

The Dental **WORKFORCE** in MALAYSIA

Modelling The Future

Muhd Firdaus Che Musa



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Preface

The global dental workforce faces unprecedented change driven by socio-demographic shifts, economic trends, policy changes, political developments, and technological advancements. In response, Malaysia has expanded the number of dental schools, thereby increasing the number of dentists entering the workforce each year. However, this has raised concerns about the long-term implications of such policies. This third book in the series aims to model the future clinician dental workforce in Malaysia in relation to population needs and demands, and to propose policy recommendations to address future challenges.

A system dynamics (SD) model was developed using Vensim software to model the needs, supply, and demand for dental care in the public and private sectors between 2010 and 2040. The model comprised two sub-models: a needs/demand sub-model and a supply sub-model. These incorporated evidence from two previous studies—i) student surveys (Book Series 1) and (ii) interviews (Book Series 2)—alongside available and relevant data.

The needs/demand sub-model integrated demographic trends (population growth and ageing), oral health trends (based on epidemiological surveys), and the level of demand for care (patients' preferences regarding sector and type of care) by population age bands. Meanwhile, the supply sub-model examined the Malaysian clinical dental workforce—including generalists, specialists, and therapists—across both sectors and considered working patterns (full-time and part-time).

Both sub-models were compared in terms of clinical time to explore potential over- or undersupply of clinical hours. These findings were then converted into estimates of the required clinical workforce volume. The

SD model was validated both structurally and behaviourally to inform the final baseline model for Malaysia.

The modelling results indicate a current need to expand the dental workforce to meet population needs. However, there is potential for an oversupply of dentists and therapists from 2040 or even earlier. The demand for both primary and secondary dental care is projected to increase by over 130% and 51%, respectively, from 2010, reaching nearly 38.8 million and 11.2 million hours, by 2040. This demand varies by age band and is influenced by demographic and health trends across the public and private sectors.

Demands are particularly high in the public sector and among generalists (primary care), reflecting current patient preferences and oral health needs. Supply projections suggest that increasing the number of dentists nearly tenfold and therapists twofold by 2040 could lead to potential excess capacity among dentists by that time.

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First and foremost, I would like to thank my dear father, Che Musa Jusoh, my late mother, Azizah Salleh, and my other four siblings and their families, who have always believed in me, supported me, and encouraged me throughout my education. I would like to express my gratitude to Professor Jenny Gallagher and Dr Eduardo Bernabe from King's College London for their continuous encouragement, support, and guidance. I am extremely grateful for their direction and timely advice, which enlightened me throughout the process of compiling this work. I appreciate the patience and mentoring they have given me throughout my postgraduate study. Thank you to Professor Ivor Chestnutt and Professor Louise Barriball for patiently reading this document and giving me constructive feedback.

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Finally, I would like to acknowledge myself as being courageous enough to produce this book in the field of Health Services Research and Dental Public Health. I also look forward to continuing my dream of positively impacting people's lives through my education. I thank God for His guidance always.

Abbreviations

APC	:	Annual Practising Certificate
ASEAN	:	Association of Southeast Asian Nations
CfWI	:	Centre for Workforce Intelligence
BDM	:	Biomedical & Health Sciences, Dentistry, Medicine
CP	:	Collaborative practice
CfWI	:	Centre for Workforce Intelligence
DCPs	:	Dental Care Professionals
DSAs	:	Dental surgery assistants
Dft	:	Decayed and Filled Teeth
DMFT	:	Decayed, Missing, and Filled Teeth
DSAs	:	Dental surgery assistants
GDC	:	General Dental Council
GHWA	:	Global Health Workforce Alliance
HEE	:	Health Education England
HRH	:	Human Resources for Health
HSR	:	Health services research
IP	:	Inter-professional education
IMU	:	International Medical University
LUC	:	Lincoln University College
MDA	:	Malaysian Dental Association
MDC	:	Malaysian Dental Council
MFCM	:	Muhd Firdaus Che Musa (researcher)
MOH	:	Ministry of Health Malaysia
MOHE	:	Ministry of Higher Education
MQA	:	Malaysia Qualification Agency
NGOs	:	Non-Governmental Organisations
NSR	:	National Specialist Register

Abbreviations

OHD	:	Oral Health Division, Malaysia
OR	:	Operational Research
PSD	:	Public Service Department
RESC	:	Research Ethics Subcommittee
RM	:	Ringgit Malaysia
UHC	:	Universal health coverage
UK	:	United Kingdom
UKM	:	University Kebangsaan Malaysia
UM	:	University of Malaya
USM	:	Universiti Sains Malaysia
WHO	:	World Health Organisation

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THE DENTAL WORKFORCE IN MALAYSIA: Modelling the Future is the third volume in a book series examining the development, sustainability, and future direction of the Malaysian dental workforce. Building upon evidence generated from earlier volumes involving national student surveys and stakeholder interviews, this book explores the evolving landscape of Malaysia's dental workforce amid rapid demographic, economic, policy, and technological changes. Using a System Dynamics (SD) modelling approach developed in Vensim, the book projects the future supply, demand, and population needs for dental services in Malaysia from 2010 to 2040. The model integrates demographic trends, oral health epidemiology, workforce patterns, and patient preferences across both public and private sectors. The findings highlight a growing demand for both primary and secondary dental care, particularly within the public sector, while simultaneously raising concerns regarding the potential oversupply of dentists and dental therapists in the future. This book provides evidence-informed insights and strategic recommendations for workforce planning, health policy, dental education, and sustainable oral healthcare delivery in Malaysia.

MUHD FIRDAUS CHE MUSA, Dr. is a Dental Public Health specialist and academician at the Department of Paediatric Dentistry and Dental Public Health, Kuliyah of Dentistry, International Islamic University Malaysia (IIUM). His academic and research interests focus on health services research, epidemiology, oral health systems, dental workforce planning, and the application of modelling approaches in healthcare policy and service delivery. He has been actively involved in national and international research collaborations related to workforce sustainability, oral health equity, preventive dentistry, and healthcare innovation, including artificial intelligence in oral health systems. Dr. Firdaus has published in indexed national and international journals and contributes to professional and academic initiatives related to dental public health, education, and policy development. His work emphasises evidence-informed strategies to strengthen oral healthcare systems and improve population oral health outcomes in Malaysia and beyond.

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