Unlimited exposure. The patient mix of GP trainees and their trainers: gaps, disparities, and active steering

de Jong, J.

Citation for published version (APA):

General rights
It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations
If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: http://uba.uva.nl/en/contact, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.
CHAPTER 1

General Introduction
General Introduction

This thesis concerns a series of studies into the patient mix of general practitioner (GP) trainees. In this introduction, first background information on the patient population of GPs and the GP specialty training is presented. Subsequently, the term ‘patient mix’ is defined and an important learning theory, deliberate practice, denoting the significance of patient mix, is presented. The need for obtaining a clear picture on the patient mix of GP trainees is discussed as is the identification of areas in which the patient exposure of GP trainees is low. The possible causes for low exposure are addressed. The possibility of actively steering the patient mix is introduced. Finally the aim, methods, and outline of the thesis are presented.

THE PATIENT POPULATION OF GPs IN THE NETHERLANDS

The Dutch health-care system is unique in the world. GPs in the Netherlands have a gatekeeper role, meaning patients cannot consult a specialist without being referred by their GP. A basic health-care insurance that covers care delivered by a GP is mandatory for all inhabitants. Dutch GPs therefore provide first-line, primary care to practically all inhabitants and, consequently, are confronted with a broad range of complaints and diseases (‘patient mix’). Out-of-hours care is mostly organized in GP cooperatives. Dutch GPs see patients with all kinds and stages of acute and chronic medical conditions, psychological disorders, and social health problems. These factors contribute to the fact that primary care epidemiology is highly different from specialized (secondary) care. Patients are registered with a permanent GP and consequently the continuity of the relationship between patient and doctor is an important aspect. Most patients prefer to consult their ‘own’ GP or GP practice whenever a new health problem arises.1

Due to the way in which the Dutch health-care system is organized, GPs see many different health problems and must therefore be competent in many areas. This is supported by the The Dutch College of General Practitioners (NHG) and the Dutch Association of General Practitioners (LHV) stating in ‘Health Care Supply General Practice 2009’ that GPs are capable of delivering a broad range of care.2

THE GP SPECIALTY TRAINING PROGRAMME

To become a fully licensed GP in the Netherlands, qualified medical doctors have to follow an intensive, 3-year training, at one of the eight GP specialty training institutes. In these 3 years, the competencies are acquired to work as a responsible,
Supervised work-based learning, gaining experience by seeing patients, is the core of the training. There is, however, no formal system to monitor patient mix, so the exact patient mix a GP trainee actually sees during surgery hours is not known. This means that the trainer and trainee as well as the training institute have no formal information about the number of patients, the gender and age distribution, or the types of patient health problems the trainees encounter. Both nationally\(^3\) and internationally\(^4-7\) (see Text box 1), the training institute and the GP trainer are regarded as being responsible for delivering a sufficient and adequate patient mix. For this, a clear view of the GP trainees’ patient mix is essential.

**DEFINITION OF PATIENT MIX AND PATIENT MIX MEASURES**

In order to obtain a view of the patient mix of GP trainees, a clear and workable definition of ‘patient mix’ has to be formulated. The first article with ‘patient mix’ in the title in Medline is a commentary by Edward Brandt Jr\(^8\) in 1974 on an article of McAllister and Dzur\(^9\) about the patient population in an acute medical care service. In this commentary, the author states that the ‘number of patients’ and the ‘types of medical problems’ are of prime importance and that clinical learning involves both quality and quantity. Of course, the issue of the health problems that
doctors in training are exposed to is much older, and numerous papers have been published following this quality and quantity or patient-volume and diagnosis-diversity approach.\textsuperscript{10-12}

In these papers, there is a large semantic overlap between the terms ‘clinical experience’, ‘clinical exposure’, ‘clinical encounters’ or ‘patient encounters’ and ‘case mix’ or ‘patient mix’. ‘Clinical exposure’ can be regarded as the umbrella term for clinical contacts of any kind. The term ‘patient mix’ inclines towards the description of the diversity of the exposure, focusing not only on variety or diversity, but also on quantity or volume. Because it is a more focused term than ‘clinical exposure’ or similar terms, it is the preferred term in this thesis.

