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A global value chain analysis of offshore medical universities in the Caribbean

Sheldon McLean
Don Charles



UNITED NATIONS



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This document has been co-authored by Sheldon McLean, Coordinator of the Economic Development Unit of the Economic Commission for Latin America and the Caribbean (ECLAC) subregional headquarters for the Caribbean, and Don Charles, Economic Research Assistant.

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Abstract

The business of training North American students in offshore medical universities (OMU) in the Caribbean began in the 1970s as American entrepreneurs saw a demand for medical education which could not be met domestically. The Caribbean was selected as a region for OMU, given what is perceived as less stringent regulatory oversight from local authorities. Furthermore, the region's close geographic proximity, language similarity, and weaker domestic currencies all favored the Caribbean as a choice location.

This study is intended to be exploratory in nature. It seeks a better understanding of i) how the OMU cluster emerged; ii) the characteristics of the offshore medical universities in the Caribbean cluster; iii) the contribution of the offshore medical universities to the economy of the host Caribbean countries; and iv) the prospects for enhancing the educational quality, and value added captured by the Caribbean in the medical value chain.

The Caribbean OMUs can improve their quality education by pursuing accreditation from the Caribbean Accreditation Authority for Education in Medicine and other Health Professions (CAAM-HP). More value added can be captured domestically in each host country by providing more consumer goods and support services to the students.

Introduction

In the Caribbean, medical universities can be classified as being either regional or offshore. The regional medical universities are the institutions which predominantly train students that are mostly national of countries of the sub-region, or intend to practice medicine in a Caribbean country. Offshore medical universities (OMUs) refer to institutions, which target students that are mostly non-Caribbean, and intend to practice medicine in North America.¹ The student population of the OMUs is comprised of students who failed to gain admittance into a North American university due to: i) their low scores on the Medical College Admissions Test (MCAT); and/ or ii) a low grade point average (GPA) at the undergraduate level.² Most OMUs offer dual-campus programmes, whereby the theoretical aspect is completed in the Caribbean while clinical clerkships are completed at teaching hospitals in the United States (US).

Since the 1970s there has been an increase in the number of offshore medical universities in the Caribbean. The proliferation of such universities is being driven by the unique combination of market demand, and few supply restrictions. The demand may be seen by the large number of mostly North American students seeking to obtain tertiary level medical education, whereas the low barriers to establish a medical university in the Caribbean facilitates supply.

A number of questions arise regarding the Caribbean offshore medical university cluster.

- How did the cluster emerge?
- What are the characteristics of the OMUs in the Caribbean cluster?
- What are the contributions of the offshore medical universities to the economy of the host Caribbean countries?

As a result we also try to capture what are the prospects to gain more value-added from the medical value chain.

¹ More specifically, the OMUs in this study focus on the training students seeking to practice medicine in the United States (US).

² It is important to note that the cost of attendance of the OMUs is lower than the cost of North American medical universities. However, the academic entry requirements are the main determinants of the students opting for the OMU.

Section I of the study provides an overview of the Caribbean OMU cluster. Section II presents a discussion on the global value chain of medical universities worldwide. Section III examines the contributions that the OMUs make to the host countries. Section IV assesses the local competitiveness factors of the Caribbean cluster. Section V explores the challenges experienced in the cluster. Section VI reviews strategies for developing the cluster and section seven concludes.

I. Overview of the Caribbean offshore medical university cluster

A. History of the Caribbean offshore medical university cluster

Tertiary level medical education in the Caribbean began with the University of College of the West Indies in 1948. It was a constituent of the University of London. Enrolment began with thirty-three students at the Mona Campus at Jamaica. Later in 1962 the university sought independence from the University of London, and became the University of the West Indies (UWI).

Two other regional universities also emerged around the same time as UWI. These were the University of Guyana (1963), which developed its School of Medicine in 1985; and the University of Suriname (1969), which created its medical school in 1969.

The business of training North American students in offshore medical universities in the Caribbean began in the 1970s as American entrepreneurs took note of the demand for medical education which could not be met domestically. They saw an opportunity to meet this demand by developing for-profit medical universities. Table 1 presents the available data on the number of applicants and matriculants to US medical universities. The approximate 40 per cent acceptance rate has led to the excess demand for tertiary level medical education.

Table 1
Number of applicants and matriculants to US medical universities

Year	Applicants	Matriculants	Acceptance rate (per cent)
2007-2008	42 315	17 759	42
2008-2009	42 231	18 036	43
2009-2010	42 268	18 390	44
2010-2011	42 741	18 665	44
2011-2012	43 919	19 230	44
2012-2013	45 266	19 517	43

Table 1 (concluded)

Year	Applicants	Matriculants	Acceptance rate (per cent)
2013-2014	48 014	20 055	42
2014-2015	49 480	20 343	41
2015-2016	52 549	20 631	39
2016-2017	53 042	21 030	40

Source: AAMC (2017).

Caribbean countries were targeted to accommodate these medical universities as their institutions were subjected to less stringent regulatory oversight from local authorities than was the case in the US or Canada (Swedish Development Advisers 2004; McAvinue et al. 2005; Morgan et al. 2017). Furthermore, the region's close geographic proximity, language similarity, and weaker domestic currencies all favored the Caribbean as a choice location (Swedish Development Advisers 2004).

The late 1970s saw the establishment of three universities: St. George's University School of Medicine (SGU) in Grenada (1976); Ross University School of Medicine (RUSM) in Dominica (1978); and the American University of the Caribbean (AUC) (1978). Other early entrants include: the Spartan Health Services University in Saint Lucia (1980), and the University of Health Sciences in Antigua (1983)³.

From the 1970s to 2017, there has been a significant increase in the number of offshore medical universities in the Caribbean. Babcock et al. (2013) notes that over the 1970 to 2013 period, approximately 40 per cent of the offshore medical universities commenced operation since 2000. Many of the newer medical universities such as the American University of Saint Vincent and of Barbados, All Saints, and Atlantic University Schools of Medicine have commenced operations within five years alone.

By September 2017, there were one hundred and one medical universities in the Caribbean, offering programmes leading to an award of Doctor of Medicine (MD) and/or Bachelor of Medicine, Bachelor of Surgery (MBBS) degrees (see table 2)⁴.

Table 2
Summary of medical universities in the Caribbean 2017

Country	Number of medical schools
Anguilla	1
Antigua and Barbuda	3
Dominica	2
Grenada	1
Montserrat	3
Saint Kitts and Nevis	8
Saint Lucia	8
Saint Vincent and the Grenadines	5
Total OECS	31
Aruba	2
Curacao	4
Saba	1
Total Netherlands Antilles	7
Barbados	5
Cuba	14
Haiti	5
Trinidad and Tobago	1
Jamaica	2

³ This information was obtained by checking the website of each of the respective universities.

⁴ Note: the Caribbean OMUs are included in this total.

Table 2 (concluded)

Country	Number of medical schools
Guyana	8
Dominican Republic	17
Belize	11
Total other Caribbean	63
Total	101

Source: WDMS (2017).

B. Characteristics of the Caribbean offshore medical university cluster

As previously mentioned, the Caribbean OMUs are all private, for-profit institutions. Some of the medical universities are owned by large corporations, such as R3Education, Inc.,⁵ DeVry, Inc.⁶, and Manipal Education Americas, LLC⁷. The remaining Caribbean offshore medical universities are owned and managed by individuals or small organizations (Eckhart and Zanten 2014).

Most of the lecturers employed in the Caribbean OMUs are foreigners. Such faculty staff would have had at least an M.D. degree, while many possess PhD degrees. The aforementioned faculty staff typically would have received their medical education at a North American university.

The offshore universities routinely rely on full time lecturers to instruct taught courses. However, there are instances when visiting lecturers are used to teach specific subjects.

The financial compensation of the lecturers varies across the universities. Academic qualifications, experience, and specialty also influences a lecturer's financial remuneration. Annual salaries tend to range from US \$40,000 to US \$90,000. In the US, the average salary for a lecturer in basic sciences averages US \$130,000 per annum. Since Caribbean offshore medical university lecturers' salary tend to be lower than their US counterparts, in some countries⁸ lecturers are not required to pay income tax on their salaries (Swedish Development Advisers 2004).

