more quickly in the Netherlands than in other countries. The Netherlands also spends more than average on healthcare, and has relatively high mental healthcare expenditures. According to the Administrative Agreement on Mental Healthcare, the available national budgetary framework will increase in absolute terms over the coming years. The relative budget increase is levelling off. All in all, the growing healthcare demand will fuel rising demand for the mental healthcare professions.

Demedicalisation and quality improvements

There is a growing focus on demedicalisation, especially in the mental healthcare sector. In an effort to improve the quality of care and life, various drugs - including psychopharmaceuticals such as antidepressants and antipsychotics - being fully or partially replaced by psychological or psychotherapeutic interventions. Efforts are also being made to improve the provision of care in increasingly complex situations, through the deployment of more highly qualified care professionals. These developments are especially prominent in the elderly care, disability and mental healthcare sectors. The deployment of medical academic, paramedic and medical support staff in the mental healthcare sector declined sharply over the 2010-2017 period, by 59%, 44% and 20%, respectively. The deployment of behavioural scientists (academic and academic+ level) increased by 47% over the same period.

Higher demand for substitution due to growth of population groups

In line with the aforementioned developments, the number of healthcare professionals working in the mental healthcare professions is increasing sharply. Mental health psychologists are fulfilling an increasing share of current healthcare demand, at a total of 10,649 practitioners. The number of practising mental health psychologists has almost doubled since 2010, with a significant increase after 2015. Mental health nurse practitioners experienced the largest growth, with a more than fivefold increase to 954 practising practitioners. The number of practising clinical neuropsychologists, psychotherapists and clinical psychologists has been increasing since 2010, by 85%, 23% and 5% respectively, to a total of 139, 1,913 and 2,069 practising practitioners. These increases are resulting in a higher demand for substitution and, as a result, have prompted higher recommendations in this forecast.

Shifts in the mix of disciplines

In the wake of the 2014 reforms, the mental healthcare system is currently still experiencing movements among patient groups and healthcare professionals. The generalist basic mental healthcare sector is deploying fewer psychotherapists, clinical psychologists and clinical neuropsychologists. Tasks are increasingly being reassigned to mental health psychologists, nurse practitioners and Master's psychologists. Generalist basic mental healthcare institutions continue to take on chronic patients and patients with minor depression from specialised mental healthcare institutions, with the assistance of mental health nurse practitioners. The specialised mental healthcare sector is reassigning tasks formerly carried out by psychotherapists to mental health psychologists and clinical psychologists. Clinical neuropsychologists are now more frequently deployed to carry out complex diagnostics. Tasks are also increasingly being reassigned from psychiatrists to mental health nurse practitioners. The deployment of mental health nurse practitioners is expected to double over the

coming 10 years. The deployment of mental health psychologists, clinical psychologists and nurse practitioners is falling short of desired targets in several sectors, due to both the tight labour market and cost considerations. The following practitioners are being deployed in their place: Master's psychologists, nurses with a higher professional education background, welfare workers with a higher professional education background, remedial education generalists or NIP-registered child and youth psychologists.

Healthcare professionals are leaving mental healthcare institutions

A growing number of psychologists, psychotherapists and mental health psychologists are opting to reduce their working hours at mental healthcare institutions and work more as independent practitioners. This is being prompted by their dissatisfaction with the working conditions and workloads at mental healthcare institutions. Psychotherapists are also motivated by the fact that they feel that they now have less freedom to carry out longer treatments. Mental health psychologists with an independent practice are increasingly focused on the generalist mental healthcare sector, where they are being deployed to provide both generalist and specialised mental healthcare. The departure of clinical psychologists is expected to cause especially serious shortages at mental healthcare institutions. These institutions are already facing shortages and can expect to see further age-related outflow, while intake in their training programmes is falling far short of targets.

No projected efficiency gains

Efficiency is declining across the full breadth of the healthcare sector due to growing administrative burdens and registration obligations in the area of quality and other aspects. This development is taking place despite horizontal oversight of the mental healthcare sector, sessions aimed at cutting red tape and initiatives aimed at improving healthcare providers' digital environment. This is mainly due to: changes to the healthcare system, care procurement processes and a growing demand for more detailed information on waiting times, treatment indicators and outcomes. Specialised mental healthcare institutions are treating more complex patients, spending more hours on each patient as a result. The product structure in generalist basic mental healthcare is based around cutting the number of hours spent on each patient. Far-reaching recent legislative changes (Social Support Act, Child and Youth Act, Participation Act) are forcing youth services and disabled care institutions to deploy more mental health psychologists and other practitioners. This will continue to create an additional administrative burden and require coordination with numerous other parties for the foreseeable future.

Outflow from youth services

The Child and Youth Act entered into force in 2015, reassigning responsibility for all mental healthcare for children and youths to the municipalities. However, the transformation is progressing less rapidly and is causing more problems than had been assumed upon the new law's introduction. There are numerous reports about professionals and specific mental healthcare professions leaving the youth services sector. The number of mental health psychologists working in the youth healthcare sector has decreased by 40% since 2015. However, there is no concrete information on the number of patients in treatment, making it impossible to accurately estimate the resulting impact on demand for professionals. The problematic transformation and thus sub-optimal quality of

mental healthcare being provided to youths may cause more serious mental health issues among adolescents and adults in the longer term. Healthcare demand may increase in future as a result of these developments. In any case, rebuilding capacity, training capacity and expertise within the Youth Services sector will require a considerable amount of time and resources.

Recommendations and advice

The ACMMP recommends to the Ministry of Health, Welfare and Sport and parties in the professional field that the annual number of intake places should fall within the bandwidth shown in table 45. If the number of annual entrants is within the specified bandwidth, labour market supply will be sufficient to ensure a balance between supply and demand.