Throughout this thesis patient mix is measured and a simple definition of patient mix measures (‘case mix’ in the publication) was formulated by Hutchinson.\textsuperscript{13} ‘A system of classifying ‘cases’ – patients, contacts, episodes, or visits – into groups which are similar according to some characteristic, such as diagnosis (e.g. International Classification of Diseases), treatment (e.g. OPCS operations codes), severity, potential for health-care improvements, or costliness.’

**DELIBERATE PRACTICE: THEORETICAL RELATIONSHIP BETWEEN PATIENT MIX AND LEARNING**

The way medical trainees acquire knowledge has been studied for many years and various theories have been developed. An important theory was postulated by K. Anders Ericsson, a Swedish psychologist and Professor of Psychology at Florida State University, USA.\textsuperscript{14} His ‘Deliberate Practice’ theory assumes that becoming an expert requires sufficient practical training in representative tasks and appropriate reflection which can be stimulated by feedback from coaches or trainers.\textsuperscript{15} He states that expert performance is different from normal performance and denies the more traditional theory assuming that achievable performance is limited by genetically determined talent. He argues that expert performance is reached by life-long deliberate training to improve performance in a specific domain and he describes training as a ‘highly structured activity explicitly directed at improving competence in a particular domain.’\textsuperscript{16} Deliberate practice is further specified by repetitive performance of intended cognitive or psychomotor skills in a focused domain, coupled with rigorous skills assessment, that provides learners with specific, informative feedback, resulting in increasingly better performance, in a controlled setting.\textsuperscript{15-17} Ericsson explicitly discussed the appropriateness of deliberate practice theory for the performance development of medical professionals.\textsuperscript{15}
Based on this, Duvivier et al.\textsuperscript{18} recently (2011) described medical training programmes as developed to overcome weaknesses and to improve competence. The level of competence must be monitored to provide cues for further improvement. Deliberate practice based (medical) training is not the repetition of activities but a focused approach aiming for well-defined learning goals.\textsuperscript{18} Within this framework, patient mix is an important training condition because it embodies the required representative tasks in the medical domain at issue onto which the desired competence can be practised. The patient mix offers different experiences on which reflection and assessment can be made by the trainee themself, by the trainer, or eventually, by an external preceptor.

**Text box 1.**

*International recognition of the importance of an adequate patient mix*

Patient mix has gained emphasis in the diverse accreditation standards of several countries.

*The World Federation for Medical Education (WFME), Postgraduate Medical Education WFME Global Standards for Quality Improvement.*\textsuperscript{5}

‘Training locations must have a sufficient number of patients and an appropriate case-mix to meet training objectives. The training must expose the trainee to a broad range of experience in the chosen field of medicine and, when relevant, include both inpatient and outpatient (ambulatory) care and on-duty activity. The number of patients and the case-mix should allow for clinical experience in all aspects of the chosen specialty, including training in promotion of health and prevention of disease.’

*Liaison Committee on Medical Education (LCME).*\textsuperscript{6}

‘Each course or clerkship clerkship rotation must identify any core experiences needed to achieve its objectives and ensure that students receive sufficient exposure to such experiences. Similarly, although the proportion of time spent in inpatient and ambulatory settings may vary according to local circumstances, in such cases the course or clerkship clerkship rotation director must ensure that limitations in learning environments do not impede the accomplishment of objectives.’
The placements within a training programme, combined with a range of other learning opportunities must, together, provide GP Specialty Registrars with exposure to a range of patients, clinical problems, training environments and training opportunities sufficient to deliver the GP curriculum and so equip them for a career in independent practice.

The trainer ensures that the trainee is exposed to patient-based and non patient-based activities, resulting in the development of the desired competences.

- **Level II** (beginner): guides the volume of the patient supply for the trainees on the basis of their competences.
- **Level III** (advanced): takes action to adjust the patient supply where necessary in terms of quantity and quality. Encourages the trainees to adjust the patient supply themselves as much as possible, together with the medical receptionist.
- **Level IV** (experienced): takes a pro-active attitude in order to ensure that the trainees are provided with the patient supply that meets the requirements of the practical learning plan.