The student population varies by university. Ross University School of Medicine, reports a student population of more than 2,500 students; St. George's University Medical School holds a student population ranging between 7,000 and 8,000 students; and Universidad Autónoma de Guadalajara (UAG)⁹ School of Medicine in Mexico reports a student population greater than 4,000 students (Eckhart2010). This is large when compared to the medical schools of the US whose student bodies tend to average 500students. The Spartan Health Sciences University and the University of Health Sciences have student populations below 500 students (Swedish Development Advisers 2004).

As an admission requirement, the offshore medical universities typically require entrants to possess a baccalaureate degree from an accredited university. Students are required to have some training¹⁰ in any of the following areas: Biology, Chemistry, or Physics. Students are also assessed on their employment history, and volunteer experience. The majority of these Caribbean offshore medical universities do not require students to submit MCAT scores (Eckhart 2010).¹¹

Students in the Caribbean OMUs are typically required to spend the first five semesters completing taught courses from the basic sciences curriculum, which usually includes:

⁵ R3 Education Inc. owns the Medical University of the Americas, Saba School of Medicine and St. Matthew's University. See R3 Education website.<http://www.r3education.com/>

⁶ DeVry, Inc is a publicly traded company for-profit education company. It owns RUSM and AUC.

⁷ Manipal Education Americas owns American University of Antigua (AUA) (Eckhart and Zanten 2014).

⁸ Some of these countries include: Antigua and Barbuda, Dominica, Grenada, St Kitts and Nevis, and St Lucia (Swedish Development Advisers 2004).

⁹ Unlike most Caribbean offshore medical universities, UAG is a not for profit institution (Eckhart 2010).

¹⁰ This training includes laboratory training, and classroom training.

¹¹ Examples of some Caribbean offshore medical universities that do not require MCAT include: AUA, the International American University (IAU) College of Medicine, and the Caribbean Medical University (Babcock et al. 2013).

- Anatomy and cell biology;
- Biochemistry;
- Medical genetics;
- Neuroscience;
- Microbiology;
- Behavioral science;
- Pharmacology; and
- Pathology.

These courses are taught through lectures on the campus of the respective OMU. In each course, students are assessed through a combination of mid-semester examinations or group/ individual assignments, and end of semester examinations. Such basic science curriculums in the Caribbean offshore medical universities are similar to those of US medical universities. On completion of the basic science curriculum, students proceed to sit the United States Licensing Exam (USMLE)¹².

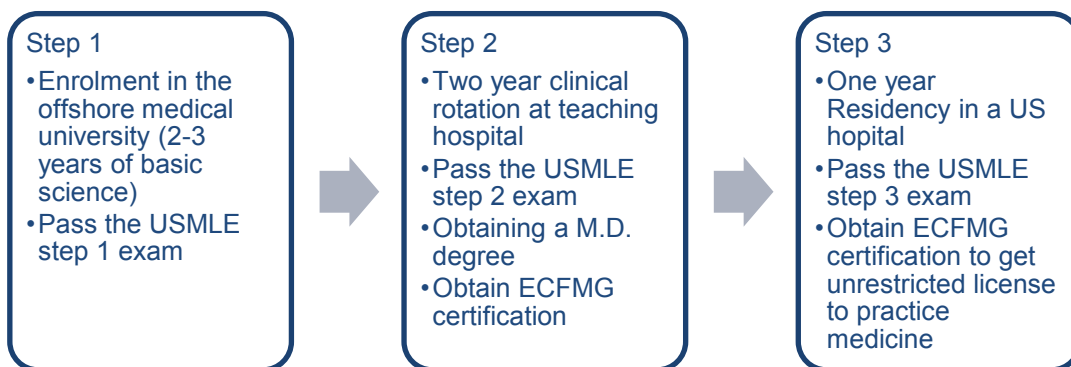
On the passing of the USMLE Step 1 exam, students can then begin clinical rotations at a teaching hospital approved by the university. Students pay their fees to the offshore medical university, while the university makes contractual arrangements with respective hospitals. The Caribbean offshore medical universities may pay as much as US \$400 per week per student to teaching hospitals to accommodate the students. In 2008, the New York City's Health and Hospitals Corporation signed an exclusive, ten year, \$100 million contract with St. George's University to provide clinical rotations for six hundred of its medical students at the city's eleven public hospitals. The American University of the Caribbean also made a similar arrangement where it agreed to pay US \$19 million to Nassau University Medical Center (Hempstead, NY) for exclusive rights to train sixty four of its students on clinical rotations (Eckhert2010).

During the clinical internship, the students are required to observe physicians and take additional taught courses. These taught courses are in the areas of Pediatrics, Psychiatry, Obstetrics/Gynecology and Family Medicine. This internship takes two years. On completion of the clinical rotations, students may proceed to sit the USMLE Step 2 examination. Passing this examination entitles students to a M.D. degree (Swedish Development Advisers 2004; USMLE 2017).

As an additional requirement for practicing medicine in the US, graduates are required to complete a residency programme and pass the USMLE Step 3 examination. The residency programme requires graduates to practice medicine under the supervision of more experienced physicians. Students desiring to specialize may do so by entering a specialized residency programme. Successful completion of the residency and the USMLE step 3 allows a graduate to legitimately practice medicine in the US (Swedish Development Advisers 2004; USMLE 2017). Diagram 1 provides an overview of the steps required for a student to obtain a M.D. degree and practice medicine in the US.

¹² Some universities such as St George's University School of Medicine, Ross University School of Medicine, Spartan Health Sciences University, International University of Health Sciences, etc. may require students to sit an in-house exam before sitting the USMLE (Swedish Development Advisers 2004).

Diagram 1
Overview of the steps required for a student to practice medicine in the US



Source: Authors' compilation.

C. Distinguishing traditional medical universities

Traditional medical universities typically cater for students from the domestic country or region. Although, there may be students from other countries or regions, these foreign students may number less than the local/regional students. Under the 'traditional education approach' lecturers and medical students are confined to a local curriculum developed in their own countries.

Traditional medical universities typically have their own curriculum, and arrangement with teaching hospitals for students to become certified medical practitioners. In the US, students attending top ranking universities typically perform well at the USMLE examinations, and obtain residency training in their desired area of specialization. Such universities typically have low student dropout rates from their medical degree programmes.

Transnational education occurs where an institution of a home country establishes a subsidiary in a foreign country. The curriculum developed in the home country may be offered to students in the foreign country. Alternative forms of transnational education include: i) the offering of online courses or degrees; ii) the collaboration of multinational universities in the offering of degree programmes; iii) the collaboration of universities within a region to allow for the comparability of standards; and iv) the establishment of offshore universities. In the cases of online education, the curriculum may be developed by the home country institution. In the instances of the multinational collaboration, the curriculum for a degree programme may be a joint effort of both universities (Biviano and Makarehchi 2002; American Medical Association 2010).

The University of the West Indies, Faculty of Medical Sciences, can be categorized as a traditional medical university. When the university was established as a college of the University of London in 1948, all thirty three undergraduate students which were admitted were medical students (UWI Cave Hill 2017).

UWI's Mona Campus, offers a five year Bachelor of Medicine and Bachelor of Surgery (MBBS). Their graduate students may opt to specialize in dentistry, nursing, clinical pharmacy, basic medical science, diagnostic imaging and physical therapy.

"In 1967 medical teaching expanded from Mona to Cave Hill campus. Students completed their final clinical year at the Queen Elizabeth Hospital, and later with the establishment of the School of the Clinical Medicine and Research (SCMR), both clinical years. In 2008 with a track record of 41 years of

clinical teaching, established professional postgraduate programmes and internationally recognised research, the SCMR was upgraded to the Faculty of Medical Sciences (FMS).” (UWI Cave Hill 2017, 1).

UWI’s St. Augustine campus, which is located at the Eric Williams Medical Sciences Complex, commenced operation since 1989 (UWI St Augustine 2017a). Like the other campuses, it offers a MBBS which spans five years, is divided into three pre-clinical and two clinical years. Upon successful completion of the MBBS, the graduates must pursue an eighteen month internship in a local hospital in order to be eligible for certification by the Medical Council and practice medicine¹³.