A number closer to the upper end of the bandwidth will ensure that the current shortage of care professionals can be resolved sooner. If trends remain stable, intake will then have to be adjusted downwards to prevent surpluses. For example, a large number of new mental health psychologists are currently being trained. If current trends and intake figures remain stable, labour market equilibrium will be achieved by the year 2024. Training capacity will then have to be adjusted downwards.

The ACMMP has also formulated a preference recommendation for the most appropriate number of intake places required to achieve equilibrium between healthcare supply and demand on the labour market in the future (2030) for each profession. These preference recommendations are well founded and have been set at the lower end of the bandwidth for most professions in view of the fact that current trends cannot necessarily be expected to continue. The preference recommendation for clinical psychologists constitutes an exception in this regard. In view of the tight labour market and high expected outflow, (33% of all practising practitioners are 60 and over), the recommendation for this profession has been set at the upper end of the bandwidth. The aim is to ensure that current labour market shortages rise less steeply in the coming years and subsequently achieve labour market equilibrium.

Intake in the psychotherapy and clinical psychology programmes has been falling short of the number of training places recommended by the ACMMP and the number of places funded by the Ministry of Health, Welfare and Sport for years now, and will require further attention. Shortages in these professions are currently worsening. The demand for clinical psychologists, in particular, currently far exceeds supply. The funding for training places offered under the current framework has proved insufficient incentive to realise the necessary intake. Additional measures to increase intake in this programme would appear necessary if major shortages are to be prevented.

Table 45: Intake recommendation: annual number of entrants required in the training programmes for the five mental healthcare professions

	Intake recommendation bandwidth 2018	Preference recommendation 2018	Preference recommendation 2015	Preference recommendation 2013
Mental health psychologist	723 – 787	**723**	524	585
Psychotherapist	130 – 139	**130**	198	271
Clinical psychologist	239 – 270	**270**	226	245
Clinical neuropsychologist	21 – 26	**21**	22	20
Mental health NP (two- and three-year training programmes)*	160 – 199	**160**	86	87

*** previous recommendations exclusively concerned the three-year mental health nurse practitioner training programme**

The intake recommendation for mental health nurse practitioners was considerably lower in the previous 2015 forecast, at 86 places per year. However, the previous recommendation was exclusively focused on the three-year categorical mental health nurse practitioner programme in Utrecht. For the first time, this 2018 recommendation also covers required intake in two-year MANP programmes at the nine universities of applied sciences catering to the mental healthcare domain. Regarding the total number of students to enter both the two- and three-year mental health nurse practitioner programmes over the past few years, the outcomes of this forecast are higher. The number of entrants in the two programmes totalled just over 150 people over the past three years.

Capaciteits orgaan

Sub-report 8: FZO Professions

More people to undergo training

The FZO Professions still had just enough capacity to meet the healthcare demand in 2016.[11] However, the turning point has since been reached, with current healthcare demand exceeding the available supply in all professions. Accordingly, this report concludes that more new practitioners will have to be trained. In addition to addressing the current shortages as quickly as possible, this will also help achieve a balance between healthcare supply and demand by 2024. The current imbalance is reflected in the high vacancy rate calculated on the basis of data from the healthcare institutions. The vacancy rate has doubled since the 2016 forecast.

The ACMMP thus recommends a total of 5,945 training places for the various FZO Professions and Ambulance nurses. This preference recommendation of 5,945 places is 63% higher than the preference recommendation issued in 2016 (not including Ambulance nurses).

In absolute numbers, the greatest discrepancies between healthcare supply and demand are currently occurring among intensive care nurses, surgical assistants, emergency nurses, anaesthetics staff and paediatric nurses In relative terms (in terms of the ratio between the size of the professional group and healthcare demand), the greatest shortages are currently occurring among paediatric oncology nurses, paediatric intensive care nurses, neonatal intensive care nurses, emergency nurses and clinical perfusionists.

This marks the first forecast to include extramural paediatric nurses, paediatric oncology nurses and ambulance nurses. As a result, it is impossible to make any comparisons with previous years. In the case of extramural paediatric nurses, the situation at the time of the forecast proved too uncertain, and insufficient data was available. As a result, these Recommendations do not contain a formal recommendation for Extramural paediatric nurses. As is common for the FZO Professions, the ACMMP calculates the required intake on the basis of two scenarios: the demographic scenario and expert scenario. A preference recommendation is then issued within this bandwidth.

[11] The term 'professions' is factually incorrect in that they are job roles/positions rather than professions. The term FZO (Hospital Training Programmes Fund) also no longer applies, as training programmes are now financed with availability contributions rather than through the Hospital Training Programmes Fund. However, because the term is used so frequently, it is also used in this report.

Table 46: Nationwide recommendation: annual intake required from 2019

	Demographic scenario	Expert scenario	Recommendation per year
Anaesthesia staff	492	625	**492**
Infection prevention practitioners	31	70	**51**
Cast specialists	53	76	**76**
Clinical perfusionists	31	46	**37**
Surgical assistants	1,068	1,240	**1,068**
Radiology lab technicians*	468	542	**505**
Radiotherapy lab technicians*	89	82	**86**
Subtotal medical assistants	**2,232**	**2,681**	**2,315**
Dialysis nurses	383	361	**371**
Paediatric intensive-care nurses	144	192	**144**
Neonatal intensive-care nurses	158	192	**175**
Intensive-care nurses	796	985	**796**
Paediatric nurses	449	572	**510**
Obstetric nurses	327	411	**369**
Oncology nurses	397	548	**397**
Emergency nurses	507	583	**545**
Paediatric oncology nurses	9	13	**13**
Extramural paediatric nurses**	2	8	**-**
Subtotal specialised nurses	**3,172**	**3,865**	**3,320**
Ambulance nurses	272	348	**310**
Total, general	**5,676**	**6,894**	**5,945**

*** Concerns all training scenarios, including intake in full-time MIRT programme over the past four years.**

**** A sufficiently reliable recommendation for extramural paediatric nurses could not be issued at present. As a result, no formal recommendation can be issued for this profession.**

