

Predictors of Performance of Foreign-Trained Medical Doctors in the Registration Examination of the Ghana Medical and Dental Council: A 5-Year Analysis

Henry Jeremy Odartei Lawson, Nana Ayegua Hagan Seneadza

Department of Community Health, University of Ghana Medical School, Accra, Ghana

Abstract

Introduction: Although the influx of foreign-trained medical doctors (FTMDs) can improve the doctor-to-patient ratio in Ghana, there is the need to ensure that the quality of training is maintained. We assessed the performance of FTMDs in registration examinations over a 5-year period. **Methodology:** Data were extracted from Ghana Medical and Dental Council (GMDC) records from 2015 to 2019. Chi-squared tests assessed the association between the selected characteristics and the final grades. A multivariate logistic regression analysis determined significant predictors of the failure. The data were analysed using the statistical software IBM SPSS (version 26). The significance level was set at $P < 0.05$. **Results:** Of the 1356 doctors, majority (63.1%) were male, 64.3% were aged 21–30 years and 95.5% were Ghanaian. In all, there were 41 countries of training with majority training in China (35.4%) and Ukraine (31.9%). More than half (58.5%) failed the examination. Country of training, number of years from qualification to time of registration examination and number of previous attempts were statistically significantly associated with success at the examination. The logistic regression analysis showed that those who failed were more likely to have trained in Belarus (odds ratio [OR] = 3.20, 95% confidence interval [CI]; 1.50–6.82), Ukraine (OR = 2.47, 95% CI; 1.55–3.92), China OR = 2.06, 95% CI; 1.30–3.26) and Russia (OR = 1.98, 95% CI; 1.21–3.23) and were 0.58 times likely to have trained in Cuba. **Conclusion:** The performance at the examination is low. The significant predictor of performance is country of training. The authors recommend that the GMDC provides counselling services for students who leave for medical training abroad.

Keywords: Foreign-trained medical doctor, Ghana, medical and dental council, performance, predictors

INTRODUCTION

Almost every country in the world has medical doctors working in it who were not originally trained in that country. For smaller countries, this is essential because there may be no medical schools while for others, the demand for doctors far outstrips the number of doctors that can be trained. In the United States of America, they are referred to as International Medical Graduates (IMG).^[1]

Foreign-trained medical doctors (FTMDs) need to assure the medical councils in their intended countries of practice that their training is indeed adequate to cope with the exigencies of practice. In different parts of the world, varying approaches are used to verify quality of training.

The United States has strict policies regarding medical licensing - a doctor is only allowed to practice in the U.S. once he has obtained a license in the state in which he intends to work. The person must acquire a visa, pass the first two steps of the United States Medical Licensing Examination (USMLE), become certified by the Education Commission for Foreign Medical Graduates, get into an accredited U.S. or Canadian residency program, and finally, go back and pass step three of the USMLE. Each of these steps could take multiple years, repelling doctors who are already able to practice in

Address for correspondence: Dr. Henry Jeremy Odartei Lawson, Department of Community Health, University of Ghana Medical School, Accra, Ghana.
E-mail: hlawson@ug.edu.gh

Received: 03-05-2022,

Revised: 18-06-2022,

Accepted: 27-06-2022,

Published: 22-07-2022

Access this article online

Quick Response Code:



Website:
www.npmj.org

DOI:
10.4103/npmj.npmj_128_22

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Lawson HJ, Seneadza NA. Predictors of performance of foreign-trained medical doctors in the registration examination of the Ghana Medical and Dental Council: A 5-year analysis. Niger Postgrad Med J 2022;29:249-55.

the country in which they were trained.^[2] The practice is similar in Canada, Europe, Australia, the United Kingdom and Hong Kong, to mention a few.

The situation in Nigeria is unique. The Medical and Dental Council of Nigeria conducts remedial lessons for 3 months to prepare candidates for the registration examination for foreign-trained doctors.^[3]

In Ghana, a combination of the factors listed above has necessitated the influx of FTMDs into the country. In addition, intake into medical schools in Ghana has become so competitive that several prospective applicants, who qualify by the criteria set by universities, are unable to secure admission because of large numbers of applicants for relatively fewer training positions available. This compels unsuccessful applicants to seek training outside Ghana.