For post graduate studies, students can pursue MPhil and PhD in Pre-Clinical Sciences, from the Department of Pre-Clinical Sciences. The Department of Para-Clinical Sciences offers an MPhil and a PhD in Para-Clinical Sciences, a Diploma, MSc and DM in Family Medicine, and a Master of Public Health (MPH). At the Department of Clinical Medical Sciences, students may pursue a Doctorate in Medicine (MD), where they may specialize in General Internal Medicine, Paediatrics, Psychiatry, or Radiology. The Department of Clinical Medical Sciences also offers an MSc in Clinical Psychology. At the Department of Clinical Surgical Sciences, students may pursue a Doctorate in Medicine part-time over four years, where they may specialize in Anaesthetics, Obstetrics and Gynaecology, Ophthalmology, Orthopaedics, Surgery, or Urology (UWI St Augustine 2017b).

The medical degree programmes offered at all three campuses are accredited by the Caribbean Accreditation Authority for Medicine and other Health Professions (CAAM-HP), the regional accreditation board. UWI three campuses attract students from over the Caribbean. Upon completion of the medical degree programmes, the students opt to practice medicine in a Caribbean territory.

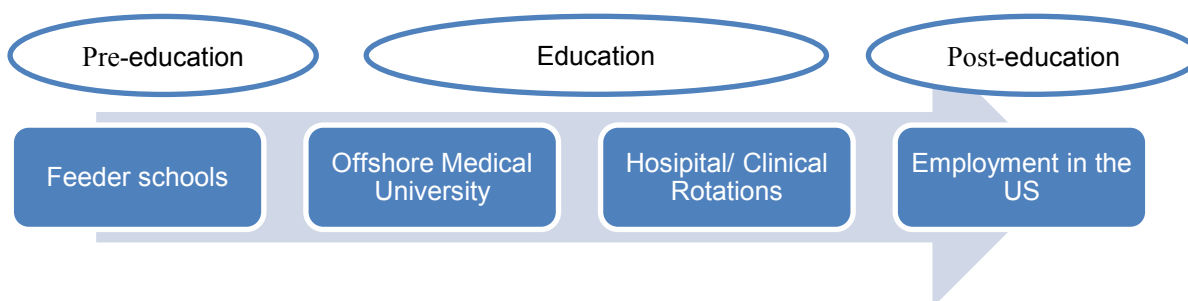
¹³ In each campus, after completion of the MBBS, the student must pursue eighteen months internship in a local hospital in order to gain certification from the local medical board, and gain permission to legally practice medicine.

II. The global value chain for offshore medical universities

A. The global value chain

The global value chain of offshore medical universities is the network which includes the feeder schools from which the students come, the offshore medical university, the clinical rotation hospitals, and the employers to which graduates go (Dorri et al. 2012). The global value chain may be comprised of three (3) segments, namely, pre-education (student recruitment), education (teaching and evaluation), and post-education (graduate placement and alumni support) (Sison et al. 2000; Dorri et al. 2012). Diagram 2 represents such global value chain.

Diagram 2
Global value chain for offshore medical universities



Source: Authors' compilation.

1. Feeder schools

The feeder schools range from high/ secondary schools to tertiary level institutions. In some instances, students would have pursued studies at a tertiary level institution. However, as previously mentioned, their low scores on the MCAT, or their low GPA from their undergraduate science degrees prevent them from gaining acceptance into a medical degree programme in North America. In other instances, students may have completed only secondary level or high school level education. Their grades at their secondary/ high school level exams may not meet the requirement of the North American universities, and thus they are unable to gain admittance into a North American medical university programme. As a secondary resort, these students enroll in offshore medical universities.

North American students have historically attended universities in Europe, the Asia-Pacific region, the Middle East and the Caribbean¹⁴. However, the entry requirements of European universities tend to be on par with US universities. Thus students failing to meet the educational requirements of North American universities may also fail to meet the requirements of European universities.

2. Offshore medical university education

OMUs in effect act as a substitute for US medical universities in providing pre-clinical training. The websites of the OMUs typically emphasize that they are playing a crucial role by training physicians to address the shortage in the US. For example, the American University of Antigua website states that the offshore industry is a promising solution:

“Caribbean medical school graduates help fill the void of much needed primary care physicians... The realities of the physician shortage may seem bleak but by enrolling in a Caribbean medical school, you can be a part of the solution.” (Cited in Morgan et al. 2017, 4).

The OMUs in the Caribbean typically construct their degree programme based upon the curriculum of a US medical university. This allows the OMU to truly act as a substitute of the traditional US medical university. Thus, the students spend their first three to four years in their medical degree programme pursuing taught courses in basic sciences. In some OMUs¹⁵, a student may spend as much as six years pursuing the basic sciences curriculum.

Then the students may sit the USMLE step 1 exam. Many OMUs market their programmes as being on par with US medical universities. They advertise the number of students that were successful at the USMLE step 1 exam. For example, St. George’s University in Grenada website states:

“St. George’s 2012 performance on USMLE Step 1 was an improvement on the outstanding results from 2011, a year in which [the school’s] first-time test takers achieved a pass rate of 95 per cent overall and 96 per cent among those from the US and Canada. By contrast, the first-time taker pass rate for students at US and Canadian schools was 94 per cent in 2011.” (Cited in Morgan et al. 2017, 4).

These pass rates notwithstanding, it is important to note that there is significant variation in the quality education students receive in offshore medical universities (Swedish Development Advisers 2004; van Zanten and Boulet 2008). Issues regarding the quality of education will be discussed in greater detail in section 5.0.

Success at USMLE step 1 exam would allow the student to proceed to a two year clinical rotation. However, many Caribbean OMUs do not have their own teaching hospital. Instead they pay a teaching hospital in the US to accommodate their students (Swedish Development Advisers, 2004; van Zanten and Boulet, 2008). At the clinical rotation stage, the students which attended Caribbean OMUs would train alongside students which attended traditional US medical universities in the teaching hospital.

¹⁴ North American students which attended feeder schools in the Asia-Pacific or the Caribbean would be required to have good MCAT scores and GPA in order to gain acceptance in a US medical university. If the student’s score are not up to par, then they will have to opt for an OMU.

¹⁵ In Cuban and Haitian schools a student may spend as much as six years pursuing basic sciences before taking the USMLE step 1 examination (van Zanten and Boulet, 2008).

Thus, the clinical rotations offer the OMU students an opportunity to learn in the same environment as their US university student counterparts.

3. Residency and employment in the United States

Residency is an important step for medical students as it influences their growth of clinical knowledge. In fact, the residency dictates the direction the career of the medical graduate will go. During the residency programme the students practice medicine under the supervision of more experienced physicians. If the student desires to specialize, it is done by entering a specialty residency programme.

The National Resident Matching Programme (NRMP), also referred to as “The Match”, on an annual basis places US medical graduates and IMGs into residency training positions in US teaching institutions (Curtin and Singer 2017). In 1952 when the Match was established, 10,400 internship positions were available for 6,000 US medical graduates. However, from 1980, the number of applicants increased beyond supply, creating a shortage (NRMP 2016).

In 2016, there were 42,370 applicants for the Match, but only 30,750 positions offered, and 29,572 positions filled. There was a 96.2 percent position fill rate by the Match. Thus, there are a relatively small number of positions that need to be filled via the Supplemental Offer and Acceptance Programme (SOAP). SOAP is a supplementary residency placement system, whereby positions that were not filled via the Match, can be eventually filled by standby applicants.

The Match process is therefore highly competitive, with the best students landing their preferred specialties. To get in a residency of choice, the students are assessed on their USMLE step 1 and 2 scores, four letters of recommendation from medical practitioners in the desired specialty, and grades obtained in basic sciences (Freedman 2011).

Apart from the assessment by the NRMP, the US has also mandated that all IMGs seeking medical residency training in the US, to obtain certification by the Educational Commission for Foreign Medical Graduates (ECFMG). To be certified by ECFMG, an IMG must pass USMLE step 1 and 2. Additionally, only graduates of a medical university may apply for the ECFMG certification¹⁶.