This higher forecast is mainly attributable to the following factors:

- The great majority of professions failed to achieve the programme intake recommended in the ACMMP's 2016 report. As a result, the shortages identified at that time have not been resolved.
- In the case of most professions, current training efforts will not be enough to meet the demand for substitution in the near future (the coming six years to 2024). After all, professionals are retiring and leaving their professions. Furthermore, healthcare demand will continue to grow in the coming years, requiring a further increase of programme intake.
- Healthcare demand is set to increase more sharply over the coming years according to both national experts and the healthcare institutions themselves. This is partly attributable to the ageing population, which is causing an increase in required programme intake.
- Healthcare demand is also becoming increasingly complex, largely as a result of technological advances and developments in the professional field, such as the formulation of new guidelines. As a result, the amount of time spent on each patient is increasing sharply. Broadly speaking, this applies to all professions. In addition to causing higher immediate healthcare demand, this

also means that more effort will be required to maintain current levels of knowledge and competences. While this will theoretically benefit the quality of healthcare, it will also make demands on healthcare capacity. Administrative burdens are also increasing. This development is also driving up healthcare demand.

It is uncertain whether a significant amount of required additional intake can be realised in practice. Adequate efforts by the governing boards and executive boards of the institutions will be crucial in this regard, as will further efforts to strengthen regional cooperation within the FZO regions. Financial considerations will also play a key role here, despite existing availability of funding and other funds. There are also various substantive considerations. What, for example, is a reasonable training capacity? The feasibility of the current recommendations has become highly dependent on the degree to which recruitment efforts can ensure adequate programme intake.

Regional forecast

The ACMMP prepares a national forecast and regional forecast for each professional group described in this plan. The regional forecasts contain the outcomes of the demographic scenario (DS) and expert scenario (ES). The institutions and the regions should make their own choice within this bandwidth. Table 47provides an overview of the outcomes for each FZO profession (with the exception of extramural paediatric nurses) in the 12 FZO regions, as well as the national total.[12]

[12] There may be some minor differences between the national forecast and regional forecast as a result of rounding.

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Table 47: Recommendation: regional forecast

Profession	Sce-nario type	The Hague - Leiden	Limburg	Nijmegen	North Brabant	North Netherlands	Northwest Nether-lands	SR(ijnmond)Z	Stedendriehoek	Twente East/Achterhoek	Utrecht:	Zwolle	National: total
Anaesthesia staff	DS	49	26	35	70	54	96	54	16	14	72	5	**492**
	ES	52	34	42	89	88	114	69	18	18	94	8	**625**
Infection prevention practitioners	DS	4	1	0	4	4	4	2	0	0	9	3	**31**
	ES	7	3	1	7	16	7	5	1	2	15	6	**70**
Cast specialists	DS	6	0	4	8	2	15	4	2	1	9	2	**53**
	ES	11	0	6	10	5	19	6	2	3	10	4	**76**
Clinical perfusionists	DS	1	3	4	2	2	10	1	0	0	6	1	**31**
	ES	0	6	7	4	2	13	2	0	0	9	3	**46**
Surgical assistants	DS	97	44	69	153	142	232	70	31	34	164	32	**1,068**
	ES	106	54	88	156	193	255	92	49	41	175	30	**1,239**
Radiology lab technicians	DS	59	25	29	65	49	81	38	18	1	82	21	**468**
	ES	61	36	28	83	50	93	39	20	4	107	22	**543**
Radiotherapy lab technicians	DS	10	4	4	9	0	27	8	0	0	24	3	**89**
	ES	8	8	-1*	19	-2*	14	2	0	1	30	4	**82**
Dialysis nurses	DS	42	11	16	61	59	75	43	11	15	28	22	**383**
	ES	40	13	16	66	57	66	38	9	13	26	16	**361**
Paediatric intensive care nurses	DS	3	13	16	0	23	36	36	0	0	18	0	**144**
	ES	2	14	10	0	31	48	52	0	0	34	0	**192**
Neonatal intensive care nurses	DS	11	10	4	20	12	49	15	4	4	17	12	**158**
	ES	19	10	4	19	17	56	26	5	4	16	18	**192**
Intensive care nurses	DS	64	23	49	117	104	147	103	23	36	100	31	**796**
	ES	62	49	58	142	107	185	113	45	37	148	41	**985**
Paediatric nurses	DS	51	16	35	31	48	95	53	16	8	83	10	**449**
	ES	54	19	36	37	74	125	88	20	17	90	12	**572**
Obstetric nurses	DS	35	6	9	39	26	92	34	15	9	49	14	**327**
	ES	44	13	11	50	50	90	47	17	10	62	18	**412**
Oncology nurses	DS	32	10	33	52	50	95	46	5	9	52	12	**397**
	ES	49	18	43	65	65	118	54	9	13	101	14	**548**
Emergency nurses	DS	68	24	39	66	57	100	57	5	18	63	10	**507**
	ES	75	31	44	76	64	114	62	5	27	76	10	**583**
Paediatric oncology nurses	DS	0	0	0	0	0	0	1	0	0	7	0	**9**
	ES	0	0	0	0	0	1	4	0	0	8	0	**13**

*** A negative value points to a projected surplus of Radiotherapy lab technicians in the relevant region in the year of equilibrium 2024. This means that regional healthcare demand for the relevant profession is growing less rapidly than the healthcare supply. The negative values only occur in small training programmes where minor changes in the intake numbers can quickly produce negative values.**

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Table 48 features the outcomes of the regional forecast for ambulance nurses. Ambulance nurses are subject to a different regional classification method than the FZO professions.