Under the Ghana's late President Nkrumah's regime, an intercourse began with the then Union of Soviet Socialist Republics where scholarships were awarded to young Ghanaians to study in different fields of endeavour – including medicine. These students were required to study the Russian language for about a year and then complete their medical training in the ensuing 6 years. The idea was for them to return to support the medical personnel in Ghana immediately after their training.^[4] Currently, thousands of Ghanaians are receiving medical education in various parts of the world with significant numbers reported to be in China, Ukraine, Russia and Northern Africa. Some of these students are on various forms of scholarships while a significant number are self-sponsoring. A FTMD must therefore satisfy the Ghana Medical and Dental Council (GMDC) that he or she has acquired the basic knowledge, skills and competencies of practitioners by passing the Council's registration examinations. Section 20 (3) of the National Redemption Council Decree (NRC) 91 (1972) enjoins the GMDC 'to direct any person to undergo such examinations as it deems necessary before registration.' Many FTMDs find it difficult to gain registration in the host country due to having to fulfil various long, costly and complex regulatory requirements.^[5]

The first attempt by the GMDC in 1987 was suspended after being described as a discrimination against certain practitioners, including those already practising in the country.^[6] Registration examinations for FTMGs were fully instituted in Ghana in October 1999. It was initially organised three times a year in February, June and October. The examination has four sections – English language, multiple choice questions, problem-solving questions and an oral examination. The average pass rate has generally been under the average final score causing a lot of disaffection between the public and the council.^[7]

Ghana has seven accredited medical schools – five public and two private. One of the private medical schools successfully graduated its first cohort of six students in

November 2020. In 2014, The University of Ghana (UG) graduated 156 medical doctors and 21 dentists.^[8] At the Kwame Nkrumah University of Science and Technology, 176 new medical doctors graduated from the School of Medical Sciences (SMS) and Dental School in 2017.^[9] The University of Developing Studies has graduated 290 graduates from 2011 to 2017, an average of 41 students/year.^[10] A total of 42 new doctors comprising 18 females and 24 males were inducted into the medical profession in 2017 after the completion of their studies at the SMS of the University of Cape Coast (UCC).^[11] This brings the total number of doctors who have graduated from the UCC SMS since 2013 to 243. This is an average of 49 doctors per year.^[12] Thus, between the four public universities, an average of 450 doctors graduate every year.

Only 5 of the 49 countries categorised as low-income economies by the World Bank meet the minimum threshold of 23 doctors, nurses and midwives per 10,000 population that was established by WHO as necessary to deliver essential maternal and child health services. With the current doctor-patient ratio at 1:10,450 (compared to 1:5,000 recommended by the Commonwealth, and 1:1,320 recommended by the World Health Organization), Ghana is yet to realise the WHO recommended ratio.^[13] Considering the rate at which doctors are being trained locally, significant improvements in this ratio continue to be more of a dream than a reality. The influx of FTMDs is a useful addition to the numbers through the standardisation of the quality of training needs to be enforced by the GMDC. It is imperative that the GMDC examination is supervised and conducted with the highest standards that will be able to sift the competency skills of this large number of doctors.

Furthermore, becoming a medical doctor is a venture which is attractive to young senior high school science graduates leading to intense competition for the few slots available in the country. Many graduates with excellent results either do not acquire positions in the universities in Ghana or cannot afford the 'fee-paying' rates offered. They thus opt for medical training in countries outside Ghana with subsequent swelling up of the numbers of FTMDs returning to Ghana annually. At the onset of these registration examinations, few numbers were involved, for example, there were 26 candidates for the examination in June 2010 compared to nine candidates in October 2009 and the numbers continue to rise. Sections of the Ghanaian populace have hounded the GMDC with allegations that their work is shrouded in secrecy and there is a belief that either there is a hidden agenda to prevent doctors from certain countries from practicing, or there is a quota system on number of doctors who should pass each year.^[4] The GMDC, therefore, has to cope with increasing numbers of prospective applicants, the challenges of maintaining standards and the continuous badgering from failed candidates, their parents and some sections of the media and government that the examinations are deliberately designed to prevent some doctors from practicing in Ghana.