Currently, one of the requirements for ECFMG certification is that the IMG must have attended a medical university listed in the World Directory of Medical Schools (ECMFG 2017). However in 2010, the ECFMG announced that effective in 2023, physicians applying for ECFMG Certification will be required to graduate from a medical school that has been appropriately accredited (Rabben 2013; ECFMG 2017).

The ECFMG announcement can have two implications for the OMUs. Either i) they obtain accreditation, which would allow their students which are successful on the USMLE to obtain ECFMG certification; or ii) they don't acquire certification, and their students would not be allowed to obtain ECFMG certification. If the latter scenario is realized for some OMUs, it would be problematic for their IMGs, who would be denied eligibility for a US residency.

B. The Caribbean's position in the global value chain

The Caribbean offshore medical universities do not enjoy a strong ranking in terms of the reputation of their institutions, when compared with other medical universities in the world. However, were offshore medical universities ranked based on their performance and number of awards of ECFMG Certification alone, the medical universities in Grenada, Dominica, Sint Maarten, and Antigua and Barbuda would emerge among the top 10 universities (see table 3)¹⁷.

¹⁶ Note: IMGs need to obtain ECFMG certification in order to land residencies. After success at USMLE step 3, IMGs may apply to the ECFMG to gain an unrestricted license to practice medicine in the US (ECFMG 2017).

¹⁷ Note: the ECFMG only report the absolute number of students that obtain ECFMG certificates by country. No mention is made of the total number of their students that attempt to acquire ECFMG certification on an annual basis. Information on the total number of

When the Caribbean cluster is compared to the international cluster, India comes out on top receiving the highest number of ECFMG certifications. They are followed by Grenada and Dominica with 9.1 per cent and 8.7 per cent respectively, of total ECFMG certification. This implies that offshore medical universities in Grenada and Dominica offer the highest quality medical education among the Caribbean cluster¹⁸. The amount of ECFMG certificates received by the top five Caribbean countries is equal to approximately 86 per cent of the total ECFMG certificates earned by IMGs in the Caribbean.

Table 3
Top 20 countries by award of ECFMG Certificates in 2015
(Percentage)

Rank	Country of medical school	Number of certificates	Percentage
1	India	1093	10.9
2	Grenada	912	9.1
3	Dominica	874	8.7
4	Pakistan	765	7.7
5	Sint Maarten	384	3.8
6	Saint Kitts and Nevis	339	3.4
7	Antigua and Barbuda	233	2.3
8	Iran	230	2.3
9	Egypt	225	2.3
10	China	212	2.1
11	Israel	205	2.1
12	Mexico	201	2
13	Jordan	198	2
14	Dominican Republic	185	1.9
15	Ireland	167	1.7
16	Lebanon	148	1.5
17	Saudi Arabia	148	1.5
18	Nigeria	141	1.4
19	Saba	135	1.4
20	Poland	130	1.3
Caribbean cluster			
2	Grenada	912	9.1
3	Dominica	874	8.7
5	Sint Maarten	384	3.8
6	Saint Kitts and Nevis	339	3.4
14	Dominican Republic	185	1.9

students attempting to acquire ECFMG can be used to determine the success rates at ECFMG certification. Furthermore, no disaggregation is made by institution, nor age of the institution.

¹⁸ St. George's University School of Medicine is the only offshore medical university in Grenada. Therefore, the high ECFMG certification rates displayed in Table 5 reflects the performance of SGU. Thus, SGU ranks number 1 in the ECFMG certification among the offshore medical universities in the Caribbean.

Table 3 (concluded)

Rank	Country of medical school	Number of certificates	Percentage
19	Saba	135	1.4
31	Cayman Islands	81	0.8
33	Saint Lucia	80	0.8
34	Cuba	79	0.8
42	Saint Vincent and the Grenadines	57	0.6

Source: ECFMG (2015b).

The top offshore medical universities in the Caribbean are SGU, RUSM, AUC, and Saba University. They tend to acquire the best performance on the USMLE and earning residency placements.

It is difficult to uniformly assess the performance of the OMUs on credentials other than the ECFMG placements since they only report their most favourable statistics and exclude the rest. For example, SGU reports that in 2017, 93 per cent of their graduates received a residency placement, and 96 per cent of its students passed USMLE step 1 in 2016. RUSM reports that 93 per cent of its students passed USMLE step 1 in 2016, and it received 660 residencies in 2017. However, no mention is made of its residency success rates, or USMLE performance. AUC reports a residency success rate of 84.4 per cent in 2017, but no comment is made on USMLE performance. Saba reports a 99 per cent success rate at USMLE step 1, but no comment is made on the USMLE step 2 or residency success rates. Other Caribbean OMUs such as the Spartan Health Services University report only 16 residencies, and the University of Health Sciences report only 17 hospitals where the residencies were achieved. But no mention is made about any other performance rhetoric. As previously mentioned SGU, RUSM, AUC, and Saba University are among the oldest OMUs in the Caribbean. Yet, the lack of transparency on the reporting of performance on the entire major benchmarks (USMLE step 1, USMLE step 2, and residency appointment rates), raises concerns about performance of the students and the quality of education in the Caribbean OMUs.

It is important to note that, “The lack of uniform data on OMUs is problematic for state medical boards, which struggle to assess the quality of the medical education offered at any one school and which, in some cases, disapprove a school.” (Eckhart 2010, 1).

Despite the uncertainty with respect to the overall quality of the medical education offered in the Caribbean, most US students that fail to gain acceptance into US medical universities typically target Caribbean OMUs rather than those in the Asia-Pacific or the Middle East region (van Zanten and Boulet, 2008; Boulet et al. 2009; Eckhart 2010).

III. Benefits of offshore medical universities to host countries and local competitiveness factors

The offshore medical universities bring financial benefits to the countries hosting such universities. Such benefits include the expenses of students and faculty who spend on accommodation, traveling, clothing, and other goods and services.

Some of the islands in the Caribbean, notably the Organization of Eastern Caribbean States (OECS) and the Netherlands Antilles, are small economies, which rely mainly on agriculture, offshore financial services, and tourism for revenue (Samuel 1993; Taylor and Francis 2003). As seen previously in Table 1, there are thirty eight offshore medical universities in the OECS and the Netherlands Antilles. Given the undiversified nature and limited revenue earning potential of such economies, offshore medical universities can have a significant positive impact on such economies. Some of the financial benefits include:

- Corporate and student taxes paid by the medical universities and their enrolled students;
- Income tax paid by the local faculty in the medical universities;
- Tariffs charged on imported products;
- Expenditure by students and faculty on accommodation¹⁹, living expenses, and entertainment. For example, at SGU, there is the “white coat” ceremony for students, at the beginning of the academic year. The event attracts parents and other relatives to Grenada for a few days. The families of the students typically incur expenses on consumer goods (food, transportation, entertainment, and other leisure activities), thus contributing to the local economy²⁰. It is estimated that SGU contributes 19 per cent to the Gross Domestic Product (GDP) of Grenada through its taxes, and expenses of faculty, staff, and students²¹.

¹⁹ The developers of student apartments for rents, and the groceries would capture larger benefits than small scale entrepreneurs.

²⁰ This was based on interviews with Shari Joseph, and Michael Baptise, officials from the Eastern Caribbean Central Bank.

²¹ This was based on interviews with Shari Joseph, and Michael Baptise, officials from the Eastern Caribbean Central Bank.

Furthermore, the existence of the offshore medical universities provides additional benefits, including:

- Increased options to access medical education for a few home country students. If there is an increase in the amount of medical universities in the host country, then there should be an increase in access to medical education as some of the host country's citizens may attend the offshore medical university²²;
- Increase in employment opportunity for some citizens of the host country. This increase could be linked to positive externalities related to the construction of medical universities, as well as the number of staff employed at the university in various professional categories.

It is important to note that the expenses directly incurred by faculty, staff, and students of the OMUs are important for the Caribbean economies, and generating multiplier effects. Unlike the goods producing Caribbean countries, these countries are not endowed with commercial reserves of hydrocarbons, gold, bauxite, or any other mineral natural resource. The islands of Antigua and Barbuda, Dominica, Grenada, and St. Lucia, to name a few, are typically reliant about tourist arrivals and tourist expenditures for their earning of foreign exchange. The Gross Domestic Product (GDP) of the service producing islands is also lower than Trinidad and Tobago. The service producing islands also grapple with high debt, and are occasionally confronted with climate related natural disasters. Thus, the OMUs are important to each island, as they act as an opportunity to channel some income/ revenue into the host countries.