Table 48: Ambulance nurses: demographic scenario, expert scenario

Regional Ambulance Service (RAV) region	demographic scenario	Expert scenario
01 Groningen	12	13
02 Fryslân	10	23
03 Drenthe	8	10
04 IJsselland	7	8
05 Twente	8	14
06 North and East Gelderland	3	8
07 Central Gelderland	9	13
08 Gelderland South	8	10
09 Utrecht	25	35
10 North Holland North	12	21
11 Amsterdam-Amstelland	15	14
12 Kennemerland	10	10
13 Zaanstreek-Waterland	10	9
14 Gooi en Vechtstreek	4	7
15 Haaglanden	11	11
16 Hollands Midden	9	11
17 Rotterdam-Rijnmond	55	63
18 South Holland South	2	6
19 Zeeland	8	8
20 Central Brabant West	6	7
21 Brabant North	4	5
22 Brabant South-east	6	11
23 Limburg North	8	11
24 South Limburg	6	6
25 Flevoland	13	15

Process

The outcomes in this forecast are based on a detailed survey among training institutions in the Netherlands. This survey was administered by means of a web-based application. Studies were also conducted to assess the demand arising from demographic developments and external yields. An inventory has also been made of the various intake parameters, and numerous experts from the field have been consulted. This concerns both national and regional experts: all healthcare institutions were asked to share their expectations on future healthcare demand development for each professional group. Their responses served as a basis for the recommendations in this forecast. Participating healthcare institutions can access the outcomes of this forecast through the web application.

Sub-report 9a: Physician assistant (PA)

This report contains a recommendation on the number of annual entrants in the physician assistant (PA) programme needed to achieve and maintain labour market equilibrium. This recommendation was prepared at the request of the Ministry of Health, Welfare and Sport, in collaboration with parties from the professional field. The ACMMP describes the developments underlying this recommendation in these Recommendations.

The intake recommendation

The ACMMP recommends that the Ministry of Health, Welfare and Sport and parties in the professional field realise an annual intake of between **181** to **250** students in the physician assistant programme between 2021 and 2024. If the number of annual entrants is within the specified bandwidth, labour market supply will be sufficient to achieve and maintain a balance between supply and demand. The preference recommendation is set at **250** entrants per year.

Average intake over the past few years has generally fallen within the bandwidth of this recommendation. An average of 204 students entered the physician assistant programme annually over the past five years. Although this is an initial indicative recommendation, there is clearly no need for any major adjustments to the current intake. However, healthcare demand is shifting between the individual sectors. Healthcare demand is increasing across all sectors. General medical practice is expected to see an especially sharp rise in demand. The number of entrants into general medical practice PA programmes will have to increase if future healthcare demand is to be met. Current and future healthcare demand also exceeds current intake in other sectors, such as elderly care. Demand for physician assistants is also expected to grow in the intellectual disabled care sector. If current trends continue, the clinical specialist sector will resolve its current shortage within several years. Accordingly, this forecast contains lower intake recommendations. In view of the fact that the necessary physician assistant capacity is subject to various factors that cannot be accurately gauged at present, the recommendation specifies a bandwidth. Examples of these uncertain factors include the speed and scale of the transition from secondary to primary care and the exact volume of work being transferred from medical specialists to trainee specialists and physician assistants.

Furthermore, initial indicative forecasts always involve a somewhat greater degree of uncertainly than forecasts that have been conducted more often. The number of entrants should thus preferably be set at a value that falls within the bandwidth of the recommendation and is close to actual intake over the past few years. Training capacity can then be gradually adjusted, preventing any major intake fluctuations. In view of the sharp rise in entrants during 2018 and 2019, the preference recommendation coincides with the upper end of the bandwidth. The preference recommendation is therefore set at **250** entrants per year (table 49). Assuming this recommendation is implemented, the number of physician assistant FTE will increase by around 200% in the coming ten years.

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Table 49: Recommendation on the annually required number of entrants in physician assistant programme, total and per individual sector

	Specialised clinical care	General medical practice	Other sectors	Total professional group
preference recommendation				
	128	**85**	**37**	**250**
Recommendation bandwidth				
Minimum	112	35	34	181
Maximum	128	85	37	250
Average intake from 2015 through 2019				
	161	24	19	204

Other sectors

The majority of physician assistants work in specialist clinical care or general medical practice. This forecast contains sector-specific recommendations for each of these sectors. In view of the relatively small number of physician assistants working in rehabilitation medicine, disabled care and elderly care, it proved impossible to formulated reliable sector-specific recommendations for these sectors and sub-sectors. Naturally, the surveyed developments in other sectors were factored in when preparing the intake recommendation for the overall professional group. The largest group of stakeholders in these other sectors foresees a growing demand for physician assistants. These stakeholders include medical specialists, managers and employers. However, the number of physician assistants in these sectors is currently still low. Estimates of future demand for physician assistants in the elderly care and disabled care sectors also vary widely. It is currently impossible to determine how quickly and to what extent demand for physician assistants will grow in these sectors. As a result, there was little room for inclusion in the calculation of the forecast for the entire professional group. It will be crucial to ensure that sufficient places are made available for these smaller sectors and sub-sectors when allocating the training places. The rehabilitation medicine sector has been signalling a shortage of training places for several years now. The ACMMP recommends a bandwidth of between 34 to 37 entrants per year. This intake recommendation were based on a number of key trends:

Current labour market shortages

Most sectors are experiencing a shortage of physician assistants. There are almost 9 vacancies for every 100 practising practitioners. 43% of physician assistants feel they do not have enough colleagues. These shortages are most pronounced in the elderly care sector, which has the largest number of vacancies in proportion to the number of practising physician assistants. As many as 81% of physician assistants working in this sector feel they do not have enough colleagues. In order to achieve labour market equilibrium, the recommendation is based on the assumption that current shortages must be resolved. In view of the relatively high intake in 2019 and projected high intake in 2020, these shortages should be resolved within several years if current trends continue. The number of entrants in specialist clinical care programmes can then be reduced.