Description of the registration examination of the Ghana Medical and Dental Council

Candidates for the examination must have completed medical/dental school and yet to do an internship; or have completed an internship in the 'Medical Officer' category. General Practitioners category registration examination consists of four components: English Language, Multiple-Choice Questions, Problem-Solving questions and an Oral Examination. Proficiency in the English language is waived for candidates who trained and wrote their examinations in English Language. The Multiple-Choice paper consists of 100 questions with 20 questions each in Internal Medicine, General Surgery, Paediatrics and Child Health, Obstetrics and Gynaecology and Public Health. Candidates have 2 h to complete this paper. The Problem-Solving paper consists of 5 questions each with vignettes in the five specialties listed above. Candidates have 2½ h to complete this paper. The oral examination involves a panel of at least two specialists and each discipline has 10 min to evaluate a candidate. All sections of the examination have equal weighting.^[7] The Court of Examiners defines the standard required to pass the examinations as: 'A candidate must obtain 50% in each of the two parts.'

Specialists must hold registerable additional medical/dental qualification in addition to a certificate from that university or other body. Registration examination for specialist practitioners involves an oral examination and an English examination. The oral examination involves a panel of at least two consultants in the field of specialisation of the candidate and lasts for one-hour.

The GMDC has been acting on its mandate to protect the public since 1972. The aspect of their work which involves licensing of FTMDs has been going on consistently since 2000 however no publications on their work have been done. Information on epidemiological characteristics of the candidates is not widely known in addition to the data on countries and universities of training these graduates. This information will be useful first to the Council in monitoring of training of these graduates in foreign countries. In this study, we used secondary data to describe the characteristics of the FTMDs, their performance in the GMDC registration examinations and explore factors associated with their performance over a 5-year period.

METHODOLOGY

This was a review and analysis of 5 years of records of FTMDs obtained from the GMDC offices in Accra, Ghana. The Medical and Dental Council is responsible for the registration and regulation of the practice of all doctors and physician assistants in the country. Electronic and hard copies of records of all registered doctors are kept at the premises.

Inclusion criteria

Data on all candidates who registered and took part in the registration examination for foreign-trained medical graduates hosted by the GMDC from 2015 to 2019 were included in the analysis. Data on 1356 doctors were included in the current analysis.

Exclusion criteria

Candidates who had missing data on the variables of interest such as country of training, grade obtained or who registered but were absent for the examination were excluded from the analysis.

Data collection and analysis

Data were extracted directly into an excel database. Variables of interest included index number, demographic data (such as age and sex), year of graduation, country of training, year of examination, type of examination (dental or medical), results of examination, the number of attempts at the registration examination and the final grade (pass/fail). The top five countries of training with the highest number of doctors graduating were captured as separate categories whilst the 'others' was used to capture the remaining countries. The number of years from qualification to time of registration examination was computed from the difference between the year of graduation and year of examination. Categorical variables such as sex, country of training were summarised using proportions, while continuous variables such as age and scores were presented as medians with interquartile range (IQR).

Chi-squared tests were used to assess the association between the variables age, sex, country of training, year of examination, type of examination, number of years from qualification to time of the examination, the number of attempts at the registration examination and their final grades. A multivariable logistic regression analysis, to determine significant predictors of the failure, was conducted with the final grade (pass/fail) as the outcome variable and factors that showed significant association based on the Chi-square test ($P < 0.05$) as covariates in the model. The results are presented as odds ratios (ORs) with their 95% confidence intervals (CIs). The data were analysed using the statistical software SPSS version 26 (IBM Corp. Released 2019. IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY, USA: IBM Corp.). The significance level was set at $P < 0.05$.

Ethical approval for the study was granted by the Ethical and Protocol Review Committee of the College of Health Sciences of the UG on 26 April 2018. Protocol Approval number: CHS-Et/M.7- P1.2/2017-2018.