**THE EMPIRICAL RELATIONSHIP BETWEEN PATIENT MIX AND LEARNING**

In the 1960s, medical education emphasized clinical problem-solving abilities as the fundamental, underlying skill to solve clinical problems, sometimes at the expense of teaching clinical knowledge. In 1978, Elstein found that the performance of doctors was not consistent in different problems. This phenomenon was called ‘case-specificity’. According to Wimmers et al., case-specificity is not solely the result of content knowledge but also of level of experience and level of case difficulty. Current theories assume case-specific knowledge is of predominant importance, so a voluminous and diverse clinical experience is crucially important for competence development.
According to these theories and the implications of the deliberate practice framework, it can be assumed that GP trainees benefit most from the training when their patient mix requires them to exercise tasks that are representative of their later work as a GP. Their patient mix should therefore be comparable to those of trainers or to the patient mixes they are later exposed to as fully licensed GPs.\textsuperscript{21-23} Such a similar patient mix enables them to practice all their learning goals over the full required spectrum. Empirical evidence about the precise contribution of patient mix for learning in the medical field seems inconclusive. Moreover, differences in the supervisory quality\textsuperscript{24;25} were found to be more predictive of learning than differences in patient mix were.\textsuperscript{26;27}

**GAPS AND DISPARITIES IN THE PATIENT MIX OF GP TRAINEES**

Earlier research suggests that the patient mix of GP trainees differs from that of their trainers. Studies addressing this found that the trainees’ patient mix consisted of more minor illnesses and fewer psychosocial, chronic, and severe conditions compared with their trainers, demonstrating low exposure to important health conditions.\textsuperscript{22;23;28-42} It is questionable whether trainees can build sufficient competence in low exposure areas because there may be too little repetitive training and reflection opportunities. Other differences found in previous studies considered circulatory, metabolic, skin, eye, ear, and respiratory diseases.\textsuperscript{22;33;35;36;38} These studies, however, are relatively old,\textsuperscript{22;28;33-38;41} were small scale (n=8),\textsuperscript{22} or even case studies (n=1),\textsuperscript{22;33;35;38;40;41} and often covered short periods (≤4 weeks).\textsuperscript{23;30;34;36} A larger study over a longer period had not been done recently.

**REASONS FOR THE DISPARITIES:**

**PATIENT ATTITUDE AND THE MEDICAL RECEPTIONIST**

Various factors may contribute to the gaps and disparities in the patient mix of GP trainees. Some are associated with unchangeable factors, such as the geographic location of the training practice, its proximity to an emergency unit, and the gender and age distribution as well as the social class of the population. Patients’ preference for seeing their GP instead of the trainee can also cause gaps in the patient mix of the trainee. In a literature review by Bonney et al.,\textsuperscript{43} four aspects that were relevant to the patients’ preference were distinguished. The first was patient acceptance of being treated by trainees. The acceptance of trainees is generally high. Patients expressed
an altruistic attitude to being involved in training the doctors of the future. Exceptions were older patients or patients with chronic disease or patients with personal or emotional concerns. The second aspect was the patient attitude towards continuity of care. Patients seeing trainees valued follow-up, involvement, and accessibility by their usual GP. The third aspect was patient trust. Trust levels for residents were reported to be high, but older patients had reduced trust in them. An association was found between continuity of care, patient trust, and satisfaction. Trainees spend a limited period in the training practice and therefore have limited time to build trust, and it is unlikely that they can establish the level of trust their trainers receive. Patients may have ‘institutional trust’ which is trust in the medical facility carried over to include trust in the staff of the facility. The fourth aspect was the desire for meaningful communication. This concerns the problems with communication with the trainee, the understanding of the role of doctors in training, and the communication around transfer of care. Patients with chronic illnesses, in particular, were found to value the personal continuity with a regular GP.

Whereas patient attitudes towards trainees has been extensively studied, the influence of the assigning behaviour of the medical receptionists on the patient mix has not. In the Dutch situation, patients are registered with a permanent GP and trainees mainly encounter patients registered with their trainer. Patients usually make appointments by telephone or at the desk and receptionists may ask for the reason for the consultation and any preference for a consultation with either the trainer or the trainee. With this information in mind, the receptionist assigns the patient either to the trainer or the trainee. Obviously, receptionists also consider the urgency of the problem in combination with the doctors’ schedules, existing arrangements regarding assigning, the availability of walk-in hours, and unbooked surgery for emergencies. Their considerations when assigning patients were unknown.