A relatively young professional group

With an average age of 43, physician assistants are relatively young. A mere 2% are 60 years or over. As a result, outflow is low. 4% of the current professional group is expected to leave the profession in the coming 5 years. As a result, the number of physician assistants that will have to be trained in order to meet current demand for substitution age related is still quite limited.

Population growth and ageing driving healthcare demand

The Dutch population is growing and life expectancy is rising. 5% more physician assistants will be needed in five years' time, due to demographic developments in the patient population. The ageing overall population is a major factor in this regard. The resulting increase in demand for physician assistants is more pronounced in the elderly care sector compared with specialist medical care and general medical practice. However, the elderly care sector only employs a small number of physician assistants.

Growing demand for independent care professionals playing a coordinating role

A number of developments are driving demand for independent care professionals with the ability to play a coordinating role. For example, the number of people with chronic conditions and multimorbidity is growing. These developments, in combination with the ageing population, government policies aimed at encouraging more people to live at home as long as possible, extramuralisation and the transition to primary care are resulting in a growing demand for physician assistants and other professionals in general medical practice and acute care sectors, and - to a lesser extent - elderly care. Patients with multimorbidity often interact with a large number of healthcare professionals and organisations. This is creating a need for care professionals with the ability to oversee the overall process and coordinate all involved healthcare professionals. Programmes such as 'the Right Care in the Right Place' (JZOJP) are also promoting more intensive collaboration between the various sectors. This is creating a need for care professionals with the ability to operate independently and coordinate activities across the various sectors or 'partitions'. Like their fellow professionals, nurse practitioners, physician assistants are thought to be suited to this coordinative role, in which they serve as a de facto 'transmural bridge' that interconnects various healthcare organisations and sectors. The growing popularity of integrated care and value-based healthcare is also driving the need for this type of coordinative role.

Increase in task shifting

Both the specialist medical care sector and general medical practice cite the need to ensure that the right healthcare professionals are deployed in the right place as the main reason to train and/or hire physician assistants. This trend towards the reassignment of tasks to physician assistants is coinciding with further sub-specialisation or task specialisation by medical specialists and trainee specialists. Medical specialists are increasingly likely to focus on a specific sub-area or new treatment methods and innovations (scientific and otherwise) within their speciality. More general and/or protocol-based care is being reassigned to physician assistants and nurse practitioners.

The specialised clinical care sector is especially focused on efficiency and the efficient use of resources. Physician assistants have lower wage costs than medical specialists, prompting some respondents to deploy this type of professional in more situations. The shortage of medical specialists and high workloads experienced by this professional group are also driving task shifting across all sectors. Hospitals are shifting less complex, patient-related activities to physician assistants and other professionals, partly driven by the shortage of trainee specialists. Physician assistants are also being trained and hired in general medical practice in response to shortages, high workloads and succession issues.

This task shifting does not appear to have reached its limits yet. Two-thirds of all physician assistants indicate that they still have the capacity to take on more tasks currently carried out by medical specialists. On average, this concerns a weekly workload of 11 hours. Medical specialists and other stakeholders foresee further task shifting in the coming years. This development is expected to have the least impact in the specialist clinical care sector. As a result, the impact in terms of required training capacity will be lower compared with other sectors. Estimates may be lower due to the fact that nurse practitioners and physician assistants have been active in these sector for a longer period of time and in greater numbers, so that many tasks have already been reassigned. Furthermore, physician assistants and nurse practitioners are also more likely to take on duties normally carried out by medical specialists when healthcare demand expands. Specialist medical care is experiencing a less pronounced increase in healthcare demand than other sectors.

Improving healthcare quality

In addition to tasks normally carried out by medical specialists, physician assistants are also taking on additional duties, including relatively new or previously uncommon activities. This includes tasks in the following areas: prevention, communicating with patients and next of kin, projects/innovations and the organisation of care. Among other objectives, physician assistants are being assigned these additional tasks to improve healthcare quality, ensure that treatments start on time and/or improve patient satisfaction. Although the great majority of working hours consist of patient-related tasks such as consultations and patient visits, additional tasks such as project-related activities make up a structural part of almost half of all physician assistants' workload.

Projected growth

The largest stakeholder groups in almost all sectors expect to see an increase in the number of physician assistants over the next five years. The largest stakeholder group in the specialist medical care sector expects to see an increase of between 5% and 25%. While estimates in general medical practice vary widely, the largest stakeholder group does expect to see an increase. The number of physician assistant FTEs has increased by approximately 16% per year since 2012. The desire to improve healthcare quality, labour market factors, the changing healthcare demand and the issue of funding are all key factors driving healthcare organisations to hire and train physician assistants. Impeding factors include the issue of funding and lack of familiarity with the profession. General medical practice is also facing practical obstacles, such as the lack of consultation rooms.

Recommendations

We have supplemented the recommendations in this forecast with various suggestions for the Ministry of Health, Welfare and Sport and parties in the professional field.

Obstacles in general medical practice

The implementation of these recommendations at an individual sector level will require further attention. General medical practice is currently not training enough physician assistants to meet future healthcare demand. This sector is experiencing a disproportionate number of obstacles when it comes to hiring and training physician assistants (and nurse practitioners). This mainly concerns obstacles in funding. GPs feel that current funding by health insurers and the deployment of physician assistants (and nurse practitioners) is inadequate, and view future funding as an uncertain factor. GPs and managers mentioned the following obstacles in relation to training: inadequate subsidies, limited time for training, inadequate consultation rooms, uncertainty with regard to future subsidies, inability to offer students a position after they have completed their training programme, insufficient training places and perceived burdens on the employer. They also mentioned the fact that few universities of applied sciences offer primary care training programmes.

