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Psychosocial Working Conditions and Well-being of
International Medical Graduates in Australia: Evidence
from the MABEL longitudinal survey

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Abstract

Background: Shortages and maldistribution of medical practitioners, particularly in rural and remote areas, are some of the major challenges besetting health systems worldwide. In its primary attempt to offset these problems, Australia, like a range of high-income countries such as Canada, New Zealand, UK, and the USA, has been actively recruiting doctors from overseas to work in underserved areas. These international medical graduates (IMGs) represent an important segment of the Australian medical workforce, accounting for over 30 per cent of the active doctor population, with higher proportions in regional and remote locations. Over the last two decades, Australia has been drawing its IMG workforce from highly diverse source countries e.g. the UK, Ireland, India, Sri Lanka, Bangladesh, China, Egypt, Iran, and Zimbabwe, most of which differ markedly from Australia on the bases of language, culture, epidemiological profile and the quality of medical training and technology. Additionally, Australia has more recently been implementing policies to increase self-sufficiency of the medical workforce, which has implications for the career opportunities for IMGs in Australia. Since the turn of the second millennium, a substantial body of literature has developed on the experiences and migration outcomes of IMGs in Australia and other Organisation for Economic Co-operation and Development (OECD) countries. But within that body of literature, as confirmed in the scoping review presented in [Chapter 3](#) of this thesis, few have attempted to study how IMGs rate the general quality of their lives amidst their changing professional and social circumstances. In that context, the overarching goal of this thesis was to add and extend this scarce literature by investigating the effect of changes in the psychosocial conditions of IMGs on their general life satisfaction (subjective well-being or SWB) in Australia. Within this, the three broad research aims were 1) to investigate the difference in SWB and its drivers between international and domestic medical graduates

(DMGs), 2) to examine the effect of changes in working conditions on the SWB of IMGs relative to DMGs and 3) to explore the effect of recent regulatory changes on the SWB of IMGs.

Methods: The thesis used eight waves of survey data from the Medicine in Australia: Balancing Employment and Life (MABEL) longitudinal study of Australian doctors from 2009 to 2016. It applied standard econometric panel regression models to address the research aims in three separate chapters (i.e. Chapters 4–6). The thesis relied upon the theory of ‘Job Demands-Resource (JD-R)’ model of Demerouti, Bakker et al. (2001) to define and operationalise work-related psychosocial risk factors into components of job demands and job resources.

Results: Chapter 4 addressed the first aim of the thesis by examining any subjective well-being (SWB) difference and its drivers between the IMG and DMG groups using the Oaxaca and Ransom’s (1994) linear decomposition method. The results showed that the IMG group was more likely to report lower SWB than DMGs ($p\text{-value} < 0.001$). The well-being gap (of 0.101) was small and largely attributable to the groups’ differences in observable characteristics such as psychosocial and demographic factors. Most notably, the IMG group was worse off with respect to self-reported financial security, exposure to work-related psychosocial risk factors, and community integration. These results therefore highlight the importance of the workplace and community context in understanding the well-being difference between IMGs and DMGs.

Chapter 5 addressed the second aim of the thesis. Using a fixed effect linear regression analysis, it examined the effect of changes in psychosocial conditions on changes in SWB of IMGs and tested whether the estimated effect sizes differed between IMG and DMG groups, and within IMGs by key subgroups. Results indicated that exposure to high work-related psychosocial risk factors and a low sense of community integration were associated with statistically significant declines in SWB among study participants ($p\text{-value} < 0.01$). However, no statistically significant differences in the estimated effect sizes were observed between IMG and DMG groups. Within the IMG sample, the effects varied by arrival cohort, country of

training, and specialty. In particular, and unsurprisingly, the SWB of the newly settled group of IMGs (<10 years) appeared to be more affected by poor peer support and a low sense of community integration, compared to their long-established (>10 years) counterparts. Counter-intuitively however, the SWB of relatively advantaged IMGs from majority English-speaking Commonwealth countries (e.g., the UK, Republic of Ireland, Canada) showed stronger declines under low job control (autonomy) than their non-majority English-speaking counterparts. Furthermore, compared to specialist IMGs, the SWB of hospital non-specialists from all socio-linguistic groups was more affected by exposure to excessive psychological and physical workloads. Collectively, these results demonstrate the importance of psychosocial risk factors to the general well-being of medical doctors, with specific IMG cohorts at particular risk. Notably, the results confirmed the importance of addressing the support needs of newly settled IMGs for an extended period, often to date restricted to initial employment in workforce shortage areas of Australia.

Chapter 6 addressed the third research aim by examining the impact of a specific policy changes on IMGs' well-being and labour supply decisions. Using a random effect model with a difference-in-differences (DiD) estimator, this chapter explored the heightened risk of de-registration of recently arrived IMGs when announcements made by the Medical Board of Australia in 2013 reinforced the policy of de-registration if Australian Medical Council (AMC) clinical exams had not been passed within 3 years. Results revealed a statistically significant increase in hours spent on educational activities and an accompanying decline in the level of SWB among limited registrants. These results suggested the relevance of regulatory actions on the behaviour and well-being of IMGs. Thus, while registration decisions in Australia are often made on the basis of public protection, there is a need to closely monitor how such decisions might be impacting the well-being of the targeted professionals.

Implications: Overall, the findings provided novel empirical evidence relating to the experiences of IMGs in Australia, measured by their SWB, with important stratifications highlighting the diverse experiences and psychosocial needs of this highly heterogeneous group. Ensuring a conducive psychosocial work environment can be useful in promoting the general well-being of medical practitioners, especially IMGs who still remain an important part of Australia's medical workforce.

Declaration

This is to certify that:

- the thesis comprises only my original work towards the PhD except where indicated in the preface;
- due acknowledgement has been made in the text to all other material used; and
- the thesis is fewer than 100,000 words in length, exclusive of tables, figures, footnotes, the reference list, and appendices.

Preface

This thesis report includes my original research works in Chapters 4 through 6, during my enrolment as a higher degree research candidate. I am fully responsible for the execution of all the works put into this thesis, with the guidance of my able supervisory team. The report was organised in accordance with the Graduate Research Training Policy of the University of Melbourne.

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I would like to express my sincere and profound gratitude to my three able and dynamic supervisors, Professor Lesleyanne Hawthorne, Professor Anthony Scott and Assoc-Professor Matthew McGrail for their unremitting support and guidance throughout my candidature. Thank you for always being there whenever I needed your support and expertise, I must say without you this work would not have been possible. I have learnt a lot from all of you and cherished every bit of the moments we shared together.

I am thankful to the Commonwealth Government of Australia for providing me with the scholarship to pursue my career dreams.

I owe my wife and family an enormous debt of gratitude for their invaluable support and understanding over the years. Sincere thanks to all my friends as well for according to me their moral support and exciting company.

Last but by no mean the least, I would like to acknowledge that my thesis was entirely based on data from the MABEL longitudinal survey of Australian doctors, jointly conducted by the University of Melbourne and Monash University (i.e., the MABEL research team). Funding for MABEL was provided by the National Health and Medical Research Council (2007 to 2016: 454799 and 1019605); the Australian Department of Health and Ageing (2008); Health Workforce Australia (2013); The University of Melbourne, Medibank Better Health Foundation, the NSW Department of Health, and the Victorian Department of Health and Human Services (2017); and the Australian Government Department of Health, the Australian Digital Health Agency, and the Victorian Department of Health and Human Services (2018). The study was approved by The University of Melbourne Faculty of Business and Economics Human Ethics Advisory Group (Ref. 0709559) and the Monash University Standing Committee on Ethics in Research Involving Humans (Ref: 195535 CF07/1102 – 2007000291). The MABEL

research team bears no responsibility for how the data has been analysed, used or summarised in this [research/publication/presentation*]."

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1 Introduction

This chapter provides a general introduction to the thesis research. In section 1.1, it presents a broader statement of the research background and motivation. After establishing the key empirical justification for the thesis, the chapter proceeds in section 1.2 to outline the research aims then in section 1.3, it highlights the general significance of thesis and concludes in section 1.4 with an outline of the thesis structure.

1.1 Background and motivation

The outcomes of migration decisions for individuals and economies has been a major source of political debate ([Laczko and Appave 2015](#)). For centuries, individuals have been crossing national borders in search of a better quality of life for themselves and their families. Countries have varying levels of migrant intakes and emigration, depending on economic and political conditions. Many countries – largely high-income nations — encourage high skilled migration to fill labour shortages in specific areas of services, such as medicine ([Siyam and Dal Poz 2014](#)). Though there may be jobs for some of these migrants, disruptions in established social relations ([Gupta 2013](#)), as well as cultural and linguistic barriers ([Rumsey, Thiessen et al. 2016](#), [Woolf, Rich et al. 2016](#)) may impede their progress and wellbeing. The overarching question this thesis seeks to address is, what is the effect of changes in psychosocial conditions (work and social circumstances) on the ‘subjective well-being’ (SWB) of overseas or internationally trained doctors who have migrated to Australia?

Like its global competitors for skills such as Canada, New Zealand, Republic of Ireland, UK and the USA, Australia has long been a major destination for migrant health professionals, particularly doctors and nurses, due to its high standard of living, generous welfare arrangements, political and economic stability ([Arnold and Lewinsohn 2010](#)). In 2016, more than 30 per cent of medical practitioners in Australia were initially trained overseas ([Department of Health Australia 2016](#)), a proportion that

exceeds the current OECD¹ average of 17 per cent ([OECD 2017](#)). For the past decades, Australia has been relying on international medical graduates (IMGs) as part of efforts to address shortage and maldistribution of its medical practitioners, particularly in rural and remote areas, that are often less attractive to local or domestic medical graduates (DMGs) ([McGrath, Wong et al. 2011](#)). Though IMGs have been critical to the Australian government's rural health workforce program ([Rural Health Workforce Australia 2016](#)), the level of reliance on these doctors has been evolving over time with changing immigration and health workforce policies ([Birrell and Hawthorne 2004](#), [Department of Immigration and Border Protection 2017](#)). These changing contexts of IMGs' policy environment are described in detail in Chapter 2 and explored empirically in Chapter 6.

The successful integration of IMGs into the Australian healthcare system has been a major political interest. The professional challenges encountered by these doctors are well-documented ([House of Representatives Committee Australia 2012](#)). Existing evidence suggests that integration into the Australian society and clinical care setting can be highly stressful for some of the IMGs particularly those coming from countries that are markedly dissimilar to Australia with respect to medical training, technology, culture, language and epidemiological profiles ([Birrell and Schwartz 2007](#), [Kehoe, McLachlan et al. 2016](#)). Cultural and linguistic differences can make communications with patients and colleagues difficult which may also impede the speed of their workplace integration even once registration and employment are gained. Furthermore, mandating of these doctors to work in rural and remote areas ([McGrail, Humphreys et al. 2012](#)) exposes some of the IMGs to socio-cultural isolation, and inadequate social and professional support ([Hawthorne, Birrell et al. 2004](#), [Kalra, Bhugra et al. 2012](#)). Additionally, those coming from less technologically advanced settings or countries that have very different disease conditions as Australia ([Birrell and Schwartz 2007](#), [Kehoe, McLachlan et al. 2016](#)) may face serious dilemmas while trying to adjust to the Australian clinical care environment. This may even be compounded if the IMG is employed on a limited registration basis and expected to

¹ The Organisation for Economic Co-operation and Development (OECD)

fulfil the requirements of achieving full registration (e.g. passing clinical exams) to avoid being de-registered. These challenges coupled with the daily stress of medical practice ([Kakunje 2011](#), [Kuusio, Heponiemi et al. 2012](#)) may have some negative implications on the general well-being of these doctors.

Well-being — the optimal mental experience and functioning ([Ryan and Deci 2001](#)) — is a fundamental aspect of human aspiration. For the past five decades, social scientists such as psychologists, sociologists, economists, and health scientists have demonstrated a strong interest in understanding the nature of human well-being. Within the same period, the scientific study of ‘subjective well-being’ (SWB) or ‘self-reported well-being’ or ‘subjective quality of life’ has advanced overwhelmingly as an interdisciplinary field ([Diener, Lucas et al. 2018](#)). The term SWB reflects how individuals perceive and evaluate the overall quality of their lives. It sums up the degree to which a person rates his or her current life situation as good and desirable vs. undesirable and poor ([Diener, Pressman et al. 2017](#)). The single-item general life satisfaction scale (1 to 10) is one of the most widely used and reliable measures of SWB ([Kahneman and Krueger 2006](#), [Fischer 2009](#), [Diener, Inglehart et al. 2013](#)). It has been found to correlate with a number of dispositional and situational factors (e.g. optimism, extraversion, socio-economic and demographic characteristics) as well as some volitional or intentional activities such as engagement in meaningful social relations and support, and goal pursuit ([Lyubomirsky, Sheldon et al. 2005](#), [Lyubomirsky, Dickerhoof et al. 2011](#)).

The SWB construct has been used as an outcome variable in a wide range of studies, for instance, in migration studies for determining how migrants are faring in host societies ([Obućina 2013](#), [Angelini, Casi et al. 2015](#), [Bak-Klimek, Karatzias et al. 2015](#), [Laczko and Appave 2015](#), [Kóczán 2016](#)), and in public policy analyses for examining the impact of policy interventions on people’s quality of life ([Fischer 2009](#), [OECD 2013](#)). In the health care sector, health services researchers have long espoused the SWB construct as a measure for patients’ perceived quality of life ([Brock 1993](#)), particularly, following some diagnostic and treatment interventions. It was not until recently however that researchers began to show some interests in the SWB of medical practitioners ([Nylenna, Gulbrandsen et al. 2005](#),

[Buddeberg-Fischer, Klaghofer et al. 2008](#), [Tyssen, Hem et al. 2009](#), [Mahmood, Grotmol et al. 2018](#)).

The issue has been attracting empirical interests owing to the growing recognition of the importance of doctors' well-being to their retention as well as the quality of care they provide, which has some implications for health systems worldwide ([Wallace, Lemaire et al. 2009](#), [West, Dyrbye et al. 2014](#)). Nevertheless, there is a small but growing literature on the subject, but most of the studies are cross-sectional and largely conducted in the European region.

Most surprisingly, the existing literature on doctors' SWB has largely overlooked the specific experiences of minority groups including IMGs. This seems to confirm the claim made by [Myers and Gabbard \(2009\)](#) that ["... there has been a tendency in the field of physician health to study and treat physicians as though they were a unitary entity (with the exception of gender)"]. Beyond the medical literature, the contemporary global migration literature ([Obućina 2013](#), [Angelini, Casi et al. 2015](#), [Bak-Klimek, Karatzias et al. 2015](#), [Laczko and Appave 2015](#), [Kóczán 2016](#)) has also been devoid of any health sector-specific data. Hence, with the scarcity of empirical data, we know little about how IMGs appraise the overall quality of their lives in destination countries, how the level of their SWB compares with that of their corresponding DMGs and the extent to which their SWB is affected by the changing context of their recognition and professional experience. Within this context, this thesis uses a nationally representative longitudinal survey data from Australia to explore the SWB of this important group.

1.2 Research Aims

The overarching question posed in this study is: what are the effects of changes in psychosocial conditions of IMGs on their subjective well-being (general life satisfaction) in Australia? Under this, the broad research aims are to:

1. To investigate SWB difference and its drivers between international and domestic medical graduates,
2. To examine the effects of changes in working conditions on the SWB of IMGs relative to DMGs,

3. To explore the effect of regulatory changes on the SWB of IMGs.

1.3 Significance of the thesis

Addressing these research questions has the potential to add value to our understanding of how IMGs are faring in Australia and the main correlates of their SWB. The well-being of medical practitioners is also argued to be essential not just to their own personal satisfaction but also relevant to the quality of patient care ([Wallace, Lemaire et al. 2009](#), [West, Dyrbye et al. 2014](#)). For IMGs in particular, their well-being is critical to the success of recruitment programs as was succinctly stated by [McGrail, Humphreys et al. \(2012\)](#):

[... IMGs are currently filling a critical shortage in rural areas of Australia long-term success of this policy is problematic unless outstanding issues affecting their significantly reduced professional and non-professional satisfaction can be addressed].

Given the limited nature of empirical data on the SWB of IMGs across all major destinations, this thesis has the potential to contribute to the current literature in a range of ways. First, it is designed to extend the existing knowledge on subjective well-being in a culturally diverse medical workforce taking Australia as a highly relevant research site. Second, it will offer new insight into understanding the key factors associated with well-being differences between international and domestically trained doctors. Third, it will provide the first longitudinal evidence demonstrating the effects of changes in professional experiences on the general well-being of IMGs relative to DMGs. Finally, it will also provide the first empirical evidence that suggests the importance of registration decision making to the general well-being and labour supply of IMGs.

1.4 The general outline of the thesis

This thesis is organised into seven separate chapters including this introduction (Chapter 1). Next, [Chapter 2](#) aims to provide an overview of the policy context of the thesis. It starts by briefly defining

issues related to Australia's healthcare system and medical workforce before proceeding to discuss the dynamics of Australia's reliance on IMGs.

[Chapter 3](#) discusses the concept of well-being, its theoretical perspectives and empirical measurements. It then proceeds to review the current global literature on the well-being of IMGs in high-income countries (HICs) including Australia with the aim of locating the thesis within a scholarly context. In particular, this chapter conducts a scoping review designed to identify, collate and synthesise current literature on levels and determinants of satisfaction—with job and life—among IMGs in high-income countries published since 2006. Key research gaps are identified, leading to the definition of three principal research questions.

Building on the current literature, [Chapter 4](#) addresses the first research question of the thesis by investigating and comparing SWB and its drivers between international and domestic medical graduates. This chapter thus serves as the first empirical analysis of the thesis and attempts to demonstrate how IMGs rate the overall quality of their lives compared to their DMG counterparts.

[Chapter 5](#) provides the second empirical analysis of the thesis. Given the dearth of longitudinal data on SWB of IMGs, this chapter examines the effects of year-on-year changes in working conditions on the SWB of IMGs relative to DMGs. More specifically, the chapter seeks to quantify the extent to which individuals' life satisfaction ratings correlate to changes in their working conditions.

[Chapter 6](#) addresses the third research question of the thesis by investigating the effect of a key recent registration decision (by the Medical Board of Australia) on the SWB of IMGs specifically. In line with the overarching goal of the thesis, this chapter seeks to examine the effect of IMGs' professional experiences on their well-being by focusing primarily on changes in their regulatory environment.

Finally, [Chapter 7](#) presents a summary of the thesis findings and discuss their contributions and implications for the workforce policies and programs. It also identifies the main limitations of the thesis and concludes by exploring areas of future research.

2 Australia's Health System and Medical Workforce

The previous chapter presented the rationale for the thesis and the fundamental issues it seeks to address. But to understand and appreciate how international medical graduates rate their life situations in Australia, first, it may be essential to understand the broader context in which they work, including notably, their overarching regulatory environment. This chapter aims to provide a general description of this context. In section 2.1, it describes relevant aspects of Australia's health care system which is then followed with a discussion of the country's medical workforce (Section 2.2). After a discussion of Australia's medical workforce and select challenges, the chapter proceeds in section 2.3 to assess the policy phases of Australia's reliance on IMGs over the last four decades.

2.1 Background of Australia's health system

2.1.1 What is a health system?

In 2004 the [World Health Organization \(2004\)](#) defined a health system or health care system as a network of people, organisations and resources that interact and operate as a whole with the primary purpose of providing healthcare and improving population health. A health system is an open system, hence, considered to be capable of interacting with the external environment and liable to affect or be affected by it ([Gray 2017](#)). Health systems differ in their structure depending on governments. For instance, some health systems are structured based on the 'welfare state model' where the state takes full responsibility to provide tax-funded healthcare services to citizens. This type of model provides relatively free healthcare services to all citizens. An example of this type of health system is the National Health Service (NHS) of the United Kingdom. Other health systems are based on a 'market-model' where individuals and private institutions are responsible for purchasing their own healthcare. An example of countries with a market-based health system includes the USA ([Willis, Reynolds et al. 2016](#)).

2.1.2 Australia's universal health system

Australia is known globally for its high-quality public health care system and generous welfare arrangements. It is ranked among the top 10 nations for highest life expectancy worldwide ([Geoba.se 2019](#)). Self-perceived health and well-being reports suggest that Australia's population currently enjoys a high level of health status which reflects the quality of its health care system ([Department of Health Australia 2019](#)).

The Australian health system is also a 'mixed-model' comprising both public welfare and private or market-based systems ([Willis, Reynolds et al. 2016](#)). It is a complex open system with a multifaceted network of funders and providers involving all levels of government — federal, state/territory and local governments — as well as private (for-profit and not-for-profit) organisations ([AIHW 2018](#)). The health system is structured around three tiers of care ([WHO 2017](#)) namely: preventive services, primary and community health care, and specialist and acute care, diagnostic tests and medications.

Preventive services are those basic services performed by healthcare professionals that help to detect, delay or prevent the onset of illness. They include health education and promotion, immunisation and screening programs. Primary and community health care represents the first level of the care process. It helps the initiations of early interventions to care, manage and prevent disease progression. Services at this level are often provided by general practitioners (GPs), nurses, dentists and other allied health professionals. At this level, GPs act as gatekeepers, referring patients when necessary for specialist care.

Specialist and acute care represent the highest level of care. Referrals from the primary and community level of care are managed here. This level of care is mainly provided in public or private hospitals, private consultations and associated specialist providers. Services provided include but by no means limited to medical and emergency services, surgical operations and care, rehabilitation and palliative care.

At each level of care, services are provided either in a public or private health care system. The federal and state governments are responsible for running the overarching public health care system whereas private organisations (largely funded by private health insurance premiums) are responsible for funding and coordinating private hospitals and health insurance. The Australian federal government provides the overall stewardship of the health system (public and private sector). Its specific responsibilities include but not limited to providing funding supports for three key national subsidy schemes namely: the national universal health insurance scheme known as the ‘Medicare’; the Pharmaceutical Benefit Scheme (PBS), which — together with the Medicare — subsidise the costs of private medical services and prescription medicines for all eligible Australians; and the Australian Government rebate on private health insurance, which subsidises for eligible residents to choose and maintain private health insurance ([WHO 2017](#), [Department of Health Australia 2019](#)). The federal government is also responsible for the training and distribution of health professionals across the country. However, it has shared responsibilities with states when it comes to matters such as regulation of health professionals, responding to health emergencies (e.g. disease outbreaks) and funding of public hospitals. For a comprehensive list of roles played by the federal government and states —the subnational governments — see **Table 2.1** below.

Table 2-1: Distribution of key health responsibilities for national and state levels of government

NATIONAL	■ Medical, dental and pharmaceutical benefits
	■ Private health insurance subsidies
	■ University training places for health workers
	■ Vocational training and support
	■ Health workforce distribution programmes
	■ Health and medical research
	■ Various indigenous health programmes
	■ Various public health programmes
	■ Various health protection programmes, including quarantine
	■ Funding to states for service delivery, public hospitals and capital infrastructure
	■ Regulatory responsibilities
	■ Leadership in developing and promoting strategies to tackle significant health issues
SUBNATIONAL	■ Public hospital management and administration
	■ Specialist mental health services
	■ Ambulance services
	■ Primary health care
	■ Public dental services
	■ Community health
	■ Environmental health
	■ Other public health services
	■ Assistance in training health workers through clinical training in public hospitals
	■ Regulation of private hospitals

Source: [WHO \(2017\)](#): *Australia - Country Cooperation Strategy 2018–2022*

Medicare is the foundation of Australia’s universal public healthcare system ([Department of Health Australia 2019](#)). Established by a Labor government in 1984 following a precursor, Medicare operates on the principle of universal access ([Willis, Reynolds et al. 2016](#)). It enables access to free or low-cost medical services for all Australian citizens and permanent residents as well as refugees and some overseas visitors — from countries having reciprocal healthcare agreements with Australia ([Dixit and Sambasivan 2018](#)). The Medicare is funded through the general taxation revenue and contributions paid by individuals through a Medicare levy of 2% on taxable income. A Medicare Levy Surcharge (MLS) of 3.5% on taxable income is imposed on individuals whose earnings are above a certain threshold but failed to purchase private health insurance cover. Thus, the aim of the MLS is to encourage the use of private health insurance which could help to offset pressure on Medicare. Both the Medicare levy and MLS account for about 20% of the government’s public health care budget ([Willis, Reynolds et al. 2016](#)). Between 2006–07 and 2015–16, the government’s spending on health has increased significantly in real terms from 113 billion to 170 million an increase of 50% ([AIHW](#)

[2018](#)). However, comparatively, recent OECD statistics report ([OECD 2017](#)) show that health spending as a percentage of gross domestic products (GDP) is lower in Australia (9.6%) compared to the USA (17%), Canada (10.6%), and the UK (9.7%), but above New Zealand (9.2%).

Medicare provides a comprehensive package that covers all levels of care. The three main components of Medicare are medical services, public hospitals, and medicines. Medicare covers all costs of public hospital services and some or all of the costs of other health care services including services provided by GPs and medical specialists, as well as by physiotherapists, community nurses and basic dental services for children ([Department of Health Australia 2019](#)). The range of services subsidised by the Government under Medicare is listed and published as the 'Medicare Benefits Schedule' (MBS). Each service listed in the MBS has an item number and a specified Medicare schedule fee. Under the current arrangement, medical doctors (or GPs) who bulk bill, charge their patients only the Medicare schedule fee and are directly reimbursed by the government. However, those doctors who don't bulk bill are free to charge their own fees, and in such circumstances, patients pay for the cost of services they receive and get a partial rebate from Medicare of their 'standard' schedule fee. Through the PBS, the Medicare subsidises the cost of medicines for all eligible Australians and also provides a 'safety net' — higher subsidies — for those whose spending on medicines has reached a certain threshold. Each eligible health care professional who participates in the Medicare program is given a unique identification number (6-digits) known as the 'Medicare provider number' ([Department of Human Services Australia 2019](#)). It is this number that practitioners use to access Medicare benefits to compensate fully or partially for their services.

Despite its merits like most health systems in the world, Australia's health system is confronted with a number of challenges. According to the [Department of Health Australia \(2019\)](#), current issues confronting the system include a rapidly ageing population and increasing rates of chronic disease— all of which exert substantial pressure on the health system's resources including the workforce.

Additionally, high costs of medical research and innovations, and harnessing emerging health technologies and data are also a major challenge which is expected to continue in the coming decades.

2.2 Australian medical workforce

The health workforce (human resources) is a highly valuable but complex resource of a health system. The workforce is the engine that drives a health system to its ultimate goals hence, the success of a health system depends — to a larger extent — on how best it has planned and managed its human resource component ([WHO 2010](#)). The medical workforce is important not just because of its role and position in clinical care, but because it takes very substantial resources by government to train and retain a single professional. Within this context, this section aims to describe the characteristics of the Australian medical workforce with a particular focus on the clinical practitioner workforce, including its sources of supply, distribution, and the contemporary challenges confronting it.

2.2.1 Characteristics of the Australian Medical Workforce

The Australian medical workforce comprises clinical and non-clinical practitioners such as researchers, educators/teachers, administrators, and public and occupational health physicians. Clinical practitioners can be further classified into four principal categories or types based on specialty and training stage namely, General Practitioners (GPs - primary and community health providers), Specialists, Specialists-in-training also known as Specialist Registrars and Hospital non-specialists.

In 2009, the average age of Australia's medical workforce was 45.6 years with a marginal increase to 45.9 years in 2016. Females were younger with an average age of 41.5 years relative to 47.8 years for males, the same trend continued into 2016 ([Health Workforce Australia 2012](#), [Department of Health Australia 2016](#)). Between 2009 and 2016, the proportion of practitioners over 55 years and above increased from 13.4 to 17.8 per cent among females and slightly from 31.2% to 33.7 per cent among males. Data on gender distribution in the medical workforce showed that there was increasing participation of females in Australian medical practice. For instance, in 2009, 36 per cent of working

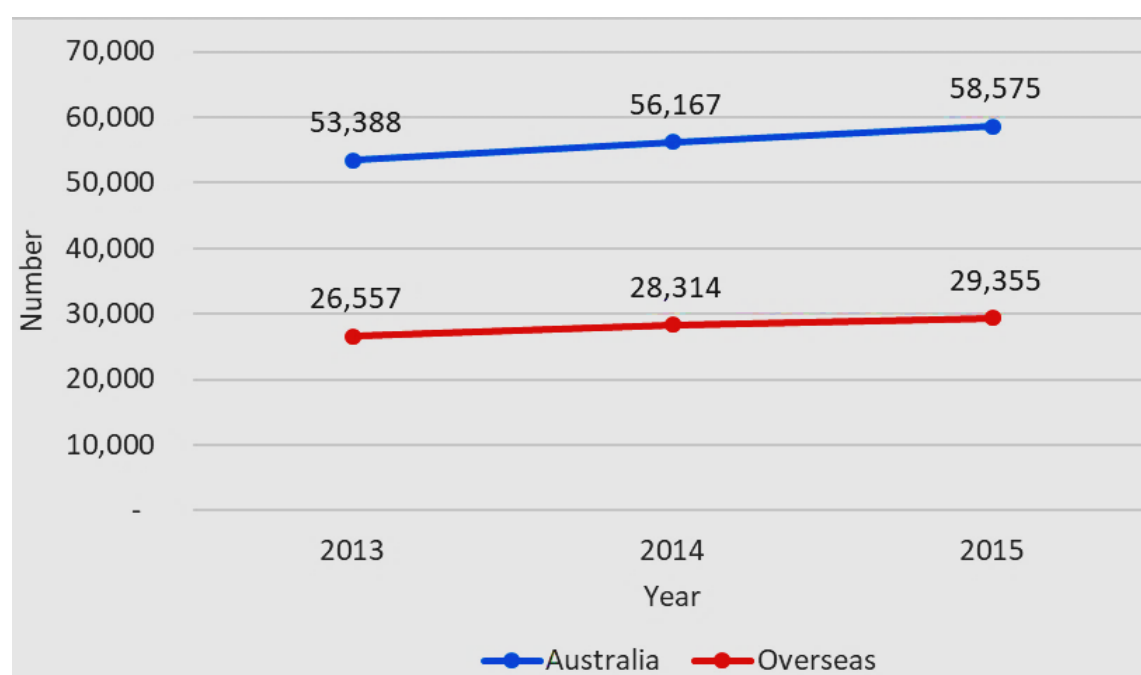
doctors were female compared to 40.7 per cent in 2016. With respect to labour supply, the 2016 statistics show that doctors worked on average 42.4 hours per week, (44.9 hours for males and 38.8 hours for females) ([Department of Health Australia 2016](#)). Gender differences in hours could perhaps be due to the fact that females tended to have more non-professional commitments such as childcare and specialty differences.

2.2.2 Medical Workforce Supply and Distribution

The Australian medical workforce supply is derived from two main sources namely, the domestic medical training of local and international students and the active recruitment of IMGs through immigrant recruitment ([Health Workforce Australia 2014](#)). Ensuring a sustainable domestic supply of health professionals including doctors has been a major policy goal in Australia since the turn of the millennium to address chronic distribution challenges, based on a strong preference for domestic supply. In 2004, the Australian Health Ministers endorsed the National Health Workforce Strategic Framework which recognised the need for ‘national self-sufficiency’ in health workforce supply ([Australian Health Ministers' Conference 2004](#)). Principle 1 of the framework stated that “Australia should focus on achieving, at a minimum, national self-sufficiency in health workforce supply, whilst acknowledging it is part of a global market (p.15)”.

Since the adoption of the framework, there has emerged a rapid expansion in the area of domestic medical training places. Along with immigration, the Australian medical workforce continues to steadily expand with an annual average growth rate of 5.3 per cent between 2005 and 2017 ([Scott 2019](#)) which is three times more than the population growth rate (of 1.6 per cent). The number of domestic and overseas trained doctors in clinical practice between 2013 and 2015 is presented in **Figure 2.1**.

Figure 2-1: Number of domestic and internationally trained doctors in Australian clinical practice



Source: Health Workforce Data 2013-2015: Department of Health, Australia. Downloaded from: <https://hwd.health.gov.au/webapi/jsf/dataCatalogueExplorer.xhtml>

In 2015, the density of practising doctors in Australia, in consequence, was 3.5 per 1,000 population which was slightly above the OECD average of 3.4, and above the ratios reported in countries such as Finland, New Zealand, UK and the USA ([OECD 2017](#)). Non-GP specialists account for the largest proportion of practising doctors (36 per cent), followed by GPs (31 per cent), doctors in training (21 per cent) and hospital non-specialists (9 per cent) ([Department of Health Australia 2019](#)).

The number of junior doctors in vocational training (20,069) in 2015 has almost tripled the number recorded in 2000. Around the same period, the number of new College Fellows has also increased significantly. A total of 53,098 medical practitioners were Fellows of Medical Colleges in 2014, more than one-third were females ([Department of Health Australia 2016](#)).

The distribution of medical practitioners across states and territories largely tends to reflect population sizes with more than half (56.6 per cent) of the workforce by 2016 were located in the more densely populated states of New South Wales (NSW) and Victoria (VIC). However, with respect to the doctor per 100,000 population, the Northern Territory (NT) and the Australian Capital Territory (ACT) had the highest number of practitioners (474.7/100,000 and 446.1/100,000 respectively).

Distribution by remoteness area (RA) showed that a considerable proportion (79 per cent) of practitioners were located in major cities or locations classified as ASGC-RA1² ([Department of Health Australia 2016](#)). For the past decades, major cities have been characterized by high practitioner density, while remote and very remote areas have continued to experience the lowest density per 100, 000 population.

2.2.3 Medical Workforce Regulation

Like most advanced democratic societies, Australia has a strong health workforce regulatory system. In 2010, the Council of Australian Governments (COAG) adopted the National Registration and Accreditation Scheme (NRAS) also known as the 'National Law' as a legal instrument for regulating health professions (including medicine) ([Pacey, Smith-Merry et al. 2017](#)). The three main aims of the NRAS are first, to ensure public protection, by making sure that only suitably trained and qualified practitioners are registered. Second, to enhance workforce mobility across states and territories of Australia, through a national registration system. Third, to facilitate the continuous development of a sustainable Australian health workforce. The scheme is managed through the Australian Health Practitioner Regulation Agency (AHPRA) in collaboration with designated national boards such as the Medical Board of Australia (MBA). AHPRA maintains a list of all health professions that are regulated under the national scheme (15 professions in total). The MBA – supported by State and Territory Boards – is responsible for the registration of medical practitioners and medical students, assessment of IMGs who wish to practise in Australia, development of standards, guidelines and codes of practice for the medical profession, investigation of all notifications and complaints about medical practitioners, and for approving accreditation standards and accredited courses of study ([MBA 2018](#)).

² Australian Standard Geographic Classification - Remoteness Area (ASGC-RA): A geographic classification system developed in 2001 by the Australian Bureau of Statistics (ABS). RA categories include: RA1 (major cities), RA2 (Inner Regional), RA3 (Outer Regional), RA4 (Remote) and RA5 (Very Remote).

Under the NRAS, all doctors (DMGs and IMGs) wishing to undertake clinical practise in Australia must be registered³ with the MBA. Currently, the MBA identifies three major assessment pathways for IMGs which lead to one of the following registration types: specialist, general, provisional and limited registrations. The three registration pathways for IMGs are the competent authority pathway (CAP), the standard pathway and the specialist pathway (specialist recognition or area of need).

The CAP is for non-specialist (and specialist) IMGs whose medical qualifications were completed in a country that is regarded to have comparable medical education and licensing examination system to Australia, or whose medical qualifications were previous assessed by a body which was identified by the Australian Medical Council (AMC) as an approved competent authority ([House of Representatives Committee Australia 2012](#)). The currently approved competent authorities are:

- United Kingdom (General Medical Council);
- Canada (Medical Council of Canada);
- United States (United States Education Commission for Foreign Graduates, the Accreditation Council of Graduate Medical Education);
- New Zealand (Medical Council of New Zealand); and
- Republic of Ireland (Medical Council of Ireland)

As of 2014, for IMGs to be assessed under the CAP, first, they must secure an employment offer, then apply to the AMC for a primary source verification and based on the outcome, they may apply to the MBA for a 'provisional registration' to complete 12 months supervised clinical practise upon which they may be issued a general registration.

The 'specialist pathway in Australia – specialist recognition' – can be defined as catering to IMGs who completed their specialist training in their countries of origin or elsewhere and are applying for

³ Registration is defined as the process of having one's details (including names, contacts, qualifications) recorded after meeting predetermined standards for the purpose of entering a profession. The term is used interchangeably with licensure in the context of health profession regulation WHO (2016). Health workforce regulation in the Western Pacific Region, Manila: WHO Regional Office for the Western Pacific.

their qualifications to be assessed and recognised as comparable to the Australian standard in that specialty ([Department of Health Australia 2016](#)). Currently, there are 23 recognised speciality fields in medicine and working in these fields would require a specialist registration. Under the specialist pathway – specialist recognition, IMGs must apply for primary source verification of their qualification at the AMC and then submit an application to the relevant college for qualification assessment (i.e. comparability assessment). The college may deem an IMG's qualification as substantially comparable to the Australia-trained specialist, which can lead to a fellowship (where available); or as partially comparable, requiring up to two years of further training to reach comparability; or as not comparable, requiring the doctor to consider alternative pathways (e.g. completing the CAP or the standard pathway).

The standard pathway exists for IMGs who are not deemed eligible to be assessed under the CAP or the specialist pathway. IMGs seeking general registration as a medical practitioner in Australia may apply through this pathway which involves two alternative assessment processes, either of which may lead to an AMC certification:

- i) Standard Pathway (AMC Examinations): involves the completion of the AMC Multiple Choice Questionnaire (MCQ) and the AMC structured clinical examination (SCE), catering to the majority; OR
- ii) Standard Pathway (workplace-based assessment): involves an examination and workplace-based assessment of IMGs' clinical skills and knowledge by an AMC-accredited authority (catering to very small numbers of IMGs, eg 91 candidates in 2018).

IMGs who have successfully completed the MCQ examination may be granted a limited registration to practice in an area of need (AoN) for 12 months while working towards completing the AMC clinical examination. An AoN is a location where deficiency of specific medical practitioners has been persistent over a period of time irrespective of active recruitment efforts to remedy it ([Department of Health Australia 2016](#)). A more detailed description of limited registration is presented in Chapter 6.

2.2.4 Current Medical Workforce Challenges

As mentioned earlier in this section, the health workforce is one of the most complex health system resources to manage. Australian medical workforce management has been faced with a number of complex issues which have been the subject of recurrent policy assessments, initiatives and reforms in recent decades ([Department of Health Australia 2019](#)). Currently, one of the major issues confronting the Australian medical workforce has been the geographic maldistribution of practitioners. As mentioned earlier in this section, almost 80% of all specialists are currently working in major cities, while rural and remote Australia (30% of the population) continue to experience lower physician density (doctor to population ratio). This situation has created a serious disparity in healthcare access across geographic areas, undermining the national goal for universal access. Another issue of the medical workforce is the growing cultural diversity which has been driven by a reliance on IMGs (immigration) and the growing participation of Aboriginal and Torres Strait Islander doctors (1.6 per cent) in the workforce. This has increased the need to ensure having a culturally safe medical workforce ([Department of Health Australia 2019](#)). Though cultural diversity is essential in a medical workforce that seeks to provide culturally competent health services ([OECD 2008](#)), the ways individual doctors function in a diverse workforce and the feelings they have about their work are potentially worth monitoring. Additionally, the ageing 'tsunami' that characterises the Australian population has increased rise in chronic illness and the need for continuing care which places additional pressure on clinical practitioners. Ageing within the medical profession is also an issue, especially as the baby-boomer generation – doctors born between 1946 and 1964 ([Joyce, Wang et al. 2015](#)) are leaving the workforce exposing the remainder of practitioners to a greater workload.

2.3 Background to Australia's reliance on IMGs

Though it is of global health interest that countries become self-sufficient in training and retaining the health workforce they need ([Tam, Edge et al. 2016](#)), this has been a complex thing to achieve in many OECD countries including Australia. Maldistribution of medical practitioners has made recruitment of

IMGs a viable policy alternative. In Australia, reliance on IMGs is not something new, in fact, it can be traced back to the early colonial periods ([Groutsis and Arnold 2012](#)). However, the degree of reliance has been evolving over time in the course of recent decades with growing diversity in source countries ([Hawthorne 2012](#)). More recently, regulations of provider numbers have somewhat controlled where they've been able to work in their first 10 years in Australia. Regional data show that IMGs account for over 40 per cent of doctors in regional and remote areas of Australia ([Rural Health Workforce Australia 2016](#)). Currently, the top ten source countries for these doctors are the UK, India, Malaysia, Sri Lanka, Pakistan, Iran, Republic of Ireland, Canada, Philippines and the Republic of South Africa ([Higgs and Hawthorne 2017](#)). This section aims to describe three policy phases of Australia's reliance on IMGs over the last four decades. In particular, it discusses the policy changes that have happened during the 1980 – mid-1990 period, the late 1990s – 2017 period and 2018-present period.

2.3.1 1980 to mid-1990 period

Emerging oversupply and restrictions on medical training places and IMGs' recruitment

One of the major reasons for the increased reliance on IMGs in recent decades has been linked to previous policy reforms especially the one that took place between 1980 and the mid-1990s ([Birrell and Hawthorne 2004](#), [Birrell 2004](#)). At the beginning of 1980, there was a general notion that Australia had an oversupply of medical doctors especially with respect to General Practitioners (GPs). Projections revealed high doctor-to-population ratios and on that premise, the then Government of Australia decided to cap the number of enrolments into Australian medical schools and reduce reliance on IMGs ([Birrell and Hawthorne 2004](#), [Birrell 2004](#)). This policy position was justified as a cost-containment strategy to prevent excess billing on Medicare.

While the then policy reform was seen as a logical step from a political standpoint, it fell short of responding to the prevailing realities of medical workforce supply. The consequences of the reform were huge, with medical workforce supply failing to meet the growing demands of the population ([The Productivity Commission 2006](#)). In addition, there were noticeable difficulties in accessing regular

GP services, particularly in rural areas, because domestic medical graduates (DMGs) were more attracted to metropolitan areas ([Birrell and Hawthorne 2004](#)). This problem of maldistribution had always occurred but became a major policy concern.

2.3.2 The late 1990s to 2017 period

Expansions in medical schools and growing recruitment of IMGs

Towards the late 1990s, the Australian Government responded to the twin problems of shortage and maldistribution in the medical workforce. So far, the responses have been threefold by dramatically increasing medical training places for local and international students, with the aim of attaining self-sufficiency in workforce supply; strengthening the international recruitment of doctors through the Temporary Skilled Migration (TSM) as well as the permanent General Skill Migration programs; and providing incentives (both financial and non-financial) to attract doctors to regional areas. Given the length of time required for training doctors, immigration was considered an important alternative short-term solution to the existing workforce crises ([House of Representatives Committee Australia 2012](#), [Siyam and Dal Poz 2014](#)). IMGs provide an immediate impact, whereas local medical school growth takes over 10 years to see the benefit.

These reforms gave employers in Australia the leverage to actively recruit doctors on a temporary basis via the TSM visa (subclass 457) pathway and retain them for a longer period (permanent entry) through the Employer Nomination/Sponsored visa scheme - ENS ([Birrell 2017](#)). These two visa categories — especially the former — were the main sources for the supply of IMGs in the country. In their analysis of unpublished data from the Department of Immigration and Border Protection (DIBP) [Higgs and Hawthorne \(2017\)](#) observed that between 2008/09 financial year and 2014/15, more than 42,000 medical doctors (primary applicants) arrived in Australia (over 32,000 on the TSM visa subclass 457, many of whom were relatively short-term in Australia, and more than 10,000 on the employer sponsor permanent visa).