Indeed, there is room for the host countries to earn more income from the foreigners attracted to the host countries due to the OMUs. To do this, there would need to be a wider range of goods and services offered by the local small and medium sized entrepreneurs (SMEs). There is scope for expansion in the production of consumer goods, such as fast foods, beverages, clothing and souvenirs. There is also scope for the provision of consumer services, such as taxi services, car rentals, accommodation rentals, hair grooming, cosmetic and beauty services, and recreational activities.

It is important to note that to a large extent, the leading motivation of investors in OMUs in the Caribbean has been capitalizing on fiscal incentives on offer to generate a substantive return on investment (i.e. the profit motive), rather than making a positive socio-economic contribution to Caribbean economies (e.g. employment creation or enhancing the quality of healthcare available). This highlights a fundamental flaw in Sir Arthur Lewis' 'Industrialization by Invitation' model, since multinational FDI does not necessarily flow with the intention of developing the region. Thus this speaks to the need for a reevaluation of the modalities employed by regional economies to achieve sustainable development in the Caribbean.

A. Local competitiveness factors

As previously mentioned, US students seeking tertiary level medical education tend to pursue studies at Caribbean OMUs. A number of factors favor the Caribbean as a choice location for the OMUs. In summary, these factors include: the Caribbean's strategic location to the US; the similarity of language; the low costs for the programmes; the unique Caribbean culture; and the less stringent requirements for setup (Swedish Development Advisers 2004; McAvinue et al. 2005; Morgan et al. 2017).

²² Locals may enrol in the offshore medical university; however, the enrolment of nationals in the offshore medical university in any given year is low. In Grenada, a nursing school was started with 28 students, all of which were locals. In the case of the nurses, upon the end of their training, they would provide their medical services to Grenada. In the case of the doctors, after they complete their residency and obtain their ECFMG certification, they target the US market for work.

1. Location

The Caribbean islands are in close geographic proximity to the US. In fact, the distance between Miami, Florida, and Havana, Cuba, one of the more northern Caribbean islands, is approximately 228 miles. The distance between Miami, Florida and Maurice Bishop Airport²³ in Grenada, the most southern Caribbean island with an OMU, is approximately 1530 miles. Such close geographic proximity results in a relatively low cost to travel between the US and the Caribbean. For example, the cost of traveling by air from Miami to Maurice Bishop Airport in Grenada ranges from US \$790 to US \$3,000 per round trip. By contrast, the cost of traveling by air from Miami to Diu, India, ranges from US \$1990 to US \$3950 per round trip. Indeed, the lower transport cost would make traveling to the Caribbean from the US more economically attractive than traveling to India.

2. Language

The official language of the US is English. The official language of many islands in the Caribbean is also English²⁴. Some exceptions exist, for example, the official language in Cuba is Spanish. In Sint Maarten both Dutch and English are spoken. However, OMUs catering for US students would provide the taught programmes in English.

The similarity in language would allow easy communication between US students and people residing in the English speaking Caribbean islands.

3. Low costs for tuition and living expenses

Tuition at the Caribbean offshore medical universities is lower than US medical universities. Table 4 provides an outline of the tuition costs and living expenses costs for students in both the US and the Caribbean offshore medical universities. The total costs of preclinical tuition ranges from US \$79,900.00 at the Atlantic University School of Medicine (AUSOM) in Saint Lucia to as high as US \$250,082 at SGU. The total cost of the preclinical tuition at AUC is US \$229,000, at RUSM it is US \$216,425, at AUA College of Medicine it is US \$176,310, at Medical University of the Americas (MUA) it is US \$127,875, and at Saba University School of Medicine it is US 128,997 (AUSOM 2016)²⁵. The University of Science, Arts and Technology in Montserrat four year programme was US \$47,500 (Eckhart 2010).

Table 4
Expenses of students

	US medical university	Caribbean offshore medical university
Tuition fees (USD)	200 000 – 330,000	47 500 – 251 000
Rent and living expenses	60 000 – 100,000	60 000 – 80 000
Total	260 000 – 430,000	107 5000 – 331 000

Source: updated Swedish development advisers (2004), and Eckhart (2010).

4. Tax incentives and full repatriation of profits

Tax incentives are provided by the governments of the host countries. Since many of these Caribbean countries have an undiversified economy, they are willing to provide tax incentives to foreign investors. For example, during SGU's inception phase in the 1970s, the government provided concessions on building materials. Additionally, VAT on construction was charges at a rate of only 5 per cent up until

²³ Maurice Rupert Bishop was a Grenadian politician and the leader of New Jewel Movement (NJM). He was shot during the coup in 1983. The International Airport in Grenada is named after Maurice Bishop.

²⁴ The English speaking islands of the Caribbean are: Anguilla, Antigua and Barbuda, Bahamas, Barbados, British Virgin Islands, Cayman Islands, Dominica, Grenada, Jamaica, Montserrat, Puerto Rico, St. Kitts and Nevis, St. Lucia, St. Maarten, St. Vincent and the Grenadines, Trinidad and Tobago, Turks and Caicos Islands, U.S. Virgin Islands (Alleyne 1985).

²⁵ Such values represent the costs in 2016.

2015 compared to the standard rate of 15 percent. Swedish Development Advisers (2004) report that the owners of the medical schools identified in their sample were allowed to repatriate all profits, dividends and capital.

5. Less stringent requirements for setup

In the Caribbean there are less stringent requirements to establish an OMU. Indeed it has been suggested that one of the reasons for the explosive growth of offshore medical universities in the Caribbean within the last decade are the less daunting requirements for their establishment and operation.

In North America, most medical universities have a teaching hospital to facilitate clinical rotation. The medical universities usually make significant investment in facilities including staff and equipment in their teaching hospital. In fact, a medical student can complete their entire medical degree at one campus. Furthermore, research is typically performed at the universities, and contributions are made to scientific knowledge. Additionally, the teaching hospital affiliated to the medical university typically provides medical services to local communities.

Not all the offshore medical universities in the Caribbean have well developed facilities. Indeed, some Caribbean offshore medical universities do not have an associated teaching hospital. Furthermore, lecture halls used for teaching have been known to lack sufficient seating to accommodate full classes. Moreover, there may be insufficient and or inadequate dorm facilities to accommodate the foreign students.

In the Caribbean, only a business license is required to open an offshore medical university (Parolini and Platek 2010; Babcock et al. 2013). There are no additional requirements imposed by the government of the host countries to open and operate an offshore medical university. For example in SGU in Grenada, the government imposes no additional requirements for building and operating an OMU other than the standard requirements to build buildings and operate a business²⁶. This is in contrast to the medical universities in the US which have a rigorous series of standards covering academics, finances, and operations that the medical university must comply with in order to gain accreditation from the Liaison Committee on Medical Education (LCME)²⁷.