General medical practice is currently experiencing growing labour market shortages. Views as to which healthcare professionals can be deployed most effectively alongside GPs also vary greatly. The necessary measures and/or investments should be discussed with parties in the field to ensure that sufficient healthcare professionals - including physician assistants - are trained for general medical practice. A sector-wide labour market policy might help to prevent further worsening of the current labour market shortages.

A future-proof training strategy

A number of developments influence the demand for physician assistants in general medical practice compared with specialist medical care sectors. These include: the ageing population, providing the right care in the right place, elderly citizens living at home longer and the transition from secondary to primary care. The speed and scale of the transition is currently still uncertain, as is the amount of work that will ultimately be transferred to PAs working in general medical practice. Although physician assistants gain practical experience in several sectors during clinical training as a part of their programme, the great majority remain practising in the sector for which they were originally trained. It remains to be seen whether sufficient physician assistants trained in specialist clinical care will transition to general medical practice (and, to a lesser extent, elderly care) if demand continues to shift to these sector.

The ACMMP recommends exploring whether more physician assistants could be trained by a consortium of multiple sectors. This will require clear agreements on their deployment after graduation. Physician assistants trained in such an intersectoral context could then serve as a 'transmural bridge' between sectors and contribute to a new form of healthcare on the nexus between primary and secondary care, while supporting the current healthcare transition. Intersectoral training could also benefit general medical practice by eliminating some of the perceived obstacles to physician assistant training.

Some stakeholders may also view the current lack of retraining programmes as an impediment to hiring physician assistants trained in other sectors. The transition to other sectors can also be facilitated through the provision of retraining programmes for qualified physician assistants.

Gradual implementation of the recommendations at sector level

General medical practice and other sectors currently require a disproportionally larger number of training places than the specialist clinical care sector. However, the specialist clinical care sector is still experiencing a shortage of physician assistants. If current trends and intake levels remain unchanged, these shortages will be resolved within several years. These recommendations should be gradually implemented at individual sector level, to prevent any abrupt fluctuations in training capacity.

Lack of familiarity with the professions

The preparation of this 2021-2024 Physician Assistant recommendation coincided with the forecasting cycle for general healthcare nurse practitioners. In the process of gathering data, it became clear that the policy and administrative tiers in most sectors are familiar with the distinction between nurse practitioners and physician assistants. However, this is often not the case at shop floor, middle management and senior management level, where most decisions on the deployment of care professionals are made. As a result, there are major differences between (and within) healthcare organisations in terms of the types of tasks carried out by physician assistants and nurse practitioners. The resulting impact on the forecasts is explained in further detail in section 1.1 of the sub-report. The development of a shared vision and clear collaboration agreements within multidisciplinary teams at sector, specialty and organisational level can ensure that the right professional is deployed in the right place. Also see Laurant & Van Vught (2018).[13]

[13] Laurant, M. & Van Vught, A. (2018). Profielen Physician Assistant en Verpleegkundig Specialist in de praktijk. Convergeren of divergeren? Nijmegen: Radboudumc and HAN University of Applied Sciences.

Sub-report 9b: Nurse practitioner in General medical health care

This report contains a recommendation on the annual number of entrants in general healthcare nurse practitioner programmes needed to achieve and maintain labour market equilibrium. This recommendation was prepared at the request of the Ministry of Health, Welfare and Sport, in collaboration with parties from the professional field. The ACMMP describes the developments underlying this recommendation.

The intake recommendation

The ACMMP recommends that the Ministry of Health, Welfare and Sport and parties in the professional field realise an annual intake of between **429** to **656** students in the general healthcare nurse practitioner programmes between 2021 and 2024. If the number of annual entrants is within the specified bandwidth, labour market supply will be sufficient to achieve and maintain a balance between supply and demand. The preference recommendation is set at **429** entrants per year.

Overall, the general healthcare nurse practitioner programmes will require a higher number of entrants compared with previous years. An average of 331 students entered the general healthcare nurse practitioner programme annually over the past five years. Healthcare demand is increasing across all sectors. The general medical practice and elderly care are expected to see an especially sharp rise in demand. In the case of elderly care, this applies to both nursing homes and community care. While this is merely an initial indicative recommendation, it is clear that intake in the general healthcare nurse practitioner programmes for elderly care and general medical practice will have to increase sharply if future healthcare demand is to be met. Current intake in other sectors such as public and occupational health and intellectual disabled care is also insufficient to meet current (and future) demand. If current trends continue, the specialist clinical care sector will resolve its current shortage within several years. Accordingly, this forecast contains lower intake recommendations. In view of the fact that the necessary general healthcare nurse practitioner capacity is subject to various factors that cannot be accurately gauged at present, the recommendation specifies a broad bandwidth. Examples of these uncertain factors include the speed and scale of the transition from secondary to primary care and the exact volume of work being transferred from clinical specialists to trainee specialists and general healthcare nurse practitioners.

Furthermore, initial indicative forecasts always involve a somewhat greater degree of uncertainty than forecasts that have been conducted more often. The number of entrants should therefore preferably be set at a value that falls within the bandwidth of the recommendation and is close to actual intake over the past few years. Training capacity can then be gradually adjusted, preventing any major intake fluctuations. As a result, the preference recommendation coincides with the lower end of the bandwidth, and is set at **429** annual entrants in the general healthcare nurse practitioner programmes (see Table **50**). If this recommendation is implemented, the number of general healthcare nurse practitioner FTE should have increased by around 170% in ten years' time.

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Table 50: Recommendation on the annually required number of entrants in general healthcare nurse practitioner programme, total and per individual sector (not including mental healthcare sector)

	Specialised clinical care	General practice	Elderly care	Other sectors	Total
preference recommendation					
	165	**66**	**161**	**37**	**429**
Recommendation bandwidth					
Minimum	165	66	161	37	429
Maximum	189	132	236	99	656
Average intake from 2015 through 2019					
	229	31	55	16	331

Mental healthcare

This forecast does not include the intake recommendation for mental health nurse practitioners, which is set at 160 entrants per year.[14] An average of 85 students started the two-year MANP general healthcare nurse practitioner programme annually over the past five years. A total of 115 places in the three-year MANP general healthcare nurse practitioner training programme will be funded through the availability funding in 2020.