Besides increasing the scale of IMGs' recruitment in the country, the Australian Government (in 1996) decided to further introduce the Medicare provider number restriction to improve the quality of the rural medical workforce over the longer term and to address the maldistribution of practitioners. A Medicare provider number has already been defined in [section 2.2.2](#) of this thesis. Section 19AB of Australia's Health Insurance Act 1973 (the Act) imposed conditions on IMGs – upon their first medical registration – to work in state-designated 'area of need' locations or 'districts of workforce shortage'⁴ for a period of 5-10 years in order to qualify for Medicare benefits such as bulk billing arrangements ([Department of Health Australia 2016](#)). From a political standpoint, this policy, commonly referred to as the '10-year moratorium', has been used as a mechanism for ensuring efficient distribution of the health workforce, with the aim of alleviating barriers to basic health services. However, at the level of individual IMGs, a wealth of studies have demonstrated it has been associated with significant family stress, restricted professional autonomy, personal hardships, as well as social and professional isolation ([McGrath, Wong et al. 2011](#), [House of Representatives Committee Australia 2012](#), [McGrail, Humphreys et al. 2012](#), [Zubaran and Douglas 2014](#)).

2.3.3 2017 to the present period

Growing supply of DMGs, concerns over internship places and limiting IMGs' recruitment in major cities

On April 2017, the Government of Australia made a surprising announcement that its 457-visa scheme — the main source of major IMG inflows into Australia — was scheduled for abolition in 2018. On March 2018, the planned abolition took effect, and the 457-visa has now been replaced with the new Temporary Skilled Shortage visa (TSS visa subclass 482) ([Department of Immigration and Border Protection 2017](#)). This reform has put stricter conditions on employers who wish to recruit IMGs on a temporary basis. There exist two temporary streams under this new skilled visa programme, namely the Short- and Medium-Term streams. The former allows IMGs to live and work in Australia for a

⁴ District of Workforce shortage are districts or geographic areas where the population's unmet needs for medical services fall below the national average Department of Health Australia. (2015). "District of Workforce Shortage Factsheet." Retrieved 10 January 2017, from <http://www.health.gov.au/internet/main/publishing.nsf/content/work-pr-dws-fact..>

duration of two years, whereas the latter stream allows a maximum duration of four years. In addition to these, the TSS visa scheme calls for the tightening of eligibility requirements for ENS visas, (e.g. English language skills, experience, an age limit of 45).

In the build-up to this reform, statistics were indicating significant growth in the supply of domestic graduates ([Department of Health Australia 2016](#)). Access to internship places for junior DMGs was becoming a major concern ([Fernandes, Cliff et al. 2018](#)), particularly in metropolitan areas. In their report, [Moynihan and Birrell \(2016\)](#) claimed that the key source of extra GPs in city areas was IMGs who had completed their term of mandatory services in rural areas, and were engaging in price chasing in metro areas. Additionally, the growth in domestic supply had also reignited debates around the Medicare billing cost concerns. In a report published by the Health Workforce Australia (HWA), was this statement;

[“... in a country with an uncapped Medicare system that supports episodes of medical care, there is a material cost to the system in having an excess of medical practitioners. Uncoordinated management of the medical workforce supply risks costing excess valuable health dollars....”]
Health Workforce Australia (2014), Australia’s Future Health Workforce – Doctors, report, p.9.

Ironically, the growth in DMG supply has not fully resolved the rural medical workforce problem ([O’Sullivan, Russell et al. 2019](#)) and addressing this issue at the time of writing still remains a major political issue. There is a growing risk of oversupply, with the current situation largely a maldistribution problem. This situation presents a major dilemma for the government as it has to regulate its reliance on IMGs while making sure that the workforce distribution is balanced. The ‘Stronger Rural Health Strategy’ introduced by the Department of Health aims to facilitate this by reducing the scale of IMG recruitment while strengthening their management and distribution in the country ([Department of Health Australia 2019](#)). One of the key objectives of this plan is as follows:

“Through the Skilled Migration Program, the number of overseas trained doctors entering Australia to work in primary health care will be reduced by 10 per cent – about 200 – annually over a period of four years. This will be a gradual process to ensure the right balance of specialist GPs is available

to the Australian community, while also providing opportunities for Australian trained doctors”.

Department of Health Australia 2019, Stronger Rural Health Strategy

This suggests that, though the government is making attempts to gradually reduce the number of IMGs it currently recruits — aligning with the self-sufficiency goal — reliance on IMGs will likely remain an important part of its primary healthcare agenda ([Hawthorne 2012](#), [House of Representatives Committee Australia 2012](#), [O’Sullivan, Russell et al. 2019](#)).

While medical workforce planning (and management) is always an ongoing process, it is imperative to determine empirically how IMGs rate the state of their lives in Australia — amidst the professional challenges and fluidity of their policy environment. The next chapter will systematically review the current global literature to examine the current state knowledge on the life satisfaction of IMGs in high-income countries including Australia.

3 Literature Review

To this point, the previous chapter has described the characteristics of Australia's health care system and medical workforce, and the dynamics of Australia's utilisation of IMGs over the last four decades. It has delineated Australia's long history of reliance on IMGs, their significance to Government's rural health strategy, and importantly, the volatility of their policy environment, giving rise to questions about their general well-being in such circumstances. This chapter aims to review the current literature on the well-being of internationally trained doctors in high-income countries (HICs) including Australia. A major aim of this review is to determine what is known globally compared to Australia about the levels and determinants of well-being among IMGs. To proceed, first, the chapter starts by introducing the general concept of human well-being, its empirical measurements and theoretical perspectives within the multidisciplinary fields of social sciences.

3.1 PART I - Human well-being: Concept, theories and measurement

3.1.1 Conceptualizing human well-being

Ever since the World Health Organisation defined health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" ([WHO 1995](#)), the concept of 'well-being' has become widely used in relation to health. The philosophical use of the term is related, but much broader ([Crisp 2001](#)), and corresponds to the notion of 'the Good Life', a concept that has intrigued great thinkers across time and cultures ([Diener and Suh 1997](#)). Throughout history, philosophers considered living well or well-being as the highest good and the fundamental goal for individuals and nations ([Diener 1984](#)). However, the importance of well-being begs for an explanation of its definition, constituents, determinants, and empirical measurements. This section deals with the first two issues.

The term well-being is a very broad concept that has evolved over the past several decades from its philosophical and religious beginnings to an advanced field of study in contemporary social science

disciplines such as psychology, sociology, economics and health sciences. Owing to the diversity of these disciplines, there seemed to be no consensus around a universally accepted definition of the concept. [Veenhoven \(2007\)](#) described the complexity of the term, thus:

“The term ‘well-being’ denotes that something is in a good state. The term does not specify what that something is and neither what is considered ‘good’. So, it is a typical catchall term without a precise meaning, like words such as ‘progress’ and ‘welfare’. This notion can be specified in two ways: first by specifying the ‘what’ and secondly by spelling out the criteria of ‘wellness’.”

Psychologists have defined the concept as optimal mental functioning and experience ([Ryan and Deci 2001](#)). Again from this definition, as [McMahan and Estes \(2011\)](#) observed, the exact nature of optimal functioning is not clear. According to [Waterman \(1993\)](#), identifying qualities deemed to represent optimal functioning has been a perennial concern for psychologists. Within the last five decades, a substantial body of literature has emerged that aimed at defining the concept of human well-being and its constituents ([Prasoon and Chaturvedi 2016](#), [Dominko and Verbič 2018](#)). In all their variants and sometimes complexity, these definitions mainly evolved around three distinct but interconnected philosophical perspectives ([Brock 1993](#)) namely: the normative ideal, preference satisfaction and the hedonic perspective.

The *normative ideal* or most commonly, the ‘*eudaimonic*’ conception of well-being extends back to the classical Hellenic philosophy, where its most notable proponents were, among others, Socrates, Plato, and Aristotle. In Aristotle's concept of *Eudaimonia*, individuals are called on to realize their true-self (called the *daimon*) in order to attain a good life ([Diener and Suh 1997](#)). The daimon is a normative ideal such as virtue, or holiness ([Ryan and Deci 2001](#)), self-actualisation, personal growth and meaning, social connectedness, autonomy, competence, and self-acceptance ([Waterman 1993](#), [Deci and Ryan 2008](#), [Kashdan, Biswas-Diener et al. 2008](#)) the realisation of which brings eudaimonia or happiness. Thus, in the eudaimonic tradition, well-being is defined or determined by individuals’ engagements in happiness oriented activities and not by their subjective experiences or fulfilment of personal wishes.

These activities or normative ideals are defined by entities external to an individual such as philosophical, religious and other systems ([Diener and Suh 1997](#)).

From a '*preference satisfaction*' perspective, well-being is defined as the fulfilment of desires or preferences. This concept is related to Jeremy Bentham's moral philosophy of utilitarianism ([Seligman and Royzman 2003](#)). At the beginning of his seminal book "*An Introduction to Principles of Morals and Legislation*" Bentham wrote:

[“Nature has placed mankind under the governance of two sovereign masters, pain and pleasure. It is for them alone to point out what we ought to do.....”].

According to Bentham, a utility is the measure of happiness and satisfaction that individuals experience as a consequence of the choices they make among alternative courses of action. He argued that societies should aim at accomplishing actions that bring the “greatest happiness for the greatest number” ([Sirgy 2012](#), [Dominko and Verbič 2018](#)). In this tradition, people are considered to be more concerned about avoiding pain and maximising pleasure, such that even under resource constraints, they end-up choosing things they deemed could enhance their experience utility or quality of life. This concept of utility is central to modern economics and is consequentialist focusing on happiness/utility as an outcome of consumption activities ([Diener and Suh 1997](#)).

The *hedonic* perspective is a special case of preference satisfaction, but with a much broader focus on people’s conscious experiences of circumstances in their lives. In the hedonic tradition, well-being is equated to the raw subjective feelings of happiness and satisfaction, that is experienced through the attainment of goals ([Seligman and Royzman 2003](#), [Diener, Oishi et al. 2009](#)) the pursuit of pleasure (comfort, entertainment and enjoyment), and the avoidance of pain ([Ryan and Deci 2001](#), [Henderson and Knight 2012](#)). This view can be traced back to earlier subjectivists (or mentalists) such as Aristippus a Greek philosopher from fourth century BC, who claimed that the goal of life is to maximise the experience of pleasure, arguing that happiness as we know it, is the totality of one’s hedonic moments ([Ryan and Deci 2001](#)). This conceptual definition holds that a good life or well-being

is the one devoid of suffering and pain and must be viewed and understood from the perspectives of the experiencer.

From these philosophical and scientific debates emerged two major scientific approaches to measuring human well-being: 'objective or social indicators' and subjective measures. Both measures were inspired by the different conceptualisations of well-being, discussed earlier in this section. For instance, the objective or social indicators simplified as 'objective well-being' are most related to the normative ideal or eudaimonic conception, whereas subjective measures, simplified as 'subjective well-being' are strongly related to the hedonic tradition of well-being. The next section takes a closer look at each of these measurement approaches and attempts to identify their strengths and limitations.

3.1.2 'Objective' or social indicators of well-being

"Social indicators are societal measures that reflect people's objective circumstances in a given cultural or geographic unit" ([Diener and Suh 1997](#)). They are based on objective, quantitative measures instead of people's subjective assessments of their social, economic, and health conditions. The social indicators movement emerged in the mid-1960s as interests in non-monetary indices of societal progress and well-being began to gain impetus. Governments and international organisations such as the United Nations Development Programme (UNDP), WHO and the OECD have identified some key domains such as health, human rights, education, environment, and culture as essential for human and societal development ([McGillivray 2007](#)). For example, variables like life expectancy, infant and maternal mortality rates, are assessed in the health domain, and access to clean water and sanitation and air quality are studied in environment-related well-being.

Diener and Suh (1997) have highlighted a number of advantages associated with social indicators. One of the key strengths of these indices is objectivity which made them relatively easy to define and quantify without having to depend exclusively on individuals' perceptions. Owing to objectivity it is convenient to systematically compare social indicators between nations, cultures and time. For

instance, indicators like infant mortality rate, crime rate can be measured based on some prescribed standards and independent of individuals' subjective judgement. Furthermore, these indicators are based on the normative ideals of societies, thus, they are easily accepted by people as measures of societal progress or welfare. For instance, the eradication of child mortality and crimes are likely to be valued by most individuals and societies.

However, social indicators are not without some limitations. The first limitation has to do with data quality and measurement errors. For instance, in countries where crimes such as rape incidence, are under-reported, reliance on such indicators may bias the within and between-country comparisons ([Diener and Suh 1997](#), [Veenhoven 2002](#)). In addition, how we weight the various objective indicators to form an overall measure of wellbeing can be challenging or even unrealistic. Further, since objective measures are independent of subjective awareness, they fail to capture the conscious experiences of individuals in their social settings. For example, objective or social indicators are useful for measuring maternal mortality, they fall short in identifying women's psychological experiences such as depression, which is an important aspect of maternal health. Additionally, policymakers are becoming increasingly interested in understanding people's subjective feelings such as their sense of safety, trust in public institutions, and overall happiness, for which traditional objective indicators failed to capture. Thus, objective or social indicators merely assess well-being from the perspective of an observer (researcher) rather than the experiencer.

3.1.3 Subjective well-being

As mentioned, subjective well-being (SWB) is an established area of research in the social sciences that began since the late 20th century. The hallmark of SWB is that individuals' well-being may best be understood, by directly measuring their cognitive and affective (emotional) responses to life as a whole or its specific domains ([Diener, Oishi et al. 2009](#)). As already defined in [Section 1.2](#), SWB or 'subjective quality of life' is the degree to which people evaluate their current life situations as good and desirable vs. undesirable and poor ([Diener, Pressman et al. 2017](#)). These subjective judgements

comprise of two distinct but interrelated components namely, the affective/emotional and the cognitive components ([Diener, Oishi et al. 2009](#)). The affective or hedonic component of SWB captures people's emotional responses to situations in their lives, such as feelings of happiness and joy (positive affect) or depression and anxiety (negative affect). On the contrary, the cognitive component reflects people's evaluative judgement of their life situations according to the extent they perceive their lives to measure up to their expectations or envisioned 'ideal life' ([Van Hoorn 2007](#)). A cognitive judgement of one's life may be context-specific such as satisfaction with domains of life (e.g. marital relations, job, finance) or a non-context-specific such as the 'general satisfaction with life as a whole'. A person is considered to be high in SWB if he or she reported 'experiencing a high level of positive affect, low level of negative affect and a high degree of life satisfaction' ([Deci and Ryan 2008](#)). Within this context, SWB has frequently been used interchangeably with happiness and life satisfaction.

Like objective or social indicators, subjective assessment of well-being is not without some shortcomings. A major limitation of this approach is that it relies exclusively on self-reports, which makes it to some extent, liable to response bias. Such bias may occur due to people's mental state at the time of responding to the question. For instance, [Kahneman and Krueger \(2006\)](#) noted that the accuracy of life satisfaction ratings may be influenced by respondents current mood, memory and the immediate context. Additionally, SWB studies are not immune to social desirability bias, a type of response bias that occurs when survey respondents have the tendency to respond (e.g. happiness or satisfaction ratings) in a manner that is more socially desirable. A recent study by [Brajša-Žganec, Ivanović et al. \(2011\)](#) found a statistically significant association between social desirability and SWB (happiness and life satisfaction).

Despite these limitations, SWB has been a promising area of research in the social sciences and the literature has been rapidly advancing over the last quarter of the century. The recent emergence of 'hedonic psychology' – a field concerned with "what makes experiences and life pleasant or unpleasant" ([Kahneman, Diener et al. 1999](#)) and the positive psychology movement – concerned with

“positive functioning and flourishing” ([Seligman and Csikszentmihalyi 2014](#)) have further heightened interests in SWB research among psychologists. Likewise, since the seminal 1974 work of Easterlin “*Does economic growth improve the human lot? Some empirical evidence*” ([Easterlin 1974](#)) economists have also been showing strong interest in people’s self-reported well-being or SWB. As already mentioned in [Section 1.1](#), SWB has currently become an important outcome measure in a wide range of disciplines including, health services research ([Ngamaba, Panagioti et al. 2017](#)), industrial/organisational psychology ([Russell 2008](#), [Bakker and Oerlemans 2011](#)), migration studies ([Bak-Klimek, Karatzias et al. 2015](#)), and gerontology ([Peter and Charles 2007](#)). Methods employed in the scientific studies of SWB have also improved significantly over the recent decades and are expected to continue in decades to come ([Prasoon and Chaturvedi 2016](#)) as more robust empirical data become available through longitudinal and experimental studies.

In the last five decades, several theoretical models have been proposed that attempted to explain factors influencing people’s SWB. The next section presents an overview of some of these theories and their underlying assumptions.

3.1.4 Theoretical perspectives on the determinants of subjective well-being

While throughout history, philosophers and social scientists have all debated the concept of human well-being and its constituents, questions such as ‘what factors determine people’s well-being or quality of life?’, and ‘how can individuals sustain their level of well-being?’, continue to attract more empirical and policy interests ([Lyubomirsky, Sheldon et al. 2005](#), [Deci and Ryan 2008](#), [Diener, Oishi et al. 2009](#)). Attempts to address these questions over the last several decades have sparked some major theoretical developments. In their paper on *Subjective Well-Being: The Science of Happiness and Life Satisfaction*, Diener, Oishi et al. (2009) have summed up these theories into three major components namely; genetic and personality predisposition, need and goal satisfaction and lastly, process or activity theories.

Genetic and personality theories claim that human well-being is strongly influenced by genetic predisposition and personality traits. A piece of overwhelming evidence currently exists on the link between personality traits such as neuroticism (emotional stability), extraversion, locus of control and SWB. The heritability of happiness and life satisfaction has captured the attention of researchers in the field of behaviour genetic for the past decades as evident in a recent meta-analysis report ([Bartels 2015](#)). In a study of 1,516 Norwegian twins of age 50–65 years, [Røysamb, Nes et al. \(2018\)](#) observed that personality facets explained 32% of the variance in life satisfaction while neuroticism and extraversion together accounted for 24% of the variance. In that study, the authors found the heritability of life satisfaction to be 0.31 (0.22–0.40), of which 65% was explained by personality-related genetic influences. According to [Kahneman and Krueger \(2006\)](#), individuals' life satisfaction ratings can be influenced by their current mood, which is largely influenced by their stable personality traits. As such, longitudinal estimates of life satisfaction are considered to be more reliable compared to cross-sectional measures which are mainly evaluated at a single time point ([Clark, Diener et al. 2008](#), [Diener, Pressman et al. 2017](#)).

The *need and goal satisfaction theories* posit that level of SWB increases as needs and goals are attained. These theories are also referred to as the *telic* or endpoint theories of well-being ([Diener 1984](#)) and they have their roots in the hedonic conception of human well-being. The need gratification theory can be traced back to Abraham Maslow's hierarchy of needs ([Maslow 1943](#)). A recent analysis of SWB across 123 countries has found the fulfilment of personal needs such as the need for autonomy, and respect to be positively associated with life satisfaction ([Tay and Diener 2011](#)).

Process and activity theories, on the other hand, claim that people tend to be happier when they are engaged in meaningful activities e.g. career, leisure, voluntary services etc. These theories are rooted in the eudaimonic tradition of human well-being, where individuals are considered as architects of their own well-being. An example of a process theories of well-being is the social comparison theory which claims that individuals tend to evaluate their life situations by comparing

themselves with other people (known as the reference group) ([Diener 2009](#)). Thus, individuals become more satisfied if they perceived themselves to be better off than others.

Besides these three theories, an integrated theory “*the sustainable happiness (SH) model*” has been recently proposed by positive psychologists [Lyubomirsky, Sheldon et al. \(2005\)](#). This theory has combined all the three broad theories of SWB discussed to this point. The SH model identified three major drivers of well-being: ‘set-point’, volitional/intentional, circumstantial/situational factors. It posits that set-point determinants (i.e. genetic and personality markers) may contribute up to 50% of variance in SWB, volitional activities such as pursuing important personal goals, leisure, and nourishing social support may account for 40% whereas, circumstantial factors (socio-demographics, working conditions, geographic locations, loss of employment) may explain only 10% of the variance. This model was recently applied by Bak-Klimek et al. (2015) in their meta-analysis of determinants of SWB among economic migrants and the authors supported its suitability in lending explanations to determinants of SWB in this population.

3.1.5 Subjective well-being of migrants

As demonstrated in preceding sections, engagements in activities and practices such as social support and networks, leisure activities and pursuit of meaningful personal goals have been reported to enhance people’s quality of life. Additionally, evidence suggests that the quest for improved well-being is one of the key incentives for many people — including health professionals — to cross national borders, and become expatriates in a new country ([Gadit 2008](#)). Whether these migrants are satisfied with their life situations as they navigate the social and institutional milieu of host societies remains an important question with growing political and empirical interests.

The World Migration Report 2013 “*Migrant Well-being and Development*” ([Laczko and Appave 2015](#)) symbolizes a major turning point in the global commitment to migrants’ well-being. In this report, the International Organisation for Migration (IOM) took stock of the original findings from the Gallup World Survey of migrants’ SWB – in 150 countries, alongside evidence from relevant literature

to enhance global understanding regarding how migrants rate their lives relative to those they left behind and to natives in host societies. The total sample for the analysis comprised of 466,689 adults, including 441,901 native-born residents and 24,788 first-generation migrants. Among the conclusions made in the report were that migrants moving from low/middle income to high-income countries, rated their lives better than their counterparts in home countries while the reverse was the case for inter-low-income country movers. However, irrespective of whether living in the high or low/middle-income countries, migrants appeared to be less satisfied with life than the native-born. Additionally, migrants who have spent less than 5 years in the host country were less satisfied with their lives relative to those who spent at least 5 or more years, suggesting the role of assimilation in well-being.

Although this report has been credited for taking such a detailed global analysis of migrants' well-being, it has not provided any information on well-being experienced by those who migrated voluntarily for career or economic reasons (economic migrants). Additionally, the use of the general population in the host country as a reference group may affect the conclusions as the composition of both groups may be markedly different in terms of a range of socio-economic and other characteristics.

Bak-Klimek, Karatzias et al. (2015) attempted to unravel the intricate link between economic migration and well-being using a meta-analysis and systematic review of existing global literature. Based on their analyses, they concluded that social support and migrants' personality traits (including optimism and self-esteem) rather than situational factors (such as; income, employment or duration of migration) are the key determinants of SWB (life satisfaction and happiness) among economic migrants. However, there are some important caveats to this conclusion. First, their review was generic hence it could not provide any sector-specific explanations to international economic migration and SWB and second, none of their reviewed studies was related to health professionals. Hence, evidence on level and determinants of SWB among migrant health professionals has not been systematically reviewed and synthesized. The next part of this section focuses exclusively on reviewing

current global literature on the level and determinants of SWB among international medical graduates in high-income countries (HICs).

3.2 PART II: Subjective well-being of migrant doctors in high-income countries: A scoping review

This second part of the chapter aims to review the current global literature on the subjective well-being of IMGs in high-income countries (HICs) including Australia. This scoping review focuses on two key aspects of SWB that are widely studied in organisational psychology namely: job and life satisfaction ([Judge and Watanabe 1993](#), [Russell 2008](#), [Bakker and Oerlemans 2011](#), [Diener, Heintzelman et al. 2017](#)). The former concept is often considered as a context-specific indicator for SWB, that has been referred to as work-related or professional well-being or career outcome, in the human resource and labour economics literature. The latter, as mentioned in [Section 3.2.3](#) is regarded as a global measure of subjective well-being or self-reported quality of life among psychologists, sociologists, economists and health scientists. However, the two forms an integral part of what is collectively known as ‘cognitive well-being’ ([Diener, Oishi et al. 2009](#)), which entails individuals’ cognitive evaluation of their lives as a whole or its domains including but not limited to satisfaction with the job. In this review, the term ‘well-being’ is used as an umbrella term to denote individuals’ satisfaction with job and life overall.

Scoping reviews are useful for mapping and examining relevant evidence in a field of interest ([Arksey and O'Malley 2005](#)). As Peters, Godfrey et al. (2015) observed, scoping reviews are meant to clarify working definitions and conceptual boundaries of a topic or a field ([Peters, Godfrey et al. 2015](#)). According to Arksey & O'Malley, (2005), a scoping review differs from a systematic review in that the latter “focuses on a well-defined question where appropriate study designs can be identified in advance, whereas a scoping study tends to address broader topics where many different study designs might be applicable” ([Arksey and O'Malley 2005](#)). Furthermore, scoping reviews are relatively useful especially in a situation where the extent of literature has not been comprehensively reviewed or

demonstrates some intricacies that renders it unsuitable for a “systematic review” ([Peters, Godfrey et al. 2015](#)). Given that the issue of well-being among immigrant doctors has not been comprehensively reviewed before, a scoping review may therefore be a feasible approach that could enable us to gather existing evidence in this field and further identify gaps in the literature as well as some avenues for future research.

The specific objectives of this scoping review exercise are to:

- i. explore the extent of global literature on the professional and non-professional well-being of IMGs in HICs
- ii. identify the level of well-being among IMGs relative to DMGs in HICs
- iii. define the key individual and contextual drivers of well-being among IMGs in Australia and other HICs, and
- iv. establish the major gaps in the current literature

3.2.1 Review method

A scoping review of the current literature was performed following the five-step methodological framework proposed by [Arksey and O'Malley \(2005\)](#). These five steps include:

1. Identifying the research question(s);
2. Defining relevant studies;
3. Study selection;
4. Extracting and charting the data;
5. Collating, summarizing and reporting the data;

3.2.2 Identifying the research question(s)

This scoping review sought to address the following fundamental research questions:

- i. what is the extent of current global literature on the professional and non-professional well-being of IMGs?

- ii. what is the level of well-being among IMGs relative to DMGs in high-income countries?
- iii. what are the main individual and contextual drivers of well-being among IMGs in Australia versus other HICs?
- iv. what are the major gaps in current global literature on the well-being of IMGs in HICs?

3.2.3 Identifying relevant studies

A four-step search strategy was employed. First, a search for MeSH (Medical Subject Heading) terms for job and life satisfaction was performed; second, keywords used in previous systematic reviews on IMGs were identified; third database search was conducted using all the index-terms and keywords identified; and fourth, the reference lists of selected papers were searched for additional articles. Only studies published in the English language between the 1st of January 2006 to 31st of December 2016 were included in this review. The rationale for selecting papers in the English language was because it was the language the reviewer is most familiar and comfortable with. The review period 2006 was selected as the starting point owing to it being the year when health workforce shortage began to gain prominence in the global health discourse as evident in the World Health Report 2006 ([WHO 2006](#)).

The review focused on both academic and grey literature (published and unpublished studies) in order to present a wider picture of the current state of knowledge on the subject. The identified studies were located through the following internationally recognised electronic databases: Medline (Ovid), PsycINFO (Ovid), Excerpta Medica Database (EMBASE) (Ovid), PubMed, Web of science, APAIS-Health – Australian Public Affairs Information Service, the Australasian Medical Index (AMI) database, and ProQuest Dissertations & Theses Global Database. The following keywords and their combinations were used:

[Foreign* or medical* or graduate* or international* or overseas* or trained* or doctors* or physician* or migrant* or refugee*] and [satisfaction* or well-being* or wellbeing* or happiness* or "life satisfaction" or "quality of life" or "job satisfaction" or "career satisfaction"] and [Australia* or Canada* or "United States" or US* or USA* or UK* or "United Kingdom" or Britain* or Europe* or

“OECD countries” or OECD* or “New Zealand*” or Ireland* or France* or Germany* or Netherlands* or “high-income country” or “high-income country” or HICs*]

The review included, original studies that focused on IMGs living and working in HICs, studies that compared IMGs and DMGs, studies that described the level and determinants of job or life satisfaction or both outcomes. With respect to study designs, the review has considered studies that applied quantitative or qualitative designs or both (i.e. mixed method designs).

3.2.4 Study selection

The study selection in this review followed a systematic process. First articles identified through database searches were imported into the EndNote citation software. Second, duplicates were identified and removed and third, the reference list of selected articles were searched for additional studies.

3.2.5 Extracting and charting the data

Data were extracted on the basis of the research questions: comparing well-being levels between IMGs and DMGs, and identifying levels and individual and systemic drivers of well-being among IMGs in the world’s affluent nations. Each article was carefully read and reread in the light of these set of questions and in the process, a number of themes were developed.

3.2.6 Collating, summarizing and reporting the data

The information extracted was collated into quantitative and qualitative thematic summaries (narrative synthesis) on the basis of the research objectives. The data extracted included; Author(s), source origin/country of the study, the purpose of the study, design(s) of the study, population and sample size.

3.2.7 Results

3.2.7.1 Description of reviewed studies

This section presents a summary of the review process and a description of methodological and country-specific characteristics of all included studies. In **Figure 3.1**, a flow chart is presented illustrating the number of studies identified at each stage of the review process. Overall, 173 articles were identified through a systematic search of the eight selected databases. This number was later reduced to 141 articles following removal of duplicate citations. As illustrated in Figure 2, further trimming was done based on the inclusion criteria and finally, a total of 25 full-text articles were selected including eight articles that were identified through reference lists and bibliographies of selected papers.

Figure 3-1: Flow chart of studies identified at each stage of the review process

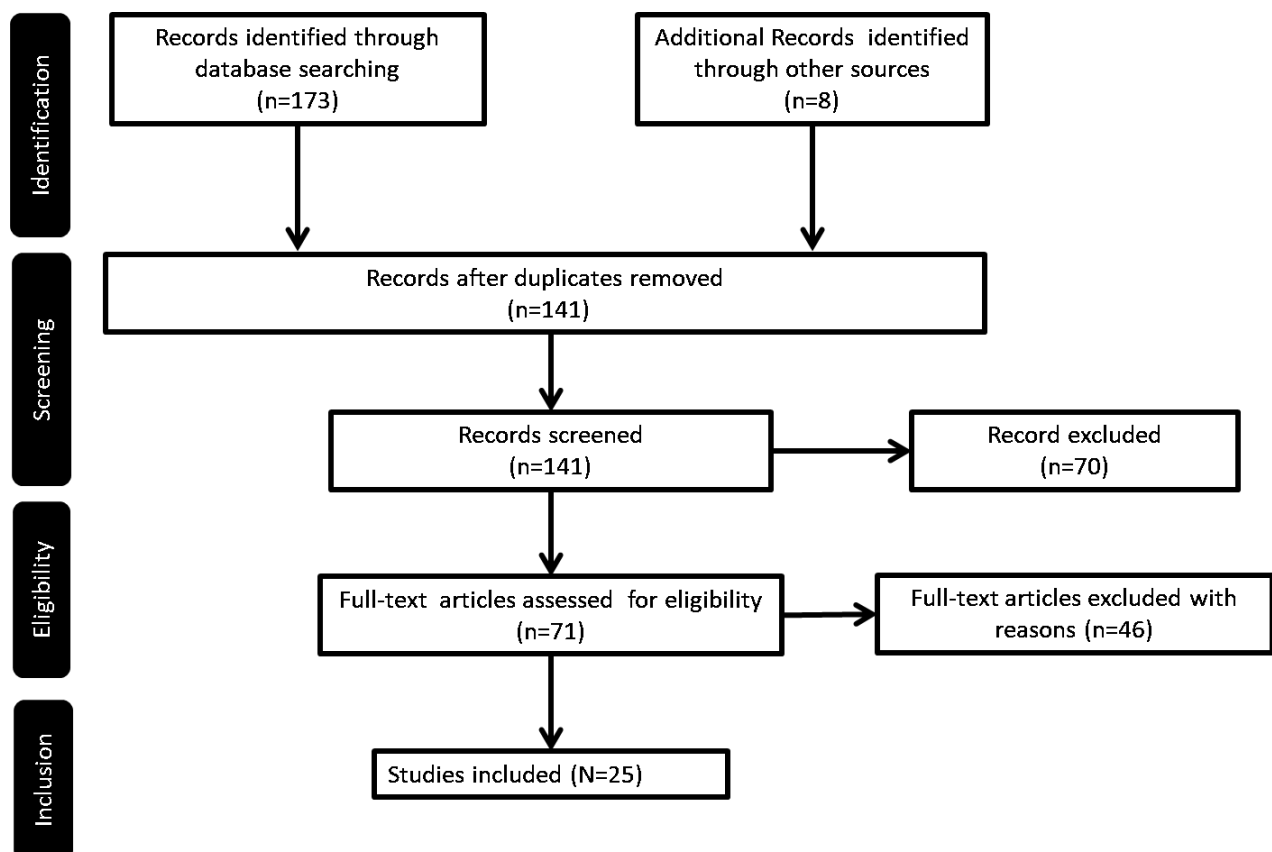


Table 3.1 depicts a summary of included studies by; source country, author(s), year of publication, study title/purpose, study design, data collection technique, and sample (participants). Of the 25 reviewed articles, 64% (n=16) were quantitative, 20% (n=5) were qualitative and 16% (n=4) were

mixed-method studies. Additionally, all the studies were cross-sectional with one being an evaluative case study. Furthermore, the majority of the reviewed studies 60% (n=15) were of a relatively small sample size (ranging between 30 and 300 participants); most of them 64% were published between 2011 and 2016 inclusive.

Table 3-1: Summary of reviewed studies – grouped by source country

Source/Author/Article	Design	Data collection	Sample
AUSTRALIA			
(Han and Humphreys 2006) “Integration and retention of international medical graduates in Rural Communities: A typological analysis”	Cross-sectional Survey (Qualitative)	In-depth interviews (50 face-to-face and 7 by telephone)	A total of 57 IMGs practising in rural Victoria Australia
(Alexander and Fraser 2007) “Education, training and support needs of Australian trained doctors and international medical graduates in rural Australia: a case of special needs?”	-Cross-sectional survey (Quantitative)	-Using questionnaires: one for IMGs and the other for DMGs -Questionnaires contain questions on; Demographic characteristics and support programs	-A total of 114 GPs and registrars (20 IMGs and 94 DMGs) working in rural north-west New South Wales, Australia.
(Wilks, Browne et al. 2008) “Attracting psychiatrists to a rural area - 10 years on”	-Evaluation study (Mixed method)	-An internal review of psychiatrist recruitment and retention over the past 10 years, focusing on elements such as: - o aggregation of data from employment records, - o documented changes to the medical structure, - o level of professional support provided - o Latrobe Regional Hospital educational program for psychiatrist IMGs -Qualitative interviews: with psychiatrists who have been or are now employed by Latrobe Regional Hospital	-Psychiatrists employed by Latrobe Regional Hospital 1994-2006) with the majority being IMGs*
(McGrail, Humphreys et al. 2012) “International medical graduates mandated to practice in rural Australia are highly unsatisfied: Results from a national survey of doctors”	-Cross-sectional survey (Quantitative)	-Self-reports using paper or optional online version of a semi-structured questionnaire: distributed to medical doctors all over Australia.	-A total of 3,502 Medical doctors in Australia (Incl. 940 (27%) IMGs) who participated in Wave 2 MABEL longitudinal survey between June and December 2009. -GPs and GP registrars under mandatory and non-mandatory forms of registration
(Terry, Le et al. 2014) “Satisfaction amid professional challenges: International medical graduates in rural Tasmania”	-Cross-sectional (Mixed method)	-Questionnaire and semi-structured interviews with IMGs working in Tasmania	-105 IMGs working in South, North, and Northwest of Tasmania. -Those under mandatory and non-mandatory forms of registration

			-A purposive snowball and convenience sampling was employed
(Joyce and Wang 2015) "Job satisfaction among Australian doctors: the use of latent class analysis"	-Cross-sectional (Quantitative)	-Self-reports using paper or optional online version of a semi-structured questionnaire: to doctors across all Australian states and territories	-5,764 doctors in Australia who participated in wave 4 (2011) of MABEL survey - GPs and specialists -About 27% of the sample were IMGs
NEW ZEALAND			
(Morton, Hider et al. 2008) "Factors influencing the departure of non-consultant hospital doctors from Christchurch, New Zealand"	-Cross-sectional (Mixed method)	-Review of Canterbury District Health Board (CDHB) database: to identify Resident Medical Officers who terminated their contracts between 1 October 2005 and 30 September 2006. -Exit questionnaire (semi-structured): administered to departing medical staff (n=159)	-Resident Medical Officers registered with Canterbury District Health Board who left or on the verge of leaving the medical unit (N=190)*
(Sharma, Lambert et al. 2012) "Why UK-trained doctors leave the UK: a cross-sectional survey of doctors in New Zealand"	-Cross-sectional survey (Quantitative design)	-Using a postal and online structured questionnaire	-A total of 282 UK medical graduate from 10 graduation-year cohorts who were registered with the New Zealand Medical Council in 2009
CANADA			
(Vardy, Ryan et al. 2008) "Provisionally Licensed International Medical Graduates Recruitment and Retention in Newfoundland and Labrador"	Cross-sectional survey (Quantitative)	Self-administered Questionnaire	-All physicians in Newfoundland and Labrador who practised under a provisional license during the years 1995 through 2004. -A total of 200 physicians responded
(Joudrey and Robson 2010) "Practicing medicine in two countries: South African physicians in Canada"	-Cross-sectional (Qualitative)	Two data sources for pre- and post-migration practice experiences ○ Exploratory interviews with six physicians ○ Open-ended mail surveys with 67 physicians	-73 South African physicians working in Canada -The sample obtained through: ○ Purposive sampling of Alberta health region ○ Advertisement placed in the health region's newsletter
(Armstrong, François et al. 2013) "Understanding Canadian and International Medical Graduate physicians in Manitoba"	-A cross-sectional survey (Quantitative)	-Paper questionnaires were distributed through mail	Authors targeted Manitoba Physicians whose information are listed in the 2010 Scott's Medical Database (N=2442, including 1258 family physicians and 1184 specialists) A random sample of 40% of all Manitoba physicians was selected for the study 718 physicians responded (29.6% IMGs)
UNITED STATES			
(Crouse and Munson 2006) "The effect of the physician J-1 Visa Waiver on rural Wisconsin"	-Cross-sectional (Quantitative)	Sites in Wisconsin at which physicians with a J-1 Visa Waiver practised between 1996 and 2002 were identified.	-All health facilities in Wisconsin (18 hospital and 19 clinics) that have participated in the J-1 Visa Waiver program 1996 through 2002. -145 physicians in total (received J-1 Visa Waiver)

			-Questionnaires returned by 72 physicians (69% response rate)
(Morris, Phillips et al. 2006) "International medical graduates in family medicine in the United States of America: an exploration of professional characteristics and attitudes"	Cross-sectional study (Quantitative)	Secondary data analysis of the 1996-1997 Community Tracking Study (CTS).	Physician Survey comparing 2360 United States medical graduates and 366 international medical graduates who were non-federal allopathic or osteopathic family physicians providing direct patient care for at least 20 hours per week
(West, Shanafelt et al. 2011) "Quality of Life, Burnout, Educational Debt, and Medical Knowledge Among Internal Medicine Residents"	-A national cross-sectional study (Quantitative)	-A study of internal medicine residents using data collected on 2008 and 2009 Internal Medicine In-Training Examination (IM-ITE) scores and the 2008 IM-ITE survey.	Participants were 16 394 residents, representing 74.1% of all eligible US internal medicine residents in the 2008-2009 academic year. This total included 7743 US medical graduates and 8571 international medical graduates
(Chen, Curry et al. 2012) "Career Satisfaction in Primary Care: A Comparison of International and US Medical Graduates"	National representative self-administered mail survey (Quantitative)	Using data from the 2008 Health Tracking Physician Survey, authors examined the association between IMG status and career satisfaction among primary care physicians	-The sampling frame was drawn from the American Medical Association master file including all active, non-federal, office-, and hospital-based physicians. -A total of 4,720 physicians completed the 2008 survey with a weighted response rate of 62%. -Analysis limited to 1,890 primary care physicians (internal medicine, family/general practice and paediatrics), 24.2% of respondents were IMGs
UNITED KINGDOM			
(Oikelome and Healy 2007) "Second-class doctors? The impact of a professional career structure on the employment conditions of overseas- and UK-qualified doctors"	-Cross-sectional (Quantitative)	Use self-administered questionnaires sent by post to health professionals in the UK in 2004. -Questionnaires contain questions about; Contractual arrangements, salary and workload, pay scale and out-of-hours responsibilities, career progression and aspirations, morale, communication about negotiations and socio-demographic details	-A total of 2,596 completed responses were returned, a response rate of 28 per cent. -of this sample, authors run an analysis on a sample of 1,715 of the staff and Associate Specialist doctors. -Sample consisted; 1,225 (71.4 per cent) Over-seas Qualified doctors.
(Oikelome and Healy 2013) "Gender, Migration and Place of Qualification of Doctors in the UK: Perceptions of Inequality, Morale and Career Aspiration"	Cross-sectional (Quantitative)	A postal questionnaire was sent by researchers to a total of 9,300 Staff and Associate Specialist doctors and dentists in the UK.	-A total of 2,596 completed responses were received -a response rate of 28 per cent -with IMGs 71% of the sample
(Hatzidimitriadou and Psinos 2014) "Cultural health capital and professional experiences of overseas doctors and nurses in the UK"	-Cross-sectional (Qualitative)	An autobiographical narrative interview; -Lasting 1.5hr -Audio recorded	Purposive sampling used to recruit; 5 doctors (4 males, 1 female), 5 nurses and 5 social workers via professional networks in London.
IRELAND			

(Humphries, Tyrrell et al. 2013) “A cycle of brain gain, waste and drain - a qualitative study of non-EU migrant doctors in Ireland”	-Cross-sectional (Qualitative)	-In-depth interviews	-37 non-EU migrant doctors in Ireland in 2011/2012
(Brugha, McAleese et al. 2016) “Passing through – reasons why migrant doctors in Ireland plan to stay, return home or migrate onwards to new destination countries”	A cross-sectional study (Quantitative)	-An online survey questionnaire; -assessing physicians’ reasons for migrating to Ireland, their experiences whilst working and living in Ireland, and their future plans	-A total of 366 non-European nationals registered as medical doctors in Ireland;
(Tyrrell, Keegan et al. 2016) “Predictors of career progression and obstacles and opportunities for non-EU hospital doctors to undertake postgraduate training in Ireland”	Cross-sectional (Quantitative)	An online survey questionnaire; -about recruitment, -training and -career experiences in Ireland.	-Authors utilized quantitative data from the Doctor Migration Project (2011–2013). -The analysis focused on a sample of 231 non-EU physicians registered with the Medical Council of Ireland
GERMANY			
(Pantenburg, Kitze et al. 2016) “Job satisfaction of foreign-national physicians working inpatient care: a cross-sectional study in Saxony, Germany”	A cross-sectional survey (Quantitative)	Paper-pencil questionnaire addressing; -socio-demographics -job satisfaction by -self-rated satisfaction with the overall job situation on a 5-point Likert scale (1 = very dissatisfied to 5 = very satisfied)	-All physicians ≤40 years and registered with the State Chamber of Physicians of Saxony (n = 5956). -A total of 2357 questionnaires were returned (response rate = 40 %). -Ten per cent (192/1893) of the sample were IMGs
FINLAND			
(Aalto, Heponiemi et al. 2014) “Employment, psychosocial work environment and well-being among migrant and native physicians in Finnish health care”	A national cross-sectional survey (Quantitative)	Use of self-administered questionnaires containing issues related to; -Work-related stressors -Work-related resources -Work-related well-being (burnout & workability).	-A random sample of Finnish medical graduates (N = 7000) and all foreign-born physicians licensed to practice in Finland (N = 1292). -The final response rates were 56% (n = 3,646) among native Finns and 43% (n = 553) among foreign-born physicians.
(Kuusio, Lamsa et al. 2014) “Inflows of foreign-born physicians and their access to employment and work experiences in health care in Finland: qualitative and quantitative study”	A cross-sectional study (Mixed method)	The authors used three different datasets: -registers, -theme interviews -questionnaire survey	The sample consisted of foreign-born physicians in Finland. -interview data were obtained from foreign-born GPs (n = 12), -Survey data were obtained from all (n = 1,292; response rate 42%) foreign-born physicians.
NORWAY			
(Skjeggstad, Sandal et al. 2015) “International medical graduates’ perceptions of entering the profession in Norway”	Cross-sectional (Qualitative)	The authors collected data using semi-structured interviews	A total of 16 international medical graduates who had foreign training and citizenship; and who had worked as doctors in Norway for less than two years were interviewed.