RESULTS

Of the 1,356 doctors, majority (63.1%) were male, with a male: female ratio of 1.2:1, 64.3% were aged 21–30 years with a median age of 29 years, an IQR of 6 years and 95.5% were Ghanaian. In all, there were 41 countries of training with 35.4% training in 61 schools in China and 31.9% in 22 schools in Ukraine. 'Others' as shown in Table 1 represents Algeria, Belgium, Benin, Bolivia, Burkina Faso, Czech Republic, Dominica, Egypt, Equatorial Guinea, Eritrea, Germany, Ghana, India, Israel, Lebanon, Mali, Morocco, Mozambique, Netherlands, New Zealand, Nigeria, Pakistan, Philippines, Poland, Romania, Rwanda, Saint Lucia, Sierra Leone, South

Africa, Sudan, Turkey, United Kingdom, USA, Venezuela, West Indies and Zambia.

In the 5 years under review, the years 2015 and 2019 had the lowest proportions of the candidates writing the examination (16.5% and 15.9% respectively), while the highest proportion (23.9%) of candidates wrote the examination in 2017. There was a steady rise of about 30% from 224 in 2015 to 324 in 2017. This rise however dropped marginally to 314 in 2018—a drop of 3% points and subsequently dropped to 216.

Majority (97.9%) participated in the non-specialist medical practitioners' examination and 89.2% sat for the examination within 1–5 years' post qualification. One hundred and two (7.5%) sat for the examination in the same year of qualification while 1.9% wrote the examination within 6–10 years of qualifying. One candidate took the examination 31–40 years after qualifying as a doctor. Majority (67.4%) of the doctors included in our analysis were taking the registration examination for the first time, 294 (21.7%) were on their second attempt whilst 11% were on their third to sixth attempt. The median final score (IQR) was 47.2% (11.9%), with the multiple-choice section having the highest median score of 49.0% (IQR = 11.7%) while the oral examination had the lowest median score of 45.0% (IQR = 13.4%). More than half

of the doctors (58.5%) failed the examination. Details of the registration examination are shown in Table 2.

Chi-square analysis showed that the country of training, number of years from qualification to time of registration examination and number of previous attempts were statistically significantly associated (P value 0.05) with whether the doctor passed or failed the examination [Table 3]. Training in Cuba was significantly associated with passing (pass rate of 55.9%) while the doctors who failed were likely to have trained in China, Ukraine, Russia or Belarus ($P < 0.01$). Writing the examination in the same year of qualification as well as 21–40 years after qualification was associated with passing whereas those who wrote 5–20 years were associated with failing ($P = 0.04$). Those who wrote the examination 11–20 years after qualification had the highest failure rate (63.6%). The number of previous attempts at the registration examination was significantly associated with failure rate. Multiple previous attempts (≥ 2) were associated with higher failure rates compared to < 2 , with four previous attempts having the highest failure rate (83.3%) and one previous attempt having the lowest failure rate (58.6%).

The logistic regression analysis showed that compared to those who passed, those who failed were more likely to have trained in

Table 1: Baseline characteristics of foreign-trained medical doctors who took the Ghana Medical and Dental Council registration examinations for non-specialist from 2015 to 2019 ($n=1356$)

Characteristic	Frequency (%)
Age (years) ^a	29 (6)
Age (years)	
21-30	872 (64.3)
31-40	450 (33.2)
41-50	24 (1.8)
51-60	5 (0.4)
Sex	
Male	856 (63.1)
Female	500 (36.9)
Nationality	
Ghanaian	1295 (95.5)
Non-Ghanaian	61 (4.5)
Country of training	
China	482 (35.4)
Ukraine	433 (31.9)
Russia	253 (18.7)
Belarus	46 (3.4)
Cuba	27 (2.0)
Others	117 (8.6)
Number of candidates	
2015	224 (16.5)
2016	278 (20.5)
2017	324 (23.9)
2018	314 (23.2)
2019	216 (15.9)

^aMedian (IQR). IQR: Interquartile range

Table 2: Characteristics of the Ghana Medical and Dental Council non-specialist registration examinations taken between 2015 and 2019 ($n=1356$)

Characteristic	Frequency (%)
Type of exam (non-specialist)	
Dental	28 (2.1)
Medical	1328 (97.9)
Number of years from qualification to time of registration examination	
Same year	102 (7.5)
1-5	1208 (89.2)
6-10	26 (1.9)
11-20	11 (0.8)
21-30	7 (0.5)
31-40	1 (0.1)
Number of previous attempts	
0	914 (67.4)
1	294 (21.7)
2	84 (6.2)
3	43 (3.2)
4	12 (0.9)
≥ 5	9 (0.7)
Percent scores for sections of registration examinations (non-specialist) ^{a, b}	
Multiple choice	49.0 (11.7)
Problem-solving	47.5 (14.8)
Orals	45.0 (13.4)
Final score	47.2 (11.9)
Final grade	
Pass	563 (41.5)
Fail	793 (58.5)