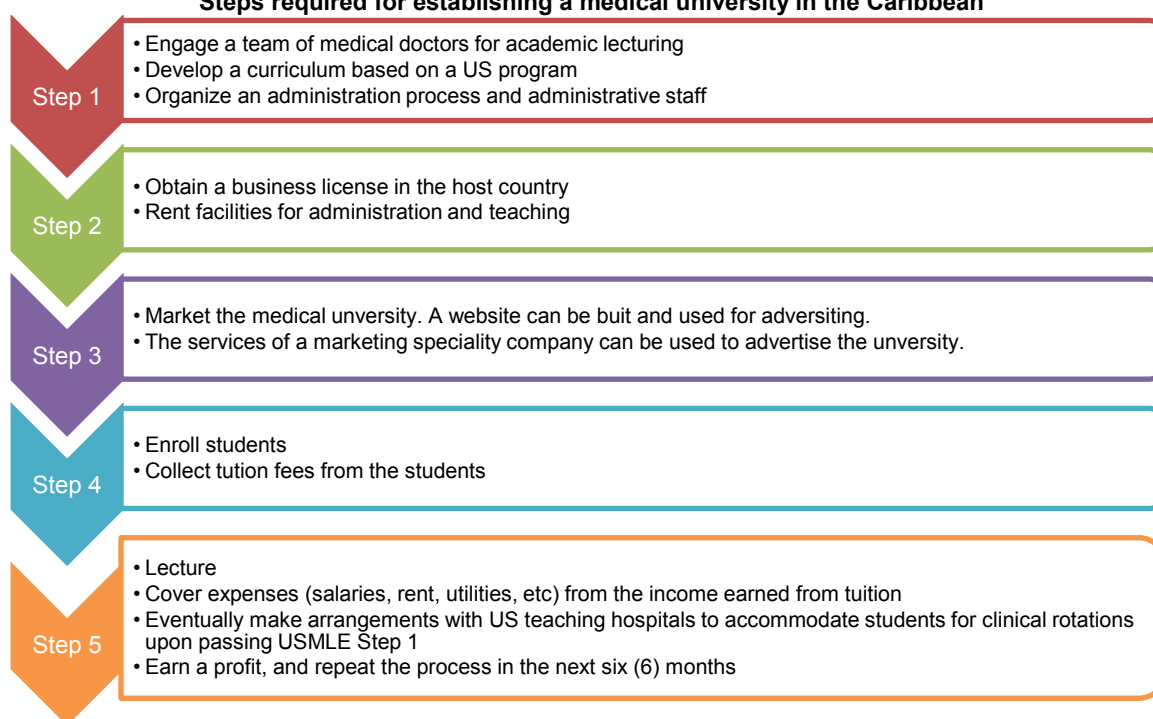
The World Health Organization reports that medical universities have a social obligation to focus research, clinical and training activities on local health priorities (Boelen and Heck 1995). This has led to the development of a global consensus statement on medical education, which states the moral and social obligations of a medical university (GCSAMS 2010). However, Caribbean governments do not impose such requirements of the OMUs. Thus, Caribbean OMUs do not meet such social obligations, as they train international students to practice elsewhere. This lack of social mandate undoubtedly makes it easier to operate a medical university in the Caribbean.

Diagram 3 outlines the step required for an entrepreneur to establish a medical university in a Caribbean country. It is noteworthy that the low requirements for setup has both allowed the cluster to grow, and compromise the quality of education offered.

²⁶ This was based on interviews with the officials from Grenada.

²⁷ For students to gain access to the US federal student loan program, the university must be accredited by US state medical board. This results in US medical universities seeking such accreditation. In the Caribbean it is practiced on a voluntary basis.

Diagram 3
Steps required for establishing a medical university in the Caribbean



Source: Adapted from Swedish development advisers (2004).

IV. Challenges in the Caribbean's OMU cluster

There have been many reports which expressed concerns regarding the quality of education offered by offshore medical universities in the Caribbean (Charles 1979; Korcok 1979; Swedish Development Advisers 2004; Boulet et al. 2009; Eckhert 2010).

There have been reports of high dropout rates²⁸ and students performed poorly on the USMLE step 1 examination. U.S. medical schools admit approximately 40 to 250 students per class per year, with graduation rates for their four-year programmes ranging from 90 per cent to 95 per cent. In contrast, Caribbean OMUs admissions are two to three times per year, with as many as 300 students per class (Halperin and Goldberg 2016).

One study notes

“Even for the Caribbean schools with the best outcomes, graduation statistics are poor by U.S. medical school standards: 34 per cent of Ross University School of Medicine (RUSM) students, 33 per cent of American University of the Caribbean School of Medicine (AUC) students, and 20 per cent of St. George’s University School of Medicine (SGU) students fail to graduate on time.” (Halperin and Goldberg 2016, 639).

Parolini and Platek (2010) reports that the teaching structure at offshore medical universities is designed specifically to prepare students for USMLE examinations. Such “teaching for the test it is argued, “may not properly prepare IMGs for the rigors of a professional career in medicine. Parolini and Platek (ibid) also report that the teaching frequently occurs over the internet and through distance learning programmes. Such teaching methodology runs contrary to the North American medical university model where attendance at lectures is mandatory.

Table 5(a) and 5(b) outline the performance of students from US and non-US medical universities on the USMLE Step 1 examination. First time takers from North American medical schools tend to experience a 96 per cent pass rate. However, first time takers from offshore medical universities, including the Caribbean, tend to experience a 78 per cent pass rate. The US students can be expected to perform better at the USMLE examination given that they admit students with better academic performance (on GPAs and MCAT scores). Those students in the OMUs are statistically likely to perform not as well as their US counterparts, notwithstanding the quality of education. Nevertheless, there is a general perception that weaker performance of the students of the OMUs at the USMLE

²⁸ In some instances more than 50 per cent of the enrolled students dropped out within the first year of study (Korcok 1979).

examinations indicates a lower quality education in the OMUs (Swedish Development Advisers 2004; Boulet et al. 2009; Eckhert 2010; Halperin and Goldberg 2016).

All medical graduates, whether from US or non-US medical universities, must pursue their residency training in the US in order to later practice medicine in that country. As a prerequisite to enter a US residency programme accredited by the Accreditation Council for Graduate Medical Education (ACGME), IMGs are required to achieve certification by the Educational Commission for Foreign Medical Graduates (ECFMG). The ECFMG requires IMGs to have passed USMLE Step 1 and 2 examinations, and successfully completed their clinical rotations. The ECFMG also assesses the applicant's medical credentials (Boulet et al., 2006).

Table 5(a)
USMLE Performance Scores Step 1

Performance of IMGs on USMLE Step 1 (2015)		
	Number passing	Passing rate (per cent)
Total	12 687	72
First takers	11 646	78
Repeaters	2 720	38
U.S. citizens	3 590	71
First takers	3 232	79
Repeaters	358	35
Foreign citizens	9 097	72
First takers	8 414	77
Repeaters	683	40

Source: ECFMG (2015b).

Table 5(b)
USMLE Performance Scores Step 2

USMLE Step 2 Clinical Knowledge			USMLE Step 2 Clinical Skills		
	Number passing	Passing rate (per cent)		Number passing	Passing rate (per cent)
Total	10 336	70	Total	11 393	78
First takers	9 221	75	First takers	9 433	80
Repeaters	1 115	46	Repeaters	1 960	71
U.S. citizens	3 035	70	U.S. citizens	3 492	82
First takers	2 572	75	First takers	2 939	85
Repeaters	463	49	Repeaters	553	72
Foreign citizens	7 301	71	Foreign citizens	7 901	77
First takers	6 649	75	First takers	6 494	78
Repeaters	652	45	Repeaters	1 407	70

Source: ECFMG (2015b).

A. Accreditation

Another challenge experienced in the Caribbean's OMU cluster is a wide range of mechanisms for oversight of formal accreditation. In some countries, such as Cuba and the Dominican Republic, accreditation is carried out by a local governmental agency. In countries lacking a nationalized medical accreditation system, the university may opt for accreditation by a foreign agency. For example medical universities in the Cayman Islands and Netherlands Antilles may seek accreditation from the Accreditation Commission on Colleges of Medicine based in the Republic of Ireland (van Zanten and Boulet 2008).

UWI's MBBS, and MD programmes were initially accredited by the General Medical Council (GMC) of the United Kingdom (UK). However, since 2001 the GMC was no longer authorized to accredit schools outside of the UK. Subsequently the Caribbean Community (CARICOM) established the Caribbean Accreditation Authority for Education in Medicine and other Health Professions (CAAM-HP) in 2003, to accredit CARICOM medical tertiary level institutions. Thus UWI's MBBS, and MD are currently accredited by the CAAM-HP (CAAM-HP 2014; Parkins 2009). However, the UWI medical degree programme can be classified categorized as regional since it accommodates students from the Caribbean seeking to practice medicine in the sub-region.