Overall, 52% (n=13) of the reviewed studies included IMGs and DMGs of which two failed to make mention of the number or proportion of IMGs in the sample (indicated in the table with an asterisk *). With respect to source countries of reviewed studies, 32% (n=8) were conducted in Australasia (Australia + Zealand), 28% (n=7) in North America (Canada + the USA), and 40% (n=10) in Europe (UK, Republic of Ireland, Germany, Finland and Norway).

3.2.7.2 *The extent of current global literature on the professional and non-professional well-being of IMGs*

Of the 25 reviewed articles, 76% (n=19) were related to aspects of job satisfaction (satisfaction with the job as a whole or its domains) and only 24% (n=6) were related to satisfaction with life (in the host country/community). Most notably, only one study had measured life satisfaction using a standard 'satisfaction with life scale', which was an Australian-based cross-sectional study. In terms of identifying possible determinants of well-being, 76% (n=19) of the studies have identified one or more contributing factors to IMGs' well-being (satisfaction with job and life). The remaining 24% (n=6) of the studies had only reported the level of well-being experienced by IMGs. Most notably, only 24% (n=6) of the studies had specifically explored subgroup differences in level and drivers of well-being among IMGs.

3.2.7.3 *Level of satisfaction among IMGs compared to DMGs by key regions*

Based on the literature search findings, the aim of this section is to compare levels of satisfaction between IMGs and DMGs across the following three major regions: Australasia, North America, and Europe.

Australasia

In a small-scale cross-sectional study in rural north-west New South Wales, Australia, [Alexander and Fraser \(2007\)](#) observed that IMGs were more satisfied compared to Australian graduates with respect to life as rural GP (95% compared with 84%) and their overall job (89% vs. 82%). However, analysis of a nationally representative data by [McGrail, Humphreys et al. \(2012\)](#) has indicated that certain groups

of IMGs – mainly those restricted by regulations encouraging rural practice – were more likely to report lower job and life satisfaction compared to their rural DMGs counterparts. In their analysis of Job satisfaction in a representative sample of 5,764 Australian doctors, [Joyce and Wang \(2015\)](#) reported that being an IMG was associated with reporting a lower level of job satisfaction.

North America

In Manitoba (Canada), it was observed that IMGs and Canadian medical graduates were similar in terms of overall job satisfaction rating ([Armstrong, François et al. 2013](#)). In a large sample of primary care physicians in the US (4,720 physicians), [Chen, Curry et al. \(2012\)](#) observed that compared to DMGs, IMGs were less likely to report career satisfaction. In another representative study of 16,394 internal medicine residents, in the United States, it was observed that the IMG group was less likely to report lower subjective quality of life than DMGs ([West, Shanafelt et al. 2011](#)). However, it is not clear from these studies whether the newly employed, recently arrived, or those IMGs from more linguistically dissimilar backgrounds to the population base, were the least or most satisfied.

Europe

In Germany, [Pantenburg, Kitze et al. \(2016\)](#) observed that compared to DMGs, IMGs were more satisfied with respect to the patient relationship but less satisfied with regards to their job content and environment. Likewise, in Finland [Aalto, Heponiemi et al. \(2014\)](#) reported that IMGs perceived less professional well-being (contentment with job and career prospect) compared to DMGs.

In summary, across all the regions, it appears that IMGs' job satisfaction tends to fall below that of their DMG counterparts. Interestingly only the works of [Alexander and Fraser \(2007\)](#), [McGrail, Humphreys et al. \(2012\)](#) and that of [West, Shanafelt et al. \(2011\)](#) had compared life satisfaction across the two groups of doctors. But precisely, only [McGrail, Humphreys et al. \(2012\)](#) had applied the validated standard 'general life satisfaction questionnaire'.

3.2.7.4 *Determinants of satisfaction among IMGs in Australia versus other HICs: A synthesis of quantitative and qualitative evidence*

This section aims to bring together a summary of factors associated with satisfaction of IMGs in Australia compared to other HICs. Based on the research objective, papers were read, and factors associated with a specific domain of satisfaction were identified and categorised under the following major analytic themes namely: individual and systemic drivers as presented in **Table 3.2**.

Table 3-2: Narrative synthesis (thematic analysis process)

Items from primary sources	Descriptive themes	Analytic themes
Theme 1		
Registration/license category	Regulatory/policy factors	Systemic drivers
Restriction of location of practice		
Theme 2		
Scope of practice	Organisational/work-related factors	
Access to professional networks		
Adequate professional support		
Feedback from Patients and management		
Access to career opportunities		
Theme 3		
Security (sense of safety for self and family in geographic location)	Community/geographic factors	
Social and cultural connectedness in work location		
Theme 4		
Gender	Individual-related factors	Individual drivers
Cultural adaptation		
Family		
Financial security		

Systemic drivers of satisfaction in IMGs

Regulatory/policy-related factors

The reviewed studies have demonstrated the significance of regulatory conditions to IMGs' satisfaction. For instance, a study in Australia revealed that internationally trained GPs who were mandated to practice in underserved areas were more likely to report a lower level of job and life satisfaction than their domestic or non-mandated GP counterparts ([McGrail, Humphreys et al. 2012](#)). Importantly, this was the only major quantitative analysis on the influence of mandatory practice on the subjective well-being of IMGs in Australia. Beside mandatory practice, the type of registration that

a doctor holds also appeared to be important for their sense of autonomy and well-being. Commenting on this, [Alexander and Fraser \(2007\)](#) speculated that access to full/unconditional registration and passing of the AMC clinical exams could result in a high level of job and life satisfaction among IMGs in rural Australia. However, it must be noted that this assumption had no statistical basis.

Similar issues were observed in Canada, where it was reported that though overall job satisfaction ratings were similar between IMGs and DMGs, reduced mobility due to return-of-service (ROS)⁵ agreement has been claimed as one of the key contributing factors to job dissatisfaction among some IMGs ([Armstrong, François et al. 2013](#)). Additionally, one of the themes from an exclusive IMG focussed qualitative enquiry (73 participants) in Canada reported that Canadian medical system being perceived as a restrictive system is considered a major source of frustration and dissatisfaction among some South African doctors ([Joudrey and Robson 2010](#)). Likewise, in rural Wisconsin (the United States), [Crouse and Munson \(2006\)](#) reported that while physicians under J-1 Visa waiver (foreign physicians mandated to practice in undersupplied locations for 3 years) were satisfied with patient interaction, they were less satisfied with life in the community. However, this study relied on data obtained from health facilities observer and not the direct responses of individual IMGs under J-1 Visa Waiver.

Organizational/workplace-related factors

Scope of clinical practice

The term “scope of clinical practice” is used here to denote all issues relating to IMGs’ practice orientation e.g. public vs. private hospital practice, specialist vs. general practice and type of hospital department (paediatric, cardiology, neurology). Surprisingly, there appeared to be a scarcity of literature on the association between the scope of practice and the well-being of IMGs in Australia.

⁵ In some Canadian provinces, IMGs who match to residency programs are required to sign agreements which condition them to work in a rural community for a specified period following the completion of their residency ([Armstrong, François et al. 2013](#)).

However, in the United States, [Chen, Curry et al. \(2012\)](#) reported that IMG paediatricians were almost twice more likely to be satisfied with their job compared to IMGs internists. These authors further reported that IMGs in solo practice also tend to report a lower level of job and career satisfaction. With respect to the type of health care sector, in Finland, it was observed that IMGs in private practice reported higher mean score of job satisfaction compared those IMGs working in public sector ([Kuusio, Lamsa et al. 2014](#)).

Professional support and networks

Studies showed that the availability of appropriate professional support (i.e. support obtained from co-workers and the management) in the workplace are positively associated with IMGs' job satisfaction. Qualitative evidence from Australia revealed that despite some challenges, professional support has the potential to increase IMGs' job satisfaction ([Terry, Le et al. 2014](#)) especially in the earlier parts of their employment. Likewise, [Wilks, Browne et al. \(2008\)](#) suggested that job satisfaction of IMGs in rural Australia could increase if they have access to professional networks and supportive supervision.

Similarly, in Finland, it was observed that compared to Finnish doctors, IMGs were more likely to report a lack of access to professional support and a lower sense of professional wellbeing ([Aalto, Heponiemi et al. 2014](#)). Further, in Germany, [Pantenburg, Kitze et al. \(2016\)](#) reported that while patient interaction was rated satisfactory by IMGs in the study, they were highly dissatisfied with the relationship with their co-workers and the work atmosphere. This was speculated to be driven by the poor socialization experienced by some of these doctors in the workplace.

Performance Feedback from Patients and management

The reviewed evidence showed that getting recognition for doing a good job and access to information all appeared to be important for promoting a sense of well-being among IMGs. In a cross country study, comprising 'Australia and New Zealand', it was reported that some of the overseas trained

psychiatrists reported feelings of anger, frustration and were visibly demoralized by the inadequacy of feedback from resident training colleges and the workplace ([Huthwaite, Short et al. 2012](#)). In Australia, timely feedback has been reported as essential for IMGs especially during the early stages of their settlement and interactions with training colleges, see the parliamentary report “Lost in the Labyrinth’ ([House of Representatives Committee Australia 2012](#)).

Similarly, in New Zealand, some resident medical officers including IMGs (number and percentage not reported) were dissatisfied at receiving a lower level of performance feedback from the management ([Morton, Hider et al. 2008](#)). Furthermore, in Finland, getting positive feedback on task performance not only from supervisors as well as patients were found to increase the job satisfaction of IMGs ([Kuusio, Lamsa et al. 2014](#)). According to these authors, negative feedback from patients has negative consequences for IMGs’ wellbeing in and outside the workplace.

Opportunities for professional training and development

Access to professional training and development (such as; opportunities for promotion, training and career advancement) has been identified as an important determinant of doctors’ job satisfaction ([Krogstad, Hofoss et al. 2006](#)) and IMGs are no exception as demonstrated in some of the reviewed studies. In New Zealand, [Morton, Hider et al. \(2008\)](#) reported that receiving a lower level of career training is the reason for discontentment among some resident medical officers (including IMGs). In a sample of 176 internationally trained health professionals in Canada, [Bourgeault, Neiterman et al. \(2013\)](#) reported a lack of access to residency training programs as a contributing factor to downward professional mobility and frustration among IMGs. Surprisingly, there was no report from Australia on the link between career opportunities and IMGs’ satisfaction.

Community-related factors

Access to social support and networks in the geographic location

As demonstrated throughout this thesis report, IMGs are mostly employed to fill clinical positions in remote or underserved locations ([Chen, Curry et al. 2012](#), [McGrail, Humphreys et al. 2012](#)), affiliation with a social network appears to enhance the integration processes of these doctors into their host societies ([Han and Humphreys 2006](#), [Skjeggstad, Sandal et al. 2015](#)). Lack of access to social networks results to dissatisfaction with life in a host community as reported in Australia ([Han and Humphreys 2006](#)) and similarly in Canada ([Vardy, Ryan et al. 2008](#)). In Manitoba – Canada, [Armstrong, François et al. \(2013\)](#) observed that while Canadian Medical Graduates (CMGs) were mainly dissatisfied with certain professional structures at work, IMGs, on the contrary, were more dissatisfied with their work location due to lack of access to social support and networks. A qualitative data from UK [Rich, Viney et al. \(2016\)](#), indicated that separation from social support has the potential of affecting the mental well-being of doctors including IMGs from black and minority backgrounds. IMGs are likely to be dissatisfied with communities that fail to connect them to their networks of religious groups as reported by [Crouse and Munson \(2006\)](#) in Wisconsin, USA. Availability of social support – being able to talk to someone for advice or emotional support – was associated with the mental well-being of IMGs in US psychiatry ([Atri, Matorin et al. 2011](#)).

Individual-level factors

A range of socio-demographic factors has been reported in the literature as correlates of IMGs' professional and non-professional well-being. These factors are further described below.

Gender

Most notably, gender disparities in well-being among IMGs have been reported only in the UK. Comparing female IMGs to male IMGs and female UK graduates, using the Chi-square test of association, [Oikelome and Healy \(2013\)](#) observed that being female IMGs was significantly associated experiencing inequality in the workplace which also correlated with their perception of low morale and career aspiration.

Family

Five studies have mentioned the role of the family to the satisfaction of IMGs in host societies. These include; from Australia ([Han and Humphreys 2006](#), [Wilks, Browne et al. 2008](#), [McGrail, Humphreys et al. 2012](#)) and Canada ([Vardy, Ryan et al. 2008](#), [Joudrey and Robson 2010](#)). The studies showed that communities that are responsive to the employment, security and educational needs of IMGs and their families tend to be more appreciated than those that fail to fulfil such needs.

Cultural adaptation

Two studies in Australia have demonstrated that the ability of IMGs to acculturate to the host community was positively associated with their job satisfaction and the intention to remain in rural areas ([Han and Humphreys 2006](#), [Wilks, Browne et al. 2008](#)). Similar findings were observed in the United States ([Atri, Matorin et al. 2011](#)) and the Republic of Ireland ([Tyrrell, Keegan et al. 2016](#)).

Immigration status

In Australia, having a permanent residency has been speculated by [Alexander and Fraser \(2007\)](#) as one of the reasons for job and life satisfaction among some of the IMGs in rural areas of north-west New South Wales. Likewise in the UK, within the NHS, IMGs with temporary migration status were less satisfied with their career progression compared to those with EU citizenship or work permit ([Hatzidimitriadou and Psinos 2014](#)).

Country of medical training and language

A cross-sectional study in Australia suggested that IMGs (in general practice) from culturally and linguistically dissimilar backgrounds tend to be less satisfied with their job and life even after completing the term of mandatory service ([McGrail, Humphreys et al. 2012](#)).

Income and financial related factors

A representative survey in the US found that exposure to financial debt had a stronger negative effect on the self-reported quality-of-life among IMGs than DMGs ([West, Shanafelt et al. 2011](#)). Surprisingly, among the reviewed studies, this was the only major study that explored the association between earnings and well-being among IMGs.

3.2.8 Discussion

This Chapter used [Arksey and O'Malley \(2005\)](#) framework for scoping review to systematically explore and synthesize existing literature on levels and determinants of job and life satisfaction (professional and non-professional well-being respectively) among IMGs in high-income countries including Australia. The database search included both academic and grey literature, published from January 2006 to December 2016. There is a small but growing body of literature on the satisfaction of IMGs in HICs. However, the existing literature has largely focused on job satisfaction (professional well-being) of IMGs (19 out of the 25 reviewed studies) rather than their general life satisfaction (subjective well-being). What was even more startling is that only one of the studies relating to life satisfaction had applied the standard validated life satisfaction scale ([McGrail, Humphreys et al. 2012](#)) – An Australia-based study. One of the potential explanations for the increasing focus on job satisfaction could be because it is widely viewed as an important measure of career outcome. Thus, health services researchers might be more inclined towards measuring IMGs' job satisfaction as a means of estimating their labour market integration and outcome. However, overlooking the life satisfaction of IMGs, has limited our understanding about the way they are faring in destination countries. If the primary motivation for migration among these doctors was for a better quality of life as demonstrated in previous publications ([Klein, Hofmeister et al. 2009](#), [Arnold and Lewinsohn 2010](#), [Kalra, Bhugra et al. 2012](#)), then the application of the life satisfaction measure in these professionals is highly relevant.

Another surprising trend in the literature was the distinct absence of longitudinal studies on IMGs' satisfaction across all major destination countries including but not limited to Australia, Canada, New Zealand, UK, and the USA ([Chen, Curry et al. 2012](#), [Aalto, Heponiemi et al. 2014](#), [Joyce and Wang](#)

[2015](#), [Pantenburg, Kitze et al. 2016](#)). This suggests that changes in the experiences and satisfaction of IMGs over time have not been investigated in the current literature. Such studies may be vital for increasing our understanding of how the doctors' professional circumstances and well-being evolve over time and what these mean for policy. Furthermore, only two studies ([Aalto, Heponiemi et al. 2014](#), [Kuusio, Lamsa et al. 2014](#)) have applied a job stress theory in trying to explain work-related determinants of professional well-being among IMGs.

With respect the specific experiences of IMGs, most of the reviewed studies demonstrated that they more likely to experience lower satisfaction (with job) than DMGs ([Chen, Curry et al. 2012](#), [McGrail, Humphreys et al. 2012](#), [Aalto, Heponiemi et al. 2014](#), [Joyce and Wang 2015](#), [Pantenburg, Kitze et al. 2016](#)); more likely to occupy the lower echelon of clinical position ([Oikelome and Healy 2013](#), [Aalto, Heponiemi et al. 2014](#)) and experience career stagnation ([Bourgeault, Neiterman et al. 2013](#)). Additionally, the reviewed evidence showed that IMGs were largely discontented with the social aspects of their employment (e.g. interpersonal relations, social support, and feedback) ([Pantenburg, Kitze et al. 2016](#)) as well as job content (e.g. career opportunities) ([Morton, Hider et al. 2008](#)). This is critical, given the negative consequences that persistence discontentment may pose to practitioners' performance, retention and the quality of care ([Wallace, Lemaire et al. 2009](#), [Scheepers, Boerebach et al. 2015](#)).

The review identified a number of key factors associated with IMGs' job and life satisfaction across HICs. Regulatory factors such mandatory clinical practice in underserved areas ([Crouse and Munson 2006](#), [McGrail, Humphreys et al. 2012](#)), return of service agreement ([Armstrong, François et al. 2013](#)) and/ or being provisionally licensed ([Vardy, Ryan et al. 2008](#)), were associated reduced level of satisfaction among affected IMGs. This observation demonstrates the potential impact of regulatory induced professional and social isolation on well-being. Though, the primary motive for IMGs' recruitment is to serve in under-supplied areas, practising in these locations could increase the risk of social and professional isolation ([Hawthorne, Birrell et al. 2004](#)) with the propensity to

negatively influence their well-being. While all doctors under mandatory contract are likely to experience similar hurdles ([Frehywot, Mullan et al. 2010](#)), the issue of migrant physicians raises particular concerns due to their experience in the regulated healthcare labour market ([Owusu and Sweetman 2015](#)) and their status as migrants (minority group).

Workplace-related factors such as access to; professional supports, career opportunities and professional networks all appeared to be important for IMGs' overall satisfaction with their job ([Wilks, Browne et al. 2008](#), [Aalto, Heponiemi et al. 2014](#), [Terry, Le et al. 2014](#), [Pantenburg, Kitze et al. 2016](#)). Furthermore, positive interactions with patients and co-workers, obtaining encouraging performance feedback from both patients and management ([Kuusio, Lamsa et al. 2014](#), [Pantenburg, Kitze et al. 2016](#)) all appeared significant for the professional well-being of IMGs in HICs (Australia, Germany and Finland).

At the broader social context, community characteristics appear to be important factors of IMGs' well-being. Communities that offer IMGs some security, connection to ones' cultural and religious groups, opportunities for spousal employment and children's education tend to be critical for both their job and life satisfaction in Australia, Canada, and the USA ([Crouse and Munson 2006](#), [Han and Humphreys 2006](#), [Joudrey and Robson 2010](#), [McGrail, Humphreys et al. 2012](#)).

At individual level, the literature showed that female gender ([Oikelome and Healy 2013](#)), having cultural and linguistic background that is markedly different from that of the host country ([McGrail, Humphreys et al. 2012](#), [Bourgeault, Neiterman et al. 2013](#)) and having temporary (as opposed to permanent) residential status ([Hatidimitriadou and Psinos 2014](#)) are associated with lower professional well-being among IMGs in Australia and UK. Additionally, family circumstances such as separation from family ([Vardy, Ryan et al. 2008](#), [Rich, Viney et al. 2016](#)), and limited spousal employment opportunities ([McGrail, Humphreys et al. 2012](#)) are found to be important for the job and life satisfaction of IMGs in Australia, Canada and the UK.

3.2.9 Conclusion

This scoping review presented in this chapter has confirmed that the current literature on the satisfaction of IMGs in HICs is in its infancy and that their job satisfaction is the most studied domain of their satisfaction. Empirical evidence on IMGs' life satisfaction is scarce in the current literature. Additionally, this review further identified that factors associated with the well-being of IMGs in HICs are multifaceted, relating to their regulatory, workplace, community and individual circumstances. Though this scoping review has described the current state of knowledge on job and life satisfaction of IMGs in HICs, it has also identified some major gaps in the literature which need to be addressed in future research.

3.3 Major research gaps in the global literature on the well-being of IMGs in HICs

The literature has not provided substantial evidence on the extent to which IMGs in HICs rate the overall quality of their lives relative to their DMG counterparts. With the absence of such data, it is difficult to draw a global comparison of general life satisfaction (subjective well-being) between IMGs and other economic migrant populations. Additionally, (at methodological level), this scoping review has identified a dearth of longitudinal analysis on the satisfaction of IMGs across HICs including Australia. Some other major methodological constraints identified in this review include external validity or generalizability problems (owing to the use of small sample sizes), reliance entirely on cross-sectional data (inability of establishing temporality between predictors and measures of satisfaction), and measurement problems (only one study used a validated life satisfaction scale). Further, surprisingly, though IMGs are often regarded as a highly diverse group with respect to culture, language, and racial composition, they have been largely considered as a monolithic entity in the majority reviewed studies. This limits our understanding about which groups of IMGs are at a greater risk of sub-optimal well-being and why.

3.4 Addressing existing gaps in the literature: the present study

Addressing the above limitations in contemporary global literature is the main motivation for this thesis research. As stated earlier (in [Chapter One](#)), this thesis aims to investigate the effects of changes in professional experiences of IMGs on their subjective well-being (general life satisfaction) in Australia. To do this, it will proceed in three parts (separate empirical chapters) each of which attempt to address a specific research question.

More specifically, the **first empirical chapter** ([Chapter Four](#)) focused on exploring difference in subjective well-being and its drivers between international and domestic medical graduates. The key objectives of this part are to:

- i. determine if IMGs are more likely to report lower SWB than DMGs,
- ii. describe key factors associated with the SWB difference between the groups

To accomplish these objectives this chapter applied the linear decomposition method proposed by [Oaxaca and Ransom \(1994\)](#). The main predictor variables are psychosocial risk factors such as job demands, job resources (e.g. job control, rewards and peer support) as defined by the Job Demands-Resource Model ([Demerouti, Bakker et al. 2001](#)), sense of community integration (perceptions about one's geographic location or community to be precise), and personal resources (i.e. personality traits). The data source was the MABEL (Medicine in Australia: Balancing Employment and Life) longitudinal survey, spanning from 2009 to 2016.

The **second empirical chapter** (Chapter Five) seeks to examine the effects of changes in working conditions on the SWB of IMGs compared to DMGs. The specific objectives of this part are to:

- i. compare trends in SWB and psychosocial distress between IMGs and DMGs over time,
- ii. test whether individual-specific responses to changes in psychosocial working conditions and community integration vary by doctors' training status (international vs. domestic trained),

- iii. determine whether individual-specific responses to changes in psychosocial working conditions and community integration vary within IMGs by:
 - a. arrival cohorts,
 - b. the pathway to clinical practice (competent vs. non-competent authority pathway)
 - c. region of the primary medical degree
 - d. doctor type (Specialists, GPs and hospital non-specialists)?

These specific research questions were addressed using the Fixed Effect (FE) linear regression model. The main predictors were job characteristics (job demands and resources) and a sense of community integration. It used the same dataset as Chapter Four.

1. The **third part** aims to explore the effect of regulatory changes on the SWB and working hours of IMGs. More specifically, this part aims to
 - a. test, whether the de-registration decision of MBA in 2013 was associated with changes in hours worked on clinical and educational activities, and life satisfaction among limited compared to fully registered IMGs working across Australia.

This research question was examined using a difference-in-differences (DiD) estimator in a generalised random effect (RE) linear regression model. The main predictor was the post-announcement period for the MBA's decision. Like the other two, this part used the MABEL longitudinal dataset (2009-2016).

4 Exploring Well-being Difference and its Drivers between IMGs and DMGs

The previous chapter confirmed that little research has been conducted to date on the life satisfaction or subjective well-being of internationally trained doctors in advanced industrial societies relative to domestic medical graduates (e.g., Australia, Canada, New Zealand, UK, and the USA). The following chapter attempts to address this gap in an Australian context by systematically investigating the magnitude and determinants of subjective well-being (SWB) gap between IMGs and DMGs. The chapter is built upon the premise that decent employment is a central part of people's lives and a mean for self-fulfillment ([Laczko and Appave 2015](#)). Unfavourable conditions at work can have undesirable consequences on the overall quality of people's life ([Wilkinson and Marmot 2003](#)). As stated earlier in [section 1.2](#), life satisfaction has been widely recognized as a measure of people's subjective (self-reported) well-being or quality of life ([Diener, Inglehart et al. 2013](#)). Additionally, it has also been previously used as a proxy of immigrants' 'integration' in host societies ([Amit 2010](#), [Amit and Bar-Lev 2015](#)). The twin aims of this chapter are first, to determine whether the IMG group is more likely to report lower SWB than the DMG counterpart; and second, to use the detailed linear decomposition technique of [Oaxaca and Ransom \(1994\)](#) to identify key factors contributing to the differences (if any) in SWB between the two groups. The chapter uses a unique longitudinal dataset from the Medicine in Australia Balancing Employment and Life (MABEL) survey.

4.1 Introduction

The attainment of national and global health goals depends on a skillful, motivated, well-distributed and functioning health workforce ([WHO 2013](#)). Unfortunately, shortage and maldistribution of skilled health workers continue to hamper access to basic healthcare services worldwide.

In an ambitious attempt to offset acute shortages and maldistribution problems in their medical workforces, — especially in rural areas characterised by low population density — many high-income

nations like Australia, Canada, New Zealand, UK and the USA and some Gulf States (Kuwait, Qatar, Saudi Arabia) ([Connell 2010](#)) have initiated various strategies including most notably, the active international recruitment of IMGs ([Siyam and Dal Poz 2014](#)). These IMGs, upon first registration, are mainly conditioned to serve in districts of workforce shortage ([McGrath, Wong et al. 2011](#), [OECD 2016](#)) where they provide healthcare services to residents. This recruitment of IMGs has been helping affluent nations to leverage the supply and distribution of medical practitioners, reducing pre-existing geographical imbalances, and promoting equitable access to basic healthcare services. Additionally, reliance on IMGs has been associated with improved diversity and the cross-cultural sharing of knowledge and experiences in the medical workforces ([OECD 2008](#)). However, active international recruitment on a large scale has been heavily criticized at the global level for exacerbating the medical workforce shortages and imbalances in many source countries, which are frequently poorer than the destination country ([Aluttis, Bishaw et al. 2014](#), [Tam, Edge et al. 2016](#)).

From human right perspectives, doctors have a fundamental human right to mobility, including the freedom to emigrate to global destinations if this is their choice. Migration to affluent nations is mainly a personal decision that is primarily motivated by the desire to optimize better opportunities and 'well-being'. However, for many IMGs moving to a new country comes at a cost. For instance, many experience disruptions in social and cultural ties, and increasing stress while navigating the social milieu of the host society ([Chen, Nunez-Smith et al. 2010](#)). Additionally, overcoming the hurdles of pre-employment language and clinical assessments can be daunting and highly stressful for many doctors ([Rumsey, Thiessen et al. 2016](#)). Furthermore, although their successful adjustment to the health system of their host countries is central to the success of recruitment policies ([Birrell and Schwartz 2007](#)) and their own well-being, many IMGs experience a high level of stress as a result of persistent exposure to adverse psychosocial factors ([Kalra, Bhugra et al. 2012](#), [Kuusio, Heponiemi et al. 2013](#), [Khan, Chikkatagaiah et al. 2015](#)).

Broadly defined, psychosocial factors are the social conditions under which people live, interact or work that has the potential to influence their behaviours and well-being through the mediation of perceptions ([Levi 1972](#), [Siegrist and Marmot 2004](#)). In the context of work, psychosocial factors according to [Dollard, Shimazu et al. \(2014\)](#) are those aspects of the work environment that are of human design and construction, that have the propensity to influence employees' mental or physical functioning. They are generally related to the nature of social relations at the workplace, and the design, organization, and management of work. Specifically, psychosocial factors include but are not limited to workload, job security, job control, social support, and career opportunities. Theory suggests that prolonged exposure to uncontrolled adverse psychosocial factors (e.g. poor peer support, excessive workload) constitutes a risk factor for employees' mental and emotional distress ([Schaufeli and Taris 2014](#)).

Exposure to psychosocial risk factors is a major challenge for workers in human service industries. In particular, medical doctors are exposed to a complex array of these stressors at work including but not limited to; high work pressure, low job control, inadequate supervisor and co-worker support, having to deal with complex patients and emotionally intense situations, long working hours, risk of malpractice lawsuits, and poor work-life balance ([Kakunje 2011](#), [Brower and Riba 2017](#)). Persistent exposure to these adverse psychosocial conditions at work has been linked to lower job and life satisfaction among medical practitioners ([Nylenna, Gulbrandsen et al. 2005](#), [Buddeberg-Fischer, Klaghofer et al. 2008](#), [Tyssen, Hem et al. 2009](#), [Mahmood, Grotmol et al. 2018](#)). There have long been reports of higher psychosocial risk exposure (e.g. higher job demands, lower social support, and professional isolation) among IMGs compared to their local/domestic medical graduate (DMG) counterparts in several high-income countries such as the Australia, UK, USA, Finland and Germany ([Han and Humphreys 2006](#), [Chen, Curry et al. 2012](#), [Aalto, Heponiemi et al. 2014](#), [Kuusio, Lamsa et al. 2014](#), [Pantenburg, Kitze et al. 2016](#), [Rich, Viney et al. 2016](#)). However, to date, it remains unclear to what extent differences in psychosocial risk exposure explain well-being inequalities between IMGs and DMGs.

Concerns over the psychosocial experiences of migrant health personnel including ‘doctors’ has gained momentum in the global health discourse since the year 2010, when the World Health Organisation adopted the WHO global code of practice on the international recruitment of health personnel (the Code) ([Siyam and Dal Poz 2014](#)). The Code is a non-binding ethical framework and principles for governing the international recruitment of health personnel. Besides calling on member states to ensure self-sufficiency in health workforce training and supply, the Code also requires states to recognize and safeguard the individual rights of migrant health personnel. More specifically, Article 4.5-6 of the Code states

[“Member States should ensure that.... migrant health personnel enjoy the same legal rights and responsibilities as the domestically trained health workforce in all terms of employment and conditions of work ^{4.5}. States should take measures to ensure that migrant health personnel enjoy opportunities and incentives to strengthen their professional education, qualifications and career progression, on the basis of equal treatment with the domestically trained health workforce subject to applicable laws. All migrant health personnel should be offered appropriate induction and orientation programmes that enable them to operate safely and effectively within the health system of the destination country ^{4.6}”]

This chapter aims to systematically investigate psychosocial determinants of differences in SWB between the IMG and DMG groups using Australian data. As established in [Chapter three](#), there is a paucity of scientific evidence on the life satisfaction of IMGs across all major destination countries. In Australia, only one previous study has been identified that applied the standard life satisfaction scale from the MABEL survey to investigate the personal well-being experiences of IMGs ([McGrail, Humphreys et al. 2012](#)). In addition to its cross-sectional design, this study was also limited by being confined to only general practitioner IMGs (restricted or unrestricted) in districts of workforce shortage. Thus, despite its significant findings, this study may not be generalizable to all IMGs in the country. To address this, the following chapter takes a more general approach by using the entire sample of IMGs and compares directly to DMGs while adjusting for physicians’ personal and employment characteristics. Using the pooled sample helps to enhance the statistical power and precision in the estimates during data analysis and improve the generalisability of the results.

Understanding factors that influence the general satisfaction of medical professionals are critical for the promotion of physician retention, well-being, and patient satisfaction ([Wallace, Lemaire et al. 2009](#), [West, Dyrbye et al. 2014](#), [Scheepers, Boerebach et al. 2015](#)). In the case of IMGs, such knowledge may be essential for promoting their community and workplace integration. Like the population they serve, physicians need to understand which factors—in and outside the workplace—matter to their personal well-being and how to influence them ([Yamey and Wilkes 2001](#), [World Medical Association 2015](#)).

To explore well-being inequality and its drivers between IMGs and DMGs, this chapter will address the following key questions of interest:

- Are IMGs more likely to report lower SWB than DMGs?
- What are the main factors associated with the observed SWB difference?

It is anticipated that by addressing these questions, this chapter will contribute to the literature in several ways. First, it will add to and extend the scarce literature on the life satisfaction of doctors, in particular, IMGs. Second, it will assist in identifying modifiable psychosocial risk factors in and outside the workplace that account for any general satisfaction gap between IMGs and DMGs. Third, to the author's knowledge, this is the first nationally representative investigation of the size and determinants of any general satisfaction gap between these two groups of doctors.

The chapter is organized into the following subsections: section 4.2 presents the theoretical foundation of the chapter, section 4.3 discusses the methodology, section 4.4 presents the results, and the last sections provide discussion and conclusion of the chapter.

4.2 Theoretical foundation

The quest for a quality life raises questions about why some individuals and groups enjoy a higher level of well-being than others? This question has been intriguing social scientists for decades, contributing to growing empirical and theoretical development. 'Psychosocial theories of work stress'

such as the Demand-Control-Support (DCS) model of [Johnson and Hall \(1988\)](#), Effort-Reward Imbalance (ERI) model of [Siegrist \(1996\)](#) and the Job Demands-Resource (JD-R) model of [Demerouti, Bakker et al. \(2001\)](#) are among the popular theoretical models that attempt to unravel drivers of well-being inequalities in the workplace by emphasizing the role of psychosocial risk factors ([Mackenbach 2012](#)). The central tenet of these theories is that employees exposed to psychosocial risk factors such as excessive job demands, lower sense of control and inadequate rewards and social support will experience poorer health and well-being ([Marmot, Fuhrer et al. 1998](#), [Siegrist and Marmot 2004](#)).

There already exists an extensive body of evidence on the psychosocial correlates of physicians' occupational health and well-being ([Brower and Riba 2017](#), [Milner, Witt et al. 2017](#)). Although, as established earlier in this chapter, there is a paucity of evidence on the SWB of doctors globally, a number of its psychosocial correlates have been reported. For instance, there already exists some longitudinal evidence suggesting that doctors exposed to high workload and low social support have a relatively lower chance of reporting higher SWB ([Buddeberg-Fischer, Klaghofer et al. 2008](#), [Tyssen, Hem et al. 2009](#)). Against this backdrop, it may be useful to apply a psychosocial theory when measuring variations in life satisfaction across medical professionals.

One such psychosocial theory is the Job Demands-Resource (JD-R) model of [Demerouti, Bakker et al. \(2001\)](#). The main rationale for choosing the JD-R model over all the other existing job stress models for the analysis in this chapter is due to its flexibility and simplicity relative to the other models. For instance, owing to the model's comprehensive definition of what factors may or may not constitute a job demand or resource, study variables can be easily operationalized into components of demands and resources. This would have been difficult with other work stress models (e.g. the ERI model, DCS model), that mainly rely on specific questionnaires limiting the scope of job demands and resources to those captured in these questionnaires ([Bakker and Demerouti 2014](#)).

In particular, this model can be applied to investigate psychosocial risk differentials in self-assessed well-being between IMGs and DMGs. JD-R model was first introduced by Demerouti, Bakker

et al. (2001) in an attempt to identify the antecedents of burnout in a human service industry. The JD-R model assumes that employee well-being is a function of an equilibrium state between positive (resources) and negative (demands) job characteristics ([Schaufeli and Taris 2014](#)).

[Demerouti, Bakker et al. \(2001\)](#) defined job demands as those *“aspects of the job that require sustained physical or mental effort and are therefore associated with certain physiological and psychological costs”*. Thus, demands according to the JD-R model are associated with negative situations (e.g. high workload, job insecurity, time pressure) that result in emotional exhaustion, depersonalization and dissatisfaction in employees ([Schaufeli 2017](#)). The basic theoretical assumption is that high demands cause employees to exert extra efforts at work to ensure tasks are executed and expectations are met; however, in the long-run, they run into fatigue and irritability and will need time to recover by either taking a break or switching tasks ([Schaufeli and Taris 2014](#)). In the absence of adequate recovery, employees may become mentally drained and emotionally and physically exhausted with a propensity to adversely influence their own health and well-being.

Job resources, on the other hand, are those *“aspects of the job that may do any of the following: (a) be functional in achieving work goals; (b) reduce job demands and the associated physiological and psychological costs; (c) stimulate personal growth and development”*. Thus, increased job resources (e.g. support from supervisors and colleagues, job control, and performance feedback) contribute to positive experiences that tend to neutralize the harmful effects of high demands resulting in increased employee morale and work engagement ([Schaufeli 2017](#)).

Under the JD-R model, job resources are further subdivided into organizational, social and personal resources. Examples of organizational resources include job rewards (e.g. remunerations, and various opportunities), and job control/autonomy. Social resources include supports from supervisors, co-workers, family or peers. Personal resources are the positive self-evaluations of individuals that are linked to resilience and includes peoples' sense of mastery or control over their own circumstances ([Bakker and Demerouti 2014](#)). Job demands, as well as social and organizational

resources, are termed as external or situational factors while personal resources are termed as stable internal factors. Thus, JD-R model is in conformity with the mainstream psychological theories of well-being which claimed that peoples' self-reported well-being is a function of their stable internal conditions (neuroticism, extraversion, and sense of mastery) and external circumstances (income, education, employment) and the interactions between these factors ([Diener, Oishi et al. 2009](#)).

The JD-R model has been extensively applied in studies of burnout and work engagement ([Schaufeli and Taris 2014](#)). The model's theoretical assumptions have been supported in a number of cross-sectional and longitudinal studies ([Bakker and Demerouti 2014](#)). Although there has been a limited application of job stress models among IMGs, the few that have been conducted suggest that they experience a higher prevalence of job demands compared to DMGs. For instance, two nationally representative surveys in Finland ([Aalto, Heponiemi et al. 2014](#), [Kuusio, Lamsa et al. 2014](#)) have suggested that IMGs experience higher levels of job demands relative to DMGs. With respect to resource components, a survey ([Chen, Nunez-Smith et al. 2010](#)) in the United States, suggest that IMGs experience lower social support compared to DMGs. In Australia, inadequate support and professional isolation among IMGs have been previously reported ([Hawthorne, Birrell et al. 2004](#), [House of Representatives Committee Australia 2012](#), [Australian Medical Association 2015](#), [Terry and Lê 2015](#)).

However, the JD-R model has not been previously applied in the study of the extent to which job demands and resources influence the life satisfaction gap between international and domestic medical graduates. Based on the JD-R model, this chapter proposes two hypotheses that relate to its aims. First, it posits that IMGs may be more likely to experience a lower average SWB and second, that the lower average SWB in the IMG sample may be partly explained by their more frequent exposure to adverse working conditions (professional experiences) and a lower sense of community integration.

The novelty of this chapter lies in it being the first that has applied a widely recognized work stress theory — the job demands resource model ([Demerouti, Bakker et al. 2001](#)) to investigate and compare differential exposure to psychosocial risk factors between IMG and DMG physicians.

4.3 Methods

4.3.1 Data and sample

The analysis in this chapter was based on data from “Medicine in Australia: Balancing Employment and Life (MABEL)” survey. MABEL is a national longitudinal study of Australian doctors, funded by the National Health and Medical Research Council ([Taylor, La et al. 2016](#)). The directory of Australasian Medical Publishing Company (AMPCo) serves as the sampling frame for the MABEL study. At baseline (2008), the population of 54,750 doctors in clinical practice across Australia was invited to participate, 10,498 completed the survey (comprising 3,873 general practitioners, 4,310 specialists, 864 specialists in training, and 1,451 hospital non-specialists) and followed in subsequent annual waves ([Joyce, Scott et al. 2010](#)). In each wave, cohorts of new doctors whose information become available in AMPCo’s directory are included as a ‘top-up’ sample. As [Joyce, Scott et al. \(2010\)](#) noted, the ‘top-up’ sample is meant to address potential attrition and ensure the representativeness of each cross-sectional wave. In wave 2 (2009) a total of 10,381 doctors responded to the survey questionnaires of which approximately 80% were repeated responders, being part of the baseline cohort (wave 1) while 20% were the new cohort of doctors.

For this chapter, the analysis has been restricted to all IMGs and DMGs age 25 years and above who participated in the MABEL survey between 2009 and 2016 inclusive (i.e. wave 2 to wave 9). Wave 1 (2008) has been excluded as information on SWB is not available in this wave. Hence, the entire sample across the included eight waves comprises 20,736 individual doctors (6,104 for IMGs and 14,632 for DMGs) corresponding to a total of 79,226 person-year observations; of which 18,901 (24%) and 60,325 (76%) of the observations were IMGs and DMGs respectively. In the survey questionnaire, IMGs were identified by the following question: “In which country did you complete your basic medical

degree?” with response options being “1) A medical school in Australia and 2) A medical school in the country specified (...)”. IMGs were defined following the standard Australian government definition; as a doctor whose primary medical qualification was obtained in a country other than Australia and New Zealand ([Department of Health Australia 2016](#)).

Asides from its longitudinal design, the ability to capture information on doctors’ personal well-being, their countries of initial medical qualification, socio-demographics and employment circumstances makes MABEL dataset the most suitable for the present analysis. The MABEL survey was approved by The University of Melbourne Faculty of Business and Economics Human Ethics Advisory Group (Ref. 0709559) and the Monash University Standing Committee on Ethics in Research Involving Humans (Ref: 195535 CF07/1102 – 2007000291). Further details on the survey including ethics and questionnaires can be found here <http://mabel.org.au/home>.

4.3.2 Study variables and Measurements

Outcome variable: Subjective well-being

Self-reported general satisfaction with life, measured on a standard 10-point scale was used to measure SWB. Each year, participants in the MABEL survey are asked; “*all things considered, how satisfied are you with your life in general*”? Response options ranged from 1 “completely dissatisfied” to 10 “completely satisfied”. Thus, higher scores indicate a more satisfactory life. This is a widely accepted measure of subjective wellbeing used in the ‘world values survey’ ([DeJonge, Veenhoven et al. 2016](#)), ‘Gallup World Survey’ ([Rath, Harter et al. 2010](#)), and in many household panel surveys like Household, Income and Labour Dynamics in Australia (HILDA) survey, the German Socio-Economic Panel Survey (GSOEP) ([Kóczán 2016](#)), Panel Study of Income Dynamic (PSID) survey in USA ([Dawson, Veliziotis et al. 2017](#)) and the British Household Panel Survey (BHPS) ([Dawson, Veliziotis et al. 2017](#)).

Main predictor variables

Job demands: Theoretically, persistent exposure to high demands at work can influence the mental and physiological impairments through the mediation of perception ([Schaufeli and Taris 2014](#)). In the current analysis ‘job demands’ were assessed on a five-item Likert scale that measures the psychological demanding aspects of doctors’ work. These five items include:

- i. It is difficult to take time off when I want to
- ii. The hours I work are unpredictable
- iii. Running my practice is stressful most of the time
- iv. Majority of my patients have complex health and social problems
- v. My patients have unrealistic expectations about how I can help them

For each of these items, participants were asked to select one out of the following five response options: (1) Strongly disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5) Strongly Agree. The composite job demands scale ranged from five to 25 and has a Cronbach’s alpha coefficient (overall reliability) of 0.63. Authors [Milner, Witt et al. \(2017\)](#) have previously applied this scale to evaluate the effects of job demands on the self-reported health of Australian doctors. Consistent with the overall general hypothesis of the chapter, job demands are expected to explain the SWB gap between IMGs and DMGs. Following the works of ([Kuper and Marmot 2003](#)), and ([Fujishiro, Roux et al. 2011](#)), scores for job demands were further divided into tertile, and individuals exposed to high psychological demands were identified by the highest tertile of the distribution.