^aMedian (IQR), ^bPass mark is 50%. IQR: Interquartile range

Belarus (OR = 3.20, 95% CI; 1.50–6.82), Ukraine (OR = 2.47, 95% CI; 1.55–3.92), China OR = 2.06, 95% CI; 1.30–3.26) and Russia (OR = 1.98, 95% CI; 1.21–3.23) as shown in Table 4. Compared to those who passed, those who failed were 0.58 times as likely to have trained in Cuba [Table 4].

DISCUSSION

Globally, FTMDs have been crucial to supporting healthcare delivery and Ghana is no exception. However, the registration process for these doctors is in its developmental stages in Ghana. In addition, the performance of doctors at these registration examinations in Ghana has not been published. We set out to examine the predictors of performance at the registration examination of the GMDC over a 5-year period (2015–2019). For this study, performance was classified as pass or fail at the registration examination

In this study, 1356 doctors who attempted the registration examination of the GMDC over the study period were enrolled.

Table 3: Factors associated with final grades obtained in Ghana Medical and Dental Council registration examinations taken between 2015 and 2019 (n=1356)

Characteristic	Pass (%)	Fail (%)	P
Age (years)			
21-30	381 (43.7)	491 (56.3)	0.14
31-40	171 (38.0)	279 (62.0)	
41-50	7 (29.2)	17 (70.8)	
51-60	2 (40.0)	3 (60.0)	
Sex			
Male	362 (42.3)	494 (57.7)	0.45
Female	201 (40.2)	299 (59.8)	
Country of training			
China	202 (42.1)	278 (57.9)	<0.01
Ukraine	156 (36.0)	277 (64.0)	
Russia	107 (42.3)	146 (57.7)	
Belarus	14 (30.4)	32 (69.6)	
Cuba	19 (70.4)	8 (29.6)	
Others	65 (55.6)	52 (44.4)	
Number of years from qualification to time of registration examination			
Same year	57 (55.9)	45 (44.1)	0.04
1-5	486 (40.2)	722 (59.8)	
6-10	11 (42.3)	15 (57.7)	
11-20	4 (36.4)	7 (63.6)	
21-40	4 (50.0)	4 (50.0)	
Type of exam (non-specialist)			
Dental	11 (39.3)	17 (60.7)	0.81
Medical	552 (41.6)	776 (58.4)	
Number of previous attempts			
0	378 (41.4)	536 (58.6)	0.03
1	137 (46.6)	157 (53.4)	
2	33 (39.3)	51 (60.7)	
3	11 (25.6)	32 (74.4)	
4	2 (16.7)	10 (83.3)	
≥5	2 (22.2)	7 (77.8)	

This is much lower when compared to Romania where 6,986 FTMDs were admitted into the country over a 5-year period from 2004 to 2008;^[14] 28,283 in Australia in 2016; and the US where 216,182 IMGs were admitted in 2016.^[15,16] From 2000 to 2009, Canada added 7,181 IMGs to its workforce, a significant increase from the 80s and 90s when Canada gained 5,216 and 4,755 IMGs, respectively.^[1] Comparatively, the sample size in this study is much lower than the number of candidates who sat for the registration examination of the Nigerian Medical and Dental Council, i.e., 341 in April 2017,^[3] 903 in October 2018,^[17] and 1,228 doctors sat in 2019.^[18] Reliance on foreign medical doctors is negligible in Turkey, Estonia, Slovakia and Poland (0.02%–0.7%).^[14]

The age of the participants had a median of 29 years with an IQR of 6. This portrays a relatively young cohort. We report that there was no statistically significant difference in the pass rate of the participants when differentiated by age ($P = 0.14$).