STEERING THE PATIENT MIX OF TRAINEES
In order to solve the gaps in GP trainees’ patient mix and eventually to reduce the disparities between trainees and trainers, several authors have suggested that more balance can be obtained by steering the patient mix in a desired direction. Steering patients can also be desirable when an individual trainee needs more exposure to meet a specific learning goal. Adam and Oswald proposed steering by instructing medical receptionists. This has several practical difficulties, for instance,
because patients are free to choose a doctor and, as stated before, do not always wish to consult trainees.\textsuperscript{49,50} Trainees and trainers have influence on the patient mix as well. For instance, they will ask patients to return for follow-up consultations, or they can start to hold surgery hours in an old people’s home or start consultation sessions for diabetic patients. The active steering of the patient mix of GP trainees by instructing medical receptionists, trainees, and trainers, whether this is possible, and whether this would have a beneficial effect on learning, had never been studied.

**USING DATA DERIVED FROM ELECTRONIC PATIENT RECORDS TO OBTAIN A CLEAR VIEW OF THE PATIENT MIX OF GP TRAINEES AND THEIR TRAINERS**

To obtain a detailed overview of the patient mix trainers and trainees are exposed to, data on patient contacts, such as the diagnosis, the contact type (consultation, home visit), and age and gender of the patient are needed. These data can be obtained in interviews or in questionnaires, or recorded in a hand-written, optically scanned, or electronic logbook. A logbook is usually a card or a paper or electronic form which is completed after a patient contact. In a recent review, Denton concludes that logbooks currently in use have insufficient reliability or validity.\textsuperscript{51} Other authors found electronic logbooks to be more effective and accurate\textsuperscript{52} than handwritten logbooks, because the latter are more prone to underreporting.\textsuperscript{53,54} Data extractions from electronic patient record (EPR) systems have been proven to be valid for providing insight into the patient mix of medical students and GP trainees.\textsuperscript{52,55-58} They also respond to almost all of Denton’s recommendations for the ideal logbook,\textsuperscript{51} apart from the fact that these recommendations were formulated for students in a clerkship.

**ICPC CODING**

In the Netherlands, most GPs keep detailed EPRs, including a standardized system of diagnosis codes: the International Classification of Primary Care (ICPC). Stimulated by the NHG, all EPR systems now include the ICPC-1 codes. This allows uniformity in descriptions of the patient mix. The World Health Organization (WHO) has accepted ICPC-2 within the Family of International Classifications (WHO FIC) and users may use it as a diagnostic classification for primary care or general practice, wherever applicable.\textsuperscript{59} The differences between ICPC-1 and ICPC-2 with regard to diagnosis codes are minor. ICPC-2 has never been implemented in the Netherlands.
The validity of morbidity coding has been extensively studied.\textsuperscript{60-65} Comparison of 52 British studies in a systemic review by Thiru et al.\textsuperscript{60} was hampered due to the lack of standardized methods for assessment of EPR data quality.\textsuperscript{50} However, the studies consistently reported completeness, indicating that the EPR data were valid. Another review by Jordan et al.\textsuperscript{66} gives an overview of the completeness and correctness of computerized general practice medical records in 24 studies; in this review, a consistent finding was that the quality of morbidity recording varied, probably caused by differences in the distinctiveness of diagnosis.

In the GP specialty training, trainees are taught that providing each contact with an ICPC code is the desired standard. It may be assumed that the completeness of the ICPC codes in the trainees’ EPR contacts are high. Still a small but meaningful part of the contacts may not have been coded, which may, even nowadays, in an educational setting, account for structural bias of the patient mix description. The coding performance of the trainees and the trainers is not known, neither are their opinions about coding, or the barriers they encounter.

**THE AIM OF THE PRESENT STUDY**

The aim was to answer the following research questions.

1. What is known about the relationship between patient mix and learning in work-based clinical settings?
2. What is the relationship between the barriers to ICPC coding of GP trainees and trainers and their self-reported and actual coding performance?
3. What patient mix do GP trainees encounter in GP training practices and what are the differences in patient mix between first-year and third-year GP trainees?
4. What are the differences in patient mix between trainees and trainers?
5. Which assigning behaviour do receptionists report?
6. Is it possible to intentionally steer trainees’ patient mix?
7. Does greater exposure contribute to better learning?