Job resources: From a theoretical standpoint, job resources are meant to enhance employees’ ability to effectively deal with the physical and psychological demands at work ([Schaufeli 2017](#)). In the present study, the job resources scale has four sub-scales namely:

- i. *Job control:* Theories suggest that employees’ sense of ability to influence what happens in their work is critical to their psychological well-being ([Bakker and Demerouti 2014](#)). Here, ‘job control’ comprises four items that asked participants to rate the extent of their satisfaction for instance with the freedom/autonomy, task variety and responsibilities given to them in their

employment. Each of these items has five response options: (1) Very Dissatisfied, (2) Dissatisfied, (3) Moderately Satisfied, (4) Satisfied and (5) Very Satisfied. The same items were used by [Milner, Witt et al. \(2017\)](#) to evaluate perceived job control among Australian doctors using the MABEL dataset. The scale ranged from five to 20 and has a Cronbach's alpha coefficient of 0.70. Like job demand, scores for job control were categorized into tertile and lower job control group were identified by the lowest tertile of the distribution. The rest were the medium and high job control groups.

- ii. *Job rewards*: They are measured on a two-item Likert scale. The two items ask study participants to rate the degree of their contentment with the levels of recognition they get for a good job and the remuneration they get at work. The response options were the same as those used for the job control scale. The composite rewards scale ranged from two to 10 with a Cronbach's alpha coefficient of 0.57 ([Milner, Witt et al. 2017](#)).
- iii. *Peer support*: The nature of social support was assessed using a single question. Participants were asked to respond to the following statement: "*I have a poor support network of other doctors like me*" by selecting one of the following ordered response options (1) Strongly disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5) Strongly Agree. The responses were re-coded so that a higher rating would indicate a perception of good support at work.
- iv. *Personal resources*: These include three variables: a) *sense of mastery* ([Skaiff, Pearlin et al. 1996](#)) measured on a seven-item mastery scale with seven response options (1=Strongly Disagree to 7=Strongly Agree). This scale measures individuals' sense of control over circumstances in their lives and it has a Cronbach's alpha coefficient of 0.84. b) *Neuroticism* (the extent of emotional stability) with a reliability score of 0.79 and c) *extraversion* (sociability and enthusiasm) with a reliability score of 0.76. Both neuroticism and extraversion consist 3-items with seven ordered response options (1= Does not apply to me at all, to 7= Applies to me perfectly). Both represent two of the dimensions of the 'Big Five personality inventory' ([Barrick and Mount 1991](#)) that have

been found to predict feelings of satisfaction in populations ([Diener, Inglehart et al. 2013](#)) including among medical doctors ([Stenmarker, Palmérus et al. 2009](#), [Tyssen, Hem et al. 2009](#)).

The sense of community integration: Asides from job demands and resources, this chapter also included a variable on perceived community integration which has been found to be an important determinant of well-being ([Adams and Serpe 2000](#), [Amit and Bar-Lev 2015](#)). Generally, perceived community integration may be termed as a social resource outside of the workplace that enhances individuals' ability to cope with work stress through engagements in happiness relevant activities ([Lyubomirsky, Sheldon et al. 2005](#)) such as leisure and social interactions in their neighborhoods. In this study, community integration was assessed using 5-items that measure participants' ability to meet their basic needs (for social interaction, leisure, choice of children's schooling and employment opportunities for spouse) in their current geographic location. These items were found to be associated with job satisfaction and retention of doctors in rural Australia ([Hawthorne, Birrell et al. 2004](#), [Russell, McGrail et al. 2017](#)). Like job demands, each item under community integration scale has five responses levels. Thus, the composite community integration scale ranged from five to 25 and has an overall reliability score of 0.73.

Work hour: Total hours worked per week was included as a proxy estimate of workload. The MABEL survey captures the workload of doctors by asking them to report the total hours they worked in a week.

Financial security: Feelings of financial security were reported to predict life satisfaction in doctors ([Austrom, Perkins et al. 2003](#)) and is a major goal for immigrants. Here, financial security was assessed using a single question with five response options (1) Strongly Disagree to (5) Strongly Agree. More specifically participants were asked to indicate the extent of their agreement with the following statement: "Given my current financial situation and prospects, I believe I will have enough to live on when I retire". The return for financial security is expected to be greater among IMGs, relative to DMGs.

Family restriction: This variable measure whether participants are restricted in the hours they work due to lack of available childcare. In the MABEL survey participants are provided with the following statement: I am restricted in my employment and/or the time and hours I work due to lack of available childcare. Response options ranged from (1) Strongly Disagree to (5) Strongly Agree. The family restriction may impact on the number of hours that physicians' work —especially for female physicians — which may eventually affect their earnings. For instance, [Schurer, Kuehnle et al. \(2016\)](#) concluded that female GPs with children earn less relative to their counterparts without children and the reverse was the case for male GPs.

Mandatory clinical practice: This is already discussed in detail in previous chapters. In brief, the variable captures whether participants are subjected to any restriction in their location of work due to a condition in their contract. In the MABEL survey, participants were asked whether they are subjected to restriction in their location of employment — e.g. in a district of workforce shortage or an Area of Need location (yes/no). The mandatory practice has been reported to be associated with lower life satisfaction among IMGs ([McGrail, Humphreys et al. 2012](#)).

Covariates

A number of sociodemographic covariates which have been reported to be associated with subjective well-being ([Lyubomirsky, Sheldon et al. 2005](#), [Diener, Inglehart et al. 2013](#)) were also included in the analysis. These include age, gender, marital status, number of children, annual income, remoteness of work location (based on Australian Standard Geographical Classification (ASGC)), residency status (Australian citizen, permanent or temporary resident), and doctor type (GP, specialist, specialist in training and hospital non-specialist).

4.3.3 Statistical Analysis

The first part of the analysis assessed whether levels of satisfaction and exposure to psychosocial risk factors varied between IMGs and DMGs. To do this in statistical terms, first, the distribution of life satisfaction responses was compared between the two groups using a non-parametric density

estimation (Epanechnikov kernel density). This helped to determine the probability density function (distribution) of responses on the 10-point life satisfaction scale for the two groups of doctors. Second, bivariate analyses were run to estimate the between-group differences in means and proportions for continuous and categorical variables, respectively. Differences in the proportional distribution of categorical variables (e.g. gender, marital status) between the IMG and DMG samples were estimated using a Chi-square analysis of association. This method was used because of its meaningfulness in interpreting and identifying between-group differences in the proportional distribution of a random categorical variable ([Khademi 2016](#)). Additionally, Analysis of Variance (ANOVA) was applied to compare differences in average SWB and psychosocial factors as well as other continuous predictors between IMGs and DMGs. The rationale for using this method was to ascertain whether levels of SWB and psychosocial risk exposure differ between IMG and DMG groups.

Then, the second part of the analysis aimed to further explore the most important factors accounting for any observed differences in SWB between the two groups. This was accomplished through the application of a two-fold Oaxaca-Ransom decomposition method ([Oaxaca and Ransom 1994](#)). This technique splits the differences in the mean of a continuous dependent variable between two independent groups into; first, a component that is attributable groups' difference in levels of predictor variables and second a component that is attributable to their differences in coefficients of these explanatory variables. It has been extensively applied in labour economics literature for the study of racial and gender inequalities in wages ([Fortin, Lemieux et al. 2011](#)). The method was also applied in quantifying socioeconomic-related inequalities in health and well-being ([Adesanya, Rojas et al. 2017](#), [Adesanya, Darboe et al. 2017](#)), and analysis of earning gap in doctors ([Gravelle, Hole et al. 2011](#), [Dumontet, Le Vaillant et al. 2012](#), [Schurer, Kuehnle et al. 2016](#)). However, it has not been previously applied in the study of inequalities in subjective well-being or life satisfaction across healthcare professionals including doctors.

In this chapter, to perform the two-fold Oaxaca-Ransom decomposition analysis, three separate linear regression models were formulated: first for the pooled sample (all doctors), second and third for DMGs and IMGs samples, respectively. Coefficients from these three models were subsequently used in the linear decomposition analysis using that of the pooled model as the reference coefficient as follows;

$$SWB_D - SWB_I = (X_D - X_I)' \beta^* + [X_D'(\beta_D - \beta^*) + X_I'(\beta^* - \beta_I)] \quad (4.1)$$

As demonstrated in equation (4.1), using the two-fold decomposition technique allowed any observed average SWB gap between DMGs (LS_D) and IMGs (LS_I) to be split into two distinct components. The first is the “*explained component*” $(X_D - X_I)' \beta^*$ capturing the part of the SWB gap attributable to IMG/DMG differences in the mean levels of observable characteristics (where X_D and X_I are vectors of predictor variables such as job demands, hours worked, peer support for DMGs and IMGs respectively). β^* denotes the regression coefficient obtained from the pooled model. Its role in this part of the equation is to capture the expected change in IMGs’ mean SWB compared to all the doctors if they have the same observable characteristic as DMGs. The second part of the gap is the “*unexplained component*” $[X_D'(\beta_D - \beta^*) + X_I'(\beta^* - \beta_I)]$ capturing part of the SWB gap explained by group differences in the effects (returns) of these predictors/characteristics on SWB (where β_D and β_I are vectors of coefficient estimates on predictor variables obtained from separate regression models for DMGs and IMGs. Again, the role of the pooled coefficient β^* in this part of the equation is to capture how IMGs and DMGs differ in the effect of a predictor variable relative to its effect on the SWB of all the doctors.

Previous decomposition methods ([Blinder 1973](#), [Oaxaca 1973](#)) used to apply the coefficient of one of the comparative groups as the reference coefficient, thus, the results are sensitive to which reference group was used. This has been recently criticized in the literature for being discriminatory, and the use of a non-discriminatory coefficient estimate is recommended ([Oaxaca and Ransom 1994](#)). Hence, the use of a pooled coefficient β^* in the present analysis was meant to prevent

discrimination in the estimated decomposition results. The role of this pooled model was to serve as a reference coefficient in the decomposition analysis.

Further, the unexplained portion can be subdivided into two components ([Jann 2008](#)); the part due to group membership (i.e. the difference in regression intercepts) and the component due to differences in the slope coefficients of predictor variables between the two groups. According to [Gravelle, Hole et al. \(2011\)](#), group differences in regression intercepts can arise from “unobserved differences in returns and from differences in the means of unobserved variables and from differences in the returns on these omitted variables”.

There are several categorical variables in the analysis (e.g. tertile of job demands, marital status,) and the unexplained portion of the Oaxaca-Ransom decomposition is highly sensitive to the choice of the omitted base category of categorical variables, such that when categories change, decomposition results also change. To avoid this problem in the interpretation of results, all categorical variables were normalized following the procedure proposed by ([Yun 2005](#)).

Furthermore, since the data used in the decomposition analysis were pooled across 8 waves, we applied cluster-robust standard errors in the analysis and control for year fixed effects ([Wooldridge 2015](#), [Schurer, Kuehnle et al. 2016](#)). Data were analyzed using Stata 13.

4.4 Results

This section is divided into four parts. The first part describes the source countries for IMGs in the study sample, the second part presents the descriptive statistics of DMG/IMG differences in satisfaction and psychosocial risk factors, the third and fourth parts present the results of regression and decomposition analyses respectively.

The pooled MABEL longitudinal data (2009-2016) comprised 20,736 individual observations of which 8% (N=1,693/20,736) had missing values on life satisfaction and were excluded. This brought the final sample to 19,683 individual observations (n= 14,270 for DMGs and n=5,413 for IMGs)

corresponding to 73,013 person-year observations. To account for missing values in explanatory variables, a listwise deletion (complete case analysis) technique was used in all the multiple linear regression models. As the name implies, this technique restricts regression analysis to only cases with a complete record of the outcome and predictor variables ([Allison 2001](#)). In the case of the present analysis, the final sample for the regression results was for 17,526 individuals after excluding cases with missing values. This corresponds to 57,549 person-year observations (N=44,494 for DMGs and 13,055 for IMGs).

4.4.1 Description of IMGs in the sample

IMGs in the current sample came from highly diverse source countries. The top 21 countries of qualification for IMGs in the sample are listed in **Table 4.1**. The list was restricted to those with at least 100 person-year observations. As shown in this table, a larger proportion of IMGs was initially trained in the UK, India, Republic of South Africa, Sri Lanka, Republic of Ireland and Philippines thus, mirroring Australia's top recent source countries (see [Hawthorne 2012](#) p.3). Approximately 51% of IMGs were trained in low/middle-income countries based on the World Bank country classification ([World Bank 2017](#)) and 87% were of Commonwealth member countries.

Table 4-1 Top 10 countries of training for IMGs in the MABEL sample (N=13,173 person-year observations)

Country	N	%
UK	4,275	28.9
India	1,713	11.6
South Africa	1,720	11.6
Sri Lank	546	3.7
Republic of Ireland	418	2.8
Germany	390	2.6
Philippines	327	2.2
China	241	1.6
Iran	236	1.6
Pakistan	233	1.6
Other	4,698	31.8
Country classification (income)		
<i>High income</i>	5,654	42.9
<i>Low/middle income</i>	7,519	57.1

Commonwealth trained

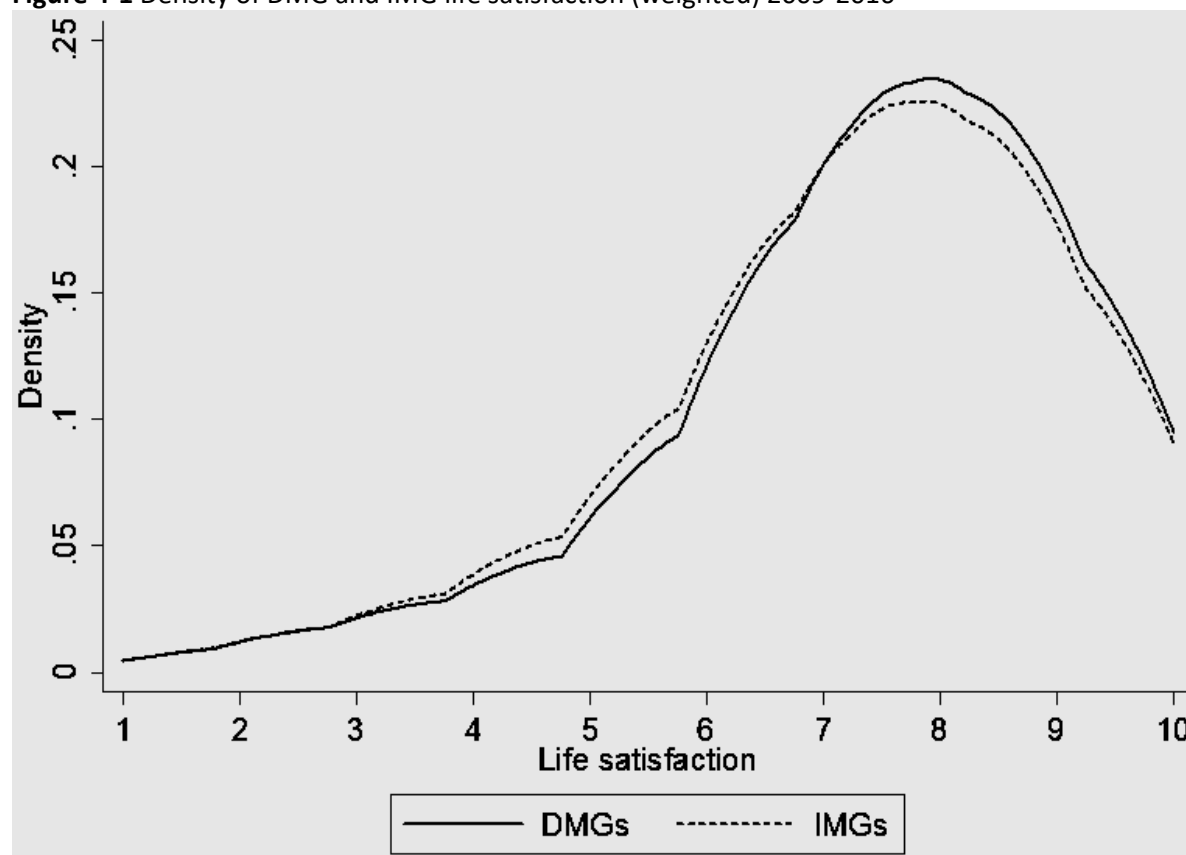
Yes	10,158	77.1
No	3,015	22.9

Note: List limited to countries with hundred or more person-year observations in the dataset

4.4.2 Comparison of IMG/DMG differences in SWB, psychosocial factors and key demographic and professional characteristics

This section compares the SWB and other observable characteristics of IMGs to those of DMGs. Only test results that were statistically significant are reported here. **Figure 4.1** demonstrates the Epanechnikov kernel density estimates of life satisfaction for IMGs compared to DMGs. As in most studies of SWB, here, life satisfaction scores were concentrating towards the end of the scale (7 to 9) suggesting that most of the doctors in the survey were happy. However, the concentration appeared to be stronger for DMGs compared to IMGs. A Kolmogorov-Smirnov test suggests that this observed difference in the distribution of life satisfaction between the two groups was statistically significant ($p < 0.001$).

Figure 4-1 Density of DMG and IMG life satisfaction (weighted) 2009-2016



Notes: Epanechnikov kernel density estimates of life satisfaction by DMG/IMG groups

Results of descriptive statistics (ANOVA and Chi-Square analysis) are presented in Table 2. As shown in this table, mean SWB was 7.45 (SD ± 1.61) across the entire sample which falls slightly below the national average of 7.6 as reported by the [Australian Bureau of Statistics \(2015\)](#). Average life satisfaction was 7.47 for DMGs and 7.37 for IMGs corresponding to a gap of 0.101 (using DMGs as the reference; $p < 0.001$).

Results indicated that IMGs and DMGs differ in levels of exposure to psychosocial risk factors. On average IMGs reported higher psychological demands at work than DMGs. Furthermore, IMGs reported lower peer support, community integration and financial security relative to DMGs. The potential reasons for the lower perceived financial security in IMGs may be attributable to the increasing level of dependency from the family since most of them came from low-income countries (issue of remittances) and were married and have dependent children. Additionally, IMGs reported a lower sense of control and were more subject to mandatory practice than DMGs. Proportionally, reports of restriction in hours worked due to lack of childcare were also higher among IMGs compared to DMGs. On the other hand, IMGs appeared to be more emotionally stable (lower neuroticism) than DMGs.

Concerning the observable personal and professional characteristics, as shown in **Table 4.2**, IMGs were relatively older compared to DMGs (mean ages 48.08 and 45.08 respectively). While as expected most DMGs⁶ were Australian citizens, the majority of IMGs were permanent and temporary residents. However, within the IMG group, there was more permanent resident IMGs (24.54%) relative to temporary residents (11.23%). IMGs were relatively more likely to be male, married/cohabiting, and have dependent children compared to DMGs. On average IMGs were more likely to report higher annual incomes compared to DMGs. Additionally, the two groups differ in their specialties to some extent. IMGs were more likely to be a GP, but less likely to be a specialist-in-training and hospital non-

⁶ The permanent and temporary resident members of DMGs are the international students who obtained their primary medical degrees in Australia and New Zealand graduates.

specialists compared to DMGs. The groups also differ in their locations of work: IMGs were less likely to be working in major cities than DMGs but were more likely to be working in regional, outer regional and remote locations than DMGs.

Table 4-2 Descriptive statistics of select variables for pooled, DMG and IMG samples, MABEL survey 2009 to 2016

Variable	Pooled sample (N=73,013)	DMG sample (N=56,237)	IMG sample (N=16,776)	DMG/IMG Difference
SWB (Life satisfaction)	7.45 (1.61)	7.47 (1.60)	7.37 (1.65)	0.101***
<i>Psychosocial factors</i>				
Job demands (5-low to 25-high)	14.30 (3.60)	14.24 (3.48)	14.47 (3.65)	-0.23***
Job control (5-low to 20-high)	16.88 (2.80)	16.92 (2.66)	16.76 (3.00)	0.16***
Job rewards (5-low to 10-high)	7.55 (1.84)	7.56 (1.83)	7.55 (1.88)	0.01
Peer support at work (1-low to 5-high)	3.48 (1.06)	3.54 (1.05)	3.31 (1.08)	0.23***
Community integration (5-low to 25-high)	15.10 (5.43)	15.34 (5.22)	14.29 (5.81)	1.05***
Sense of mastery (7=low to 49=high)	37.72 (7.13)	37.86 (6.97)	37.13 (7.53)	0.73***
Neuroticism (3-low to 21-high)	11.10 (3.91)	11.27 (3.89)	10.48 (3.90)	0.79***
Extraversion (3-low to 21-high)	13.84 (3.54)	13.85 (3.53)	13.78 (3.55)	0.07
Hours worked	41.63 (13.50)	41.65 (16.49)	41.56 (14.84)	0.09
Mandatory practice (dummy 1=Yes)	0.09 (0.28)	0.03 (0.18)	0.27 (0.44)	-0.23***
Family restriction (1-low to 5-high)	2.07 (1.10)	2.04 (1.10)	2.15 (1.10)	-0.11***
Financial security (1-low to 5-high)	3.44 (1.14)	3.52 (1.12)	3.15 (1.17)	0.38***
<i>Professional characteristics</i>				
DMG	76.24%	-	-	-
IMG	23.76%	-	-	-
Specialist	40.36%	40.37%	40.32%	0.06
General practitioner	36.41%	34.20%	43.84%	-9.64***
Hospital non-specialist	13.36%	15.23%	7.10%	8.13***
Specialist in training	11.22%	11.62%	9.89%	1.72***
Experience (yrs.)				
<i>Socio-demographics</i>				
Age (yrs.)	45.75 (13.00)	45.08 (13.32)	48.08 (11.55)	-3.00***
Male	53.96%	51.95%	60.69%	-8.74***
Female	46.03%	48.04%	39.29%	8.75***
Married or cohabiting	79.43%	77.58%	85.66%	-8.08***
Single	19.61%	21.48%	13.32%	8.16***
Have dependent child	53.12%	50.27%	62.74%	-12.47***
Log (income)	12.02 (0.82)	11.98 (0.83)	12.13 (0.77)	-0.15***
Year since migration (years)	-	-	14.50 (11.37)	-
Australian citizen	87.86%	94.32%	66.16%	28.16***
Permanent resident visa	8.82%	4.15%	24.54%	-20.39***
Temporary resident visa	3.33%	0.98%	11.23%	-10.24***

Practice location

ASGC: Major city	76.54%	79.38%	66.98%	12.40***
ASGC: Regional areas	15.87%	14.61%	20.12%	-5.51***
ASGC: Outer-regional and remote areas	7.58%	6.00%	12.89%	-6.89***

Notes: Chi-Square test of distribution and One-way ANOVA for equality of means between the groups.

*Standard Deviations for the means are in parenthesis. The asterisks ***, **, * indicate differences in proportion and mean were significant at <1%, 1%, and 5% levels respectively.*

4.4.3 Regression results: predictors of SWB, IMGs compared to DMGs

Having described the differences in observable characteristics between IMG and DMG groups, this section presents results on how IMGs' and DMGs' personal and professional experiences are associated with their SWB. **Table 4.3** shows the ordinary least squares estimates for SWB. The first column indicates estimates from the pooled model (all doctors), and the last two columns indicate estimates from the DMG and IMG models, respectively. These results are subsequently used in formulating the decomposition analysis.

As anticipated, exposure to high job demands was inversely associated with SWB in the entire sample and the effect size was relatively greater on the SWB of DMGs. This may be due to the resistance built by IMGs as a result of prior experiences considering many were from low/middle-income countries with perhaps more adverse working conditions compared to Australia. The increased physical workload as measured by the number of hours worked per week appeared to be inversely (weakly) associated with SWB across all the models. Consistent with theory, high job resources such as a high level of perceived job control, rewards, and peer support were all positively associated with SWB. More specifically, the effect sizes were marginally higher among IMGs than DMGs. Additionally, high sense of community integration, was positively associated with SWB, but comparatively the effect size was greater among IMGs. With regards to personality variables, having a high sense of mastery (locus of control), low neuroticism, and high extraversion, were all found to be positively associated with SWB. However, the marginal effect of neuroticism was greater among IMGs, while that of a sense of mastery and extraversion were greater among DMGs. Being restricted in hours worked due to lack of childcare (family restriction) was negatively associated with SWB and

the effect size appears to be greater for DMGs compared to IMGs. A positive statistically significant association was observed for perceived financial security and SWB in DMGs and IMGs, but the effect size was slightly greater in the latter.

Coming to doctors' personal and professional characteristics, results of the pooled model indicated a statistically significant association between age and SWB with older doctors (aged 60 or above) being more satisfied with life across the two groups, similar to what has been reported in the literature ([Blanchflower and Oswald 2008](#)). Additionally, the results suggest that married/cohabiting physicians were more satisfied than those who reported being single. This remained significant for both DMG and IMG models, but the effect size was greater on the SWB of DMGs. The results showed that higher self-perceived health status was significantly associated with an increase in SWB, but the effect sizes were greater in the DMG sample. Having one or more child was inversely associated with life satisfaction across the entire sample and in the two separate models, which appears to be in agreement with previous evidence from population-based surveys ([Clark, Diener et al. 2008](#)). However, this result contradicts those of [Barak, Tishler et al. \(2011\)](#) who observed a positive association between parenthood and SWB in a sample of 223 Israeli doctors. Compared to specialists, being a specialist in training was negatively associated with SWB in the pooled sample and among DMGs and IMGs, with a stronger association for IMGs. These doctors especially hospital medical officers in Australia face autonomy problem and tend to work longer hours ([Joyce and Wang 2015](#)) all of which may have negative consequences for well-being. Among DMGs, working in regional and remote areas was associated with a decline in average SWB. However, no statistically significant associations were observed for IMGs.

Table 4-3 OLS regression results for pooled, DMG and IMG models, N=57,549 person-year observations, MABEL survey 2009-2016

	Pooled coef.	DMG coef.	IMG coef.
	Model 1	Model 2	Model 3
<i>Psychosocial factors</i>			
Job demands (ref: lowest tertile)			
<i>Middle tertile</i>	-0.09***	-0.10***	-0.06
<i>Highest tertile</i>	-0.24***	-0.26***	-0.20***
Job control (ref: lowest tertile)			
<i>Middle tertile</i>	0.44***	0.43***	0.46***
<i>Highest tertile</i>	0.73***	0.73***	0.74***
Job rewards (ref: lowest tertile)			
<i>Middle tertile</i>	0.27***	0.26***	0.31***
<i>Highest tertile</i>	0.47***	0.45***	0.52***
Peer support (ref: poor)			
<i>Good</i>	0.27***	0.26***	0.27***
Sense of mastery (ref: lowest tertile)			
<i>Middle tertile</i>	0.37***	0.37***	0.35***
<i>Highest tertile</i>	0.60***	0.60***	0.58***
Neuroticism (ref: highest tertile)			
<i>Middle tertile</i>	0.14***	0.12***	0.20***
<i>Lowest tertile</i>	0.23***	0.20***	0.34***
Extraversion (ref: lowest tertile)			
<i>Middle tertile</i>	0.13***	0.13***	0.09
<i>Highest tertile</i>	0.18***	0.20***	0.05
Community integration (ref: lowest tertile)			
<i>Middle tertile</i>	0.10***	0.06**	0.22***
<i>Highest tertile</i>	0.25***	0.22***	0.36***
Hours worked	-0.01***	-0.01***	-0.01***
Mandatory practice	-0.01	0.01	-0.06
Family restriction	-0.16***	-0.15***	-0.15*
Perceived financial security	0.20***	0.19***	0.23***
<i>Doctor characteristics</i>			
Self-reported health	0.51***	0.54***	0.43***
Age group (ref: <40)			
40-49	-0.07**	-0.10***	0.02
50-59	-0.05	-0.05	-0.02
60+	0.26***	0.27***	0.29***
Female	-0.02	-0.02	-0.03
Married or Cohabiting	0.28***	0.31***	0.18**
Have dependent child	-0.11***	-0.11***	-0.09*
log of personal income	-0.002*	-0.002*	-0.001
Residency status (ref: Australian citizen)			
Permanent resident	-0.07*	-0.08	-0.03
temporary resident	-0.13**	-0.15	-0.07
Doctor type (ref: specialist)			
General practitioner	0.07**	0.06*	0.09
Hospital non-specialist	0.05	0.07	-0.13
Specialist in training	-0.21***	-0.20***	-0.24***
<i>Practice location</i> (ref: Major city)			
Regional	-0.05*	-0.07**	0.001

Remote areas	-0.01	-0.07	0.09
Time (survey waves) ref: 2009			
2010	0.03	0.04*	0.001
2011	0.03	0.04	-0.02
2012	0.14***	0.14***	0.10*
2013	0.02	0.02	-0.01
2014	0.09***	0.10***	0.05
2015	-0.02	-0.01	-0.06
2016	0.09***	0.10***	0.04
<i>N</i>	57,549	44,494	13,055
<i>F-test</i>	313.48***	256.70***	69.03***
<i>R</i> ²	0.42	0.43	0.39

Note: Asterisks *, **, *** Indicate significance at 5%, 1% and <1% level

To check the robustness of the results, the above analysis was repeated but this time excluding health and personality variables (neuroticism, extraversion, and locus of control) from the model. The estimation results are reported in Table 9.1 (Appendix A). By excluding these variables, the estimated coefficients on the main variables have increased significantly while the adjusted R^2 estimates have dropped across all three models. For example, the r-square for the pooled model has dropped from 0.42 to 0.28 (i.e., 33% decline), while that of the DMG and IMG models showed a 35% and 31% decline in adjusted r-square estimates, respectively. Thus, in line with the literature, the above analysis showed that health and personality traits have a strong explanatory power with respect to SWB.

4.4.4 Decomposition of the SWB difference between IMGs and DMGs

This final section quantifies the proportion of IMG/DMG SWB gap attributable to their differences in observable characteristics versus differences in the way they respond to these characteristics. Table 4 presents the results from the two-fold Oaxaca-Ransom decomposition analysis. The first and second rows of the table indicate average SWB levels for DMG and IMG respectively and the third and fourth rows represent the estimated SWB gaps (mean differences). The unadjusted (raw) gap in mean SWB was estimated to be 0.101 while the adjusted gap was 0.091, all differences were statistically significant ($P < 0.01$). The explained part (due to average differences in levels of observable characteristics) was 0.151 and the total unexplained part (due to differences in coefficients) was -0.060. The explained part implies that 166% ($0.151/0.091$) of the adjusted SWB gap between IMGs

and DMGs is attributable to their differential observable characteristics. While the unexplained part implies that differences in the way IMGs and DMGs respond to their observable characteristics is associated with 66% (-0.06/0.091) reduction in mean SWB gap.

Concerning the contributions of observable characteristics (e.g. psychosocial factors) to the explained satisfaction gap, it appears that IMGs were more exposed to psychosocial risk factors which increases the SWB gap to the advantage of DMGs. For example, IMGs were more likely than DMGs to experience higher psychological demands at work, which contributed 8% to the adjusted SWB gap. The lower prevalence of job control among IMGs compared to DMGs was associated with a 14% increase in the adjusted SWB gap. Lower support from colleagues at work among IMGs increased the adjusted gap by 38%. IMGs were also more likely than DMGs to report a lower sense of mastery and community integration which were associated with 33% and 31% increase in the adjusted SWB gap respectively. However, the high level of emotional stability reported by IMGs in the sample appeared to narrow the adjusted gap by 26%. Furthermore, IMGs were more likely than DMGs to report a lower sense of financial security which contributed 32% to the adjusted gap. A higher prevalence of family restriction among IMGs accounted for only 3% of the adjusted gap.

On the side of personal and professional characteristics, living with a partner reduced the IMG/DMG SWB difference by 35%, being a GP and a specialist-in-training, each reduced the SWB gap by 17% and 6% respectively. Additionally, over the survey period, the SWB gap appeared to have decreased by 6%, suggesting a potential effect of assimilation on well-being. However, self-perceived health status, immigration status, having dependent children, being a hospital non-specialist, and age all increased the SWB gap between IMGs and DMGs.

The unexplained part of the detailed decomposition results in Table 4 indicates that IMGs gained more from community integration which reduced the adjusted gap by 89%. Again, IMGs were less concerned about their immigration status and work location which fairly reduced the gap. These two conditions especially immigration, are strictly regulatory and individual IMGs have no control over

them except to accept and adjust. On the contrary, IMGs gained less from mandatory clinical practice, living with a partner, health and working as a hospital non-specialist which contributed to an increase in the SWB gap.

Table 4-4: Detailed linear Blinder-Oaxaca decomposition of DMG/IMG life satisfaction gap

	Estimates	z-stat		
Differentials				
Predicted mean SWB of DMGs	7.47***	575.85	N=44,494	
Predicted mean SWB of IMGs	7.37***	328.91	N=13,055	
Raw gap	0.10***	3.90		
Adjusted gap	0.09**	3.08		
Decomposing SWB difference into;				
Total explained	0.15***	6.40	166%	
Total unexplained	-0.06*	-2.30	-66%	
Predictors	Explained part ^a	%	Unexplained part ^b	%
<i>Psychosocial factors</i>				
Job demands	0.007** (2.69)	8%	-0.046 (-1.71)	-51%
Job control	0.013* (2.33)	14%	-0.026 (-0.67)	-29%
Job rewards	0.001 (0.28)	2%	0.005 (0.14)	6%
Peer support	0.0344*** (10.49)	38%	0.019 (0.53)	21%
Sense of mastery	0.030*** (3.80)	33%	0.034 (0.97)	37%
Neuroticism	-0.024*** (-6.41)	-26%	0.046 (1.37)	51%
Extraversion	0.0003 (0.14)	0.3%	0.061 (1.51)	67%
Sense of community integration	0.028*** (9.50)	31%	-0.081** (-2.72)	-89%
Hours worked	-0.001 (-0.63)	-2%	-0.005 (-0.07)	-6
Mandatory practice	0.007 (0.88)	8%	0.020* (1.97)	22%
Family restriction	0.003*** (3.30)	3%	-0.002 (-0.47)	-2%
Financial security	0.029*** (11.72)	32%	-0.002 (-0.13)	-2%
<i>Doctor characteristics</i>				
Age	0.014** (3.22)	15%	-0.058 (-1.58)	64%
Gender	-0.001 (-0.30)	2%	0.021 (1.05)	-23%
Self-reported health	0.052***	58%	0.430***	478%

	(5.76)		(4.44)	
Married or Cohabiting	-0.032***	-35%	0.108*	119%
	(-9.49)		(1.98)	
Have dependent child	0.018***	20%	0.006	7%
	(5.00)		(0.20)	
Income	0.001	2%	-0.304	-334%
	(0.22)		(-0.73)	
General practitioner	-0.015***	-17%	0.026	29%
	(-3.31)		(0.60)	
Specialist	-0.001	-2%	0.028	31%
	(-0.74)		(0.69)	
Hospital non-specialist	0.016***	18%	0.026**	29%
	(4.18)		(2.99)	
Specialist in training	-0.005***	6%	0.016	18%
	(-3.64)		(1.63)	
Immigration status	0.024**	26%	-0.025*	-28%
	(2.65)		(-2.07)	
Location	0.007	8%	-0.035*	-39%
	(1.85)		(-2.28)	
Year (time)	-0.005***	-6%	0.034	-37%
	(-6.95)		(0.89)	

Notes: t statistics in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

^aExplained part: a negative sign suggests the characteristic favors IMGs,

^bUnexplained part: a negative sign suggests an IMG advantage for that characteristic

4.5 Discussion

This chapter examined how international medical graduates evaluate the overall quality of their life relative to domestic medical graduates in Australia, a nation known globally for its long history of reliance on and attractiveness to IMGs. Unlike most previous studies of IMGs' satisfaction (with job or life), this chapter used a theoretical approach to systematically investigate the size and determinants of any SWB difference between IMGs and DMGs. Using the Oaxaca-Ransom (1994) linear decomposition technique, the chapter described the proportion of the well-being gap attributable to IMG/DMG differences in prevalence versus responses to psychosocial factors and other personal and professional circumstances. The theory of the JD-R model of [Demerouti, Bakker et al. \(2001\)](#), was used to operationalize psychosocial factors in the workplace into components of job demands and resources.

Results indicated that IMGs as a group were fairly happy with the state of their lives in Australia. An average satisfaction score of 7.37 falls within the range of 'a satisfactory life,' based on the categorisation of the OECD ([OECD 2013](#)), the Australian Bureau of Statistics ([Australian Bureau of Statistics 2015](#)) as well as other reports ([Winkelmann and Winkelmann 1998](#), [Fischer 2009](#)). Comparatively, however, confirming one of the principal hypotheses of the study, the results indicated that IMGs as a group were not as satisfied with the general state of their lives as their corresponding DMG group. The point difference of 0.101 was statistically significant even after adjusting for their personal and professional attributes ($p\text{-value} < 0.001$). This was slightly higher than the male/female life satisfaction gap of 0.08 that was reported by ([Montgomery 2016](#)) using data from the Gallup World Poll. A nonparametric – Epanechnikov kernel density – estimation for the distribution of responses on the '10-point life satisfaction scale', revealed that the satisfaction ratings of IMGs were more likely to fall in the lower limit of the scale than it was for the DMG group. The estimated coefficient on the IMG dummy in the pooled linear regression model further suggested that there were negative returns to satisfaction associated with being in the IMG group compared to the DMG group. To some degree,

these results were similar to those of [McGrail, Humphreys et al. \(2012\)](#) who observed a lower level of job and life satisfaction among general practitioner IMGs mandated to practice in rural Australia. However, the results contradicted those of [West, Shanafelt et al. \(2011\)](#) who (in a sample of 16,394 internal medicine residents, 8,571 IMGs) found the IMG group to be less likely than their US medical graduates counterpart to report a low 'quality of life' – on a 5-point Likert scale. On a broader context, the results also appeared to be related, to some extent, with those described in the literature about the lower levels of job/career satisfaction among IMGs relative DMGs in many of the HICs e.g. Australia, the USA, Finland and Germany ([Chen, Curry et al. 2012](#), [Aalto, Heponiemi et al. 2014](#), [Joyce and Wang 2015](#), [Pantenburg, Kitze et al. 2016](#)). The differential experiences of the IMG and DMG groups in the workplace could be key to understanding the satisfaction gap between the two groups of doctors.

Results of the decomposition analysis for factors that might be driving the IMG/DMG SWB difference confirmed that the key factors associated with the SWB gap were mainly the groups' differences in their observable characteristics and experiences in the workplace. More specifically, the results demonstrated that IMGs were worse off with regards to psychosocial factors such as perceived financial security, psychological workload, professional autonomy, peer support, sense of mastery/control, and community integration. Taking these results together, they implied that IMGs were more likely to rate the overall quality of their lives less favourably than DMGs partly because of their disadvantaged psychosocial attributes. Concerning the high prevalence of psychosocial risk among IMGs, the results corroborated with those reported in previous studies ([Vardy, Ryan et al. 2008](#), [Chen, Curry et al. 2012](#), [Aalto, Heponiemi et al. 2014](#), [Terry, Le et al. 2014](#)). Furthermore, psychosocial problems among IMGs were reported in a number of reviews, for instance, in the UK ([Khan, Chikkatagaiah et al. 2015](#)), Canada ([Covell, Neiterman et al. 2016](#)) and Australia ([Kalra, Bhugra et al. 2012](#), [Kehoe, McLachlan et al. 2016](#)). Concerning financial security and well-being of IMGs, [West, Shanafelt et al. \(2011\)](#) found a strong negative association between financial debt and the QOL of IMGs in the USA. Viewing these results in the context of job stress theories including the JD-R model,

it appeared that IMGs in this study were having a 'strained' job, defined as having high perceived psychological demands along with low job resources such as job control. This contradicted the results obtained in Finland by [Kuusio, Lamsa et al. \(2014\)](#) who found IMGs to be having an 'active' job profile defined as high demands along with high control (job resources) in a sample of 1,292 IMGs. The results confirmed the assumptions of the JD-R model ([Demerouti, Bakker et al. 2001](#)) and the psychosocial theories of health inequalities ([Marmot, Fuhrer et al. 1998](#), [Mackenbach 2012](#), [Arcaya, Arcaya et al. 2015](#)) that psychosocial factors are important drivers of disparities in health and well-being across individuals and social groups.

A counter-intuitive finding in this Chapter, however, was the observation that IMGs were more likely to be associated with emotional stability (low neuroticism), one of the Big Five personality traits. This result appeared to confirm that of [West, Shanafelt et al. \(2011\)](#), who found lower emotional exhaustion among IMGs than US medical graduates. Likewise, [Ifediora \(2015\)](#) also observed a similar result for IMGs in a sample of 300 doctors who were involved in 'after-hours home visits' in Australia. One potential explanation would be that perhaps IMGs might have developed resilience owing to the prior experience they have gained from navigating the complex maze of migration, accreditation and registration processes. Again, along that line of explanation, it may also be due to their prior experiences in home countries since most of them came from low/middle-income countries (LMICs) with potentially more adverse psychosocial work arrangements than Australia.

4.6 Chapter conclusion and implications

The results of this chapter have added interesting insight into understanding the factors associated with the difference in subjective well-being and its drivers between IMGs and DMGs. Despite this, there were some important counter-intuitive findings. As was expected, the chapter showed that the IMG group was more likely to report lower SWB level than the DMG group and this observed difference was partly explained by their frequent exposure to psychosocial risk factors. IMGs reported lower financial security, higher job demands and lower resources than DMGs, which provided some

clues about their vulnerability to psychosocial risk factors. At the same time, it is essential to note that DMGs were more likely to be associated with high neuroticism (low emotional stability) personality trait. Thus, IMGs may be more resilient despite their high exposure to psychosocial risk factors. Importantly, the analyses presented in this chapter have raised some fundamental questions such as to what extent do the SWB of IMGs responds to changes in their psychosocial working conditions? Which of the factors contribute to substantial changes in SWB of IMGs after controlling for their observable and unobservable personal characteristics? How do effect sizes differ between the IMG group and DMG? And between subgroups of IMGs? The next chapter will attempt to explore these questions in more detail.

5 Effects of Changes in Working Conditions on SWB of IMGs Compared to DMGs

Chapter 4 has systematically examined the size and determinants of subjective well-being gap between international and domestic medical graduates across Australia, using the [Oaxaca and Ransom \(1994\)](#) linear decomposition method. The results concluded that IMGs were significantly less satisfied with the overall quality of their lives than DMGs largely because they were more likely to experience sub-optimal health and psychosocial distress (e.g., lower financial security, lower community integration, and exposure to high psychological demands and low resources at work). However, one of the important caveats with this analysis is that it has not demonstrated the changes in IMGs' SWB and how it correlated with changes in their psychosocial conditions over time relative to DMGs. Additionally, since the regression results from the preceding analysis were obtained from pooled ordinary least square (OLS) models, there were restrictions for causal inferences. The pooled OLS model has the limitation of not accounting for omitted variables such as unmeasured time-constant individual characteristics (e.g., cultural identity, race, innate ability, genetic predispositions). These unobserved fixed characteristics (individual heterogeneity) if correlated with both the outcome variable (e.g. SWB) and the main independent variables (e.g. psychosocial risk factors) will result in biased regression estimates ([Ferrer-i-Carbonell and Frijters 2004](#), [Boyce 2010](#), [Wooldridge 2010](#)).

To account for these limitations and in line with the overall goal of this thesis, the current chapter aims to apply a fixed effect (FE) linear regression model (within estimator) to measure individual-specific responses to changes in psychosocial risk factors among IMGs compared to DMGs. It will use eight waves (2009-2016) of longitudinal data from the MABEL survey to i) compare trends in subjective well-being and psychosocial distress between IMGs and DMGs over time; ii) test whether individual-specific responses to changes in psychosocial risk factors vary by doctors' training status (international vs. domestically trained), and iii) determine whether individual-specific responses to changes in

psychosocial conditions vary within IMGs by length of stay in Australia, the pathway to clinical practice, source region, and doctor (specialty) type.