In our study, a majority of the doctors were male with a male: female ratio of 1.2:1. This compares favourably with data from Romania with a male:female ratio of 1.7:1 for FTMDs from 2004 to 2008.^[14] It is however much lower than the United States of America where a ratio of 2.1:1 is reported.^[16] This follows the general male preponderance in global medical practice. Performance at the examination was not however found to be significantly related to the sex of the candidate ($P = 0.45$).

Table 4: Predictors of failure in Ghana Medical and Dental Council registration examination taken between 2015 and 2019

Characteristic	Unadjusted odds ratio (95% CI)	Adjusted odds ratio (95% CI)
Country of training		
China	1.720 (1.145-2.585)	2.061 (1.303-3.259)
Russia	1.706 (1.096-2.653)	1.980 (1.214-3.232)
Ukraine	2.220 (1.467-3.358)	2.465 (1.549-3.924)
Belarus	2.857 (1.382-5.906)	3.199 (1.499-6.824)
Cuba	0.526 (0.213-1.298)	0.576 (0.228-1.457)
Others	Reference	Reference
Number of years from qualification to time of registration examination		
Same	0.789	0.412 (0.092-1.841)
1-5	1.486	0.846 (0.200-3.588)
6-10	1.364	1.143 (0.227-5.753)
11-20	1.750	1.621 (0.250-10.522)
21-40	Reference	Reference
Number of previous attempts		
0	0.405 (0.084-1.961)	0.551 (0.113-2.699)
1	0.327 (0.067-1.603)	0.388 (0.079-1.918)
2	0.442 (0.086-2.257)	0.510 (0.099-2.626)
3	0.831 (0.150-4.615)	0.879 (0.158-4.910)
4	1.429 (0.161-12.701)	1.529 (0.171-13.655)
5	Reference	Reference

CI: Confidence interval

A vast majority of the cohort were Ghanaians with non-Ghanaians hailing from Ghana's neighbouring countries of Nigeria, Benin, Togo, and Burkina Faso. Other African countries involved were Egypt, Equatorial Guinea, Eritrea, Mali, Morocco, Mozambique, Rwanda, Sierra Leone, South Africa, Sudan and Zambia. Country of training saw a pattern of 54% of doctors trained in Eastern Europe (Ukraine, Russia and Belarus), 35% from China and 2% from South America (Cuba). This means that a whopping 89% of graduates coming to Ghana were trained in Asia and Eastern Europe. The factors accounting for this are legion. First, there is a large and growing cohort of Ghanaians living in these two regions. Students, therefore, enjoy social support on arrival in these regions which helps them to adapt to their new environment. Furthermore, even though the number of scholarships to these regions has dropped significantly over the years, the school fees charged are marginally higher than the 'fee-paying' options offered by the public universities in Ghana; and lower than the fees charged by private medical schools in Accra. The lack of opportunities for healthcare professionals, for example, laboratory technicians and nurses who want to switch to become doctors in the current educational system in Ghana, make it attractive for these professionals to move to Europe and Asia.

The study listed 41 different countries of training for the participants from all continents of the world. This is similar to the Nigerian experience where FTMDs return from over 20 countries in Europe, Asia, Africa, The Caribbean, Eastern Europe, Middle East, North and South America.^[18] It was however evident that even though China accounted for 35% of country of training for the participants, this country represented the highest number of schools of training (61 schools) compared with 22 schools in Ukraine, which was the second highest.

The number of candidates applying to sit for the registration examination of the GMDC saw an interesting trend. There was a steady rise of about 30% from 224 in 2015 to 324 in 2017. This rise however dropped marginally to 314 in 2018—a drop of three percentage points. The authors would like to mention that our data covered the first part of 2019 only; hence, the figure of 216 recorded could have been higher if the data for October 2019 was available. Even though the numbers here are much lower than in Nigeria, Australia and the United States, there is clear evidence of a rising number of candidates. This poses challenges on the integrity of examinations and the number of hours required to adequately test each candidate and assure quality of examinations. There has been an increase in the number of examiners required to set examination questions, conduct oral examinations and mark the examination scripts. Space for conducting the examinations has also seen a considerable need for expansion. The venue for examinations has been changed to accommodate the rising numbers in Accra. These factors also have cost implications for the process. More examiners to remunerate, larger venues to pay for and more general logistics for the examination.