**METHODS**

The CASANOVA (CASe AssigNment fOr GP VocAtional training) project was started in a cohort of 73 training practices in the Netherlands. In these training practices, the patient mix was assessed by EPR data extractions. First a pilot was done in Almere, in 2007, in 16 practices which learned that data processing by using the statistical modules within the EPR did not give the desired result and data
processing software outside of the EPRs had to be developed. Data were collected between March 2008 and February 2010. Sixty-two training practices were included for a full year, and 11 were included for 9 months, as this was the length of the trainees’ secondment. Each trimester, data were obtained by the GP trainers or by the researchers. The data from the first 6 months of each training practice were used for the baseline registration (Research Questions 3 and 4). The baseline registration of third-year trainees that were enrolled for 9 months was reduced to 3 months. Over the next 6 months, a randomized controlled trial was carried out addressing the effects of steering the patient mix. The practices were randomized into two arms. In the intervention arm, the patient mix was actively steered by instructing the medical receptionist, the trainer, and trainee. The instruction was to assign more skin diseases in the first steering trimester and more psychosocial conditions in the second. First-year trainees who were enrolled in the study for 9 months only participated in the first intervention period. Learning outcome was measured by study-specific, self-assessment questionnaires and an online knowledge test. In addition, the supervision quality of the trainer was measured. ICPC coding behaviour of the GP trainers and trainees was assessed in a study-specific questionnaire as was assigning behaviour of the medical receptionists. During the study project, a Best Evidence in Medical Education (BEME) systemic literature review was done on the relationship between patient mix and learning in work-based clinical settings.
CHAPTER 1

OUTLINE OF THIS THESIS

**Chapter 2** addresses the relationship between patient mix and learning in work-based clinical training settings in a systematic review (Question 1).

**Chapter 3** addresses the barriers the GP trainees and trainers face in their daily clinical work as perceived to ICPC coding. Barriers that affect coding performance and specific situations prone to non-coding are identified. The results of a questionnaire survey are compared with the outcome of coding percentages measured in the EPR extractions (Question 2).

In **Chapters 4 and 5**, a cohort study of 73 training practices is described. Data were collected using the EPR of the GP training practices. Chapter 4 describes the patient mix of GP trainees and differences between the first and the third training year are investigated (Question 3); and Chapter 5 identifies the differences between the patient mix of GP trainees and their trainers. Gaps and disparities between these patient mixes are examined (Question 4).

**Chapter 6** concerns the role of the medical receptionists in the composition of the patient mix of GP trainees and their trainers. The assigning behaviour of the receptionists was evaluated by qualitative (focus group) and quantitative (questionnaire) methodology. The aim was to obtain a better understanding of the role of receptionists with respect to the composition of the patient mix of the GP trainee (Question 5).

**Chapter 7** describes a randomized controlled trial in which the patient mix of the GP trainees was actively steered by instructing the medical receptionists, the trainer, and trainee. Outcome measures were both the influence of steering on the patient mix (Question 6) and on learning outcomes (Question 7). To measure these learning effects, self-assessment questionnaires (self-efficacy) and an online knowledge test (psychiatric knowledge) were developed.

**Chapter 8** discusses the results of the study. Implications for the GP specialty training and for future research are indicated.

Finally in **Chapter 9**, a summary is presented.
REFERENCES

2. Health Care Supply General Practice 2009 [Aanbod Huisartsgeneeskundige zorg 2009]. Dutch College of General Practitioners (NHG) and Dutch Association of General Practitioners (LHV).
6. Liaison Committee on Medical Education (LCME). Functions and Structure of a Medical School. Standards for Accreditation of Medical Education Programs Leading to the M.D. Degree. http://www.lcme.org/standard.htm
Unlimited Exposure


57. Nierenberg DW, Eliassen MS, McAllister SB, Reid BP, Pipas CF, Young WW et al. A web-based system for students to document their experiences within six core competency domains during all clinical clerkships. Acad Med 2007; 82:51-73.