5.1 Introduction

For decades health professionals — largely doctors and nurses — have been crossing national borders due to a variety of reasons including, for instance, the search for decent employment opportunities ([Mej'ia, Pizurki et al. 1979](#)). Some countries, such as Australia, the United States (USA), the United Kingdom (UK), Canada, New Zealand and the Republic of Ireland along with other high-income Gulf States; have a long history of reliance on migrant health professionals. The global migration, settlement and labour market integration of these highly skilled health professionals — in destination countries — have been the subject of burgeoning empirical studies since the turn of the millennium ([Buchan, Wismar et al. 2014](#)). These studies sometimes draw attention to the dilemmas faced by immigrant health workers during migration and settlement processes in host countries ([Aluttis, Bishaw et al. 2014](#)). However, little has been documented to date on the subjective well-being (life satisfaction) of immigrant physicians in global destination countries including Australia ([McGrail, Humphreys et al. 2012](#)). The aim of this chapter is to present a national longitudinal study of the association between exposure to psychosocial risk factors and subjective well-being (SWB) among internationally trained doctors relative to domestic medical graduates (DMGs) in Australia. As [Gadit \(2008\)](#) suggested: happiness and satisfaction are primary motivators of physician migration, so it may be imperative to apply these indexes to understand how they fare in their places of destination.

As defined in [Section 4.2](#), Psychosocial risk factors in the context of work are the social and organisational aspects of the work environment that have the propensity to negatively impact employees' physical and mental well-being ([Dollard, Shimazu et al. 2014](#)) through the mediation of their perception ([ILO 1986](#)). They include, for instance, poor supervisor and co-worker support, low sense of autonomy/control at work, excessive working hours, high work pressure, conflict with others and poor occupational rewards. Exposure to psychosocial risk factors has been linked to a number of

negative outcomes including but not limited to physician distress and burnout (a syndrome of emotional exhaustion, depersonalization, and low personal achievement) ([Kakunje 2011](#)), job dissatisfaction ([Joyce and Wang 2015](#)), poor health ([Milner, Witt et al. 2017](#)), and provision of suboptimal quality of care ([Klein, Frie et al. 2011](#)). Some studies have attempted to demonstrate the contribution of doctors' psychosocial work environment to their SWB. However, current literature on this subject is in its infancy and has been mainly dominated by cross-sectional studies. Longitudinal investigations of SWB among medical professionals are limited ([Nylenna, Gulbrandsen et al. 2005](#), [Buddeberg-Fischer, Klaghofer et al. 2008](#), [Klaghofer, Stamm et al. 2011](#), [Mahmood, Grotmol et al. 2018](#)) and have mainly overlooked groups like IMGs in their analyses.

The systematic scoping review presented in [Chapter Three](#) has revealed consistent evidence across post-industrial nations (including Australia) indicating that IMGs were more likely to be exposed to psychosocial risk factors at work than their domestic graduate counterparts. For instance, they were more likely to experience inadequate professional support at work, social and professional isolation due to mandatory services in remote and underserved locations, high job pressure, lower professional autonomy and importantly low level of career satisfaction ([Chen, Curry et al. 2012](#), [Humphries, Tyrrell et al. 2013](#), [Joyce and Wang 2015](#), [Brugha, McAleese et al. 2016](#), [Pantenburg, Kitze et al. 2016](#), [Tyrrell, Keegan et al. 2016](#)). In addition to a paucity of longitudinal evidence on the SWB of IMGs, there has also been a limited application of job stress models in the study of their personal and work-related well-being.

Theories of work stress have been existing for decades ([Mark and Smith 2008](#)), guiding empirical investigations into understanding the mechanisms underpinning employees' health, well-being, and motivation. For instance, theories such as the Job Demands-Control (JDC) model ([Karasek Jr 1979](#)), Effort-reward Imbalance (ERI) model ([Siegrist 1996](#)) and more recently the Job Demands Resource (JD-R) model ([Demerouti, Bakker et al. 2001](#)) have all attempted to explain the role of psychosocial risk factors in employees' physical and mental well-being. In the work context, psychosocial risk factors

entail, for instance, poor supervisor and co-worker support, low sense of autonomy/control at work, excessive working hours, high work pressure, conflict with others and poor occupational rewards ([Dollard, Shimazu et al. 2014](#)). In Finland, [Kuusio, Lamsa et al. \(2014\)](#) have applied the JDC model in their study of inflows, labour market entry and work experiences of (N=553) immigrant physicians and concluded that most of them were experiencing high job demands along with high control. Thus, based on the JDC model, the immigrant doctors were having an “active job profile”. In a study of similar sample size, [Aalto, Heponiemi et al. \(2014\)](#) also found a higher prevalence of poor professional support among immigrant doctors than the native Finnish doctors. However, none of these studies had measured the SWB of immigrant doctors and owing to their cross-sectional designs, they were unable to demonstrate how doctors’ situations evolved and its correlations with their general well-being.

In Australia, the longitudinal study of medical doctors (including IMGs) and their SWB has been ongoing since 2009. The MABEL (*Medicine in Australia: Balancing Employment and Life*) survey is a globally unique survey that provides rich, comprehensive and robust empirical data on doctors’ professional and personal life experiences. The present chapter seeks to use eight waves (2009-2016) of the MABEL longitudinal data to investigate the SWB of IMGs and how it correlates with changes in their psychosocial working conditions relative to DMGs. To identify psychosocial risk factors in the MABEL dataset, it relies on the theoretical definition provided by the Job Demands-Resource (JD-R) model of [Demerouti, Bakker et al. \(2001\)](#). This model defined the psychosocial work arrangement into two mutually exclusive components namely: the “job demands” (the bad things) and the “job resources” (the good things) components ([Schaufeli 2017](#)). The model is highly flexible and can be applied in all jobs that entail these two domains (demands and resources). Job demands are regarded as “bad things” because their sustained prevalence can drain employees’ energy leading to exhaustion and health impairments. They include, for instance, excessive workload (physical and mental), violence, job insecurity, excessive time pressure, and work-home conflict to name a few.

Unlike job demands, job resources, are regarded as the “good things” because their presence enhances employees’ morale, motivation, and engagement leading to optimal physical and mental functioning (improved well-being). Examples of job resources include, but not limited to having improved freedom/autonomy in the workplace, coworker and supervisor support, recognition/feedback, and adequate remunerations. The JD-R model has divided job resources into three separate dimensions ([Bakker and Demerouti 2014](#)). The social dimension of job resources entails the experience of adequate support from coworkers and the management and positive interpersonal relations in the workplace. The organizational dimension of resources comprises having satisfactory occupational rewards (e.g. remunerations, promotions and other career opportunities) and control over one’s job. Finally, the personal aspect of job resources relates to employees’ stable personal characteristics that are linked to resilience (e.g. self-esteem and locus of control).

Using the JD-R model, this chapter seeks to:

- i. compare trends in general life satisfaction (subjective well-being) and psychosocial distress between IMGs and DMGs over time,
- ii. test whether individual-specific responses to changes in psychosocial risk factors differ between IMGs and DMGs,
- iii. determine whether individual-specific responses to changes in psychosocial working conditions vary within IMGs by:
 - a. arrival cohorts,
 - b. the pathway to clinical practice (competent vs. non-competent authority pathway)
 - c. the region of primary medical degree
 - d. doctor type (Specialists, GPs and hospital non-specialists)?

By answering these research questions, this chapter is expected to be the first longitudinal analysis of the subjective well-being of IMGs by key variables. While few longitudinal analyses already exist on

the life satisfaction of medical doctors, most of them have largely overlooked immigration as a focus of analysis albeit the rising tide of global health workforce migration. Addressing this void in the current literature is a key motivation for this chapter.

The rest of the chapter is organised into the following sections: Section 5.2 discusses the methods used, section 5.3 presents the results and section 5.4 and 5.5 provide discussion for the main results and chapter conclusion, respectively.

5.2 Methods

5.2.1 Data and Sample

This chapter used eight waves of data from the MABEL longitudinal survey which is an ongoing nationally representative study of medical practitioners (GPs, specialists, specialist registrars, and hospital non-specialists) in Australia ([Taylor, La et al. 2016](#)). The time span of the survey is from 2008, but the first time it started measuring doctors' life satisfaction (subjective well-being) was in 2009 (wave 2). At baseline (2008), a census approach was used to survey the entire population of clinical practitioners (54,750 doctors) in Australia at the time using the directory of Australasian Medical Publishing Company (AMPCo) as the sampling frame. Of this population, a total of 10,498 responded and were later followed in subsequent waves ([Joyce, Scott et al. 2010](#)). A refreshment sample was added at each subsequent wave to address attrition which is an issue for all longitudinal survey designs. The analysis was conducted on a random sample of 19,043 individual doctors (73,013 total observations) aged between 25 and 75 years with at least one observation on SWB. Of this sample, 13,895 were DMGs and 5,148 were IMGs. In the dataset, IMGs were coded (1) if the doctor obtained his/her primary medical qualification outside of Australia/New Zealand and (0) otherwise. The ethics approval for the MABEL survey was granted by the institutional ethic approval boards University of Melbourne and Monash University respectively (see Section 4.3.1).

5.2.2 Variables and Measurements

Measuring subjective well-being

The outcome variable in this chapter was subjective well-being (SWB) measured as self-reported general life satisfaction. There has been a burgeoning empirical interest in the relationship between work and the overall life satisfaction of employees in recent decades ([Judge and Watanabe 1993](#)), and such interest has been gaining momentum in the contemporary medical literature since the turn of the millennium ([Yamey and Wilkes 2001](#), [Nylenna, Gulbrandsen et al. 2005](#)). Work has the tendency to influence human life in a number of ways. Economically, for instance, it is a principal source of income for most adults that allows them to acquire their basic needs and wants in life. Additionally, work also enhances the self-esteem and social status of individuals, with a propensity to improve their sense of well-being ([Marmot, Friel et al. 2008](#)). However, it also occupies a greater part of the waking hours of most adults, thus, adverse conditions at work such as persistent stressful experiences have the tendency to negatively impact employees' health and well-being ([Bakker and Demerouti 2014](#), [Schaufeli and Taris 2014](#)).

In this chapter, the overall life satisfaction of doctors was assessed using the following question: *"all things considered, how satisfied are you with your life in general"*? With response options ranging from 1 "completely dissatisfied" to 10 "completely satisfied". This single-item measure of life satisfaction is a globally accepted indicator of people's self-reported well-being ([Rath, Harter et al. 2010](#), [DeJonge, Veenhoven et al. 2016](#)). It has been widely applied in population-based surveys to evaluate human well-being and its determinants. Some of the popular panel surveys that have applied this measure include the British Household Panel Survey (BHPS) ([Nowok, Van Ham et al. 2013](#)), the German Socio-Economic Panel (GSOEP) ([Kóczán 2016](#)) and the Household, Income and Labour Dynamics in Australia (HILDA) Survey ([Wooden, Warren et al. 2009](#)). High scores, according to theoretical interpretations, depict a more fulfilling life while lower ratings (towards the bottom of the scale) suggest struggling with life with potentially unmet goals and livelihoods.

Measuring time-varying psychosocial risk factors

Job demands

The scale measuring job demands consisted of five items assessing the psychological demanding conditions in the workplace. The items were:

- vi. It is difficult to take time off when I want to
- vii. Majority of my patients have complex health and social problems
- viii. My patients have unrealistic expectations about how I can help them
- ix. The hours I work are unpredictable
- x. Running my practice is stressful most of the time

Each of the above items (questions) had five ordered response options ranging from “strongly disagree” coded (1) to “strongly agree” coded (5). The first three sets of items were previously used by [Milner, Witt et al. \(2017\)](#) as measures of psychological demands at work in their longitudinal study of work stress and health among Australian doctors using the MABEL data. Scores for job demands were calculated as the sum of the item scores. The sum score had a reliability estimate (Cronbach’s alpha coefficient) of 0.63 and ranged from 5 (min) to 25 (max). Following the approach used by [Kuper and Marmot \(2003\)](#) scores on the job demand scale was divided into tertile (lowest, middle and the highest tertile). An indicator variable was then created that took the value “1” if the individual was in the highest tertile of job demand and zero otherwise. Taking a fixed effect estimation of this indicator variable would enable the chapter to draw attention to changes in SWB within individuals as they move from low to high psychological demand at work. Based on the theory of the JD-R model, this chapter hypothesized that changing to high job demands will have negative marginal effects on SWB of individuals. Thus, the average SWB score of an individual (IMGs or DMGs) will be expected to move

downward on the life satisfaction scale in response to changes in exposure status from the low to the high job demand.

Job resources

Availability of social resources among study participants was assessed using a single survey question. Participating doctors in the MABEL survey were asked to respond to the following question: *“I have a poor support network of other doctors like me”*. Response options ranged from strongly disagree (1) to strongly agree (5). To determine exposure to poor peer support, an indicator variable was created that took the value “1” if an individual’s response to the foregoing statement was either “agree” or “strongly agree” and “0” otherwise. The assumption was that moving from good to poor peer support will be inversely associated with SWB within individuals in the study.

Under organizational resources, the chapter evaluated extents of participants’ satisfaction with their job control and rewards. Satisfaction with job control was assessed using four items each of which asked doctors to rate how satisfied/dissatisfied they feel about the freedom they have at work, variety in their job, the responsibilities given to them and the opportunities they have to use their abilities effectively. The response options ranged from 1-very dissatisfied to 5-very satisfied. The sum score ranged from 4 (min) to 20 (max) and has a Cronbach’s Alpha Coefficient of 0.70.

Two items were used to evaluate satisfaction with job rewards among study participants. The items asked participants to rate the extent of their satisfaction with the levels of recognition they receive for good work and their remunerations respectively. These two items also represent elements of occupational rewards defined under other popular job stress models such as the Effort-reward Imbalance (ERI) model ([Darboe, Lin et al. 2016](#)). Response options ranged from 1-very dissatisfied to 5-very satisfied making the sum score to range from two (min) to 10 (max). Both the reward and job

control scales were each divided into tertile and low job control and reward were indicated by the lowest tertile respectively.

Working hours: Studies linking the number of hours worked and employees' SWB are sparse with mixed conclusions in the broader as well as medical workforce literature. For instance, a negative effect of long working hours on SWB has been reported in a longitudinal sample of employees in the UK ([Bryan and Nandi 2015](#)). Similarly, [Valente and Berry \(2016\)](#) observed that long working hours was associated with lower SWB for Latin American men but not for men in the United States. Using a longitudinal data from Australia (HILDA survey), [Wooden, Warren et al. \(2009\)](#) concluded that it is not the absolute number of hours that matters to employees SWB, but the working time mismatch. Specific to medical doctors, while [Eckleberry-Hunt, Kirkpatrick et al. \(2016\)](#) observed no significant association between hours worked and happiness among 2000 family physicians in the USA, [Buddeberg-Fischer, Klaghofer et al. \(2008\)](#) found it to be strongly related to work stress — which was associated with lower SWB in a prospective study of 433 resident doctors in Switzerland. The MABEL survey questionnaire captures the workload of doctors by asking them to report the total hours they worked per week. In the present analysis, a dummy variable was created that divided participants into four working hour categories: under 35 hours per week, 35-40hrs (the standard hours), 41-49hrs and 50+ hours.

Mandatory clinical practice: Like other major destination countries (e.g. Canada, USA and the UK), in Australia IMGs are first required to serve in geographically underserved locations —mainly rural areas— for a specified period of time (10 years, subject to reduction depending on the degree of remoteness) before they could access full license to practice ([Department of Health Australia 2016](#)). [McGrail, Humphreys et al. \(2012\)](#) using the MABEL data reported evidence about marked dissatisfaction (with job and life overall) among mandated general practicing IMGs. To identify individuals under mandatory practice, this chapter used an indicator variable that took the value of “1” if the participant is mandated and 0 otherwise.

Perceived community integration: The scale for community integration comprised five items each measuring participants' perceptions about their work location. An example of these items was: *"It is easy to pursue my hobbies and leisure interests in my current work location"*. Response options for each item ranged from 1-strongly disagree to 5-strongly agree making their sum score to fall between 5 (min) and 25 (max). The higher the score the more the participant is assumed to be integrated. This scale yielded a reliability estimate of 0.73 and was divided into tertile. The least integrated participants were defined by the lowest tertile of the distribution. The assumption was that the least integrated will be significantly less satisfied with life compared to the moderately or highly integrated participants. Items used to measure community integration were selected based on what has been reported in the existing literature on community integration (see [Han and Humphreys \(2006\)](#) and retention of medical doctors (especially IMGs) see ([Hawthorne, Birrell et al. 2004](#), [Russell, McGrail et al. 2017](#)).

Perceived financial security: This measured whether participants would have enough finances following retirement. Each year, participating doctors in the MABEL survey are asked to answer the following question about their perception of financial security *"given my current financial situation and prospects, I believe I will have enough to live on when I retire"* (five response options ranging from strongly disagree to strongly agree). An indicator of low financial security was created that took the value "1" if the participants' answer to the above question was disagree or strongly disagree and 0 otherwise.

Time-varying covariates

To quantify the marginal effects of psychosocial factors on SWB within individual IMGs and DMGs, it was imperative to identify those time-varying personal and professional determinants of SWB that have been reported in the literature. The following covariates have been included in the current analysis to adjust for potential confounders: socio-demographic factors (age, gender, marital status, number of children, annual income, and health), geographic location (remoteness of work location

based on Australian Standard Geographical Classification (ASGC)), migration-related factors (year since migration, country/region of medical training and immigration status), professional characteristics (doctor type, pathway to practice and type of medical registration).

5.2.3 Statistical Analysis

First, a range of panel data descriptive analyses was performed to determine the distribution of study variables across individuals (*i*) and over time (*t*). Next, a bivariate analysis was conducted to compare patterns of change in SWB and psychosocial risk exposure between IMGs and DMGs. Then multivariate fixed effect (FE) linear regression models were performed to determine the marginal effects of changes in psychosocial risk factors on changes in SWB of medical doctors. Additionally, some subgroup analyses were conducted to identify the determinants of changes in SWB across key groups of IMGs. It may be recalled that the pooled ordinary least squares (OLS) estimate reported in the previous chapter have portrayed some significant associations between psychosocial factors and SWB of doctors. However, with those pooled OLS estimates, we were unable to differentiate “confounding” from the “real” associations between psychosocial factors and SWB. Confounding may occur in the longitudinal study of psychosocial factors and SWB because some unobserved characteristics (e.g. dispositional traits, race, and cultural factors) might be influencing the way participants to rate their well-being as well as psychosocial conditions over time. If such is the case, the pooled OLS estimates will be biased, for they cannot account for omitted variables. One of the statistical techniques for addressing this type of bias in a longitudinal study of subjective well-being ([Clark, Diener et al. 2008](#), [Pollmann-Schult 2014](#)) is to apply an FE regression. Regression parameters (i.e. β s) in an FE model are estimated using only within-subject information that is time-varying thereby controlling for all observed and unobserved time-constant characteristics. While an FE model does not fully address the problem of confounding — resulting from unmeasured time-varying factors, it is a more consistent and robust model for causal inference owing to the ability to rule out some spurious relationships ([Mehmetoglu and Jakobsen 2016](#)). Since the analysis in this chapter has not accounted for unobserved

time-varying factors that influence both the SWB and psychosocial risk factors, caution must be taken when interpreting the regression coefficients.

A typical FE analysis works by subtracting the individual-specific mean value of a variable from its actual value at each time point (i.e. taking measures of deviations from the mean for each variable over time). In the context of psychosocial factors for instance, the FE model pooled the data points for each individual in the sample and compare the time point where the person was exposed to a specific psychosocial risk factor (e.g. high job demands) to the time point where he/she was not exposed (e.g. low job demands) ([Milner, Witt et al. 2017](#)). Consequently, an FE estimator will control for all measured and unmeasured time-invariant characteristics (e.g. gender, personality traits, race, cultural background) in the regression model. Hence, with FE models we can move closer to estimating the causal effects of time-dependent predictors (e.g. psychosocial risk exposure) on a time-dependent outcome variable (e.g. SWB). The following FE model has been specified to measure the longitudinal relationship between psychosocial factors and SWB in IMGs compared to DMGs:

$$SWB_{it} = \beta_0 + \beta_1 PSF_{it} + \beta_2 (PSF_{it} \times IMG_{Dummy}) + \beta_3 X_{it} + \lambda_t + \alpha_i + \epsilon_{it} \quad t = 1, 2, \dots, 8 \quad (5.1)$$

In the above equation (5.1), SWB_{it} denotes the expected change in average SWB for individual doctor i , at time/year t . β_0 represents the regression intercept (the value of SWB when all the predictors take the value of zero) and β_1 is a vector of regression coefficients for the effects of change in psychosocial risk factors (PSF_{it}) for an individual i , at time t . β_2 represents a vector of regression coefficients for the marginal effects of the interaction term between psychosocial risk factors and the IMG dummy. The rationale for including the interaction term is to test whether the marginal effects of psychosocial distress on SWB significantly differ between DMGs and IMGs. Since the indicator for IMG is time constant (taking values of 0, or 1), its main effect will not be estimated by the FE model, however, its interaction with a time-dependent factor can be estimated. In the context of an FE regression, the coefficient from this interaction term measures how the within-person effect of a time-varying predictor (e.g. psychosocial risk) varies across levels of the indicator variable (e.g. the IMG dummy).

Thus, in the case of an FE regression, this is like a stratified analysis, only that it provides a statistical test of whether the coefficients differ across levels of the indicator variable. As [Giesselmann and Schmidt \(2018\)](#) noted, this analytical strategy is a characteristic of the FE model that has long been applied in the empirical analysis of panel data. Coming back to equation 5.1, β_3 is a vector of regression coefficients for measured time-varying control variables (X_{it}) e.g., health, marital status, number of children, that were included to adjust for potential confounding factors. λ_t denotes year fixed effects controlling for common time trends influencing the well-being of doctors (e.g. change of regulations, practice structure). α_i denotes doctor fixed effects that capture measured time-constant control variables (e.g. gender, country of training) and unmeasured time-invariant characteristics (race, culture, ability). Finally, all other unobserved variances in SWB are captured in ϵ_{it} .

It is imperative to note that the most salient difference between the FE model and the random effect model—another widely applied panel regression model—is the assumption made about the individual specific error term α_i ([Bălă and Prada 2014](#)). While the FE model assumed that the errors are correlated with the independent variables, the RE model, on the contrary, assumed that they are uncorrelated with the predictors. Thus, the RE model can be considered as a special case of the generalised least squares model. In estimating the regression coefficient, the RE model presents the weighted average of the within and between-person effects ([Wooldridge 2010](#), [Mehmetoglu and Jakobsen 2016](#)). Thus, with the RE model, one can determine the average effect of a predictor variable (e.g. high job demands) on the outcome variable (e.g. SWB) when the value of the predictor changes over time and between individuals. To confirm that the fixed effects model is preferred to random effects, a [Hausman \(1978\)](#) specification test was performed.

Further, to compare rates of change in exposure to high psychosocial risk factors (high demands and low resources) between IMGs and DMGs, a number of categorical variables were created directly from the data. Each variable had four categories coded: “1” if the individual’s current exposure to the specific psychosocial risk factor (PSF_t) is low whereas their exposure status at the previous interview

(PSF_{t-1}) was also low (remain in low risk), “2” if the individual’s current exposure status is high whereas their status in the previous interview was low (low to high risk), “3” if the individual’s current exposure status is low whereas their status in the previous interview was high (high to low risk) and “4” if the individual’s current exposure status is high whereas their status in the previous interview was also high (remain in high risk). Next, Chi-square analyses were performed to determine differences in the distributions of these categorical variables across IMGs and DMGs. To identify time trends in life satisfaction between IMGs and DMGs, a pooled OLS linear regression model was used adjusted for year and doctor fixed effects.

The analyses were first conducted on the entire sample to identify the main effects of changes in psychosocial risk factors on SWB and then adjusted with interaction terms to determine any potential effect modifications. Additionally, separate analyses were performed to determine individual-specific responses to psychosocial risk across select groups of IMGs. All analyses were performed in Stata 15.1 (Stata Corp, College Station, TX, USA).

5.3 Results

This result section is divided into five parts. The first part presents the descriptive statistics of the study population and variables. The second part compares rates of change in levels of life satisfaction over time between IMGs and DMGs. The third part compares levels of SWB across select subgroups of IMGs (length of stay in Australia, the pathway to clinical practice, source regions, and the type of doctor). The fourth part presents the results of multivariate FE linear regression analysis measuring individual-specific responses to changes in psychosocial risk factors over time across all individual doctors and stratified by DMG/IMG samples. The last part compares individual-specific responses to psychosocial distress in an FE regression framework across subgroups of IMGs.

5.3.1 Descriptive statistics

Table 5.1 presents the total number of times each doctors' SWB was observed from wave 2 to wave 9 – the most recent wave at the time of the present analysis – of the MABEL survey stratified by all the doctors and by DMG/IMG samples. As shown in this Table, individuals were observed at an unequal number of times, thus, the analytic data are unbalanced. Approximately, 16.3% of all the doctors were observed at the entire eight time-points (years), 59.1% were observed for at least two to seven times – not necessarily consecutively – while 24.6% were observed once. By splitting the data into DMG/IMG samples, it appeared that about 78% of DMGs and 68% of IMGs were observed for more than one time-point. This is crucial because the analytical approach (fixed effect regression) adopted in this chapter requires individuals to be observed at least for two-time points to be able to pick up any meaningful change in their status ([Gibbons, Hedeker et al. 2010](#)).

Table 5-1 Rates of participation in the MABEL longitudinal survey from waves 2 to 9 (2009-2016) by pooled, DMG and IMG samples

Number of times appeared in the survey	All doctors <i>ppl (n)=19,683</i> <i>Obs (N)=73,013</i>		DMG sample <i>ppl (n)=14,270</i> <i>Obs (N)=56,237</i>		IMG sample <i>ppl (n)=5,413</i> <i>Obs (N)=16,776</i>	
	n	%	n	%	n	%
1	4,840	24.59	3,082	21.60	1,758	32.48
2	2,931	14.89	2,002	14.03	929	17.16
3	2,258	11.47	1,605	11.25	653	12.06
4	1,958	9.95	1,462	10.25	496	9.16
5	1,652	8.39	1,234	8.65	418	7.72
6	1,289	6.55	1,016	7.12	273	5.04
7	1,546	7.85	1,224	8.58	322	5.95
8	3,209	16.30	2,645	18.54	564	10.42

Note: Univariate analysis of the number of times data on SWB was collected on individuals in the survey dataset. *n*=unique individual observations and *N*=person-year observations.

Table 5.2 presents the descriptive statistics of SWB and psychosocial risk factors stratified by DMG/IMG samples. For each of the two samples, three types of variations were described: (1) the “overall variation” which described the variation over individuals (*id*) and time/year (*t*) – i.e. the entire sample, (2) the “between variation” which showed the variation across individuals (*id*) and (3) the “within variation” which captured the variation over time. If a variable is time constant, the within standard deviation will be zero. Further, the last column of Table 2 presents test statistics for

comparing differences in the overall distribution of each variable in the two samples. Differences in the distribution of continuous and categorical variables were examined using ANOVA and Chi-square analysis respectively.

The average satisfaction in both groups (DMGs vs. IMGs) appeared to fall above seven on the 10-point scale, thus indicating most of the doctors in both groups were satisfied with life. The 7-point mark has been considered nationally ([Australian Bureau of Statistics 2015](#)) and elsewhere ([Winkelmann and Winkelmann 1998](#), [Fischer 2009](#), [Kassenboehmer and Haisken-DeNew 2009](#)) as an indicator of a good level of SWB. This result is in concordance with the long-established notion that most people are fairly happy ([Diener and Diener 1996](#)). However, the average satisfaction of DMGs was significantly higher than that of IMGs ($p < 0.001$), and the potential reasons for this difference have been initially investigated in Chapter 3. The within standard deviations for both DMG and IMG samples was approximately ± 0.88 , suggesting that the average scores vary within each individual across time points, thus, supporting the idea of applying an FE (within) regression model.

Coming to psychosocial risk factors, the proportion of doctors ever having high psychological demands was 35% among DMGs compared to 37% in the IMG sample ($p < 0.001$). Levels of perceived job control (professional autonomy) were significantly different between DMGs and IMGs ($p < 0.001$). Individuals with a low sense of job control were 22% among DMGs compared to 25% in IMGs. However, the chapter observed no significant differences in levels of satisfaction with job rewards between IMGs and DMGs, but the two groups significantly differ in levels of support received from their work peers ($p < 0.001$). The proportion of doctors reporting poor peer support was 20% among DMGs compared to 26% in IMGs. The numbers of hours worked per week were significantly different between the groups as most DMGs worked 50 hrs and above while most IMGs worked within the standard 35-40 hours mark ($p < 0.001$). As expected, the results indicated that mandatory clinical service was more of an IMG rather than a DMG problem, for instance, it was observed that 27% of

IMGs were restricted to serve in a specific geographic location yet, compared to DMGs⁷ this was only 3% ($p<0.001$). Furthermore, the level of community integration—the degree of meeting personal and social needs in the current work location—was significantly different between IMGs and DMGs. About 31% of DMGs and 37% of IMGs reported a lower sense of community integration ($p<0.001$). Perception of financial insecurity (feeling that one will NOT have enough finances after retirement) was 12% among DMGs compared to 25% among IMGs). The within standard deviations suggested that all these psychosocial risk factors vary within individuals over time. This raised a question about whether yearly rates of exposure to high psychosocial risk at work (e.g., high job demands and low resources) significantly differ between the two groups of doctors. This question is explored next.

Table 5-2 Descriptive Statistics of study variables among IMGs compared to DMGs

	DMGs (Obs.=56,237)			IMGs (Obs.=16,776)			Sig. overall
	Variations			Overall mean	Between SD	Within SD	
	Overall mean	Between SD	Within SD				
Subjective well-being							
Subjective well-being	7.47 (1.60)	1.43	0.88	7.37 (1.65)	1.53	0.88	<0.001
Psychosocial factors							
High job demand (highest tertile=1)	0.35 (0.48)	0.40	0.30	0.37 (0.48)	0.42	0.29	<0.001
Low job control (lowest tertile=1)	0.22 (0.42)	0.36	0.28	0.25 (0.43)	0.39	0.28	<0.001
Low reward (lowest tertile=1)	0.26 (0.44)	0.38	0.29	0.27 (0.44)	0.39	0.28	0.195
Poor peer support (dummy=1)	0.20 (0.40)	0.32	0.28	0.26 (0.44)	0.38	0.29	<0.001
Low community integration (lowest tertile=1)	0.31 (0.46)	0.39	0.31	0.37 (0.48)	0.42	0.31	<0.001
Hours worked (per week)							<0.001
<35 hrs	0.26 (0.44)	0.37	0.23	0.22 (0.42)	0.35	0.21	
35-40 hrs	0.23 (0.42)	0.34	0.30	0.29 (0.46)	0.40	0.30	
41-49 hrs	0.21 (0.40)	0.31	0.30	0.23 (0.42)	0.35	0.30	
50+ hrs	0.31 (0.46)	0.40	0.28	0.26 (0.44)	0.38	0.25	
Mandatory practice (dummy=1)	0.03 (0.19)	0.21	0.10	0.28 (0.45)	0.45	0.20	<0.001
Financial insecurity (dummy=1)	0.20 (0.40)	0.35	0.23	0.31 (0.46)	0.42	0.25	<0.001
Doctor characteristics							
Self-rated health (1-5)	4.07 (0.92)	0.83	0.45	3.97 (0.93)	0.85	0.45	<0.001
Female (dummy=1)	0.48 (0.50)	0.50	0.00	0.39 (0.49)	0.46	0.00	<0.001
Married or cohabiting (dummy=1)	0.78 (0.41)	0.42	0.17	0.86 (0.34)	0.34	0.15	<0.001
Have dependent child (dummy=1)	0.51 (0.50)	0.47	0.21	0.63 (0.48)	0.46	0.19	<0.001
log (income)	11.98 (0.83)	0.76	0.38	12.13 (0.77)	0.72	0.35	<0.001
Specialist	0.41 (0.49)	0.47	0.00	0.40 (0.49)	0.47	0.00	0.767
General practitioner	0.34 (0.47)	0.46	0.00	0.44 (0.50)	0.50	0.00	<0.001
Hospital doctor	0.15 (0.36)	0.39	0.19	0.07 (0.26)	0.29	0.13	<0.001
Specialist registrar	0.12 (0.32)	0.29	0.19	0.10 (0.30)	0.32	0.13	<0.001
Limited registration (dummy=1)	0.15 (0.35)	0.30	0.27	0.36 (0.48)	0.45	0.24	<0.001
Competent Authority (dummy=1)	-	-	-	0.38 (0.49)	0.47	0.00	
Arrival cohort: before 2000				0.41 (0.49)	0.46	0.00	
Arrival cohort: 2000-2009	-	-	-	0.50 (0.50)	0.50	0.00	

⁷ The restricted DMGs are mainly foreign graduates of Australian Medical Schools (FGAMS)

Arrival cohort: 2010-2016	-	-	-	0.09 (0.28)	0.38	0.00	
Citizen (dummy=1)	0.95 (0.23)	0.28)	0.00	0.66 (0.47)	0.50	0.00	<0.001
Geographic location							<0.001
ASGC: major city	0.79 (0.41)	0.39	0.13	0.67 (0.47)	0.46	0.14	
ASGC: regional area	0.15 (0.35)	0.34	0.12	0.20 (0.40)	0.39	0.13	
ASGC: remote area	0.06 (0.24)	0.22)	0.08	0.13 (0.34)	0.33	0.10	

-P-values representing Chi-square test and Analysis of variance for overall differences between IMGs and DMGs.

5.3.2 Bivariate analysis

Average levels of life satisfaction among IMGs by key subgroups

Table 5.3 presents the results of the one-way ANOVA for differences in mean SWB across IMG subgroups. This analysis seeks to identify variations in levels of satisfaction within IMGs. The analysis was restricted to unique individual observations in the dataset instead of the pooled (person-years) observation. There appeared to be no significant gender and regional (geographic) variations in average levels of SWB across IMGs. However, satisfaction levels appeared to significantly vary by length of stay in Australia and the long-established IMGs were relatively more satisfied than the newly established (i.e. those in their first ten years of residency). This result is in line with the immigrant assimilation theory ([Brown 2006](#)) suggesting the longer the stay the better the immigrants' conditions become which provides better opportunities for improving well-being ([Laczko and Appave 2015](#)). The results showed that IMGs with Australian citizenship were more likely to report a higher mean level of SWB than those with either permanent or temporary residency. Again, this was perhaps due to the duration of their settlement, as the data indicated (not reported here) that citizens spent nine more years in Australia than the non-citizens.

Considering IMGs by doctor type, it appeared that hospital non-specialists were the least satisfied with life, followed by registrars (specialists in training). Specialists were the most satisfied group followed by general practitioners. This is to some extent related to the findings of ([Joyce, Eyre et al. 2015](#)) who also found lower levels of career satisfaction among hospital doctors relative to other doctors. Perhaps differences in workloads (physical and psychological demands), relative status and other professional characteristics are the potential contributing factors. The mandated IMGs (i.e. IMGs

restricted to serve in a specific geographic location such as districts of workforce shortage for a specified period) were significantly less satisfied with life than their non-mandated counterparts. This is in agreement with the results of ([McGrail, Humphreys et al. 2012](#)) about the high prevalence of dissatisfaction (with job and life) among this category of IMGs. Similarly, those IMGs with limited registration were significantly less satisfied than the fully registered IMGs. According to the Australian Health Practitioner Regulation Agency, limited registration holders are only allowed to renew their registration three times after which a new application must be made ([AHPRA 2015](#)). Thus, transitioning from this form of registration to a full registration may be challenging and moreover having to deal with periodic renewals may also be a major effort for many IMGs. Those IMGs coming from the competent authority countries (e.g. New Zealand, UK, USA, Canada, Republic of Ireland, and South Africa) were significantly more satisfied with life than those from other countries. As already described in [Chapter 2](#), competent authority pathway is exclusively for IMGs who were initially trained in countries that are considered to have comparable medical education and licensing examination systems as Australia such as Canada, UK, Republic of Ireland and the USA ([House of Representatives Committee Australia 2012](#)). Doctors under this pathway enjoy the privilege of not undergoing the hurdles of pre-employment language assessment and clinical examinations as experienced by other IMGs. These doctors may be able to assimilate quickly within their work and community settings due to the cultural proximity to Australia. Also, perhaps the exemption may have boosted their self-esteem leading to improved self-assessment of their well-being. Considering the level of technological and economic advancement of countries of initial medical training (high vs. low/middle income countries), it appeared that the low/middle-income IMGs were significantly less satisfied compared to the high-income IMGs (from the UK, Republic of Ireland, USA, Canada, Germany, and the Netherlands). This latter group of IMGs may be more satisfied owing to their cultural proximity to Australia.

Table 5-3 Average levels of subjective well-being by subgroups of IMGs, Analysis of Variance

Categories	IMGs <i>ppl (n)= 5,413</i> <i>Obs (N)= 16,776</i>			
	n	Mean	SD	<i>P-value</i>
Gender				0.265
Male	3,122	7.25	1.752	
Female	2,026	7.19	1.655	
Year since migration				0.022
Under 10 years	2,334	7.21	1.660	
Over 10 years	1,070	7.36	1.746	
Immigration status				0.010
Citizen	2,784	7.28	1.737	
Non-citizen	2,364	7.16	1.686	
Doctor type				<0.001
Specialist	1,616	7.40	1.660	
GP	2,126	7.33	1.718	
Hospital non-specialist	683	6.86	1.731	
Registrar	723	6.90	1.717	
Mandated				<0.001
Yes	2,014	7.12	1.741	
No	3,134	7.30	1.694	
Pathway to practice				0.046
Competent Authority	1,673	7.30	1.712	
Non-Competent Authority	3,475	7.19	1.715	
Source countries (classification)				<0.001
Low/middle income country	3,700	7.17	1.742	
High income country	1,448	7.37	1.633	
Location of work				0.916
ASGC: major city	3,330	7.23	1.717	
ASGC: regional area	1,106	7.23	1.698	
ASGC: remote area	708	7.20	1.738	

Analysis of variance (ANOVA)

Changes and stabilities in adverse psychosocial conditions of IMGs relative to DMGs

So far, the chapter has described variations in exposure to psychosocial risk factors across individuals and time, but it does not show how psychosocial conditions of IMGs changed relative to DMGs. Here, the analysis focuses on comparing participants' current (the time of the survey interview) exposure status to psychosocial risk at work to that of their previous status and determine if there has been a change or not. The rates of these changes and stabilities in adverse psychosocial conditions (high job demands and low resources) are compared between DMGs and IMGs in **Table 5.4**.

The analysis shows statistically significant variations in the rates of change and stability in exposure to psychologically demanding situations at work between DMGs and IMGs. It showed that among DMGs and IMGs who were previously exposed to low psychological demands at work, 10.41% and 10.66% became exposed to high demands respectively, while 24.4% of DMGs and 27.2% of IMGs previously under high demands remained in this category.

There also appeared to be statistically significant variations in the proportions of DMGs and IMGs moving in and out or remaining under resource frustration at work. For instance, the results showed that 8.8% of DMGs who were previously having a high sense of job control have moved to low control, compared to 9.7% of IMGs whereas DMGs who were previously having low control 10.4% remained in that situation compared to 12% of IMGs ($p < 0.001$). For peer support, DMGs and IMGs previously identified with good access to peer support, 9.4%, and 11.1% had appraised their current level of support as poor respectively. Additionally, 10.2% and 13.5% of the poorly supported DMGs and IMGs remained inadequately supported respectively ($p < 0.001$).

Table 5-4 Comparing changes in job demands and resources over time for IMGs compared to DMGs, (MABEL 2009-2016)

Psychosocial factor	DMGs		IMGs		Sig.
	N	%	N	%	
Job demands					<0.001
stay low	18,892	54.09	4,784	50.90	
low to high	3,636	10.41	1,002	10.66	
high to low	3,891	11.14	1,058	11.26	
stay high	8,509	24.36	2,554	27.18	
Job control					<0.001
stay low	3,653	10.38	1,141	12.02	
low to high	3,571	10.15	1,025	10.80	
high to low	3,105	8.83	916	9.65	
stay high	24,852	70.64	6,412	67.54	
Occupational rewards					0.050
stay low	5,106	14.53	1,449	15.29	
low to high	3,740	10.62	1,007	10.62	
high to low	3,226	9.78	927	9.78	
stay high	23,068	65.65	6,096	64.31	
Peer support					<0.001
stay low	3,567	10.22	1,261	13.53	

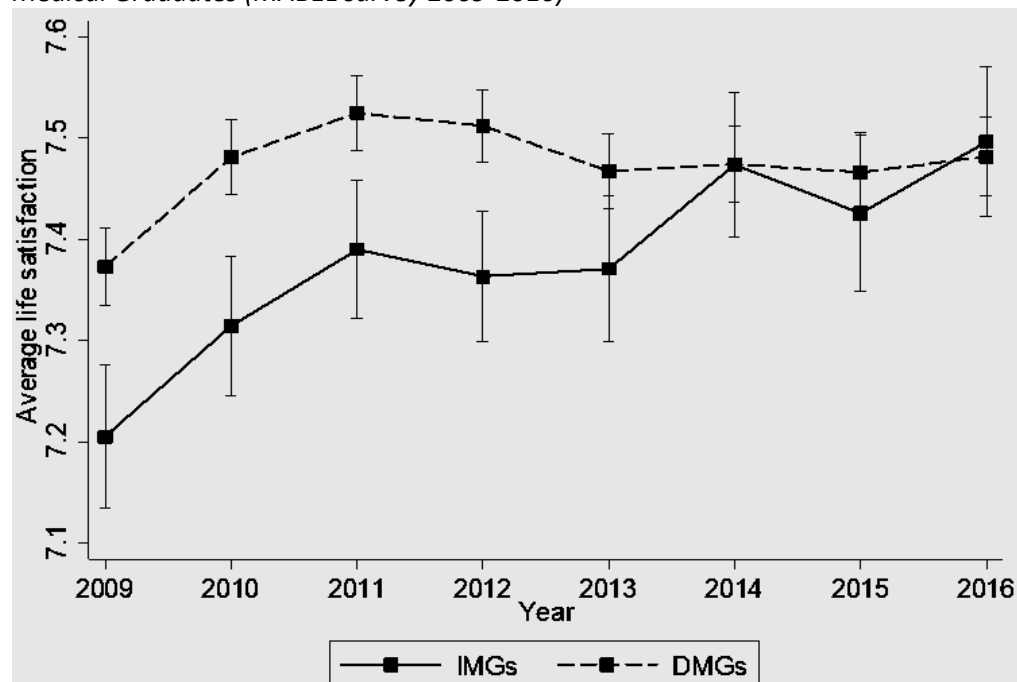
low to high	3,437	9.85	1,133	12.15
high to low	3,398	9.4	1,032	11.07
stay high	24,485	70.18	5,897	63.25

Chi-Square test of proportional differences of transitions in exposure to psychosocial risk factors at work

Yearly trends in the life satisfaction of IMGs relative to DMGs

Figure 5.1 shows predicted changes in average satisfaction levels over time by year and training status (DMGs vs. IMGs). The analysis was a bivariate analysis with year fixed effects interacting with the IMG dummy, so as to determine and compare time-trends in average life satisfaction conditional on the IMG status. From the graph, it appeared that on the average, both IMGs and DMGs experience an upsurge in levels of satisfaction with life between 2009 and 2011, which showed to have declined during the 2012 and 2013 survey periods, but DMGs were significantly more satisfied than IMGs during these periods ($p < 0.001$). However, during the 2014 survey period, the average satisfaction seemed to have risen among IMGs and was not significantly different from that of DMGs since then until the 2016 survey period. While this bivariate analysis was not adjusted for the time-variant and invariant professional and personal characteristics of doctors in the two samples, it is difficult to draw a conclusion about factors underpinning these observed patterns. Next, in Table 5, the chapter attempts to evaluate the work context of doctors' general well-being.