Proportion of dentists in the cohort

Dentists constituted 2.1% of this cohort. This number compares favourably with the proportion of dentists (i.e. 2.5% of medical practitioners) admitted in France in 2005. In Slovenia, foreign-trained dentists constituted between 2.2% and 4.5% of the total number of practicing dentists from 2005 to 2008.^[14] In Nigeria, Foreign-trained dentists constituted 2.9% of candidates who sat for the registration examination in November 2019.^[18]

Of the participants, 102 (7.5%) registered to sit for the examination within the same year that they graduated from medical school while a majority (89.2%) took the examination between 1 and 5 years of graduation. A closer look revealed that 813 doctors registered for the examination within 1-year of graduation. This means that a total of 915 (67.5%) candidates took the exam in ≤ 1 -year after graduation. This is a good observation because knowledge can be fleeting and thus long delays between graduation from medical school and sitting for the registration examination could have a negative effect on performance at the examination. This assertion was supported in this study because the pass rate was highest (55.9%) in the cohort that took the examination the same year as graduation and the difference was statistically significant ($P = 0.04$). Further analysis revealed that the odds of failing the examination is lowest (OR = 0.4, 95% CI: 0.09–1.84) when the attempt is done in the same year that the candidate graduated; and highest when the examination is attempted 11–20 years after graduation (OR = 1.62, 95% CI: 0.25–10.52).

Performance at the registration examination

The general performance of this cohort at the examination was poor in all segments of the examination – multiple choice, problem-solving and oral assessment. The worst performance of candidates was registered in the oral examinations. The median scores for this cohort were all below the pass mark of 50%, namely, 49%, 47.5% and 45%. Majority (97.9%) of the cohort participated in the non-specialist medical practitioners' examination and 89.2% sat for the examination within 1–5 years' post qualification. A majority (67.4%) of the doctors included in our analysis were taking the registration examination for the first time, i.e., the examination taken was their first attempt. The median final score (IQR) was 47.2% (11.9). More than half of the doctors (58.5%) failed the examination. Details of the registration examination are shown in Table 2. A registration examination conducted in Nigeria recorded a 55.9% pass.

In this study, the country of training was significantly related to performance at the examination ($P < 0.01$). The logistic regression analysis showed that when compared to those who passed, those who failed were more likely to have trained in Belarus (OR = 3.20, 95% CI: 1.50–6.82), Ukraine (OR = 2.47, 95% CI: 1.55–3.92), China (OR = 2.06, 95% CI: 1.30–3.26) and Russia (OR = 1.98, 95% CI: 1.21–3.23) as shown in Table 4. Compared to those who passed those who failed were 0.58 times less likely to have trained in Cuba however this finding was not statistically significant [Table 4].

Strengths of the study

A strength of this study includes the use of data spanning a 5-year period included in the analysis. This is also the first time in Ghana that data on the FTMG performance have been analysed to explore factors associated with their performance.

Limitations of the study

The limitations of the study include the unavailability of data on the site and period of clinical attachment as well as data on the English proficiency scores. Clinical attachments are required by the GMDC as part of the criteria for qualification to write the registration examination. The site and duration could affect the quality of the training received during the clinical attachment. In addition, in some of the universities where the doctors were trained, the official language of instruction was not the English language; however, the examinations conducted by the GMDC are in English. The effect of English proficiency on the performance of the doctors would have been helpful to determine whether the language barrier was an important predictor of failure in the GMDC examination.

CONCLUSION

The pass rate of FTMDs at the registration examination of the GMDC is low. This low-performance cuts across all the three areas of testing for the current examination model of multiple-choice questions, problem-solving questions and oral assessment, with the poorest performance being recorded for the oral assessment. The country of training was the only variable found to be the statistically significant predictor of performance. The country of training which recorded the lowest performance was Belarus.

The GMDC is encouraged to provide counselling services for prospective doctors who want to leave the shores of Ghana for training abroad. They can be guided on selection of country of training to enhance the performance in their registration examinations. More females should also be encouraged to pursue medical training to offset the male dominance in the profession. The authors recommend that the current examination model should be reviewed to incorporate a clinical assessment model into the current testing methods.