Other sectors

The majority of general healthcare nurse practitioners work in specialist clinical care, general medical practice or elderly care. This forecast contains sector-specific recommendations for each of these sectors. In view of the relatively small number of general healthcare nurse practitioners working in rehabilitation medicine, intellectual disabled care and elderly care, it proved impossible to formulated reliable sector-specific recommendations for these sectors and sub-sectors. Naturally, the surveyed developments in other sectors were factored in when preparing the intake recommendation for the overall professional group. The largest group of stakeholders in these other sectors foresees a growing demand for general healthcare nurse practitioners. These stakeholders include medical specialists, managers and employers. However, the deployment of nurse practitioners in these sectors is still relatively limited at present. It is currently impossible to predict how quickly and to what extent demand for general healthcare nurse practitioners will increase in these sectors. As a result, there was little room for inclusion in the calculation of the forecast for the entire professional group. It will be crucial to ensure that sufficient places are made available for these smaller sectors and sub-sectors when allocating the training places. The rehabilitation medicine sector has been signalling a shortage of training places for several years now. The ACMMP recommends an annual intake of at least 37 entrants.

This intake recommendation is based on a number of key trends:

[14] ACMMP (2018). 2020-2024 Recommendations. Sub-report 7 Mental healthcare professions.

Current labour market shortages

Most sectors are experiencing a shortage of general healthcare nurse practitioners. There are approximately 8 vacancies for every 100 practising practitioners. The elderly care sector is experiencing the most serious shortages, with approximately 19 vacancies for every 100 practising practitioners. The current tight labour market for nurse practitioners is also an impediment to the deployment of this professional group in the intellectual disabled care sector. 43% of general healthcare nurse practitioners feel that they do not have enough colleagues. In order to achieve labour market equilibrium, the recommendation is based on the assumption that current shortages must be resolved. In view of the relatively high intake in 2019 and projected high intake in 2020, the shortages in specialist medical care should be resolved within several years if current trends continue. The sector will then be able to reduce the number of entrants. The elderly care sector will need an especially large influx of new entrants in the short term if rapidly worsening shortages are to be contained.

First waves retire

The first nurse practitioners - then still referred to as nurse specialists - entered the labour market in 2000. The first waves are now set to retire. 10% of all general healthcare nurse practitioners are over the age of 60. 11% of all general healthcare nurse practitioners are expected to stop working in the profession within the next five years. Over a quarter of the current professional group will have left the profession in ten years' time. This will create demand for substitution, necessitating the training of new nurse practitioners.

Population growth and ageing driving healthcare demand

The Dutch population is growing, and life expectancy is rising. Simply as a result of demographic developments in the patient population, 25% more general healthcare nurse practitioners will be needed in 20 years' time. The ageing overall population is a major factor in this regard, causing demand for general healthcare nurse practitioners in the elderly care sector to increase by 15% in the coming five years, and another 66% in the coming 20 years. These figures do not factor in other demand developments.

Growing demand for independent care professionals who play a coordinating role

A number of developments are driving demand for independent care professionals with the ability to play a coordinating role. For example, the number of people with chronic conditions and multimorbidity is growing. These developments, in combination with the ageing population, government policies aimed at encouraging the maximum number of people to live at home as long as possible, extramuralisation and the transition to primary care are resulting in a growing demand for nurse practitioners and other professionals in general medical practice, elderly care and other sectors. Patients with multimorbidity often interact with a large number of healthcare professionals and organisations. This is creating a need for care professionals with the ability to oversee the overall process and coordinate all involved healthcare professionals. Programmes such as 'the Right Care in the Right Place' (JZOJP) are also promoting more intensive collaboration between the various sectors. This is creating a need for care professionals with the ability to operate independently and coordinate activities across the various sectors or 'partitions'. Like their fellow professionals, physician assistants, general healthcare nurse practitioners are thought to be suited to this coordinative role, in

which they serve as a de facto 'transmural bridge' that interconnects various healthcare organisations and sectors. General healthcare nurse practitioners can then devote additional attention to aspects such as prevention, risk identification and encouraging self-management. The growing popularity of integrated care and value-based healthcare is also driving the need for this type of coordinative role.

Increase in task shifting

The deployment of general healthcare nurse practitioners is frequently motivated by the desire to make sure the right healthcare professional is deployed to the right place. Nurse practitioners are deployed to care for specific patient groups and conditions. In general practice, this concerns areas such as care for the elderly or chronically ill, wound care, dermatology and diabetes care. In the case of specialist clinical care, this includes STD care, benign (mammary) conditions or memory disorders. A growing number of standards, guidelines and consensus documents now contain agreements on the division of tasks and responsibilities, facilitating the shifting of tasks. This trend towards the reassignment of tasks to nurse practitioners is coinciding with further sub-specialisation or task specialisation by medical specialists and trainee specialists.

The shortage of and high workloads among medical specialists and trainee specialists are also driving task shifting. The shortage of specialists in geriatric medicine and GPs and workloads experienced by these professional groups are frequently mentioned in this regard. Hospitals are shifting less complex, patient-related activities to physician assistants and other professionals, partly driven by the perceived shortage of trainee specialists.

This shifting of tasks does not appear to have reached its limits yet. The majority of all general healthcare nurse practitioners indicate that they still have the capacity to take on more tasks currently carried out by medical specialists. On average, this concerns a weekly workload of 10 hours. Medical specialists and other stakeholders foresee further task shifting in the coming years. This development is expected to have the least impact in the specialist clinical care sector. As a result, the impact in terms of required training capacity will be lower compared with other sectors. Estimates may be lower due to the fact that nurse practitioners (and physician assistants) have been active in these sectors for a longer period of time and in greater numbers, so that many tasks have already been reassigned. Furthermore, nurse practitioners and physician assistants are also more likely to take on duties normally carried out by medical specialists when healthcare demand expands. Specialist clinical care is experiencing a less pronounced increase in healthcare demand than other sectors.