Figure 5-1 Average life satisfaction levels over time among International compared to Domestic Medical Graduates (MABEL survey 2009-2016)



OLS estimates for average satisfaction levels over time with 95% CI, adjusted for doctor and year fixed effects,

5.3.3 Multivariate Analysis

Comparing individual-specific responses to changes in psychosocial conditions between the IMG and DMG groups

So far, the chapter has laid out some descriptive evidence about how IMGs' working conditions and levels of SWB evolved over time compared to their domestic graduate counterparts, but it does not show the extent to which well-being of individuals in each group responds to changes in psychosocial conditions. Now this section will explore the effect of changes in psychosocial risk factors on changes in SWB among doctors. To proceed, first, a [Hausman \(1978\)](#) specification test was performed to determine which panel regression model (Random vs. Fixed Effects model) best fit the data. The test was based on the null hypothesis that the RE model will be more appropriate. However, as shown in the bottom row of Table 5, the statistically significant Hausman test ($p < 0.001$) suggested that it was appropriate to apply the FE model. This model is suitable for eliminating the potential effects of both measured and unmeasured time-invariant confounders in the regression analysis.

Three separate models were used to estimate the results presented in **Table 5.5**. The first model (Model 1) included only the main variables of interest (psychosocial risk factors). Consistent with the literature, the second model (Model 2) was adjusted for doctors' time-varying personal characteristics (e.g., health status, marital status, parenthood, income, specialty, geographic location, citizenship) and year fixed effects. The goal was to reduce any potential spurious association between psychosocial factors and SWB that may be due to their time-varying personal and professional characteristics. The third model (Model 3) included an interaction term to test whether regression coefficients significantly differ between IMGs and DMGs. For the interaction analysis, DMGs were selected as the based category, thus the main effects in model 3 represent the expected change in the within-person average SWB if a doctor is a DMG while the interaction effect shows the extent of the IMG/DMG differences in the coefficients.

The R-square estimates shown at the bottom of the table indicated that the unadjusted and the adjusted models explained 6% and 13% of the within-person variance in average SWB, respectively. Determinants of self-reported well-being are inherently complex, and the result simply portrayed this complexity. Psychologists claim SWB to be a function of 'trait' (i.e. personality and dispositional factors) and 'state' (i.e. circumstantial factors). Trait and circumstantial factors, according to the sustainable happiness model of [Lyubomirsky, Sheldon et al. \(2005\)](#) account for about 50% and 10% of the variance in subjective well-being respectively, while the remaining 40% is explained by intentional activities (e.g. exercise, goal pursuit). Results of this chapter appeared to substantiate these theoretical assumptions as the unobserved time-constant individual characteristics accounted for more than 50% of the variance in SWB in the study sample as represented by the adjusted 'rho' parameter.

The second panel of **Table 5.5** (model 2) indicated that exposure to high psychological demands at work was significantly associated with a decline in the within-person average SWB over time across the study participants. Model 3 showed that the coefficient on job demand in the DMG sample was

greater than that of IMGs, but these differences were not statistically significant. With respect to job resources, the results showed a strong negative association (-0.41) between a lower sense of job control and SWB at the individual level over time. Implying that average SWB of an individual doctor declines significantly in response to perceiving a lower sense of control at work. Additionally, exposure to low job rewards and poor peer support were each associated with a significant decline in within-person average SWB. The relatively larger coefficient on job control suggested the value doctors attached to their professional autonomy as demonstrated in the literature ([Kuusio, Heponiemi et al. 2012](#), [Brower and Riba 2017](#)). Viewed in the context of mainstream medical literature, these results generally suggest the importance of job resources to the welfare of doctors. Although individual specific responses to these stressors seemed to vary across the two groups, yet the differences were not statistically significant after interacting each job resource scale with the IMG/DMG dummy.

Moving from high to low community integration was associated with a decline in the within-person average SWB among doctors. The marginal effects appeared to be higher among IMGs than DMGs, however, these differences were not statistically significant after controlling for doctors' stable personal characteristics. This result suggested the significance of doctors' work location to their personal well-being. The coefficient on mandatory practice suggests that average SWB of an individual decline in the period he/she was mandated compared to when not mandated, again reinforcing the findings of ([McGrail, Humphreys et al. 2012](#)). There appeared to be a negative within-person association between perceived financial insecurity and SWB. The effect size appeared to be higher for an IMG than a DMG, but the difference was not statistically significant after accounting for doctors' personal and work characteristics.

To check the sensitivity of the above results to possible confounding due to unobserved time-invariant individual characteristics, the results were contrasted with the pooled ordinary least squares (OLS) estimates presented in [Table 4.3](#) (Chapter 4) which has not controlled for such individual fixed effects. By comparing results of model 3 from Table 5.5 with those of model 2 from Table 4.3 it was

observed that though both models showed statistically significant associations between psychosocial factors (e.g., job demands and resources) and SWB, the estimated coefficients were apparently smaller in the FE model. The regression coefficients on job demands for example, has dropped from 0.26 in the POLS model to 0.21 in the FE model while that of job control has declined from 0.73 to 0.40 after controlling for individual fixed effects. Likewise, the effect of job rewards has dropped from 0.45 to approximately 0.30 after adjusting for unobservable time-invariant factors. This implies that controlling for individual heterogeneity has reduced the overestimation of regression coefficients (positive bias).

Table 5-5 Marginal effects of time-varying psychosocial risk factors on SWB in the pooled, DMG and IMG samples, Fixed Effect analysis

Predictor variables	<i>Changes in SWB</i>		
	All doctors		Interaction with IMG/DMG dummy
	Model 1	Model 2	Model 3
High job demand (highest tertile)	-0.221***	-0.198***	-0.206***
Low job control (lowest tertile)	-0.424***	-0.406***	-0.402***
Low reward (lowest tertile)	-0.335***	-0.293***	-0.296***
Poor peer support	-0.194***	-0.179***	-0.190***
Low community integration (lowest tertile)	-0.100***	-0.091***	-0.084***
Hours worked (ref:<35)			
35-40 hrs	-0.0556**	-0.063**	-0.072**
41-49 hrs	-0.140***	-0.136***	-0.143***
50+ hrs	-0.257***	-0.229***	-0.254***
Mandatory practice	-0.103**	-0.114**	-0.074
Financial insecurity	-0.052***	-0.104***	-0.098***
Interaction (base category: DMGs)			
High job demands x IMG	-	-	0.036
Low job control x IMG	-	-	-0.030
Low reward x IMG	-	-	0.015

Poor peer support x IMG	-	-	0.025
Low community integration x IMG	-	-	-0.040
Hours worked x IMG			
35-40 hrs	-	-	0.031
41-49 hrs	-	-	0.009
50+ hrs	-	-	0.088
Mandatory practice x IMG	-	-	-0.056
Financial insecurity x IMG			-0.015
F test (that all $\mu_i=0$)	4.59***	3.71***	3.69***
R ² within	0.06	0.13	0.13
Rho (fraction of variance due to fixed effects)	0.64	0.61	0.61
Hausman test		1181.19***	
N	64,623	57,825	57,825

Note. **Model 1:** only time-varying psychosocial factors; **Model2:** adjusted for year fixed effects and time-varying personal and professional characteristics (health status, marital status, parenthood, income, specialty, geographic location, citizenship) **Model 3:** contained interaction between psychosocial risk factors and the IMG dummy (=1 if IMG). The asterisks ***, **, * indicate regression coefficients were significant at 0.1%, 1%, and 5% levels, respectively.

How do responses to psychosocial risk factors vary within IMGs by arrival period in Australia?

To this point, the chapter has demonstrated that individual-specific responses to changes in psychosocial working conditions were not significantly different between IMGs and DMGs after accounting for their observable and unobservable stable personal characteristics. This section will test whether responses to changes in psychosocial conditions vary among IMGs by arrival cohort. To do this, a dummy variable was created that categorised IMGs into three mutually exclusive groups according to the period they first arrived in Australia. They include The pre-2000 (the early settled), intermediate (between 2000-2009) and the recent (between 2010-2016) cohorts. The term intermediate was used because it marked the period immediately before the integration of State-based medical registration systems into a single National Registration Scheme (under the National Law) in 2010 ([Department of Health Australia 2016](#)).

Table 5.6 presents the adjusted FE estimates for the marginal effects of changes in psychosocial risk factors on changes in the within-person average SWB in the study sample. These results were obtained from two separate models. Model (1) estimated the main effects of the predictor variables

for the entire sample while model 2 estimated the interaction effects between each predictor and the arrival cohort dummy. This latter model aimed to test for differences in the slope coefficients of each predictor variable between the arrival cohorts using the pre-2000 cohort as the reference group. Results showed that exposure to high psychological demands and low resources at work (low job control, rewards, and poor peer support) were significant predictors of lower within-person average satisfaction across study participants. Sense of job control (0.43) appeared to be the strongest predictor of SWB in the study sample followed by contentment with levels of rewards (0.28), job demands (0.19) and peer support (0.17). Model 2 indicated that high psychological demands and a low sense of control at work affected individuals in the Pre-2000 cohort more than those in the other comparison groups. The differences in the slope coefficients on job demands were not statistically significant but that of job control were found to be significantly different between the early and the recent cohort of IMGs this is demonstrated in Figure 9.1 (Appendix 2). Unlike job demands and control, the intermediate and the recent cohort of IMGs appeared to be most affected by poor peer support at work compared to the early settled. These differences in slope coefficients were statistically significant (see Figure 9.2 in Appendix 2). Additionally, lower sense of community integration was associated with a decline in the within-person average SWB for all IMGs and there was a significant interaction effect with arrival period. The recently settled IMG appeared to be the most affected group with respect to low community integration. These differences in slope coefficients are presented diagrammatically in Figure 9.3 (Appendix 2).

The within R-sq indicated that the observed time-varying characteristics accounted for 12% of the variance in SWB within individuals in the study sample. The value of the rho parameter indicated that 63% of the variance in SWB in the study sample was due to the unobserved stable personal characteristics.

Table 5-6 Marginal effects of time-varying psychosocial risk factors on SWB of IMGs by year since the migration to Australia, multivariate Fixed Effect analysis

Predictors	<i>Change in subjective well-being</i>	
	Model 1	Model 2
Psychosocial risk factors		
High job demand (highest tertile)	-0.185***	-0.273***
Low job control (lowest tertile)	-0.426***	-0.531***
Low reward (lowest tertile)	-0.281***	-0.275***
Poor peer support	-0.165***	-0.082
Low community integration (lowest tertile)	-0.128***	-0.133*
Hours worked (per week)	-0.006***	-0.004
Mandatory practice (ref: no)	-0.146**	-0.132
Financial security (ref: yes)	-0.118***	-0.134**
Interaction analysis (ref: pre-2000 cohort)		
High job demand x arrival period		
Arrived between 2000-2009		0.030
Arrived between 2010-2016		0.310
Low job control x arrival period		
Arrived between 2000-2009		0.078
Arrived between 2010-2016		0.368*
Low job rewards x arrival period		
Arrived between 2000-2009		-0.060
Arrived between 2010-2016		-0.046
Poor peer support x arrival period		
Arrived between 2000-2009		-0.169**
Arrived between 2010-2016		-0.368**
Low community integration x arrival period		
Arrived between 2000-2009		-0.034
Arrived between 2010-2016		-0.357*
Hours worked x arrival period		
Arrived between 2000-2009		-0.004
Arrived between 2010-2016		0.007
Mandatory practice x arrival period		

Arrived between 2000-2009		0.002
Arrived between 2010-2016		-0.267
Financial insecurity x arrival period		
Arrived between 2000-2009		0.071
Arrived between 2010-2016		0.034
<i>R-squared: within</i>	0.12	0.11
F test (that all $\mu_i=0$)	3.46***	3.48***
Rho (fraction of variance due to μ_i)	0.63	0.60
N	13,170	10,051

Note. Fixed effect analysis adjusted for year fixed effects and time-varying personal and professional characteristics (health status, marital status, parenthood, income, specialty, geographic location, citizenship). The asterisks *, **, *** indicate regression coefficients were significant at 10%, 5%, and 1% levels respectively. **Model 1:** Entire sample with no interaction term, **Model 2:** Included interaction terms (Interacted each predictor with the arrival cohort dummy)

How do responses to psychosocial risk factors vary within IMGs by assessment pathway?

In the preceding section, the chapter established that the marginal effects of psychosocial risk factors on the SWB of IMGs were modified by the period of their first arrival in Australia—i.e., effect sizes appeared to significantly differ by arrival cohort. The marginal effects of changes in peer support, sense of community integration and control over work were significantly different between the pre-2000 and the other arrival cohorts. This section seeks to determine whether marginal effects of changes in psychosocial risk factors on the well-being of IMGs vary by assessment pathway (competent vs. non-competent authority pathway). Results of the analysis are presented in Table 5.7. Differences (last column) in slope coefficients were estimated using interaction terms between the indicator for the assessment pathway and the predictor variables. In **Table 5.7**, estimates of the FE linear regression model indicated that exposure to high psychological demands at work was associated with lower SWB within individuals in the two groups. Responses to high demands appeared to be greater for those in the competent authority pathway than the comparison group, but the difference was not statistically significant. Additionally, SWB of individuals in the two groups was found to decline significantly in response to a lower sense of job control, rewards, and poor peer support. Most notably, only the slope coefficients on job control were found be significantly different across the groups. Individuals in the competent authority pathway were relatively more affected by changes in job control than the comparison group. A graphic representation of changes in SWB of IMGs as a function of the assessment pathway and sense of control at work is presented in **Figure 9.4** (Appendix 2).

Increase in hours worked per week was significantly associated with reduced general satisfaction over time for individuals in the non-competent authority pathway only. Transitioning from high to lower sense of community integration was associated with a decrease in average SWB over time for individuals in both groups but the effect sizes did not significantly differ between the two groups. Both mandatory practice and perceived financial insecurity were significantly associated with a decline in the within-person average satisfaction over time across the competent authority and the comparison group. The explanatory power of the predictor variables in the model appeared to be good. The within R-squared revealed that these predictors explained 14% and 11% of the variance in SWB within individuals in the competent and non-competent authority samples respectively after accounting for their stable personal characteristics.

Table 5-7 Marginal effects of time-varying psychosocial risk factors on SWB of IMGs by assessment pathway, Fixed Effect analysis

Predictors	Pooled sample	Interaction model
Psychosocial risk factors		
High job demand (highest tertile)	-0.180***	-0.152***
Low job control (lowest tertile)	-0.423***	-0.327***
Low reward (lowest tertile)	-0.28***	-0.266***
Poor peer support	-0.168***	-0.207***
Low community integration (lowest tertile)	0.129***	-0.112***
Hours worked (ref: <35hr)	-0.056***	-0.008***
Mandatory practice	-0.125***	-0.139**
Financial security (ref: yes)	-0.128***	-0.152***
Interaction (base category: Non-competent authority)		
High job demands x competent authority		-0.074
Low job control x competent authority		-0.250***
Low reward x competent authority		-0.048
Poor peer support x competent authority		0.086
Low community integration x competent authority		-0.045
Hours worked x competent authority		0.005
Mandatory practice x competent authority		-0.013
Financial insecurity x competent authority		0.079
R-squared: within	0.118	0.119
F test (that all $\mu_i=0$)	33.19***	25.07***
Rho (fraction of variance due to μ_i)	0.63	0.60
N	12,825	12,825

Fixed effect analysis adjusted year fixed effects and time-varying personal and professional characteristics (health status, marital status, parenthood, income, specialty, geographic location, citizenship).

*The asterisks *, **, *** indicate regression coefficients were significant at 10%, 5%, and 1% levels, respectively.*

How do responses to psychosocial risk factors vary within IMGs by key source regions of training?

To this point, the chapter has demonstrated how the period of arrival and the registration pathway moderated the effects of changes in psychosocial risk factors on changes in SWB of IMGs. This section looks specifically into differences in individual-specific responses to psychosocial distress among IMGs by key source regions (country). It compares doctors coming from the UK/Ireland to those from: North America (US and Canada), Western Europe (Germany and Netherlands), Sub-Saharan Africa—SSA (South Africa, Nigeria and Zimbabwe), Southeast Asia—SEA (Philippines, Malaysia, Singapore, China and Burma), South Asia (Bangladesh, India, Pakistan and Sri Lanka) and the Middle East/North Africa —ME/NA (Egypt, Iraq and Iran). The key rationale for selecting these countries is because they have relatively enough observations (at least 100 person-year observations). The assumption is that UK/Irish graduates will be the least affected by psychosocial distress at work owing to their cultural proximity to Australia.

Table 5.8 presents the results of a multivariate fixed-effect linear regression analysis measuring differences in individual-specific responses to changes in psychosocial risk factors between UK/Irish medical graduates and those from other regions. Compared to the UK/Irish graduates, the slope coefficient of high psychological demand appeared to be high among IMGs coming from North America and Western Europe but lower in the rest of the source regions. While these differences were not statistically significant, the differences observed between UK/Irish graduates and those coming from the ME/NA region were striking. This could perhaps be due to the groups' differences in expectations and prior experiences which may both affect the way they perceive and cope with high psychologically demanding situations at work. With respect to the low sense of control at work, the UK/Irish graduates appeared to be significantly more affected than those from Western Europe, SEA, South Asia, and the ME/NA regions. This result confirmed those reported in the preceding section about competent and non-competent authority differences in response to low job control. Further,

the marginal effect of low occupational rewards on SWB appeared to be more apparent in IMGs from Western Europe than those from UK/Ireland and the difference was statistically significant. Similar was observed for other source regions (except for ME/NA) but the differences were not statistically significant.

Albeit the non-statistical significance, IMGs coming from ME/NA region appeared to be more satisfied with the level of their occupational rewards compared to the UK/Irish graduates. Labour market entry is a major challenge for the ME/NA graduates relative to others, thus, getting access to the workforce could by itself be a major achievement. For instance, while most of the groups showed a negative response to lower community integration and mandatory clinical practice, the ME/NA IMGs appeared to be less concerned by these situations. It is likely for these doctors to be happy albeit exposure to adverse psychosocial conditions if their reference point is those of their counterparts who could not make it into the Australian medical workforce. The results indicated that the marginal effect of perceived financial insecurity was more apparent among IMGs from ME/NA than those from the UK and Ireland. This difference was found to be statistically significant at 10% level, however, differences observed between UK/Irish graduates and other source regions were not significant.

Table 5-8 Marginal effects of time-varying psychosocial risk factors on SWB of IMGs by source countries, multivariate Fixed Effect analysis

Predictors	Pooled sample	Interaction model
Psychosocial risk factors		
High job demand (highest tertile)	-0.185***	-0.224***
Low job control (lowest tertile)	-0.426***	-0.504***
Low reward (lowest tertile)	-0.281***	-0.257***
Poor peer support	-0.165***	-0.100*
Low community integration (lowest tertile)	-0.128***	-0.134**
Hours worked	-0.053**	-0.007***
Mandatory practice	-0.146**	-0.056
Financial security (ref: yes)	-0.118***	-0.112*
Interaction analysis (ref: UK + Ireland)		
High job demand x country		
North America		-0.179
Western Europe		-0.145
Sub-Saharan Africa		0.146
South-East Asia		0.061
South Asia		0.092
The Middle East + North Africa		0.236

Others		0.049
Low job control x country		
North America		-0.063
Western Europe		0.398*
Sub-Saharan Africa		-0.072
South-East Asia		0.341***
South Asia		0.236**
The Middle East + North Africa		0.372*
Others		-0.048
Low reward x country		
North America		-0.164
Western Europe		-0.413**
Sub-Saharan Africa		-0.105
South-East Asia		-0.213
South Asia		-0.056
The Middle East + North Africa		0.213
Others		0.050
Poor peer support x country		
North America		0.044
Western Europe		-0.248
Sub-Saharan Africa		-0.112
South-East Asia		-0.061
South Asia		-0.011
The Middle East + North Africa		0.059
Others		-0.168*
Low community integration x country		
North America		-0.016
Western Europe		-0.047
Sub-Saharan Africa		-0.081
South-East Asia		-0.084
South Asia		0.038
The Middle East + North Africa		0.347**
Others		0.005
Hours worked x country		
North America		-0.023*
Western Europe		-0.0004
Sub-Saharan Africa		0.006
South-East Asia		0.002
South Asia		-0.001
The Middle East + North Africa		-0.0004
Others		-0.002
Mandatory practice x country		
North America		-0.227
Western Europe		-0.190
Sub-Saharan Africa		-0.071
South-East Asia		-0.039
South Asia		-0.190
The Middle East + North Africa		0.365
Others		-0.205
Sense of financial insecurity x country		
North America		0.365
Western Europe		-0.028
Sub-Saharan Africa		0.100
South-East Asia		-0.154

South Asia		-0.028
The Middle East + North Africa		-0.394*
Others		0.001
R-squared: within	0.12	
F test (that all $\mu_i=0$)	4.19***	
Wald test		
Rho (fraction of variance due to μ_i)	0.63	
N	5363	

Fixed effect analysis adjusted year fixed effects and time-varying personal and professional characteristics (health status, marital status, parenthood, income, specialty, geographic location, citizenship).

*The asterisks *, **, *** indicate regression coefficients were significant at 10%, 5%, and 1% levels respectively.*

How do responses to psychosocial risk factors vary within IMGs by specialty?

Having demonstrated how cognitive well-being of IMGs from diverse source regions responded to changes in their psychosocial conditions relative to their UK/Irish counterparts, the chapter now attempts to determine whether specialty type modifies the effect of changes in psychosocial conditions on the well-being of IMGs. Here IMGs were categorised into four major groups of doctors as was used in the MABEL survey, namely: specialists, general practitioners (GPs), hospital non-specialists and specialist registrars. The hospital non-specialists and specialist registrar groups compared to specialists were found to be the most dissatisfied groups of IMGs in this chapter and the previous one (Chapter 3). To determine how these groups differentially respond to changes in their psychosocial work environment, an interaction effect was estimated between each predictor and the specialty dummy. As presented in **Table 5.9**, specialist IMGs were the reference category.

There was a significant decline in average SWB of individuals in each specialty group in response to a high level of psychological demands at work. Hospital non-specialists appeared to be the most affected group. The coefficient difference (0.40) indicated that the within-person decline in average satisfaction among this group was more than three times the size observed in the specialist sample. Exposure to lower job control was associated with a decrease in the within-person average SWB across the three groups. Individuals in the specialist group appeared to be the most affected by a low sense of control at work but this difference compared to other groups was not statistically significant. Average SWB were found to decline within individuals in all the three groups of doctors due to discontentment with occupational rewards (remuneration and recognition at work). However, the

within-person marginal effects were not significantly different between specialists and the other groups. Exposure to poor peer support was significantly associated with a decline in the within-person level of SWB in the pooled sample but no significant differences were observed between specialists and the other subgroups. There was evidence of a decline in the within-person average SWB in the pooled and specialist samples as weekly hours of work increased. The slope coefficient on hours worked (per week) for specialist IMGs was twice less than that of hospital non-specialists, and the difference was statistically significant. Slope coefficients on mandatory contract, levels of community integration, and perceived financial security were not significantly different between specialists and the other IMGs.

Table 5-9 Marginal effects of time-varying psychosocial risk factors on SWB of IMGs by doctor type, multivariate Fixed Effect analysis

Predictors	Pooled sample	Interaction with specialty dummy
Psychosocial risk factors		
High job demand (highest tertile)	-0.185***	-0.133***
Low job control (lowest tertile)	-0.426***	-0.494***
Low reward (lowest tertile)	-0.281***	-0.304***
Poor peer support	-0.165***	-0.139***
Low community integration (lowest tertile)	-0.128***	-0.148***
Hours worked	-0.053**	-0.054***
Mandatory practice	-0.146**	-0.093
Financial security (ref: yes)	-0.118***	-0.062
Interaction analysis (ref: specialists)		
High job demand x specialty		
GPs		-0.069
Hospital non-specialist		-0.402**
Specialist registrars		0.119
Low job control x specialty		
GPs		0.130
Hospital non-specialist		0.112
Specialist registrars		0.097
Low reward x specialty		
GPs		0.023
Hospital non-specialist		-0.121
Specialist registrars		0.032
Poor peer support x specialty		
GPs		-0.036
Hospital non-specialist		-0.025
Specialist registrars		-0.081
Low community integration x specialty		
GPs		0.023

Hospital non-specialist		0.077
Specialist registrars		0.038
Hours worked x specialty		
GPs		0.022
Hospital non-specialist		-0.126*
Specialist registrars		0.036
Mandatory practice x specialty		
GPs		-0.060
Hospital non-specialist		0.080
Specialist registrars		-0.142
Sense of financial insecurity x specialty		
GPs		-0.087
Hospital non-specialist		-0.178
Specialist registrars		-0.007
R-squared: within	0.12	
F test (that all $\mu_i=0$)	4.19***	
Wald test		
Rho (fraction of variance due to μ_i)	0.63	
N	5363	

*Fixed effect analysis adjusted for year fixed effects and time-varying personal and professional characteristics (health status, marital status, parenthood, income, specialty, geographic location, citizenship). The asterisks *, **, *** indicate regression coefficients were significant at 10%, 5%, and 1% levels respectively.*

5.4 Discussion

In line with the overarching goal of the thesis, this chapter provides novel evidence on the effect of changes in psychosocial work environment on changes in SWB of IMGs, and testing whether the effect sizes varied statistically between the IMG and DMG groups, as well as within the IMG group by length of stay in Australia, the pathway to clinical practice, source regions, and the type of doctor.

Results of the bivariate analysis showed similarities in rates of transitions into and out of psychosocial distress between IMGs and DMGs. However, the former was more likely to remain under psychosocial distress over time such as persistent exposure to high job demands and low resources (e.g. job control, rewards, and peer support) at work (all p -values <0.01). This result strengthens findings from previous studies (mainly cross-sectional) in Australia ([McGrail, Humphreys et al. 2012](#), [Joyce and Wang 2015](#)) and in other post-industrial nations such as the USA, Republic of Ireland and Finland ([Chen, Curry et al. 2012](#), [Humphries, Tyrrell et al. 2013](#), [Aalto, Heponiemi et al. 2014](#)) that reported high psychosocial risk factors among some groups of IMGs relative to DMGs. The chapter found improvements in levels of general satisfaction of IMGs and DMGs from the baseline (2009) to 2016, suggesting the presence of a period effect. However, the pattern of IMGs' satisfaction had

relatively demonstrated more variability over the survey period. This is not surprising given the diverse ethnolinguistic composition of the IMG sample (consisting countries like UK, China, Iran, India) and the different cultural and professional adjustment processes they are expected to traverse while living in Australia. Additionally, there may be some regulatory and policy events (e.g. visa and registration/license conditions) impacting select cohorts of IMGs over time especially for the newly arrived cohort (<10 years). The finding that the earlier settled IMGs' were more satisfied than the recently arrived, confirmed the potential role of assimilation in the general well-being of IMGs as reported in other immigrant populations ([Obućina 2013](#), [Amit and Bar-Lev 2015](#), [Angelini, Casi et al. 2015](#)). Unlike the newly settled IMGs, most long-established IMGs were already permanent residents, and have navigated pre-registration hurdles, and also had no restriction attached to their registration. However, looking beyond assimilation to the work-context and its role in explaining the changes in SWB of IMGs relative to DMGs over time, may be more appealing for policy orientation.

Results of the multivariate fixed effects analysis revealed that exposure to psychosocial risk factors such as excessive job demands, low job control, poor peer support, low job rewards, excessive working hours, and a low sense of community integration were all associated with a statistically significant decline in SWB among study participants in the pooled sample (all *p-value* <0.05). Precisely, job control had the strongest marginal effect on doctors' (IMG and DMG group) SWB, suggesting the importance of the sense of professional autonomy to well-being in this population. The findings put together, suggested the significance of doctors' psychosocial working conditions to their personal well-being as previously reported in Australia from a MABEL-based study ([Milner, Witt et al. 2017](#)), and other OECD countries like Norway, Finland, Switzerland ([Buddeberg-Fischer, Klaghofer et al. 2008](#), [Stenmarker, Palmérus et al. 2009](#), [Tyssen, Hem et al. 2009](#), [Kuusio, Heponiemi et al. 2013](#)). The positive association between sense of community integration and the professional well-being and retention (in rural areas) of Australian doctors has been recently reported in a systematic review ([Russell, McGrail et al. 2017](#)).

However, surprisingly, the hypothesis that the SWB of IMGs and DMGs would be differentially affected by changes in their professional conditions could not be supported by the data. This implies, perhaps, that by controlling for their stable personal characteristics, the life satisfaction of IMGs and DMGs was similarly affected by exposure to psychosocial risk factors. This could potentially be due to smaller cell counts for the number of individuals whose exposure status change over time ([Allison 2009](#)). This may be one plausible explanation considering results of bivariate analyses showed that IMGs (as a group) were less likely than DMGs to transition out of an adverse psychosocial condition such as high job demand, low job control, poor peer support over time. However, this particular result also required some explanations. According to job stress theories, including the JD-R model, long-term exposure psychosocial risk factors in the workplace poses more adverse effects on employees' health and well-being ([Karasek Jr 1979](#), [Siegrist 1996](#), [Demerouti, Bakker et al. 2001](#)). If this theoretical assumption holds, then in this study, one expects to observe a relatively stronger marginal effect of psychosocial risk factors on SWB among IMGs than DMGs. But this could not be observed, perhaps, because of the relatively higher emotional stability reported by IMGs (as a group) in the study, which suggested their resilience as discussed in [Chapter 4](#).

While individual-specific responses were not significantly different between the IMG and DMG groups, some statistically significant differences were observed between subgroups of IMGs. For example, in comparing the newly settled IMGs (first 10 years of settlement) to the long-established cohort, it was observed that the former was more affected by poor support from peers at work and a lower sense of community integration. Importantly, a vast majority (about 70 per cent) of these recently arrived IMGs were initially trained in low/middle-income countries (e.g. India, Sri Lanka, Bangladesh, China, Egypt, Iraq) with a different culture, epidemiological profiles and less technologically advanced health systems compared to Australia. Additionally, more than half of these new doctors were under mandatory contract to work in underserved locations (for 5-10 years). In their study on *Satisfaction amid professional challenges: International medical graduates in rural Tasmania*, [Terry, Le et al. \(2014\)](#) observed professional support to be an important factor for the overall job

satisfaction of IMGs during the first 3 years of settlement. The importance of professional support for IMGs' integration and well-being in Australia, particularly in rural and remote areas, has been highlighted in a number of publications ([Hawthorne, Birrell et al. 2004](#), [Han and Humphreys 2006](#), [House of Representatives Committee Australia 2012](#), [Australian Medical Association 2015](#)). In the context of the mainstream literature, the positive link between social support and the well-being of economic migrants has also been reported in a recent systematic review and meta-analysis ([Bak-Klimek, Karatzias et al. 2015](#)). In its 2012 nation-wide enquiry report: *Lost in the Labyrinth*, the [House of Representatives Committee Australia, 2012](#), made a number of recommendations for strengthening support services for individual IMGs and their families. This report was a major turning point for some reforms in the registration processes and support for IMGs in Australia. In response, the Department of Health implemented a number of programs ([Department of Health Australia 2013](#)) including but not limited to 'professional support and peer mentoring programs,' (e.g. funding educational support in specialist training colleges, professional advice, and supervision), and promoting 'access to trainings' (e.g. bridging courses for IMGs on limited registration). Although these programs are meant to enhance IMGs' successful transition to the Australian health care system, results of this study suggested that more need to be done at organisational and community levels to support these doctors especially during the early stages of their employment. The availability of job resources including peer support at work is important in buffering the effects of excessive psychological and physical workloads on employees' well-being ([Schaufeli and Taris 2014](#)). From a theoretical perspective, the findings further implied that providing adequate support to new IMGs could help reduce their risk of job-related stress which has the propensity to boost the quality of their lives.

Comparing IMGs by assessment pathway (competent vs. non-competent authority pathways), revealed a stronger negative effect of perceived low job control on SWB among IMGs coming from the competent authority or majority English-speaking countries (e.g. the UK, Republic of Ireland, USA, Canada). These results were quite startling, and they suggest that the relatively more privileged groups of IMGs were most affected by a lack of professional autonomy. This might be because these doctors

had higher expectations of the level of autonomy that they would experience in their practice than doctors migrating from developing countries or non-majority English-speaking countries. The association between met expectations and SWB was studied by [Mähönen, Leinonen et al. \(2013\)](#) in a sample of 153 Russian migrants in Finland, their findings confirmed that meeting social needs such as the need for free time, friendships and family relations were associated with an increase in migrants' life satisfaction. Job control or autonomy is considered as central to doctors' well-being and the quality of care they provide ([Klein, Frie et al. 2011](#), [Lipworth, Little et al. 2013](#)). Thus, by instilling a full sense of confidence, responsibility, and control, could elicit positive feelings in doctors and help to enhance the quality of their job and life overall.

With respect to differences across speciality groups, the chapter observed that the SWB of hospital non-specialist IMGs was more likely to be affected by exposure to excessive psychological and physical workloads than their specialist counterparts. The hospital non-specialist IMGs in this study were also more likely to come from a non-majority English speaking country and to be fairly new in the country. The hospital setting provides a conducive environment for the proliferation of stress ([Kakunje 2011](#)), hospital non-specialists in Australia are prone to not only excess workload but other psychosocial risk factors such as workplace aggression as reported in a national representative sample of doctors in Australia ([Hills, Joyce et al. 2011](#)). Additionally, a similar study found hospital non-specialists to be the least satisfied group of doctors in Australia compared to specialists, specialist registrars and GPs ([Joyce, Schurer et al. 2011](#)). This finding highlighted the demanding nature of hospital practice and suggested that providing adequate support could be highly crucial in alleviating the psychological distress demonstrated by hospital doctors in this study.

5.5 Chapter conclusion and implications

Findings of this chapter have confirmed the core theoretical assumptions of the JD-R model, that exposure to adverse psychosocial conditions at work such as high psychological demands and low resources (e.g. poor support, low control and rewards) have adverse effects on employees' well-being.

Putting the entire results into context, they suggested that changes in psychosocial experiences in the community and work/organisational contexts matter to doctors' subjective quality of life. The results suggested that by improving conditions at work, policymakers and healthcare managers can promote the professional and non-professional well-being of doctors. The link between doctors' cognitive well-being and quality of patient care has been reported in a recent randomised clinical control trial ([West, Dyrbye et al. 2014](#)) and systematic review ([Scheepers, Boerebach et al. 2015](#)). Other salient findings of the chapter were the differences observed between the subgroups of IMGs concerning the effects of psychosocial risk factors on SWB. For instance, peer support and community integration demonstrated significant positive effects on the general well-being of newly settled IMGs (<10 years of settlement) relative to the long-established cohort. This result implies the need for strengthening and establishing new support networks for the recently arrived IMGs in the country. Such initiatives may improve the personal well-being of doctors and eventually enhance the success of recruitment policies. Additionally, competent authority pathway IMGs seemed to be most affected by perceived low job control than their non-competent authority counterparts. However, what was missing from this analysis was how changes in the regulatory environment of IMGs might influence their quality of life. Addressing this concern is the primary focus of the next chapter.

6 Exploring the Effect of De-registration Decision on Hours Worked and Well-being of IMGs: A natural experiment

Results of the fixed effect linear regression models in [Chapter 5](#) confirmed that high levels of exposure to psychosocial risk factors in the workplace (e.g. high job demands and low job resources) were associated with lower subjective well-being among doctors. The results further revealed that while the marginal effects of changes in psychosocial risk factors on SWB appeared similar between IMGs and DMGs (other things constant), they significantly differed across subgroups of IMGs such as by arrival cohort, assessment pathway, the region of training, and type of doctor. A strength of these results was that they were independent of the potential effects of observed and unobserved time-constant confounding factors (e.g. gender, race, innate ability and personalities). However, results thus far have not been adjusted for the potential effects of unobserved time-varying exogenous factors that might be influencing SWB, such as policy or regulatory changes/reforms.

In addressing this potential weakness, this chapter investigates whether exogenous regulatory decisions influence the well-being of IMGs. Within this study's observation period, a key regulatory decision was the de-registration policy announcement by the Medical Board of Australia (MBA) in 2013. This announcement was targeted at all IMGs under '*limited registration*' in Australia who at the time was told that they have three years to pass the Australian Medical Council (AMC) clinical examination (leading to full registration) or else face de-registration. Whilst this was not a new regulation, having begun in 2010, prior to this announcement its enforcement had been minimal. By

using the MABEL longitudinal survey data both before and after this announcement (2009-2016), this chapter seeks to determine its association with the well-being of limited compared to fully registered IMGs.

6.1 Introduction

As highlighted in [Section 4.2](#), an important health workforce strategy to address distribution inequities in many OECD countries like Australia, Canada, New Zealand, the Republic of Ireland, UK and the USA, has been the recruitment of international medical graduates (IMGs) ([Siyam and Dal Poz 2014](#)) to work in underserved areas, often in rural and remote communities.

Many of these countries use a range of policies to encourage IMGs to work in rural and other priority areas. In Australia, a key issue is access to a Medicare provider number (for context, see [Section 2.4.2](#)) which allows eligible doctors such as those with full/unconditional registration and Fellowship of a College (e.g. RACGP, ACRRM)⁸ to access Medicare benefits arrangements ([Department of Health Australia 2016](#)) a necessity for clinician in private practice. However, regulation removes these requirements for IMGs willing to work in underserved areas usually in regional and remote locations for a specified period of time—at least 5-10 years depending on remoteness. This exemption policy is firmly entrenched in section 19AB of the Health Insurance Act (the Act), commonly referred to as the ‘ten-year moratorium’, and has been in force since 1997 across all Australian States and Territories ([Department of Health Australia 2010](#)). The policy allows IMGs who have not been judged to have the equivalent Australian medical college Fellowship qualifications or pass the clinical examination of the Australian Medical Council (AMC) to practice medicine in a district of workforce

⁸ RACGP: the Royal Australian College of General Practitioners results in Fellowship of the Royal Australian College of General Practitioners (FRACGP). Training focuses on the needs of both rural and metropolitan communities.

ACRRM: the Australian College of Rural and Remote Medicine, results in Fellowship of the Australian College of Rural and Remote Medicine (FACRRM). Training mainly focuses on the healthcare needs of rural and remote communities.

shortage (DWS). According to the National Law for health professional regulation ([AHPRA 2015](#)), these mandated doctors are only allowed to practice under 'limited registration'. This form of registration as defined by the Medical Board of Australia (MBA), allows IMGs to work under supervised practice for 12 months in a location identified as an AoN whilst preparing for the AMC's clinical examinations (for those in the standard pathway) or Fellowship of a College for those in the specialist pathway ([MBA 2018](#)).

Thus, at a State level, the primary aim of limited registration is to serve as a policy lever in addressing shortage and maldistribution of medical professionals to improve better access to primary healthcare services, mostly in rural areas. With maldistribution persisting, limited registered IMGs have remained an important segment of the medical workforce. For instance, [O'Sullivan, Russell et al. \(2019\)](#) highlighted the continuing significance of IMGs to Australia's rural medical workforce despite the country's ongoing efforts to realise self-sufficiency in medical workforce supply.

Limited registration includes restrictions on the location, duration, and scope of practice ([McGrath, Wong et al. 2011](#)). These restrictions have the potential to create some degree of precarity for limited registrants. They may be relatively more vulnerable to changes or the tightening of registration requirements and conditions than their fully registered counterparts. So far, there have been no empirical studies to evaluate these issues among IMGs. There is evidence suggesting that when licensing regulations become more stringent the hours worked (labour supplied) by employees decline owing to feelings of demotivation. For instance, in their study of nurses, [Kleiner, Marier et al. \(2016\)](#) observed a decline in hours worked by nurse practitioners compared to medical doctors when occupational licensing requirements for nurses (such as prescription restrictions) tighten.

Within this context, the current chapter aims to investigate the SWB and labour supply decisions of IMGs under limited compared to full registration before and after the de-registration decision was announced by the Medical Board of Australia (MBA) in 2013 ([ABC 2018](#)). In 2013, the MBA made the announcement that IMGs who failed to pass the Australian Medical Council's clinical examination

within 3 years will face de-registration. Whilst this was not a new regulation, prior to this announcement its enforcement had been minimal. This chapter uses the MABEL longitudinal survey dataset which comprises an extensively rich data on doctors' personal and professional life. The MABEL dataset has been previously used to evaluate workforce policies including a recent financial incentive policy reform in Australia and its implications on geographic mobility of GPs by [Yong, Scott et al. \(2018\)](#).

The main proposition is that the de-registration decision of the MBA in 2013 may encourage IMGs to increase efforts through working more hours on clinical and educational activities to help them secure full registration, and SWB level may fall as a result of increased precarity among limited registrants compared to fully registered.

As already described in preceding chapters, life satisfaction is a validated measure of people's self-reported well-being that has been widely applied in epidemiologic and population-based studies over the past decades ([Kahneman and Krueger 2006](#), [Diener, Inglehart et al. 2013](#), [de Vries, Steinmetz et al. 2016](#)). Additionally, it has recently been receiving increasing attention in the medical literature as a measure of positive psychological functioning in medical doctors ([Smith 2001](#), [CMAJ 2017](#)), however, its application among immigrant doctors has been limited ([McGrail, Humphreys et al. 2012](#)). According to the endpoint theories of subjective well-being, a good sense of well-being is experienced when goals and needs are achieved ([Diener 1984](#)). Goals that require greater amounts of efforts are more likely to bring greater happiness and satisfaction ([Lyubomirsky, Dickerhoof et al. 2011](#)). However, people may become less satisfied with the quality of their lives when they sense their goals as unattainable or threatened. In line with this, if gaining full registration is considered to be a major goal for IMGs, then its fulfilment may positively contribute to their life satisfaction, while fear of de-registration may result in declining life satisfaction.

To the author's knowledge, this chapter is the first empirical analysis that attempts to describe how decisions of regulators might influence the well-being and labour supply decision of IMGs. Its

findings may help in extending our understanding of the significance of the regulatory environment to the welfare of limited registered IMGs, who are mostly the newly arrived and culturally diverse cohort. To test the study hypotheses, this chapter uses a quasi-experimental study design ([Wing, Simon et al. 2018](#)).

The next section discusses the background to the MBA's decision announcement, this is then followed by a description of the study methods in section 6.3, then a presentation of results in section 6.4, and then their discussion in section 5.5 before concluding in Section 6.6.

6.2 Background to the 2013 de-registration decision announcement

As presented in Chapter 2 ([Section 2.3.3](#)), the types of registration pathways that IMGs can follow to gain employment in Australia and their requirements have been specified in the National Registration and Accreditation Scheme (NRAS) also known as the National Law.

The NRAS was established in July 2010 replacing the then state-based registration systems. This development came after the Productivity Commission report recommended for a national approach to health professional regulation through a single national cross profession board ([The Productivity Commission 2006](#)). Additionally, the Commission called for a uniform national registration standard for various regulated health professions including medicine. The Council of Australian Governments (COAG), a peak forum of all state, territory and national governments, acted by establishing the NRAS enforced through the Australian Health Practitioner Regulation Agency (AHPRA) supported by profession-based boards (e.g. the Medical Boards) ([Pacey, Smith-Merry et al. 2017](#)).

The NRAS stated that a limited registration can be granted to IMGs who initially did not meet requirements for a full (general or specialist) registration, such as failing to pass the Australian Medical Council's (AMC) clinical examination and are applying for supervised clinical practice in an area of need location ([AHPRA 2015](#)). If strictly enforced, limited registration can last for 12 months from the date

of issuance and up to three renewals can be granted. After the third renewal, individuals may be removed from the register unless they transition to full registration. In 2013 the Medical Board of Australia (MBA) made the decision to remind all affected IMGs about this important clause within the National Law, saying that IMGs on limited registration have three years to pass the AMC clinical exam or face de-registration ([ABC 2018](#)). As reported by the Australia Broadcasting Corporation (ABC), in late 2018 – some five years later, the MBA launched a major crackdown on some of the IMGs across rural and regional areas of Australia resulting in the de-registration of some doctors. The chair of MBA at the time was reported as saying:

“There was a period of leniency, where many doctors were given extensions, but that time had come to an end. The board has a set of standards which are now being very deliberately implemented. For some people that raise the bar that they have to cross, to be able to either get into the workplace in the first place or remain in the workplace.” (ABC, 2018: Posted Fri 3 Aug 2018, 11:55am).