Acknowledgements

The authors are grateful to the Medical and Dental Council of Ghana for access to the data used for the study.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Campbell-Page RM, Tepper J, Klei AG, Hodges B, Alsuwaidan M, Bayoumy DH, *et al*. Foreign-trained medical professionals: Wanted or not? A case study of Canada. *J Glob Health* 2013;3:020304.
- Sopher P. Doctors With Borders: How the U.S. Shuts Out Foreign Physicians. *The Atlantic*; 2014. Available from: <https://www.theatlantic.com/health/archive/2014/11/doctors-with-borders-how-the-us-shuts-out-foreign-physicians/382723/>. [Last assessed on 2020 Nov 29].
- Sumaina K. MDCN Inducts 164 Foreign Trained Medical, Dental Graduates. *Health and Wellbeing*; 2017. Available from: <https://www.thisdaylive.com/index.php/2017/07/27/mdcn-inducts-164-foreign-trained-medical-dental-graduates/>. [Last accessed on 2018 Apr 18].
- Osabutey P. Ghana snubs Russian-trained doctors. *Ghanaian Chronicle*; 2010. Available from: <http://www.modernghana.com/news/291420/1/ghana-snubs-russia-trained-doctors.html>. [Last assessed on 2020 Nov 29].
- Turner T, El-Jardali F. The crucible of COVID-19: What the pandemic is teaching us about health research systems. *Health Res Policy Syst* 2020;18:52.
- PanafricanNewsAgency. Local Exams for Ghanaian Doctors Trained Abroad. *Modern Ghana News*; 1999. Available from: <http://www.modernghana.com/news/6750/1/local-exams-for-ghanaian-doctors-trained-abroad.html>. [Last assessed on 2020 Dec 08].
- Ghana Medical and Dental Council. Registration Examination for Foreign Trained Doctors; 2010. Available from: <https://mdcghana.org/docs/RegistrationExamsforForeignTrainedDoctors.pdf>. [Last assessed on 2020 Nov 29].
- VibeGhana.com. University of Ghana Graduates 156 Medical Doctors and 21 Dentists; 2014. Available from: <http://vibeghana.com/2014/03/31/ug-graduates-156-medical-doctors-and-21-dentists/>. [Last assessed on 2020 Nov 29].
- Kenu D. KNUST Graduating Female Wins 13 Awards. *Daily Graphic* 2016. Available from: <https://www.graphic.com.gh/news/general-news/knust-graduating-female-medical-student-wins-13-awards.html>. [Last assessed on 2020 Nov 29].
- University of Development Studies. UDS; 2018. Available from: <https://www.uds.edu.gh/academics/smhs>. [Last assessed on 2020 Nov 29].
- Ghanaian Times. 42 Medical Students Graduate from University of Cape Coast; 2017. Available from: <https://www.peacefmonline.com/pages/local/news/201508/251359.php>. [Last assessed on 2020 Nov 29].
- Mensah I. UCC Graduates 5th Batch of Medical Doctors. *University of Cape Coast*. 2017. Available from: <https://www.ucc.edu.gh/news/ucc-graduates-5th-batch-medical-doctors>. [Last accessed on 2018 Apr 12].
- World Health Organisation. Achieving the health-related MDGs. *It Takes a Workforce!* 2010. Available from: http://www.who.int/hrh/workforce_mdgs/en/. [Last assessed on 2020 Nov 29].
- Wismar M, Maier C, Glinos I, Dussault G, Figueras J, editors. *European Observatory on Health Systems and Policies. Health Professional Mobility and Health Systems: Evidence from 17 European Countries*. Copenhagen: WHO Regional Office for Europe; 2011. p. 293, 538.
- Cooper M, Rasmussen P, Magarey J. Regulation, migration and expectation: Internationally qualified health practitioners in Australia—a qualitative study. *Hum Resour Health* 2020;18:74.
- Young A, Chaudry H, Pei X, Athhart K, Dugan M, Snyder G. A census of actively licensed physicians in the United States, 2016. *J Med Regul* 2017;103:7-21.
- Yekeen A. 903 Foreign Trained Graduates Take Medical Exam. *International Centre for Investigative Reporting*; 2018.
- Nasiru J. 687 Foreign-Trained Doctors Inducted Into Medical and Dental Council of Nigeria. *The Cable*; 2020.