Improving healthcare quality

In addition to tasks normally carried out by medical specialists, general healthcare nurse practitioners are also taking on additional duties, including relatively new or previously uncommon activities. This includes tasks in the following areas: prevention, identifying risks, encouraging self-management, communicating with patients and next of kin, projects/innovations and the organisation of care. Among other objectives, nurse practitioners are being assigned these additional tasks to improve healthcare quality, ensure that treatments start on time and/or improve patient satisfaction.

Although the great majority of working hours consist of patient-related tasks such as consultations and patient visits, additional tasks make up a structural part of most general healthcare nurse practitioners' workload.

Projected growth

Stakeholders in all sectors expect to see the number of general healthcare nurse practitioners increase over the coming five years. The largest stakeholder group expects to see an increase of between 5% and 25%. While estimates in general medical practice vary widely, the largest stakeholder group does expect to see an increase. The number of general healthcare nurse practitioner FTEs has increased across all sectors by approximately 10% per year since 2012. The desire to improve healthcare quality, labour market factors, the changing healthcare demand and the issue of funding are all key factors driving healthcare organisations to hire and train general healthcare nurse practitioners. Inhibiting factors include the issue of funding and lack of familiarity with the profession. General practices are also facing practical obstacles, such as the lack of consultation rooms. The limited availability of nurses with a higher professional education background forms an impediment to the training of general healthcare nurse practitioners in the nursing home and intellectual disabled care sector.

Recommendations

We have supplemented the recommendations in this forecast with various suggestions for the Ministry of Health, Welfare and Sport and parties in the professional field.

Obstacles in general practice and elderly care sector

The implementation of these recommendations at an individual sector level will require further attention. General practice is currently not training enough general healthcare nurse practitioners to meet future healthcare demand. This sector is experiencing a disproportionate number of obstacles when it comes to hiring and training general healthcare nurse practitioners (and physician assistants). This mainly concerns obstacles in the area of funding. GPs feel that current funding by health insurers and the deployment of general healthcare nurse practitioners (and physician assistants) is inadequate, and view future funding as an uncertain factor. GPs and managers mentioned the following obstacles in relation to training: insufficient subsidies, limited time for training, lack of consultation rooms, uncertainty regarding future subsidies, insufficient training places and the perceived burdens of employership. They also mentioned the fact that few universities of applied sciences offer primary care training programmes.
General practice is currently experiencing growing labour market shortages. Views as to which healthcare professionals can be deployed most effectively alongside GPs also vary greatly. The necessary measures and/or investments should be discussed with parties in the field in order to ensure that sufficient healthcare professionals - including general healthcare nurse practitioners - are trained for general medical practice. A sector-wide labour market policy might help to prevent further worsening of the current labour market shortages.
The elderly care sector will need to recruit more nurses with a higher professional education background to independently generate higher intake in the general healthcare nurse practitioner training programme.

A future-proof training strategy
Regarding general medical practice and elderly care sectors, demand for nurse practitioners from specialist medical care sectors is affected by various developments. These include: the ageing population, providing the right care in the right place, elderly citizens living at home longer and the transition from secondary to primary care. The speed and scale of the transition is currently still uncertain, as is the amount of work that will ultimately be transferred to general healthcare nurse practitioners working in general medical practice. It remains to be seen whether sufficient general healthcare nurse practitioners trained in specialist medical care will transition to general medical practice and elderly care sector if demand partly shifts to these sectors.

The ACMMP recommends exploring whether more general healthcare nurse practitioners could be trained by a consortium of multiple sectors. This will require clear agreements on their deployment after graduation. General healthcare nurse practitioners trained in such an intersectoral context could then serve as a 'transmural bridge' between sectors and contribute to a new form of healthcare on the nexus between primary and secondary care, while supporting the current healthcare transition. Intersectoral training could also benefit general medical practice and the elderly care sector by eliminating some of the perceived obstacles to nurse practitioner training.

The transition to other sectors can also be facilitated through the provision of retraining programmes for qualified general healthcare nurse practitioners. Some stakeholders may also view the current lack of retraining programmes as an impediment to hiring nurse practitioners trained in other sectors.

Gradual implementation of the recommendations at sector level

General practice, the elderly care sector and other sectors currently require a disproportionally larger number of training places than the specialist clinical care sector. However, the specialist clinical care sector is still experiencing a shortage of general healthcare nurse practitioners. If current trends and intake levels remain unchanged, these shortages will be resolved within several years. These recommendations should be gradually implemented at an individual sector level, to prevent any abrupt fluctuations in training capacity and ensure a 'soft landing'.

Lack of familiarity with the professions

The forecasting calculations for the physician's assistant programmes ran parallel to the Recommendations for the General Healthcare Nurse Practitioner 2021-2024. Data collection made clear that the difference between the two professions is clear in most sectors at the policy and executive level. However, this is often not the case at shop floor, middle management and senior management level, where most decisions on the deployment of care professionals are made. As a result, there are major differences between (and within) healthcare organisations in terms of the types of tasks carried out by nurse practitioners and physician assistants. The resulting impact on the forecasts is explained in further detail in section 1.1 of the sub-report.

The development of a shared vision and clear collaboration agreements within multidisciplinary teams at sector, specialty and organisational level can ensure that the right professional is deployed in the right place. Also see Laurant & Van Vught (2018).[15]

[15] Laurant, M. & Van Vught, A. (2018). Profielen Physician Assistant en Verpleegkundig Specialist in de praktijk. Convergeren of divergeren? Nijmegen: Radboudumc and HAN University of Applied Sciences.

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