To achieve and maintain accreditation under the auspices of the CAAM-HP²⁹, medical universities located in the CARICOM region must comply with a number of requirements regarding the institution's governance, student admissions, student administration, curriculum management, faculty administration, and educational resources. Some of the requirements include the following:

- the institution must establish periodic or cyclical institutional planning processes to ensure successful adaptation of its medical education programme to the rapidly changing environment. Planning efforts must involve the periodic reassessment of both short-term and long-term academic teaching goals;
- the university must have established by-laws governing how the medical school is organised, including the responsibilities and privileges of administrative officers, faculty, and students;
- there must be established formal policies and procedures to avoid the impact of conflicts of interest of members in the operation of the institution;
- the faculty of each institution must develop admission criteria for the selection of students;
- the medical schools must provide students with effective financial aid counselling, and must have a clear, reasonable and fair policy for the refund of a medical student's tuition fees;
- in the admission and teaching process there must be no discrimination of students on the basis of gender, sexual orientation, age, race or religion;
- the institution must publicise to all faculty and students its standards and procedures for the evaluation, graduation, and disciplinary action for its students;
- the institution must ensure that its medical students in clinical situations involving patient care are appropriately supervised at all times in order to ensure the safety of both the patient and the student;
- the medical school must design and the faculty approve a curriculum that allow medical students to develop the requisite skills of a medical practitioner. Such programmes should be at least 130 weeks of instruction delivered over at least 4 calendar years;
- In addition to science and clinical disciplines, the teaching curriculum must include behavioural and socioeconomic subjects³⁰.

Some Caribbean offshore medical universities have never undergone formal accreditation because the process is noncompulsory in nature (van Zanten and Boulet 2008). By 2015, the CAAM-HP had only assessed programmes for a small number of Caribbean offshore medical universities. Table 6 provides an overview.

²⁹ The CAAM-HP standards were originally compiled and based upon the GMC. However, they were later revised in 2017 to incorporate the standards of the Liaison Committee on Medical Education.

³⁰ For further details on the CAAM-HP accreditation requirements, see CAAM-HP (2017).

Table 6
CAAM-HP Assessed Universities

School Name	Host Country	Status
All American Institute of Medical Sciences	Jamaica	Initial Provisional Accreditation Withdrawn
All Saints University	Aruba	Not Accredited
American University of Antigua College of Medicine	Antigua and Barbuda	Accredited with Conditions, 2014-2017
Avalon University School of Medicine	Curacao	Not Accredited
British International University (BIU)	Montserrat	Accreditation Withdrawn
Global University Schools of Medicine and Public Health (GU-MED)	Turks and Caicos	Initial Provisional Accreditation Withdrawn
International American University (IAU) College of Medicine,	Saint Lucia	Not Accredited
Ross University School of Medicine	Dominica	Accredited with Conditions, 2014-2018
Saint James School of Medicine	Anguilla and Saint Vincent and the Grenadines	Pending
Spartan Health Sciences University School of Medicine	Saint Lucia	Provisional Accreditation Extended, 2016-2018
St. George's University (SGU) School of Medicine	Grenada	Accredited with Conditions, 2015-2019
The University of the West Indies (UWI) School of Medicine	Barbados, Jamaica, Trinidad and Tobago	Accreditation with Conditions extended for one (1) year, until 2019
Trinity School of Medicine	Saint Vincent	Accreditation with Conditions, 2017-2019
University of Guyana School of Medicine	Guyana	Accreditation with Conditions, 2017-2021
University of Science, Arts and Technology (USAT)	Montserrat	Not Accredited
Vanguard University School of Medicine	Montserrat	Initial Provisional Accreditation Withdrawn
Windsor University School of Medicine,	Saint Kitts	Not Accredited
Xavier University School of Medicine,	Aruba	Provisional Accreditation Extended, 2016-2018

Source: CAAM-HP website.

US medical universities are accredited by Liaison Committee on Medical Education (LCME).³¹ In many instances, accreditation by Caribbean countries' accreditation agencies is not comparable to that of the LCME. Neither in the US nor Canada is there is a formal authority mandated to accredit foreign offshore medical university programmes. The US Department of Education, through its National Committee on Foreign Medical Education and Accreditation (NCFMEA) reviews the accreditation standards used by foreign countries to determine if such standards are comparable to the US standards. If the NCFMEA determines that a country's accreditation standards are comparable to the US standards, then students enrolled in these accredited universities would be eligible for US federal loans (Swedish Development Advisers 2004; Eckhert 2010; Halperin and Goldberg 2016).

The NCFMEA recognizes only four Caribbean offshore medical universities as providing education that is equivalent to the US medical universities³². These universities include:

- St. George's University School of Medicine, Grenada;

³¹ Canadian medical universities are also accredited by the LCME.

³² Subsequently, US students attending the Caribbean offshore medical universities that are recognized by the NCFMEA, may access US federal loans.

- Ross University School of Medicine, Dominica;
- American University of the Caribbean School of Medicine, St. Martin;
- Saba University School of Medicine, Netherlands Antilles.

It is important to note that these four schools are located on the Caribbean islands with the highest ECFMG certification rates.

B. Residency

Residency matching refers to the degree of success a medical graduate is able to land a residency in the specialty area they desire. There is also disparity in the IMGs success at landing residency. In the NRMP and ECFMG (2016) report they defined match success as a match to the specialty of the applicant's first-ranked programme. Such specification results in the category "not-matched" including both matching to another specialty as well as failure to attain any matching.

In the 2016, the main residency matches that were sought by medical graduates included: Anesthesiology, Emergency Medicine, Family Medicine, Internal Medicine, Neurology, Obstetrics and Gynecology, Pathology, Pediatrics, Physical Medicine and Rehabilitation, Psychiatry, Radiology, and General Surgery.

Table 7 summarizes the medical graduates' success in their ability to obtain matching in their residency programmes. It provides a summary of the performance of US Medical Graduates (US MGs) and IMGs at landing residencies. The results indicate that US MGs generally have higher success rates at landing residencies than US IMGs. The success of US IMGs tend to range between 22per cent and 72per cent in the different specialty areas. The highest number of US IMGs land residencies in Internal Medicine followed by Family Medicine. However, Internal Medicine and Family Medicine are non-procedural specialties. The smallest number of US IMGs matches residencies in Physical Medicine and Rehabilitation, Pathology and Emergency Medicine. However, US MGs attained high success rates in matching in the aforementioned areas.

The ECFMG does not report the individual success rates of offshore universities at residency matching. RUSM reported that 785 of their students attained residency appointments for 2016. RUSM definition of success includes those students who did not get their first choice of specialty but obtained residency in one of their alternative fields. However, RUSM did not report how many of their IMGs failed to obtain any residency matching.

St. Georges University reported that more than 900 of their students managed to obtain residency matching for 2017. AUC reports that they managed to obtain 276 residencies matching for 2017. St. Matthews University (SMU) reports only 43 of their students were successful at residency matching for 2016.

Some Caribbean offshore medical universities such as Saba University School of Medicine, Spartan Health Sciences University, and University of Health Sciences Antigua do not report their success rates at matching residency. Lack of transparency in the residency matching is a major cause for concern, since students may commit time, resources, and loans to pursuing medical education in an offshore university. If they fail to land a residency, it would prevent them from becoming a physician in the US.

Table 7
Matching at Residency 2016

Preferred Speciality	Total positions offered	total number of applicants	USIMGs		success rate (per cent)	non-USIMGs		total IMG		
			matched	not matched		matched	not matched	matched	not matched	
Anesthesiology	1 696	1 771	122	48	72	87	82	209	130	339
Child neurology	170	170	7	7	50	20	17	27	24	51
Dermatology	440	614	8	14	36	10	11	18	25	43
Diagnostic radiology	1 168	1 220	76	42	64	101	76	177	118	295
Emergency medicine	1 895	2 270	84	97	46	21	52	105	149	254
Family medicine	3 238	4 139	596	631	49	315	520	911	1 151	2 062
General surgery	1 241	1 845	73	152	32	55	208	128	360	488
Internal medicine	7 352	9 857	967	911	51	1 967	1 732	2 934	2 643	5 577
Internal medicine/Paediatrics	386	460	16	12	57	6	19	22	31	53
Neurological surgery	216	342	3	5	38	8	40	11	45	56
Neurology	770	985	42	52	45	170	164	212	216	428
Obstetrics and gynecology	1 265	1 606	64	91	41	45	106	109	197	306
Orthopaedic surgery	717	1 034	6	21	22	8	17	14	38	52
Otolaryngology	304	358	3	2	60	8	8	11	10	21
Pathology	579	755	49	50	49	157	135	206	185	391
Pediatrics	2 768	3 234	202	167	55	242	280	444	447	891
Physical medicine and rehabilitation	414	538	33	44	43	11	24	44	68	112
Plastic surgery	152	206	3	2	60	3	6	6	8	14
Psychiatry	1 386	2 134	144	302	32	120	298	264	600	864
Radiation oncology	186	218	1	3	25	3	4	4	7	11
Vascular surgery	56	107	0	9	0	4	17	4	26	30

Source: NRMP and ECFMG (2016).