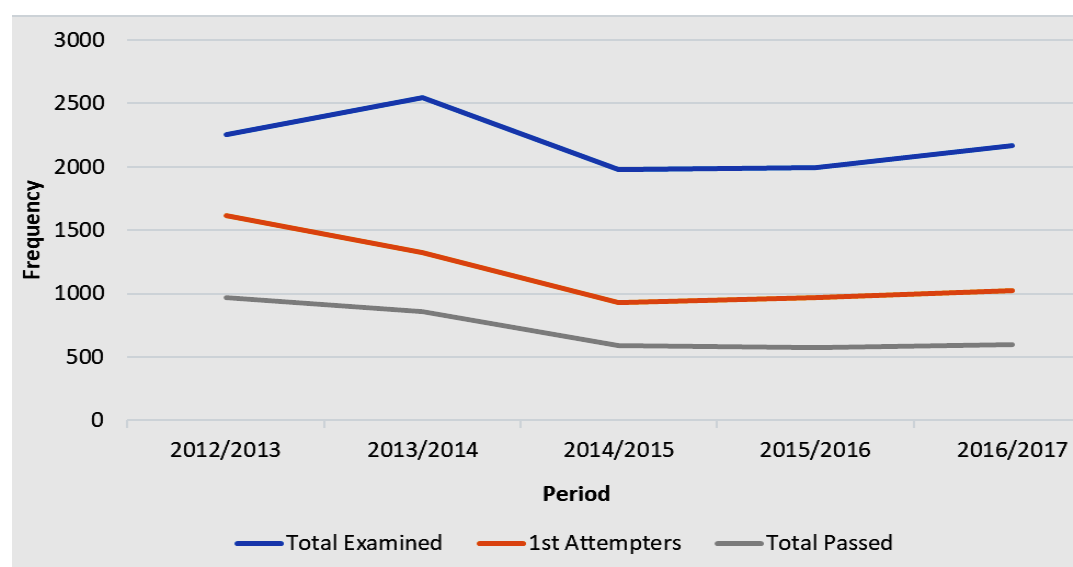
The report indicated that this decision came as the MBA decided to deliberately implement a range of standards it already had in place. According to the National Law, the MBA has the mandate to undertake a review of its registration standards every three-year period and hence, the first review was due in 2013. Another important event that might have led to the Board’s decision was the 2011 parliamentary enquiry into the registration processes and support needs of IMGs. The outcomes and recommendations from this enquiry were provided in the report “Lost in the Labyrinth” ([House of Representatives Committee Australia 2012](#)). Most notably, this report called for some reforms in the registration processes for IMGs, while at the same time it emphasized the need to maintain a quality standard throughout. Importantly, acting on the recommendations of the report, in 2013 the MBA made some changes to its ‘competent authority’ and ‘specialist’ assessment pathways for IMGs. Additionally, some recommendations in the parliamentary enquiry have also led to the establishment of the National Test Centre (NTC) for the assessment of IMGs. For a brief summary of the timeline of events between 2009 and 2016—the data period for this present Chapter— see **Figure 6.1**.

Figure 6-1: Timeline for some major policy events within the analysis period (2009-2016)



However, as mentioned earlier, whether the decision by the MBA might be associated with the labour supply decisions and well-being of IMG is yet to be investigated. Limited registered IMGs are characterised by mostly being originally from low- and middle-income countries. The top ten source countries for IMGs participating in recent (2017) AMC clinical examination were: India, Bangladesh, Pakistan, Iran, Sri Lanka, Myanmar, Philippines, China, Egypt and Iraq. Notably, these countries have clinical conditions, ethnolinguistic characteristics and levels of technological development that are markedly different from Australia. According to the 2017 annual report of the [AMC \(2017\)](#), a total of 2,165 candidates were assessed between July 2016 and July 2017 reporting period and only 597 (27.6%) passed the exam after several attempts. Of the total candidates, 1,026 (51%) had reported for the first time while the rest (49%) have sat the exam twice to four times. Considering the declining overall pass rates in the AMC clinical examinations (see **Figure 6.2**), many IMGs may be at risk of being removed from the medical register.

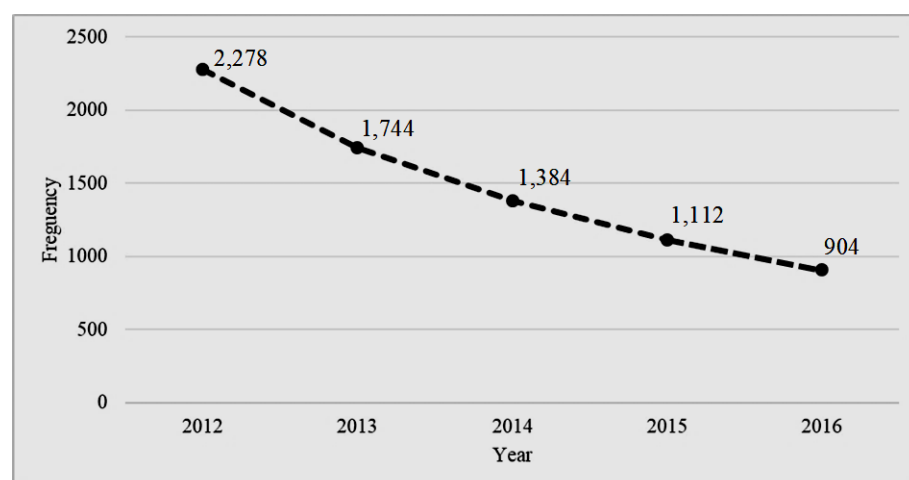
Figure 6-2: AMC clinical examination for Financial Year: 2012/13 – 2016/17 (All Candidates)



Source: Annual Report 2017, AMC

As shown in **Figure 6.3**, at the national level, statistics from the MBA show declining trends in the number of limited registrants being recruited into the workforce from 2012-2016. This is likely due to the recently growing number of domestic medical graduates ([Department of Health Australia 2016](#)) as part of the ongoing efforts to attain the country's long-established goal for self-sufficiency in health workforce ([Australian Health Ministers' Conference 2004](#)). Additionally, perhaps it could also be due to declining numbers of new limited registrants and exits of limited registrants into full registration or de-registration.

Figure 6-3: Number of IMGs on Limited Registration-Area of Need 2012 to 2016



Source: The Medical Board of Australia (MBA) Annual Statistics Reports (2012-2016)

6.3 Methods

6.3.1 Data source

This chapter pooled eight waves (2009–2016) of data from the MABEL (Medicine in Australia: Balancing Employment and Life) panel survey, which is an ongoing longitudinal study of Australian doctors (e.g. GPs, specialists, specialist registrars, and hospital medical officers) since 2008 ([Taylor, La et al. 2016](#)). A detailed description of this survey has already been presented in Chapters 3 and 4. A detailed description of this survey and the ethics approval details have already been presented in Chapters 3 and 4.

6.3.2 Study Design and Sample

This chapter used a difference-in-differences (DiD) research design to evaluate the effect of the 2013 deregistration decision announcement among limited compared to fully registered IMGs. The DiD model, also known as ‘a comparative interrupted time series design’ has been widely applied in evaluating the health impacts of public health policies and programs ([Craig, Cooper et al. 2012](#)). The model is a quasi-experimental study design, used where randomised control designs (RCD) are inappropriate or unethical ([Wing, Simon et al. 2018](#)). Like an RCD, the DiD method requires a well-defined study population, an intervention (e.g. a policy change/reform) occurring at a defined point in time, and a time dimension specifying the pre and post-intervention periods. The treatment condition allows the stratification of the study population into exposed (intervention/treatment) and unexposed (comparison) groups to compare changes in the outcome of interest over time across the groups. The DiD design is based on the assumption that in the absence of the intervention (e.g. a policy reform), the outcomes in the intervention and comparison groups would change in the same way—the ‘parallel trends assumption’ ([Craig, Cooper et al. 2012](#)). However, this latter assumption may be violated by changes in the composition of the groups and by shocks that differentially affect the groups (e.g. introduction of another intervention) ([Craig, Cooper et al. 2012](#), [Craig, Katikireddi et al. 2017](#)). Additionally, groups’ differences in unobserved time-constant (fixed) characteristics are likely to

influence the validity of DiD estimates. This is referred to as “omitted variable bias” and is often controlled statistically by using a fixed effect regression approach that accounts for unobserved individual/group heterogeneities. In this chapter, the common trend assumption was tested using full two-way interaction terms between the group dummy and the complete year dummies (2009-2016) in a random effect (RE) linear regression model.

IMGs were identified in the dataset using the same procedures applied in previous chapters (Chapters 3 & 4 respectively). Further, to determine whether an IMG holds a limited/conditional or full registration, the study relied on participants’ responses to the following question: “*What type of medical registration do you have?*” Responses were coded (1) if the doctor has limited registration and zero (0) if holding a general/specialist (i.e. full) registration. Here, all IMGs under limited registration was regarded as the ‘treatment group’ because they were the main targets of the 2013 policy reform. Fully registered IMGs were selected as the ‘comparison group’ to determine any significant differences in their labour supply decision and well-being relative to the treatment group before and after the announcement based on overall trends in these outcome variables. In order to ensure more comparability between the treatment and the comparison groups, this chapter focussed exclusively on those IMGs of Non-English-Speaking backgrounds (NESB) who are in their first ten years of employment in Australia. As such, the analytical sample is expected to be of smaller size but more homogenous which is a critical aspect of the DiD estimation.

6.3.3 Variables and Measurement

Three outcome variables were investigated namely: subjective well-being, and hours on clinical and non-clinical activities. In each wave of the MABEL survey, participants were asked to report the total hours they worked per week on direct and indirect patient care (clinical activities) and on educational activities (non-clinical). The latter was previously used by [Joyce, Eyre et al. \(2015\)](#) as an outcome variable in their study of Australian doctors’ non-clinical activity using the MABEL dataset.

SWB was assessed on a 10-point scale using the following survey question: “*all things considered, how satisfied are you with your life in general?*” Response options ranged from 1—completely dissatisfied to 10—completely satisfied. With these ratings, higher scores (towards the top of the scale) depicted a satisfactory life while lower scores (towards the bottom) indicated a dissatisfactory life overall.

Covariates

Covariates used in the present analysis to adjust for potential confounders were mostly the same as those applied in the previous two Chapters (i.e. Chapters 3 and 4), they included a range of personal, geographic/location and work characteristics that have been identified in the literature as important determinants of well-being ([Diener and Ryan 2009](#), [Rath, Harter et al. 2010](#)) and doctors’ labour supply decision ([Joyce, Eyre et al. 2015](#)).

Personal characteristics: These included socio-demographic characteristics namely: age, gender (female=1), marital status (married=1), presence of children (having one or more children=1), citizenship status (none-citizen=1) and type of doctor (Specialist=1). Additionally, assuming people may react to situations differently depending on their personalities, to control for this potential confounding, two personality measures were included namely: locus of control (7-low to 49-high) and emotional stability or neuroticism (3-low to 21-high).

Geographic/location factors: These measured the remoteness of work location based on Australian Standard Geographical Classification (ASGC), measuring whether participants’ work in an inner/outer regional, remote/very remote, or major cities.

Work characteristics: Variables relating to work characteristics include practice status (mandatory=1), practice setting (public hospital=1), psychosocial factors such as ‘job demands’ which measured participants’ sense of psychological demands at work on a 5-item scale with response options from 1-Strongly Disagree to 5-Strongly Agree. ‘Job control’ measured participants’ sense of

freedom/autonomy at work on a 4-item scale with response options from 1-Strongly Disagree to 5-Strongly Agree. 'Perceived peer support' measured sense of professional support at work on a 5-point scale (1-very poor to 5-very good support).

6.3.4 Statistical Analysis

First, descriptive analyses were performed to compare the characteristics of limited and fully registered IMGs. Then to compare changes in SWB and hours in the two groups before and after the 2013 de-registration decision announcement, a DiD estimator was included in a RE model. Unlike the fixed effect model (the within estimator, see Chapter 4), the RE model provides a weighted average of the effect of a predictor variable within and between individuals over time ([Mehmetoglu and Jakobsen 2016](#)). Thus, participants who changed from limited to full registration in the analysis period will be captured through the within estimator of the RE model. Whereas those who appeared in the data only once or whose status remained unchanged will still contribute to the between estimator. It was this quality of the RE model that motivated its application in this chapter, given the study's small sample size and the fact that most of the participants in the sample were observed only once. The model specified for this analysis can be written as:

$$Y_{it} = \beta_0 + \beta_1 T_j + \beta_2 Post_t + \beta_3 (T_j * Post_t) + \beta_4 X_{it} + \varepsilon_{it} \quad (6.1)$$

Where:

- i. Y_{it} denotes the outcome variable, in this case, either hours or average SWB of individual doctor i , at period t (2009-2016).
- ii. T_j is an indicator for treatment group j , (1=limited registered, and 0=fully registered) and its slope coefficient is β_1 . This coefficient measures the average difference in Y_{it} between limited vs. full registrants, conditional on covariates. In other words, it shows the main effects of registration status on Y .

- iii. $Post_t$ is an indicator for the post-announcement period (1=2014 to 2016, and 0 otherwise) and its slope coefficient is β_2 . This coefficient shows the average difference in Y_{it} before and after the de-registration decision announcement, and also captures the combined effects of unmeasured time-varying external factors that influence health and well-being.
- iv. $(T_j * Post_t)$, is the main variable of interest and is the interaction term between the group dummy and the year dummy. It tests whether the difference in Y_{it} between limited and full registrants is the same post announcement. The hypothesis is that limited registrants will work longer hours on clinical and non-clinical activities and experience lower average life satisfaction following the announcement compared to full registrants. The slope coefficient of this interaction term is captured by β_3 . If the common trends assumption holds, this coefficient estimate (β_3) will then represent the average treatment effect in the exposed (limited registered) group.
- v. X_{it} are control variables e.g. marital status, number of children, job satisfaction. β_4 is a vector of the regression coefficients for the marginal effects of control variables.

For each of the two outcome variables, three separate models were specified. The first model contained only the group and year dummies and their interaction, then model two was adjusted for individual and geographic variables and finally, model three was adjusted for work-related covariates. Additionally, for each model, cluster-robust standard errors were applied to adjust for within-subject error correlation (see [Nichols and Schaffer \(2007\)](#)). All analyses were performed in Stata 15.1 (Stata Corp, College Station, TX, USA).

6.4 Results

6.4.1 Descriptive analysis

In this section, the aim is to present a description of the study samples and compare the characteristics of the treatment and comparison groups. **Table 6.1** shows the distribution of the study population by year and registration status. Under each registration type, the first column represents the number of unique individuals (newly recruited respondents) and the second is for total observations or pooled sample—the combination of new and returning/continuing respondents. In total about 42% ($n=578$) and 58% ($n=805$) of eligible individuals had limited and full registrations respectively. About 33% ($N=1,236$) of total observations (pooled sample) had limited registration and 67% ($N=2,508$) had full registration. There appeared to be a decline in the number of observations in the limited registered group over time, consistent with the national data in **Figure 6.3**. The last column of Table 6.1 presents the yearly rates of transitions from limited to full registration. The major transition rate appeared to have occurred in 2014 when about 56% ($N=116$) of observations changed to full registration. These were mainly, doctors who had spent long periods on limited registration and relatively, were at a greater risk of de-registration—failure to obtain full registration. Overall, the descriptive data indicated that about 15% ($N=214$) of observations under limited registration have changed to full registration over the analysis period (2009-2016).

Table 6-1: Distribution of the study sample

Year/wave	Fully registered (Comparison group)		Limited registered (Treatment group)		Changed from limited to full registration (t/t+1)
	<i>n</i>	<i>N</i>	<i>n</i>	<i>N</i>	<i>N</i>
2009 (baseline)	165 (46.61)	165 (47.41)	183 (53.39)	183 (52.59)	-
2010	65 (59.09)	205 (55.56)	45 (42.31)	164 (40.91)	18 (9.89)
2011	42 (48.84)	232 (56.59)	44 (51.16)	178 (43.41)	27 (13.17)
2012	227 (69.21)	401 (65.85)	101 (30.79)	208 (34.15)	17 (7.56)
2013	118 (58.13)	320 (52.89)	85 (41.87)	285 (47.11)	4 (1.38)
2014	53 (55.79)	432 (82.76)	42 (44.21)	90 (17.24)	116 (56.31)
2015	40 (74.07)	384 (88.68)	14 (25.93)	49 (11.32)	25 (33.78)
2016	95 (59.75)	369 (82.37)	64 (40.25)	79 (17.63)	7 (8.14)
Total	805 (58.21)	2,508 (66.99)	578 (41.79)	1,236 (33.01)	214 (14.76)

Notes: Percentages in parenthesis, *n*=No. of new doctors, *N*=Total no. of observations (pooled data)

Table 6.2 compares summary statistics for the outcome and explanatory variables among the limited compared to the fully registered group using the one-way ANOVA approach. From the results, it appeared that limited registrants were significantly more likely to spend long hours on non-clinical (or educational) activities and to be less satisfied with life than the comparison group ($P<0.001$).

With respect to the characteristics of doctors in the two samples, limited registrants were significantly more likely to be: older, a male, a non-citizen, having higher emotional stability and a GP/Specialist than the comparison group. For job characteristics, limited registrants were significantly more likely to work in a public hospital setting, and as expected, they were significantly more likely to practice under restriction than the comparison group. Additionally, limited registrants were more likely to experience high psychological demands and inadequate peer support at work than the fully registered.

Table 6-2: Descriptive statistics of study variables for the treatment and comparison group

<i>Outcome variables</i>	Fully registered		Limited registered		<i>P-Value</i>
	Mean	SD	Mean	SD	
Clinical hours	39.00	11.86	38.20	11.53	0.060
Non-clinical hours	4.02	4.33	4.91	5.17	<0.001
Subjective well-being	7.26	1.63	7.15	1.70	0.049
<i>Personal characteristics</i>					
Age (yr.)	42.41	8.03	44.02	7.74	<0.001
Female (dummy=1)	0.42	0.49	0.31	0.46	<0.001
Married/Cohabiting (dummy=1)	0.86	0.35	0.87	0.34	0.387
Presence of children (dummy=1)	0.76	0.43	0.74	0.44	0.166
Annual income in (‘000’)	191.53	111.28	215.92	122.82	<0.001
Non-Citizenship	0.47	0.50	0.73	0.45	<0.001
Locus of control	36.28	7.72	36.54	7.71	0.365
Emotional stability/Neuroticism	13.91	3.81	14.29	3.56	<0.001
GPs/Specialists (dummy=1)	0.72	0.45	0.81	0.39	<0.001
<i>Geographic location</i>					
ASGC: major city (dummy=1)	0.53	0.50	0.48	0.50	0.001
ASGC: regional area (dummy=1)	0.28	0.45	0.25	0.44	0.099
ASGC: remote area (dummy=1)	0.19	0.39	0.27	0.45	<0.001
<i>Work characteristics</i>					
Mandatory practice (dummy=1)	0.51	0.50	0.70	0.46	<0.001
Public hospital practice	0.37	0.48	0.50	0.50	<0.001
High job demands (highest tertile)	0.33	0.47	0.39	0.49	<0.001
Low job control (lowest tertile)	0.31	0.46	0.32	0.47	0.782
Poor peer support	0.27	0.44	0.32	0.47	0.001
<i>N</i>	805		578		
<i>N</i>	2,508		1,236		

Notes: Analysis of Variance (ANOVA) for mean differences limited vs. fully registered group. The asterisks ***, **, * indicate mean differences between the groups were significant at 0.1%, 1%, and 5% levels, respectively.

6.4.2 Exploring developments in hours and well-being over time (2009-2016)

This section compares patterns of change in average hours and well-being over time between the treatment and comparison groups. Figures 6.4 to 6.6 compare trends in clinical and non-clinical hours and SWB over the survey period (2009-2016) between limited and full registrants. Trends in clinical hours tend to be steadily increasing during the post-announcement period (2014-2016) in limited registrants while declining in the comparison group. For non-clinical hours, although the pre-announcement trends appeared similar between the two groups, the post-announcement trends tend to be increasing in limited registrants but declining in the comparison group. On the contrary, post-announcement trends for SWB tend to be declining among limited registrants but increasing in the comparison group.

Figure 6-4: Yearly trends in clinical and non-clinical hours and SWB in limited compared to fully registered IMGs before and after the MBA's de-registration decision announcement

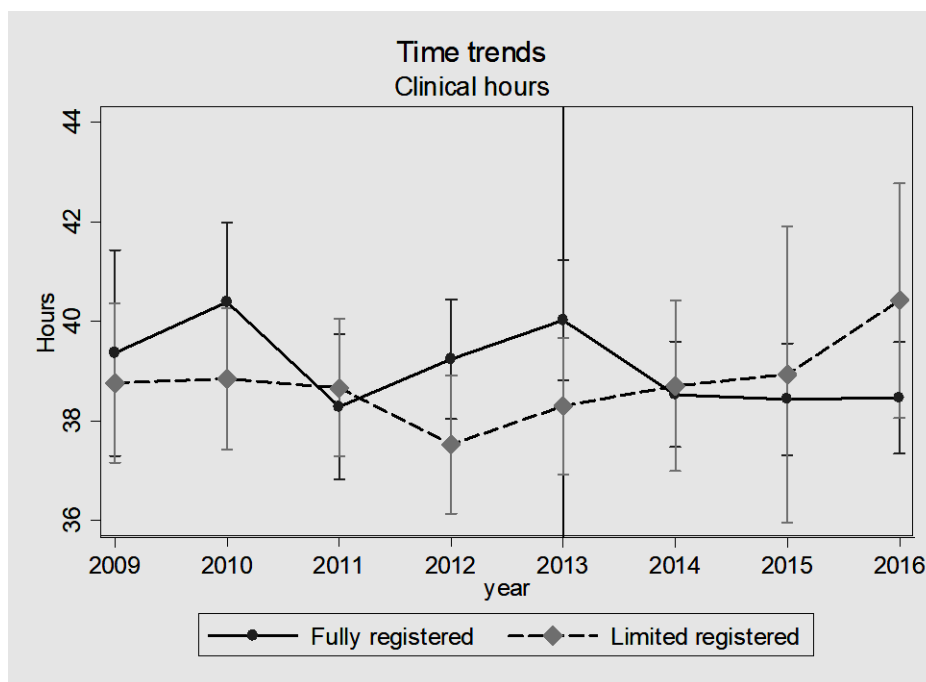


Figure 6-5: Yearly trends for average Non-clinical hours: Full vs. Limited registered

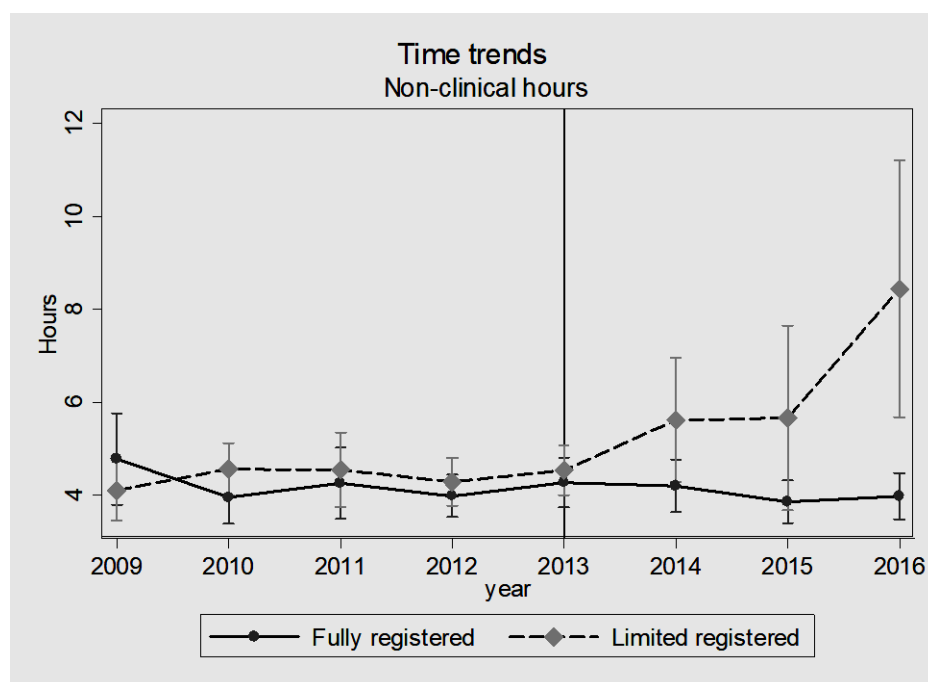
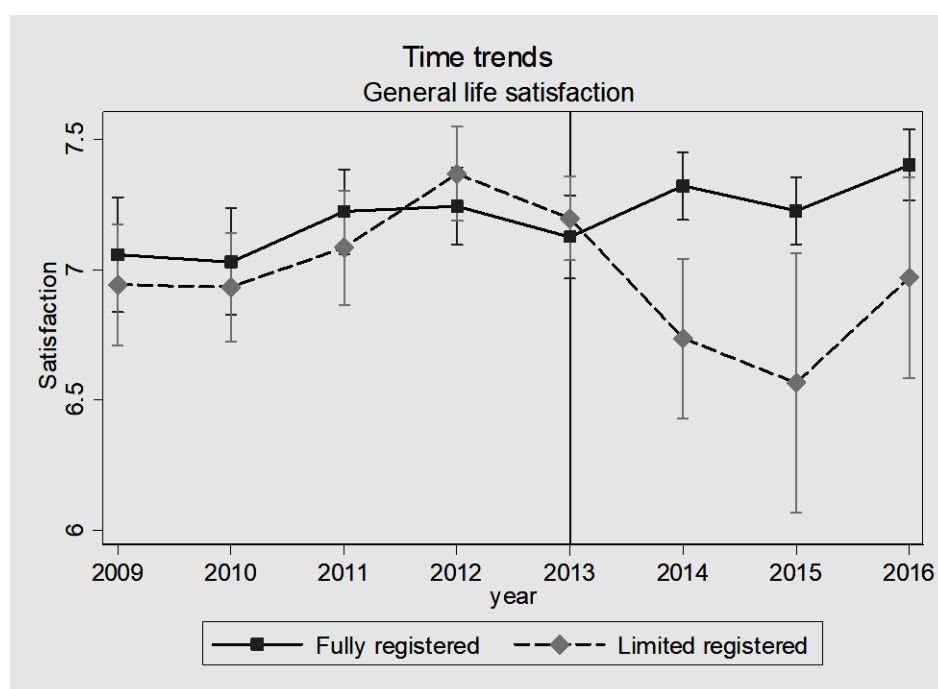


Figure 6-6: Yearly trends for average subjective well-being: Full vs. Limited registered



Notes: trend estimates were obtained in an unadjusted RE model with robust cluster-corrected standard errors.

6.4.3 Differences in mean hours and well-being before and after the announcement

So far, the chapter has demonstrated differences in changing patterns of hours and satisfaction levels over time between limited and full registrants, but whether the overall pre/post-announcement

differences were statistically significant has not yet been assessed. These differences were next examined using a simple DiD framework. **Table 6.3** shows the mean differences in clinical and non-clinical hours and life satisfaction before and after the de-registration decision announcement for limited and full registrants. The second and third columns represent mean estimates for the pre and post-announcement periods respectively and the fourth column depicts the raw DiD estimates. Compared to the fully registered group, limited registrants appeared to be spending approximately 1.8 hours (i.e. 1 hour 48 minutes)⁹ less and 1.3 hours more on clinical activities in the pre- and post-announcement periods respectively. The raw DiD estimate — the post/pre-mean differences — of 3.02 hours was statistically significant suggesting a positive association between MBA's decision announcement and the hours spent on clinical activities by those holding a limited registration ($p < 0.001$). Further, it appeared that limited registrants were spending about 0.5 (30 minutes) and 2.9 more hours on educational activities than full registrants in the pre- and post-announcement periods respectively ($p < 0.05$). The statistically significant raw DiD estimate suggested that the announcement might be positively associated with the rate of educational activities in limited registrants.

Between pre/post-announcement periods, the average life satisfaction has significantly declined from 7.2 to 6.8 among limited registrants and increased from 7.2 to 7.4 in the comparison group. The raw DiD estimate of -0.65 was statistically significant implying that MBA's de-registration decision announcement might be negatively associated with the life satisfaction of limited registrants ($p < 0.001$).

Table 6-3: Mean differences in hours worked and life satisfaction before and after the MBA's de-registration decision announcement for treatment and comparison groups

Outcome variable	Pre-announcement 2009-2013	Post-announcement 2014-2016	DiD (Post-Pre)
<i>Clinical hours</i>			
Fully registered group	39.68	38.26	
Limited registered group	37.92	39.52	
Diff. (limited-full)	-1.76 (0.63) ***	1.26 (0.97)	3.02 (1.16) ***

⁹ To convert to minutes, the point estimates were multiplied by 60.

<i>N</i>	2,138	1,300	
Non-clinical hours			
Fully registered group	4.06	3.98	
Limited registered group	4.55	6.89	
Diff. (limited-full)	0.49 (0.24)**	2.91 (0.97)***	2.41 (1.00)**
<i>N</i>	1,600	913	
Subjective well-being			
Fully registered group	7.15	7.39	
Limited registered group	7.22	6.82	
Diff. (limited-full)	0.07 (0.09)	-0.57 (0.15)***	-0.65 (0.17)***
<i>N</i>	3,876	1,850	

*Note: Means and Standard Errors were estimated using pooled OLS model adjusted for personal and geographic covariates. Standard errors were clustered at the individual level (id). The asterisks *, **, *** indicate raw DID were significant at 10%, 5%, and 1% levels, respectively. Std. errors in parenthesis.*

6.4.4 Difference-in-Differences Estimation Using Random Effect Model

To this point, the hypotheses of the Chapter have been tested only through bivariate analyses and it is hard to draw meaningful conclusions based on these results. To address this, multivariate Random Effect models with DiD estimators were used to test whether the effect of the post-MBA's decision announcement on hours and life satisfaction were significantly different for limited and full registrants.

Table 6.4 presents the results of the RE analysis for factors associated with changes in clinical and non-clinical hours within and between individuals in the study. The first panel of Table 5 represents model estimates for clinical hours and the second for non-clinical hours. The raw estimates with no additional covariates (in *model 1*) showed that compared to full registrants, limited registrants were working 1.9 hours (1 hr. 54 mins.) more on clinical activities and 2.2 hours more on non-clinical activities in the post-announcement period. Adjusting for personal and geographic/location covariates (in *model 2*) has elevated the coefficient difference in non-clinical hours to 2.3 hours (p -value<0.05), while the difference in clinical hours has dropped but was not statistically significant. By fully controlling for a range of personal, geographic and work-related variables (in *model 3*) the gap in clinical hours has declined to 0.6 hours and that of the non-clinical hour to 1.8 hours, but only the latter was statistically significant (p <0.05). The increasing R-squared values across the models and the

significant Wald test scores suggested that adding the covariates has increased the model precisions. However, a significant amount of variance in clinical and non-clinical hours could be attributed to the unobserved time-varying factors (i.e. the error term ε_{ijt}) as shown by the *Rho* estimates.

In the pooled sample, hours spent on clinical activities appeared to decrease with female gender, GP/Specialist status, and public hospital practice; but increase with remoteness, exposure to high psychological demands and low control job situations. On the contrary, hours on educational activities appeared to decrease with remoteness but increase with non-citizenship status and public hospital practice.

Table 6-4: RE analysis with DID estimates for the marginal effects of the post-MBA de-registration decision announcement on well-being and labour supply decision in limited compared to fully registered IMGs.

	<i>Clinical hours</i>			<i>Educational hours</i>		
	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>
Limited (dummy=1)	-1.05**	-1.13**	-0.66	0.23	0.18	0.11
Post-announcement (dummy=1)	-0.96**	-0.38	-0.39	-0.17	-0.14	-0.20
Post-announcement x limited	1.93**	1.11	0.59	2.17***	2.32***	1.76**
Doctor characteristics						
Age		0.01	0.01		0.03	0.03
Female		-3.55***	-3.44***		-0.07	0.03
Married/Cohabiting		-0.90	-0.78		0.12	0.11
Presence of children		-0.32	-0.17		-0.25	-0.26
Non-citizenship		0.07	0.20		0.28	0.21*
Sense of mastery		-0.79	-0.61		-0.16	-0.19
Neuroticism/emotional stability		-0.71	-0.38		-0.15	-0.14
GPs/Specialists		-1.71***	-4.43***		0.03	0.53
Geographic location						
ASGC: a major city		<i>Ref.</i>	<i>Ref.</i>		<i>Ref.</i>	<i>Ref.</i>
ASGC: regional area		1.21**	1.09*		-0.85***	-0.81***
ASGC: remote area		2.25***	1.50**		-0.79***	-0.59**
Work characteristics						
Mandatory practice			0.32			0.06
Public hospital			-3.65***			0.83***
Job demands			1.78***			-0.15
Job control			1.00***			-0.16
Peer support			0.34			0.11
No. of Obs.	3,438	3,127	3,067	2,513	2,289	2,243
R-squared: Overall	0.004	0.06	0.09	0.02	0.04	0.04

<i>Wald test</i>	5.65	103.14***	132.11***	12.22***	39.34***	43.19***
<i>Rho (fraction of variance due to μ_i)</i>	0.43	0.43	0.41	0.44	0.45	0.46

Notes: Model 1: unadjusted, Model 2: adjusted for doctor and geographic characteristics, Model 3: adjusted for work characteristics. All models were estimated with robust cluster-corrected standard errors. Asterisks *, **, *** indicate regression coefficients were significant at 10%, 5%, and 1% levels, respectively.

Table 6.5 presents the results of the RE analysis for the effect of post-MBA de-registration decision announcement on well-being in limited compared to full registrants, controlling for personal, geographic and work-related factors. The unadjusted and adjusted models all indicated that compared to full registrants, the post-MBA announcement was significantly associated with a decline in average life satisfaction among limited registrants. Thus, this result suggests that in the aftermath of the announcement, limited registrants were rating the overall quality of their lives less favourably than their fully registered counterparts.

For the covariates in the analysis, life satisfaction in the study population appeared to increase with high sense of control, emotional stability, being a GP/Specialist, and being in a marital relationship; but significantly decline with exposure to mandatory clinical practice, high job demands, lower sense professional autonomy and inadequate support from colleagues at work.

Table 6-5: RE analysis with DID estimates for the marginal effects of the post-MBA de-registration decision announcement on well-being in limited compared to fully registered IMGs

	<i>Subjective well-being</i>		
	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>
Limited registered (dummy=1)	-0.04	-0.16**	-0.15**
Post-announcement (dummy=1)	0.15***	0.06	-0.01
Post-announcement x limited	-0.51***	-0.50***	-0.41**
Doctor characteristics			
Age		0.01	0.01
Female		0.04	-0.04
Married/Cohabiting		0.31***	0.28***
Presence of children		-0.03	-0.05
Non-citizenship		0.02	0.03
Sense of mastery		0.74***	0.58***
Neuroticism/emotional stability		0.53***	0.42***
GPs/Specialists		0.43***	0.50***
Geographic location (ref: major city)			
ASGC: regional area		0.06	0.10
ASGC: remote area		0.06	0.11
Work characteristics			
Mandatory practice			-0.16**

Public hospital doctors			-0.02
Perceived stress (1-low to 5-high)			-0.34***
Sense of freedom (1-low to 5-high)			-0.72***
Sense of peer support (1-low to 5-high)			-0.27***
No. of Obs.	3,731	3,324	3,260
R-squared: Overall	0.007	0.11	0.27
Wald test	27.31***	281.99***	642.73***
Rho (fraction of variance due to μ_i)	0.57	0.53	0.47

Notes: Model 1: unadjusted, Model 2: adjusted for doctor and geographic characteristics, Model 3: adjusted for work characteristics. All models were estimated with robust cluster-corrected standard errors. Asterisks *, **, *** indicate regression coefficients were significant at 10%, 5%, and 1% levels, respectively.

6.5 Discussion

In Australia, international medical graduates who have not passed the Australian Medical Council's clinical examination or are yet to gain Fellowship of a specialist college are on a 'limited registration' to allow them to practice in a district of workforce shortage (DWS) for a specified period. The law stipulates that once issued, a limited registration lasts for 12 months and up to a maximum of three renewals can be granted. In 2013, the Medical Board of Australia (MBA) made the announcement that all IMGs on limited registration in an area of need had three years to pass the clinical examination or face de-registration. The announcement marked the Board's renewed commitment to enforcing its sets of regulatory standards.

This chapter has applied a difference-in-differences research method to test if the MBA's announcement was associated with changes in life satisfaction, and hours worked in: direct/indirect patient care (i.e. clinical hours), and educational activities (i.e. non-clinical hours) among limited registrants. The MABEL longitudinal survey dataset (2009-2016) was used and the analytic sample was restricted to non-English Speaking IMGs who were in their first 10 years of employment in Australia since they constituted the majority of limited registrants in the dataset. The chapter hypothesized that the MBA's announcement was associated with an increase in clinical and non-clinical hours and a decline in the level of life satisfaction among limited registrants. These hypotheses were tested in a

multivariate random effect model adjusted for personal, geographic and work-related factors. This was the first empirical study to systematically investigate the effect of a regulatory decision on changes in IMGs' wellbeing and labour supply.

Confirming the non-clinical work time hypothesis, the results of the analysis indicated that in comparison with those who were fully registered, limited registrants were relatively spending longer hours (approx.. 1.8 hours) on non-clinical activities following the MBA's announcement, suggesting the potential significance of educational demands to these doctors. These results implied that perhaps in the aftermath of the announcement, limited registrants responded by increasing their effort through spending more time in education-related activities. While such effort could have been crucial to maximising their chances of securing full medical registration, it could also have had some negative implications on their mental health. For example, a systematic review by [Rothenberger \(2017\)](#) in the United States, revealed that working longer hours were one of the key drivers of physician burnout. Additionally, longer working hours have also been reported to disrupt the balance between the professional and personal lives of doctors ([Kakunje 2011](#)) thereby contributing to high stress and reduced productivity.

Concerning subjective well-being, the chapter also observed a significant negative association between the post-MBA's announcement and life satisfaction among limited compared to the fully registered. This particular finding may be interpreted in the light of needs and goals satisfaction (endpoint) theories of subjective well-being ([Diener, Lucas et al. 2002](#)). Goal theorists claim that a sense of progress towards attaining an important goal(s) has a powerful influence on people's subjective judgement of their lives. Thus, progress towards meaningful goals may elicit a feeling of hope and contentment whereas a perceived lack of progress may arouse fear and discontentment. In the same vein, it may be argued that fear of losing one's medical registration or failing the clinical examination may influence the way these doctors feel and evaluate their lives overall. In the early parts of settlement in a host country, gaining a full/unconditional registration becomes one of the

most fundamental goals for IMGs — especially those from low/middle-income countries. This is the period when many experience psychosocial distress as they strive to gain registration and avoid the danger of becoming de-skilled ([Kalra, Bhugra et al. 2012](#), [Humphries, Tyrrell et al. 2013](#)). In Australia, failure to maintain registration could also limit future access to permanent residency (for those employed on a temporary resident basis). Aside from the endpoint theories of well-being, job stress theories ([Mark and Smith 2008](#), [Bakker and Demerouti 2014](#)) may also lend some plausible explanations to the declining trends in satisfaction among the limited registered group. Following the announcement, the increasing non-clinical work rates could have resulted in conflict between doctors' professional, family and personal life roles. Having to balance between these competing roles can be challenging and stressful sometimes with a propensity to reduce individuals' life satisfaction ([Kossek and Lee 2017](#)). However, a key limitation of this study is that it has not examined the differential effects of the policy decision on burnout or work-life balance in the two groups (limited vs. fully registered).

Another limitation of the study is the issue of omitted variable bias. The RE model used in this study could not account for the effects of unobserved time-invariant factors such as race, culture, innate ability, that may influence how participants judge the overall quality of their lives. A further major limitation has to do with the accurate measurement of the treatment effects. If the parallel assumption holds, the average SWB and hours of the limited and full registrants should have developed equally in the absence of the policy decision. But this appeared not to be the case as there were some variations in trends — particularly in clinical hours — already in the pre-announcement period (see Figures 6.4 to 6.6).

6.6 Chapter conclusion and implications

In support of the key hypotheses of the Chapter, it was observed that the MBA's announcement was significantly associated with an increase in rates of education-related activities and a decline in the level of life satisfaction among limited registrants. Generally, these results demonstrate the potential

importance of regulatory changes on the effort and the general well-being of IMGs. Thus, while registration decisions are often made in light of public protection, there is a need to consider the potential implications of such decisions on the well-being of targeted professionals. Providing adequate support (e.g. mentorships, training, preparation for AMC exams) to newly employed IMGs, often working in smaller and more isolated rural communities with poor access to available support infrastructure with limited registration during preparation stages for clinical examinations may contribute positively to their well-being.

7 Research Summary and Implications

7.1 Introduction

This chapter concludes the thesis in five sections. First, it begins by reiterating the aims and motivation of the research and in Section 7.2 it presents a general summary of the research findings. It then proceeds in Section 7.3 to reflect on the contribution and implications /significance of the results for the medical workforce literature, policy, and practice. Section 7.4 highlights the general strengths and limitations of the thesis and concludes in Section 7.5 by consolidating the findings and exploring avenues for future research direction.

This thesis examined the psychosocial conditions and well-being of international medical graduates in Australia. Australia, like many other OECD countries, has been a major global destination for IMGs for the past several decades. The recruitment of these doctors has been among a suite of policy strategies aimed at enhancing access to basic health services, especially for residents in rural and remote areas, as well as select workforce specialties, that are usually less attractive to domestic medical graduates. By 2014, IMGs accounted for over 30 per cent of all active doctors in Australia and over 40 per cent of clinicians in rural and remote areas ([Health Workforce Australia 2014](#)). Thus, how

these doctors feel about the general quality of their lives, particularly of their workplace experience, is a question that warrants significant research attention.

As established in Section 2.3, there have been recent policy reforms in Australia that are intended to substantially reduce the scale of IMG inflows into the country, influencing their subsequent labour market entry and geographic distribution. Most notably, the rapid escalation of domestic student training, and the increased training of international medical students graduating from Australian medical schools (and staying as part of Australia's workforce) ([McGrail, O'Sullivan et al. 2019](#)), have led to a significant reduction in the need for and scale of IMG recruitment in Australia ([Department of Health Australia 2019](#)). Despite these policy changes, there is evidence suggesting that the recruitment of IMGs will remain necessary to Australia's rural medical workforce supply into the foreseeable future ([Hawthorne 2012](#), [O'Sullivan, Russell et al. 2019](#)). Furthermore, over recent decades, the source countries for Australia's IMG workforce have also become increasingly diverse involving countries with distinct technological, training, cultural and linguistic differences compared to Australia (e.g. India, Sri Lanka, Egypt, China, Zimbabwe). This diversity may on the one hand foster inter-cultural sharing of clinical knowledge and experiences in medical practice ([OECD 2008](#)), while on the other hand, it may be a source of professional and personal challenges for individual doctors ([Kalra, Bhugra et al. 2012](#), [Khan, Chikkatagaiah et al. 2015](#)). For instance, IMGs who completed their medical degrees in countries that are less technologically advanced, with different epidemiological profiles or which are culturally and linguistically dissimilar to Australia may find it more stressful to both adjust to their new clinical care setting and secure full registration. In such a diverse medical workforce, understanding how individual doctors appraise the quality of their lives and working conditions, in the context of variable pressures for different cohort groups, may be useful for both immigration and health workforce policy management. The findings of this thesis are intended to contribute insights into these issues.