C. Other challenges – case study of SGU in Grenada

Apart from the accreditation and residency limitations, the OMUs in the Caribbean tend to be affected by the infrastructure limitations of the respective Caribbean islands. For example, the quality of the road network in Grenada (surface, lack of sidewalks, and lack of speed bumps) has negatively affected the students of SGU. In fact, on March 24, 2016, and on April 12, 2016, the lives of two students of SGU were lost via road fatalities. A related concern regarding road safety in Grenada is the lack of enforcement of the laws for the mandatory use of helmets by motor scooter riders.

In Grenada, additional challenges to the OMUs include³³:

- The capacity of the Grand Anse sewerage system to cope with continued growth of the population in the area.
- The high electricity costs in the island (US 30/kWh) which impacts heavily the operating costs of teaching facilities, research labs, dorms, etc.
- The environmental degradation resulting from the absence of standards, regulations, and policy for hazardous/toxic waste disposal; recycling, re-use, etc.
- The absence of standards of off-campus housing/food quality. In response to concerns from students and their families, SGU is considering the development and implementation of policies on the certification of off-campus housing.
- The elimination of tax concessions on the importation of rolling stock for the student bus service. Such policy shift reduces the provision of public transportation to SGU's students.
- The planned changes to American Airlines' flight schedule will result in higher travel costs for visitors. Travelers originating from the west coast of the US in particular will subsequently have to overnight in Miami in order to catch the early morning flights to Grenada.

³³ This was based on interviews with the officials from Grenada.

V. Strategies for developing the cluster

The main concern that arises regarding the offshore medical university industry is the questions surrounding the quality of education offered by the medical universities (Boulet et al. 2009; Freedman 2009; Duvivier et al. 2014). The ECFMG is well aware of the quality of education offered by offshore medical universities. Subsequently it has announced that, effective in 2023, all physicians applying for ECFMG Certification will be required to graduate from a medical university that has been appropriately accredited. Subsequently offshore medical universities must be accredited by a formal process that is comparable to the standards established by the LCME (ECFMG 2010).

In the Caribbean cluster, the CAAM-HP can also be used to address the quality of medical education. As previously indicated, accreditation is currently on a voluntary basis. This allows many Caribbean offshore universities to continue to legitimately operate without ever seeking any form of accreditation. Governments of the host countries accommodating the offshore medical universities can implement legislation that mandates all universities operating in their country to obtain CAAM-HP accreditation as a prerequisite for continued operation. Furthermore, the host Caribbean countries can adopt a coordinated and harmonized approach to mandatory accreditation. Such approach should be taken to encourage collaboration rather than competition between the host Caribbean countries. Moreover, governments of Caribbean countries can synchronize the educational requirements for medical practitioners, allowing the medical practitioners to be mobile between Caribbean and CARICOM member states. While this is a bold recommendation, it is uncertain if such policy would ever be taken.

The economic contribution of the Caribbean offshore medical universities can be increased if more regional medical doctors are hired as lecturers in the university. The host country can also experience a greater economic benefit if a greater percentage of its citizens pursue programmes in the offshore medical university. Thus, the offshore medical university can construct programmes that can prepare local students for the domestic or regional physician market.

Caribbean offshore medical universities can also increase their contribution to the economies of host countries by forming partnerships with regional hospitals to allow their students to pursue their clinical rotations. When such students are training on their clinical rotations, they may increase the amount of health care services offered to citizens of the host country. Such partnership will benefit both the university and the hospital since the university may gain access to hospitals for its students.

Likewise, the hospital may earn additional revenue streams and or equipment. Moreover, emphasis should be placed upon improving the quality of health care administered in the host Caribbean countries.

Another one of the major short comings of Caribbean offshore medical universities is their failure to conduct research. Universities typically contributed to the economic development of countries by engaging in research, building human capital, building knowledge, and dissemination of such knowledge. Indeed, given that the Caribbean region tends to experience high rates of mortality from non-communicable diseases (Murray and Lopez 1997; Boutayeb 2006; Legetic et al. 2016), research in such area can undoubtedly benefit the citizens of host Caribbean countries.

Governments in the host countries can engage the offshore medical universities in talks to engage in research and disseminate their findings to medical hospitals. A policy framework can be developed to encourage the offshore medical universities to form partnerships with local hospitals and create research units. The policy framework can also be designed to develop a medical tourism cluster. The research from the universities as well as some of the IMGs can be retained and used locally to support the potential medical tourism cluster.

It is important to note, the OMUs are established in the Caribbean with the objective of earning a profit, not to achieve any economic development of the host country. Currently, there is nothing to motivate or mandate the OMUs to take actions which will maximise the welfare of the host countries. Presently, any rents earned are a positive spillover to the region. Thus, there is room to develop an organized local content type framework that would encourage more local inputs (labour, services, goods, etc) being directly used by the OMUs. Moreover, there is room for governments to develop an enabling environment, which would enhance the amount of domestically produced inputs for the OMU cluster.

VI. Conclusion

Excess demand for medical education and constraints to training in US medical university seem to be key factors that caused the cluster to emerge. However, The Caribbean is an ideal location for the establishment of offshore medical schools given the close proximity to the US, language similarities, and relative ease in the establishment in the medical universities. This answers the first research objective.

As regards the characteristics of the cluster, the OMUs in the Caribbean are for profit institutions, training students seeking to become physicians in the US. The Caribbean OMUs act as a substitute for US medical universities, allowing students to attain pre-clinical training. However, successful students at the USMLE Step 1 examination may proceed to pursue clinical rotations in the US. Although the clinical rotation experience varies from teaching hospital, the OMUs are eventually placed in similar conditions to their US counterparts as they must also pass USMLE Step 2, and then pursue residencies in the US, before attempting USMLE Step 3, and obtaining a license to practice from the ECFMG.

While the medical universities curriculums are developed based upon the curriculums of US medical universities, the NCFMEA views only four Caribbean OMUs as providing education that is equivalent to the US medical universities. Moreover, there is weaker performance of the students on the USMLE step 1 examination, and their success rates at residency matching. This answers the second research objective.

The OMUs contribute to the economies of the host countries by the taxes directly paid by the universities, and expenditure incurred by the staff and students. Developers of housing, and groceries located in close proximity to the OMUs stand to benefit from the immigration inflows. However, SMEs can benefit by the provision of more consumer goods and services to the immigrating staff and students. This answers the third research objective.

Two strategies have been taken to improve the quality of the Caribbean medical offshore universities. One strategy has been the implementation of the CAAM-HP since 2003, to accredit medical universities located in the Caribbean region. The second measure is the new requirement of the ECFMG whereby offshore medical universities producing IMGs that target the US market must gain accreditation that is comparable to the standards established by the LCME.

Infrastructural and operational bottlenecks in the Caribbean islands continue to challenge the operations of the OMUs in the Caribbean. Addressing such challenges can certainly alleviate the operational constraints on the OMUs in the Caribbean.

The contribution of the OMUs can be increased by the hiring of more local staff (both academic and non-academic), increasing students enrolment, and by forming partnerships with regional hospitals. Furthermore, greater effort can be placed to provide more consumer goods and support services, which may be consumed by the students during their tenure at the Caribbean OMUs.

As a future study, there is room to theoretically revisit the movement of foreign capital in the form of the OMUs to Caribbean from a developmental perspective, and consider a local content strategy type strategy (consistent with the World Trade Organization's Trade-Related Investment Measures), to capture more value added in the Caribbean cluster.

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