Additionally, the thesis results are designed to contribute to the ongoing debate on the status of migrant health personnel in contemporary societies including Australia. The recent adoption of the “*WHO global code of practice on the international recruitment of health personnel*” by world health leaders symbolises such ongoing debates at the global political level ([Siyam and Dal Poz 2014](#)). Not only did the ‘Code’ require member states to ‘pledge’ to work towards achieving self-sufficiency in domestic health workforce training and supply (as Australia is currently doing), but it also urged them to safeguard the rights and psychosocial conditions of migrant health personnel currently in the workplace. For psychosocial conditions, it required countries to create a conducive work environment where all doctors – regardless of immigration status – feel supported, empowered and recognised for career opportunities like professional development, promotions and remunerations ([Taylor and Dhillon 2011](#)).

Noting this context, the overarching question posed by this research was: *what is the effect of changes in psychosocial conditions on SWB of international medical graduates in Australia?* Within this, were three broad aims.

1. To investigate the difference in SWB and its drivers between international and domestic medical graduates (IMGs and DMGs).
2. To examine the effect of changes in working conditions on the SWB of IMGs relative to DMGs.
3. To explore the effect of regulatory changes on the SWB of IMGs.

To address each of these issues, the study used data collected over an eight-year period (Waves 2-9 collected 2009 to 2016) from the MABEL survey, a nationally representative prospective study of medical practitioners in Australia. As established in Chapters 4-6, MABEL is a globally unique survey that has been generating rich evidence of doctors’ personal and professional experiences since its inception in 2008.

7.2 Summary of the findings

This section aims to provide a summary of the main findings generated from each empirical chapter of the thesis. It provides a recap of the literature on the satisfaction of IMGs in global destinations before summarizing the main empirical findings as they fulfil the research aims.

In [Chapter 3](#), a scoping review was conducted to identify what was known, in Australia compared to the global literature about the levels and determinants of job and life satisfaction (subjective well-being) of IMGs in high-income countries (HICs). Remarkably, a total of just 25 original research articles on this issue were found and reviewed, six of them from Australia. Overall, there exists a small but growing literature on the satisfaction of IMGs in HICs. However, an overwhelming majority (76%) of the studies have focused only on their job (i.e. professional satisfaction) rather than whole-life satisfaction. Methodologically, the literature has also been marked by the absence of high-quality study designs or longitudinal data so were unable to examine the career trajectories of IMGs or changes in their circumstances post-arrival. The majority (60%) of studies used relatively small sample sizes (<300 participants) and been largely confined to a specific speciality type and hospital or geographic setting. Furthermore, most of the reviewed studies have treated IMGs as if they were a single monolithic group, with little attention to subgroup analyses. As such, available evidence ignores issues related to post-arrival adaptation. In almost all of the major destination countries (Australia, the USA, Finland, Germany), feelings of low job satisfaction were predominant amongst IMGs compared to DMGs. Concerning the determinants of subjective well-being, the review showed that factors associated with the satisfaction of IMGs in HICs are multifaceted, relating to their regulatory, workplace, community, and individual characteristics such as gender, restrictions on clinical practice, social isolation, and inadequate professional support.

[Chapter 4](#) addressed the first aim of the thesis and in doing so, attempted to contribute to the scarce literature on the life satisfaction of IMGs compared to DMGs in high-income countries. The study examined the difference in subjective well-being (life satisfaction) and its drivers between the

IMG and DMG groups using the linear decomposition method proposed by [Oaxaca and Ransom \(1994\)](#). It defined the work-related psychosocial risk factors based on the theoretical definitions of the Job Demands-Resource (JD-R) model ([Demerouti, Bakker et al. 2001](#)). The analysis revealed that overall, the average life satisfaction rating among doctors in this study was 7.45 (out of 10). However, comparatively – pooling all periods of arrival – the IMG group was more likely to report lower average SWB than the DMG group (average 7.35, $p\text{-value} < 0.001$). Though statistically significant, the average well-being gap (of 0.101 ~ 1.4%) was relatively small on average and was associated with the groups' differences in observable characteristics such as psychosocial and demographic factors. Most notably, it was observed that the difference in life satisfaction between groups was due to lower levels of self-reported financial security, exposure to work-related psychosocial factors (job demands and job resources e.g. job control, peer support, job rewards) and community integration for IMGs.

[Chapter 5](#) addressed the second aim of the thesis, providing novel evidence on the effect of changes over time in psychosocial risk factors on the SWB of IMGs. It tested whether the effect sizes varied between the IMGs and DMGs. Additionally, key subgroups of IMGs were explored, notably the impact of source regions, length of stay in Australia, the pathway to clinical practice, and the type of doctor. A fixed effect linear regression analysis enabled us to control for unobserved doctor-specific factors. Results revealed that changes in exposure to psychosocial risk factors such as exposure to excessive job demands, low job control, poor peer support, low job rewards, excessive working hours, and a low sense of community integration were all associated with a statistically significant decline in SWB among study participants in the pooled sample. Whilst these supported some of the results from Chapter 4, the hypothesis that the SWB of IMGs and DMGs would be differentially affected by changes in their professional conditions could not be supported by the data. It was seen that both groups had the same reactions to changes in these risk factors. But within the IMG sample, broken down by key subgroups, some statistically significant differences were observed. For example, in comparison with the long-established cohort, the average SWB of newly settled IMGs (first 10 years of settlement) appeared to decline more under poor support from peers at work and a lower sense of community

integration. Additionally, comparing IMGs by assessment pathway (competent vs. non-competent authority pathways as defined in [Chapter 2](#)) revealed a stronger negative effect of perceived low job control on SWB among those coming from the competent authority or majority English-speaking countries (e.g. the UK, Republic of Ireland, USA, Canada). While relatively advantaged compared to LIC IMGs, it seems likely this group had higher expectations. Furthermore, it was also observed that the SWB of hospital non-specialist IMGs (not yet part of a specialty training program) was more likely to show stronger decline associated with exposure to excessive psychological and physical workloads than their specialist counterparts.

[Chapter 6](#) addressed the third empirical aim of the thesis, providing an analysis of the effect of regulatory changes on the SWB of IMGs. The chapter built on the findings presented in Chapter 5 by conducting a unique analysis of the effect of a specific regulatory decision that influenced the working conditions of IMGs and examined the impact of this on IMGs' SWB and labour supply. Perceived job demands and control may be affected by a range of factors, including changes in medical workforce regulation. The case in point was the 2013 announcement by the Medical Board of Australia (MBA) of its intention to strengthen its existing de-registration policy, which put increased pressure on a specific group of IMGs (those working on limited registration) to pass the prescribed Australian Medical Council (AMC) clinical examination within three years or face de-registration. Such a step had the potential to significantly impact on visa status in a context where two-thirds of recent IMGs had entered Australia on a temporary sponsored basis, including large numbers ineligible for the competent authority pathway. The analysis sought to test whether this announcement by the MBA in 2013 was associated with changes in hours worked on clinical and educational activities and changes to SWB among limited compared to fully registered IMGs who were in the first 10 years of employment in Australia. The analysis was restricted to those IMGs who had secured registration through a non-competent authority pathway, based on the findings from previous chapters. The results demonstrated a statistically significant increase in hours spent on educational activities and an

accompanying decline in the level of SWB among limited registrants, suggesting the impact of regulatory actions on the behaviour and well-being of these doctors.

7.3 Contributions and implications of the research findings

Having summarised the major findings of the study in the previous section, this next section aims to highlight their contributions to and implications for the existing relevant literature as well as Australian workforce policies and programmes.

7.3.1 Contributions to the literature

Over recent decades, there has been a growing body of literature on the experiences of migrant doctors in select host countries e.g. Australia, Canada and the United States ([Hawthorne, Birrell et al. 2004](#), [Han and Humphreys 2005](#), [Chen, Nunez-Smith et al. 2010](#), [Covell, Neiterman et al. 2016](#), [Rumsey, Thiessen et al. 2016](#)). They have also been the subject of a range of government and medical regulatory reports ([House of Representatives Committee Australia 2012](#)). However, as Chapter 3 confirmed, within that body of literature dealing with the experience of migrant doctors in destination countries, few had attempted to study their overall ‘life satisfaction’ (SWB). As mentioned, SWB is a widely accepted measure of people’s self-reported well-being and reflects how individuals feel and appraise the quality of their life situations as a whole ([Diener and Ryan 2009](#)). This has the potential to impact on their workplace performance and quality of care, in addition to both sector and locational retention. If part of the reason underlining medical migration was to attain a better life, then the use of a happiness or life satisfaction index might be essential in determining how they fare in places of destination ([Gadit 2008](#)). Such data become increasingly useful for countries like Australia where a significant proportion of the medical workforce (>30%) was initially trained overseas ([Department of Health Australia 2016](#)). This thesis provides novel evidence in this direction. It presents robust empirical data on the SWB of IMGs in Australia including how their SWB responded to changes in their psychosocial experiences relative to domestic medical graduates.

The findings have some important implications for the Australian context, though they may also be of relevance to other OECD countries with similar medical workforce characteristics and regulations (e.g. Canada, New Zealand, Republic of Ireland, UK and the USA). The specific contributions of the results to the Australian literature on the SWB of IMGs relative to DMGs were threefold.

Firstly, the study has provided the first nationally representative longitudinal evidence on the SWB of IMGs compared to DMGs in Australia. Like most OECD countries, there is limited literature on the SWB of IMGs in Australia. The only major quantitative study (cross-sectional analysis) that investigated the issue also using MABEL data was that of [McGrail, Humphreys et al. \(2012\)](#), but since their study was limited to solely rural GPs and focused on the impact of locational restrictions, its findings were not generalisable to all the IMGs working in Australia.

Secondly, the thesis presented a detailed analysis of IMGs' working conditions and community integration in Australia in comparison with their domestic graduate counterparts. The findings have added to the understanding of how international and domestic medical graduates differentially appraised their working conditions over time, and how that contributes to the difference in the levels of SWB between the two groups. Such information is relevant for the promotion of well-being in a culturally diverse medical workforce like that of Australia. The promotion of medical doctors' well-being is essential for improving quality of health care, and is becoming a major concern for members of the profession, both locally ([Australian Medical Association 2011](#), [Beyondblue 2013](#)) and internationally ([World Medical Association 2015](#)). Furthermore, the study is the first comprehensive empirical enquiry into the professional and non-professional experiences of IMGs in Australia since the release of the Parliamentary report "Lost in the Labyrinth" ([House of Representatives Committee Australia 2012](#)), almost a decade ago. This was an important report that provided qualitative evidence on the plight of IMGs in Australia at the time and also symbolised the interest in the welfare of this important group of the medical workforce.

Thirdly, this thesis provided important insight into understanding the effects of the changing regulatory context of IMGs' well-being in Australia. Such evidence is critical, especially in the wake of recent ongoing changes in the policy environment of IMGs in Australia such as major skilled immigration reforms ([Department of Immigration and Border Protection 2017](#)). Elsewhere, as mentioned earlier, the results may be important for other OECD countries that are experiencing similar regulatory changes like Australia. It is worth noting that given the ongoing global political demands for self-sufficiency in domestic workforce training and supply, many high-income countries, such as Australia, Canada, the UK, are responding with regulatory reforms to ease their reliance on IMGs ([Tam, Edge et al. 2016](#), [Mathews, Kandar et al. 2017](#), [O'Sullivan, Russell et al. 2019](#)). Such policy reforms allow us to explore how these internationally trained doctors are generally faring in Australia. Given the recency of these reforms, there has been no empirical analysis of the potential implications of these reforms on the well-being of IMGs across all major destinations including Australia.

7.3.2 Contributions to the literature: applying new methodologies

The thesis has made some significant contributions to the broader literature concerning the level and determinants of migrant doctors' SWB. From a methodological perspective, it is also important to point out that it has applied analytical methods that have not been previously used in this literature (Chapters 4-6). Each of these distinct methods has proven essential to further the understanding of IMGs' well-being by providing rigorous evidence at a national level, to add to the already existing but small-scale literature. Chapter 4 decomposed the difference in SWB between the IMG and DMG groups into contributing factors. While the decomposition method has been widely applied in studies of inequalities in health and other social indicators between groups ([O'Donnell, Van Doorslaer et al. 2008](#), [Fortin, Lemieux et al. 2011](#)) including medical professionals ([Gravelle, Hole et al. 2011](#), [Dumontet, Le Vaillant et al. 2012](#), [Schurer, Kuehnle et al. 2016](#)), it has never been applied in studies of migrant doctors. This method is useful for identifying the association of a rich set of factors with observed differences in an outcome variable (such as SWB) between groups. Thus, the ability to use

such a method in a nationally representative cohort of international and domestic medical graduates has strengthened the findings and conclusions of this study.

Further, Chapter 5 contributed to the literature by providing the first empirical evidence on the effects of changes in professional experiences on SWB among IMGs in the OECD region. As mentioned earlier, one of the major advantages of a longitudinal study over a cross-sectional design is that the former allows for the systematic analysis of the effect of changes in workplace characteristics over time on changes in life satisfaction. Thus, by studying change, panel data are useful for identifying more clearly, the temporal sequence at the individual level between exposure (e.g. a psychosocial risk factors) and the outcome variables (e.g. SWB), a key criterion for causal inference. Additionally, panel data also offered opportunities to use modelling techniques such as fixed effects (FE) to control for the effects of unobserved time-constant confounding factors (e.g. race, ethnicity and ability, genetic predisposition). Thus, given the diversity in the study sample, the use of an FE model in Chapter 5 has further strengthened the study findings. Furthermore, the subgroup analyses presented in Chapter 5, also appeared to be revealing especially given that such analyses have been widely overlooked in the current literature. This is because researchers tend to treat IMGs as if they were a single monolithic entity as was acknowledged by [Chen, Curry et al. \(2012\), despite global recruitment trends leading to many different pre- and post- arrival pathways and experiences:](#)

[..., although IMGs are often treated as a homogeneous group, there is great diversity within this group, which often cannot be discerned using survey data].

Contrary to their latter point, the MABEL survey data used for this thesis research contained rich information, which allowed for the classification of IMGs into the various independent subgroups. The ability to perform these subgroup analyses using standard econometric panel data modelling techniques assisted this study to generate comparative findings that are both robust and generalisable to all IMGs and DMGs in Australia as well as to some specific groups of IMGs.

As observed in Chapter 3, besides the clinical work setting, the regulatory environment also serves as an important framework for IMGs' professional experiences in destination countries. Regulatory factors like registration/licensing processes are the first point of contact for IMGs and they are critical in determining if a doctor can enter into or – following limited registration – remain active in clinical practice. In a country such as Australia, registration status may also determine permanent migration options. But so far, in all major destinations, there has not been any study assessing the effect of regulatory decisions or reforms on IMGs' well-being, including by cohort. The lack of evidence could have been driven by the shortage of appropriate survey datasets to perform such analyses. [Elkin \(2015\)](#) has previously assessed registration decision-making processes relating to IMGs in Australia and New Zealand but only in relation to public protection (safety). Within this context, Chapter 6 has added some significant contributions to the literature by being the first study to examine the effect of the looming enforcement of regulation on the well-being of IMGs. The difference-in-differences (DiD) study design used in the Chapter was appropriate for estimating the differential effects of the regulatory decision announcement on the SWB of limited compared to fully registered IMGs. As mentioned in [Section 6.3.2](#), the DiD approach is useful in investigating the impact of specific interventions on target populations and has been widely applied in public health research ([Craig, Cooper et al. 2012](#)). The design is used in observational studies to mimic randomised controlled trials (RCT) especially, in situations where such designs are deemed unethical or unfeasible ([Wing, Simon et al. 2018](#)). The application of a DiD design in Chapter 6 was unique in the current literature on IMGs. The findings generated have provided new empirical evidence suggesting the effect of regulatory decisions on the personal well-being of IMGs, a further demonstration of the quality of the MABEL survey data.

7.3.3 Implications of the study results

Having established the contributions of the thesis findings to the Australian and global medical literature on the well-being of IMGs, it is important to highlight some of their implications for the

medical workforce and healthcare system. The well-being of medical practitioners is central not only to their personal development but to the quality of care they provide ([Wallace, Lemaire et al. 2009](#), [WHO 2013](#), [Scheepers, Boerebach et al. 2015](#)). However, for many decades, studies of doctors' well-being have concentrated on negative outcomes such as burnout – a syndrome of emotional exhaustion, depersonalisation and low personal achievement – suicide, anxiety, or depression ([Yamey and Wilkes 2001](#)). Consequently, it was not until recently that measures of positive outcomes such as doctors' general happiness and life satisfaction (SWB) started to emerge in the medical literature ([Nylenna, Gulbrandsen et al. 2005](#), [Jaređić, Hinić et al. 2017](#), [Mahmood, Grotmol et al. 2018](#)). Within that body of the emerging literature on the nature and determinants of SWB among medical practitioners, the specific experiences of internationally trained doctors have been largely overlooked. This thesis provided novel empirical data on the level and determinants of life satisfaction among international compared to domestic medical graduates in Australia. The results made important contributions to the understanding of the nature and drivers of SWB in a culturally diverse medical workforce. Such knowledge is essential for initiating and strengthening existing well-being promotions and policies within medical practice.

The results presented in Chapter 4 suggested that overall, most Australian doctors in the MABEL survey 2009-2016 (pooled sample) were quite satisfied with their lives, irrespective of country of training. These results were in agreement with some of the previous studies that reported high levels of job and life satisfaction among medical professionals ([Austrom, Perkins et al. 2003](#), [Nylenna, Gulbrandsen et al. 2005](#), [Lindfors, Meretoja et al. 2007](#), [Joyce and Wang 2015](#), [Starmer, Frintner et al. 2016](#)). Importantly, the chapter further revealed that some groups of doctors were more satisfied than others and most notably, internationally trained doctors as a group were less satisfied with life than their domestically trained counterpart. This observation was not very surprising, given the literature on the high prevalence of lower career satisfaction among IMGs reported in Australia ([McGrail, Humphreys et al. 2012](#), [Terry, Le et al. 2014](#), [Joyce and Wang 2015](#)), and elsewhere in the USA ([Chen, Curry et al. 2012](#)), Canada ([Vardy, Ryan et al. 2008](#)) as well as in Europe ([Humphries, Tyrrell](#)

[et al. 2013](#), [Aalto, Heponiemi et al. 2014](#), [Pantenburg, Kitze et al. 2016](#)). Additionally, recent studies have reported lower SWB among migrants compared to natives ([Amit and Bar-Lev 2015](#), [Laczko and Appave 2015](#), [Kóczán 2016](#)). However, such an observation required an explanation about what might be the possible reasons why the IMG group was not equally as satisfied with life overall as their DMG counterpart.

The findings suggested that the observed SWB difference between the IMG and DMG groups can be understood by taking into account their work and social conditions as well as their observable personal characteristics. In particular, the results indicated that the relatively high prevalence of psychosocial risk factors in the IMG group partly explained why they were less satisfied with life than the corresponding DMG group. This result offered some support to the *psychosocial theory* which claimed that inequalities in health and well-being – in the workplace – are driven by the unequal distribution of psychosocial risk factors between groups ([Mackenbach 2012](#), [Arcaya, Arcaya et al. 2015](#)). Thus, improving the psychosocial conditions – particularly for IMGs - can be an important step in the promotion of medical doctors' well-being and in narrowing the existing well-being gap between the IMG and DMG groups.

Chapter 5 provided the first longitudinal evidence on the work and social context of changes in life satisfaction among Australian doctors with a focus on IMG subgroups. The empirical results of the chapter have pointed to the significance of changes in the psychosocial environment of doctors to their well-being. Confirming most of the previous research ([Kakunje 2011](#), [Kuusio, Heponiemi et al. 2013](#), [Milner, Witt et al. 2017](#)), the evidence presented suggested that the quality of doctors' life declined with perceived exposure to increased psychosocial risks such as perceived high job demands, low job control and rewards as well as a poor sense of support and community integration. Dissatisfaction with the level of professional autonomy /job control was the most damaging to doctors' SWB followed by low perceived occupational rewards. But the results further suggested that all else being equal, the SWB of international and domestic medical graduates might be similarly

affected by exposure to adverse psychosocial conditions. This surprising result implied that a holistic approach may be essential to mitigate the risks of psychosocial distress among medical practitioners. However, efforts should be invested in limiting exposure to the risk factors especially for the most vulnerable groups which include the IMGs as identified in this thesis.

The significance of this latter point raised the question about whether levels of vulnerability to psychosocial risk factors vary within the IMG group. It is crucial to ask such a question in the quest to design effective and culturally competent interventions that work for all groups. These issues are further elucidated in the next section.

7.3.4 Implications for recruitment agencies and the Medical Board of Australia

Unlike most previous studies on the well-being of IMGs in contemporary societies including Australia, this thesis conducted a range of subgroup analyses specific to the IMG cohort in the MABEL survey 2009-2016. The findings generated have some specific implications for these individual groups and current Australian recruitment policies. This section aims to discuss some of these issues in more detail.

The findings reported in Chapter 5 provided new evidence on the differential effects of changes in psychosocial conditions on changes in SWB among major subgroups of IMGs in Australia namely, source regions, length of stay, the pathway to clinical practice, and the type of doctor. The analysis revealed some statistically significant differences in the marginal effects of changes in psychosocial risk factors on SWB between comparison groups. This demonstrated the relevance of considering IMGs as a heterogeneous rather than a homogeneous group which most studies have tended to overlook ([Chen, Curry et al. 2012](#)). More specifically, the results suggested that the life satisfaction of an IMG coming from the competent authority or a majority English Speaking country e.g., the UK, Ireland, Canada, the USA, was more likely to be affected by the feeling of a lack of job control.

This observation, perhaps surprisingly, suggested that the relatively more privileged groups of IMGs were most affected by a lack of professional autonomy. To understand this result, it may be

essential to put into perspective two important theories of well-being namely, the aspiration or goal satisfaction and the social comparison theories (see [Chapter 3](#)). According to the former, met expectations or aspirations could lead to improved life satisfaction whereas, the latter claimed that people's satisfaction depends on how they compare their situations with others ([Diener 2009](#)). In terms of the goal satisfaction theory, it may be speculated that the competent authority IMGs might be expecting a higher level of professional autonomy in Australia than the other IMGs due to their relatively easier pathway to clinical practice in Australia and previous 'high-level' experiences in their source country. The non-competent authority IMGs – largely from low- and middle-income countries are often subjected to more rigorous assessment processes such as pre-employment language and clinical examinations e.g., the Australian Medical Council's (AMC) clinical exams as well as restricted clinical practices due to 'limited registration' in districts of workforce shortage (DWS). These pre- and post-employment experiences could have dissipated the expectations for autonomy among the non-competent authority IMGs in Australia.

Similarly, in the context of the social comparison theory, it may be that the life satisfaction of competent authority IMGs was more affected by a lower sense of autonomy because they tend to compare their situations to the domestic graduates rather than their fellow IMGs. Given the growing number of IMGs being employed in Australia through the Competent Authority pathway ([Hawthorne 2012](#), [Higgs and Hawthorne 2017](#)), it may be crucial to instil a sense of control among these doctors. As a part of job resources, a good sense of job control has been positively linked to improved employee engagement and motivation as well as high job satisfaction ([Bakker and Demerouti 2014](#), [Schaufeli 2017](#)).

Results in Chapter 5 also suggested that a good sense of professional support and community integration were critical to the SWB of a recently arriving IMG – in the first 10 years of settlement in Australia. Though not surprising, this result suggested that more still needs to be done to provide adequate support to these doctors as was previously advocated by the [Australian Medical Association](#)

(2015). A recent study in Australia (Tasmania) has reported the positive association between professional support and the overall job satisfaction of newly settled IMGs (Terry, Le et al. 2014). Up to the first 5 - 10 years of settlement represent the periods of mandatory clinical practice for IMGs under restriction in districts of workforce shortage. In the MABEL dataset, over 50 per cent of the new IMGs (<10 years) were found to be restricted to practising in a DWS location. Support services for these doctors are critical not only for their well-being but implicitly for boosting their integration and retention in underserved rural and regional areas as was previously reported (Hawthorne, Birrell et al. 2004, Han and Humphreys 2006, McGrail, Humphreys et al. 2012, Russell, McGrail et al. 2017).

Another important result from Chapter 5, was that the SWB of a hospital non-specialist IMG was more likely to be affected by exposure to excessive psychological and physical workloads than a specialist. This implied the need for institutional/hospital-based support strategies to help reduce the physical and mental workload of the hospital doctors with particular attention to diversity and recency of employment. The hospital setting provides a conducive environment for stress proliferation which in the long-run could compromise the doctors' professional and non-professional well-being (Riley 2004, Kakunje 2011, Kuusio, Heponiemi et al. 2012). While the results in Chapter 5 were unique due to the absence of such detailed stratified analyses in the literature, they were in line with some of the previous publications from Australia (Hills, Joyce et al. 2011, Joyce, Schurer et al. 2011) and other OECD countries such as Ireland, and USA (Tyrrell, Keegan et al. 2016, Brower and Riba 2017) that reported high stress and low career satisfaction in hospital doctors. In particular, the results appeared to be consistent with those reported by the Australian Medical Association (2008) from a national cross-sectional survey of hospital medical officers or junior doctors (postgraduate year 2 and above). According to their findings, these doctors experienced a high level of psychosocial distress including high workload and emotional exhaustion. Importantly, they observed that informal peer support and debriefings, among others, were found to be important coping strategies for the doctors. Additionally, the Beyond Blue survey in 2013 also reported high prevalence of mental distress such as depression and anxiety among junior doctors across Australia (Beyondblue 2013). Thus, the provision of adequate

professional support can be critical in reducing job stress, burnout and dissatisfaction associated with hospital practice. Results of the current thesis suggest that IMGs might be particularly affected within this group of training doctors.

Chapter 6 provided unique empirical evidence on the effect of registration decision making on the well-being of IMGs in Australia. The analysis used the recent changes in the regulatory environment of IMGs to determine the extent SWB of limited /conditionally registered IMGs might be influenced by the announcement of MBA's decision to reinforce its de-registration policy. The findings suggested that decisions to tighten registration conditions for IMGs in Australia are likely to contribute to reduced life satisfaction in the target groups. This result highlighted the direct impact of regulatory policies on wellbeing and effort and implied the need to provide limited registered IMGs (usually the new cohort) with the necessary professional support such as mentoring schemes to facilitate their preparations for clinical exams.

7.3.5 Policy implications

Broadly, findings of this thesis have contributed to the existing knowledge and understanding of work and social contexts of medical doctors' well-being in Australia. Identifying the psychosocial determinants of doctors' SWB provides an important direction for strengthening existing policies and programs that seek to enhance well-being in this important group. Psychosocial risk factors are the primary drivers of work-related stress, and there is evidence suggesting that stress among doctors can result to some negative outcomes including poor clinical judgement, sickness absence, sub-optimal health and lower quality of life ([Riley 2004](#), [Kakunje 2011](#), [Jaređić, Hinić et al. 2017](#), [Milner, Witt et al. 2017](#)). The results suggested that improving the psychosocial conditions of medical practitioners may help to enhance their SWB. Whether this would improve quality of care should be the subject of further research ([Klein, Frie et al. 2011](#)), [Jensen \(2014\)](#).

Furthermore, the findings demonstrated how IMGs and DMGs differentially rate the quality (satisfaction) of their lives and the extent their experiences at work and in the community impact

these ratings. The result that IMGs were more likely to report lower SWB, accompanied with higher exposure to psychosocial risk factors implied that efforts to improve the conditions of these doctors at work and in the community could help to enhance their quality of life. Further research should evaluate the costs and effects of interventions to that help to support the integration IMGs in the workplace and community levels. Given that psychosocial needs appeared to vary across subgroups of IMGs, efforts should be invested in ensuring no IMG doctor is excluded in workplace well-being promotion initiatives and higher-risk IMGs have appropriately resourced support. Identifying at-risk groups such as newly settled /employed IMGs, as well as hospital-based non-specialist doctors (largely doctors in pre-vocational training), may help to ensure effective and coordinated responses to the problem of psychosocial stress in medical practice. Support services (e.g., mentorship programs, supportive supervision, trainings) that improve assimilation of new IMGs in the Australian health system and society may be critical as a substantial body of evidence has pointed to the stress-buffering effect of social/professional supports.

The study results also demonstrated the significance of the regulatory environment of IMGs to their well-being. The negative effects of MBA's de-registration decision announcement on SWB of IMGs implied the need for providing some professional support schemes for the limited registrants as was promulgated previously by the [Australian Medical Association \(2015\)](#).

7.4 Research limitations

As shown, this research was one of the first longitudinal analyses of SWB and its drivers among international and domestic medical graduates. Its findings have provided new insight into understanding the link between doctors' professional experiences and their subjective quality of life. Despite the strengths of this research, there are some clear limitations that need to be taken into account when interpreting its results. Most of the key study outcome variables were self-reported, thus participants could under-rate or over-rate their SWB levels and psychosocial working conditions because of social desirability bias. This is a form of reporting bias that is unobservable and is strongly

linked with the social desirability personality trait, (a tendency for survey respondents to respond to questions in a manner that may be viewed acceptable by other). However, in this study, this issue (if such bias existed at all) was controlled to some extent through applying an FE regression model which keeps all these stable personal characteristics constant in the model (Chapter 5).

A second limitation has to do with the use of this FE model. This model can only control for time-constant confounders but not those confounding factors that may be time-varying such as daily experiences in and outside the workplace, in addition to changes in home countries or host country policy changes. However, the study attempted to reduce the bias due to home country situations, by conducting more subgroup analyses using country of training in the regression model (see Chapter 5). Further, the study also conducted a policy analysis to determine potential effects of macro-level phenomena on the SWB of the doctors. Another issue that is worth noting is the problem of reverse causality bias which might occur if changes in SWB has led study participants to change their job which resulted to changes in their psychosocial conditions. Unfortunately, the FE model cannot address this type of bias, hence caution must be taken when interpreting the results of the thesis.

Thirdly, the difference-in-differences study design applied in this thesis (Chapter 6) was descriptive, hence the results were not adjusted for time-constant confounding factors that could be associated with both the predictor and outcome variables e.g., culture, race, innate abilities. Adjusting for some personality variables such as locus of control and neuroticism/emotional stability may have reduced this bias. Furthermore, there could be other policy changes that might have taken place around the time MBA made the announcement, hence this must be taken into account when interpreting the results presented in Chapter 6.

Another potential limitation of the thesis was that it has relied exclusively on a single measure of well-being (life satisfaction). Life satisfaction has been widely accepted as an overall indicator of people's self-reported well-being, but it does not differentiate between how individuals are doing in

specific domains of life such as satisfaction with personal health, job, daily life/work experiences, and intimate personal relationships.

7.5 Conclusion and areas for further research

Overall, this thesis investigated the effect of changes in psychosocial conditions on the subjective well-being of international medical graduates in Australia. Where necessary, it drew comparisons between international and domestic medical graduates to shed some light on differences between these two important groups of the medical workforce. By doing so, it contributed to the ongoing local and global debates on the welfare of overseas or internationally trained medical doctors in destination countries including Australia. The study utilised eight-waves of data from the MABEL longitudinal survey (2009-2016), a nationally representative study of Australian doctors beginning since 2008.

International medical graduates remain a significant contributor to the Australian medical workforce, particularly for rural populations, though substantial numbers of IMGs also contribute to the metropolitan workforce. Their distribution, integration, and retention in rural and remote communities of Australia continue to attract considerable policy and research interest because of chronic workforce supply concerns in these communities. Despite the limitations noted above, this thesis provided new empirical evidence related to their experiences, measured by their SWB, with important stratifications highlighting the diverse experiences and psychosocial needs of this highly heterogeneous group.

While the findings may assist in our understanding of some of the major determinants of subjective well-being among medical practitioners, they are by no means exhaustive. Thus, other avenues of research have been identified in this study. Future researchers may consider investigating how the SWB of doctors correlates with the quality of care provided, and with sickness absence (health-related productivity loss) as well as geographic and sector retention. Additionally, it may be valuable for researchers to consider investigating how doctors' SWB or life satisfaction adapts to job stress over time, including how their positive or negative personal life events (e.g., marriage, the birth

of a child, separation/divorce, major illness) affect the adaption processes. Furthermore, since the study identified the importance of professional and non-professional support for relatively new IMGs (in their first ten years of settlement in Australia), it may be important for future studies to exhaustively identify and evaluate the effectiveness of existing support programs for IMGs and their families (since 2013, the post-parliamentary enquiry). Additionally, future research may investigate doctors' perceptions about their daily life experiences in the workplace and how that impact their overall job and life satisfaction. Further research may be done to assess the impact of cultural competency (acculturation) on SWB of IMGs in destination countries and how levels of SWB differ between for instance refugee and non-refugee IMGs.

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9 Appendices

9.1 Appendix 1

Table 9-1: OLS estimates for the pooled, DMG and IMG samples, excluding health and personality covariates

	Pooled model		DMG model		IMG model	
Job demands (ref: lowest tertile)						
<i>Middle tertile</i>	-0.175***	(0.016)	-0.187***	(0.018)	-0.142***	(0.034)
<i>Highest tertile</i>	-0.469***	(0.021)	-0.490***	(0.023)	-0.411***	(0.044)
Job control (ref: lowest tertile)						
<i>Middle tertile</i>	0.526***	(0.022)	0.537***	(0.025)	0.498***	(0.045)
<i>Highest tertile</i>	0.989***	(0.024)	1.003***	(0.028)	0.970***	(0.048)
Job rewards (ref: lowest tertile)						
<i>Middle tertile</i>	0.320***	(0.025)	0.318***	(0.028)	0.339***	(0.051)
<i>Highest tertile</i>	0.572***	(0.022)	0.578***	(0.025)	0.550***	(0.044)
Peer support (ref: poor)	-0.384***	(0.020)	-0.393***	(0.024)	-0.347***	(0.040)
Community integration (ref: lowest tertile)						
<i>Middle tertile</i>	0.139***	(0.018)	0.104***	(0.021)	0.248***	(0.037)
<i>Highest tertile</i>	0.410***	(0.020)	0.389***	(0.023)	0.487***	(0.042)
Hours worked	-0.007***	(0.001)	-0.007***	(0.001)	-0.006***	(0.002)
Mandatory practice	0.003	(0.029)	-0.048	(0.043)	-0.046	(0.043)
Family restriction	-0.191***	(0.032)	-0.197***	(0.039)	-0.144*	(0.058)
Perceived financial security	0.324***	(0.017)	0.320***	(0.020)	0.353***	(0.037)
Age group (ref: <40)						
40-49	-0.128***	(0.024)	-0.169***	(0.028)	-0.031	(0.046)
50-59	-0.185***	(0.027)	-0.196***	(0.031)	-0.130*	(0.057)
60+	0.102**	(0.032)	0.090*	(0.037)	0.170*	(0.067)
Female	0.006	(0.021)	0.011	(0.024)	0.001	(0.042)
Married or Cohabiting	0.331***	(0.025)	0.360***	(0.028)	0.221***	(0.059)
Have dependent child	-0.111***	(0.022)	-0.098***	(0.025)	-0.130**	(0.044)
log of personal income	0.001	(0.015)	-0.010	(0.017)	0.047	(0.030)
Residency status (ref: Australian citizen)						
Permanent resident	-0.052	(0.029)	-0.123**	(0.044)	-0.019	(0.042)
temporary resident	-0.042	(0.045)	-0.103	(0.078)	0.007	(0.060)
Doctor type (ref: specialist)						
General practitioner	0.050*	(0.024)	0.055	(0.028)	0.031	(0.048)
Hospital non-specialist	0.104**	(0.035)	0.177***	(0.040)	-0.267***	(0.080)
Specialist in training	-0.253***	(0.033)	-0.213***	(0.037)	-0.349***	(0.069)
Practice location (ref: Major city)						
Regional	-0.039	(0.025)	-0.054	(0.030)	0.005	(0.050)
Remote areas	0.024	(0.035)	-0.056	(0.045)	0.145*	(0.058)
Time (survey waves) ref: 2009						
2010	0.057**	(0.019)	0.043*	(0.021)	0.086	(0.044)
2011	0.057**	(0.020)	0.049*	(0.022)	0.053	(0.047)
2012	0.251***	(0.023)	0.250***	(0.026)	0.232***	(0.048)
2013	0.030	(0.021)	0.022	(0.023)	0.021	(0.048)
2014	0.151***	(0.024)	0.139***	(0.027)	0.161**	(0.052)
2015	-0.062**	(0.023)	-0.069**	(0.025)	-0.067	(0.053)
2016	0.137***	(0.024)	0.129***	(0.027)	0.140**	(0.053)
Observations (N)	57,549		44,494		13,055	
F-test	247.66		191.52		191.52	
Adjusted R ²	0.28		0.28		0.27	

The above analysis excluded self-reported health, and personality measures (neuroticism, extraversion, and locus of control). Robust standard errors clustered at the individual level in parentheses. Asterisks *, **, *** Indicate significance at 5%, 1% and 0.1% level

9.2 Appendix 2

The marginal effects of psychosocial risk factors on SWB of IMGs by select groups

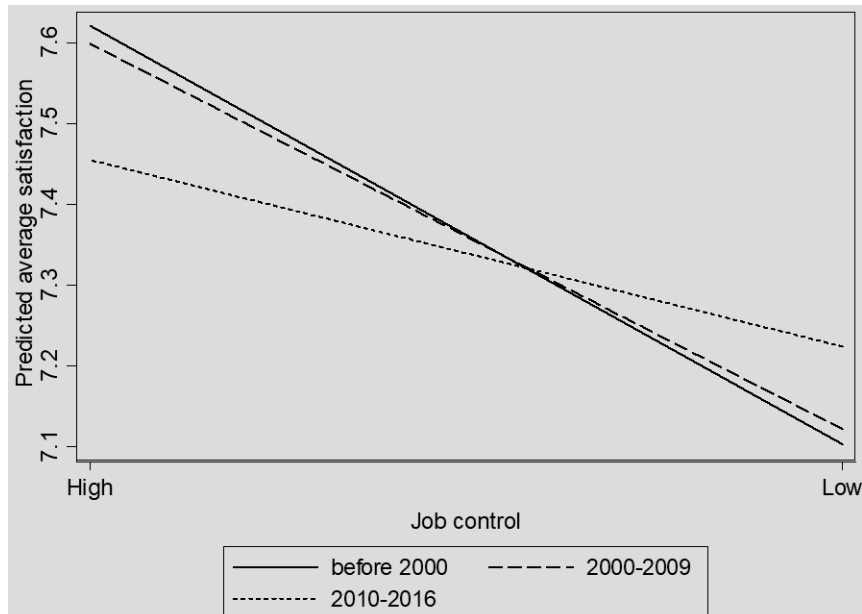


Figure 9-1 Interaction effect of sense of job control with period of arrival on SWB of international medical graduates in Australia (based on Model 2, in Table 6)

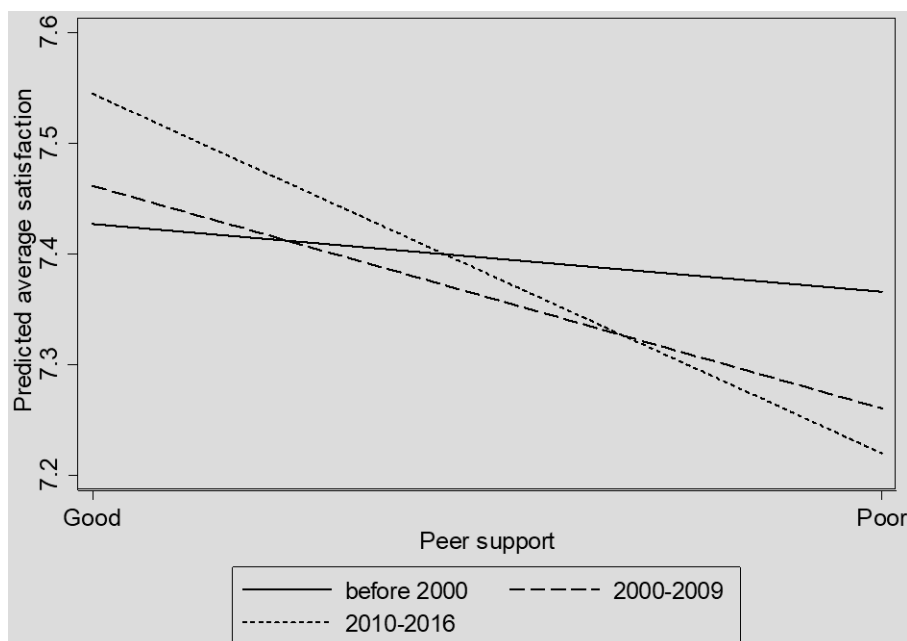


Figure 9-2 Interaction effect of nature of peer support with period of arrival on SWB of international medical graduates in Australia (based on Model 2, in Table 6)

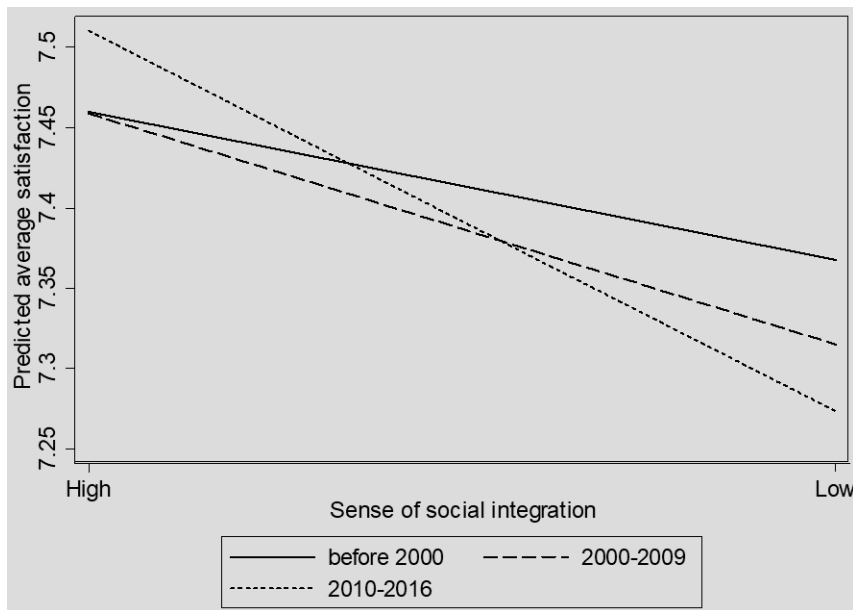


Figure 9-3 Interaction effect of sense of community integration with the period of arrival on SWB of international medical graduates in Australia (based on Model 2, in Table 6)

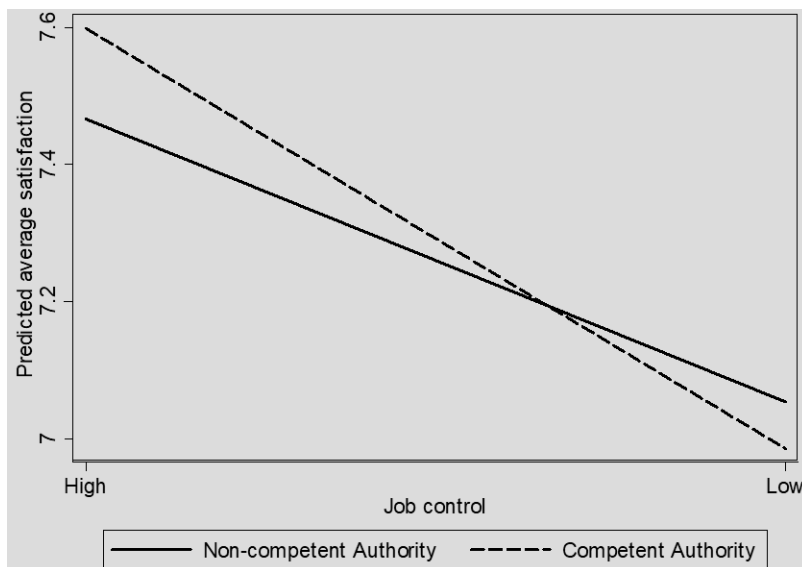


Figure 9-4 Interaction effect of sense job control with assessment pathway on SWB of international medical graduates in Australia (based on Model 2, in Table 6)