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How Many Medical Schools Does a Country Need? A Global Framework Applied to Libya

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Abstract

Medical schools play a crucial role in training competent physicians to meet a nation's health care needs. However, establishing and maintaining medical schools requires significant investment, strategic planning, and a careful balance between quantity and quality. This review explores four key questions: (1) Who needs a medical school? (2) What criteria should guide the establishment of new medical schools? (3) How can the optimal number of medical schools for a country be determined? (4) How can nations balance expansion with quality assurance to prevent an oversupply of substandard institutions?

Using Libya as a case study, this article examines the rapid proliferation of medical schools in a developing nation with unique socioeconomic and political challenges. Libya's medical education system has grown from two schools in the 1970s to 17 today, yet this expansion has not been matched by proportional increases in faculty, clinical training capacity, or educational quality. Political interference, deregulated admissions, and lack of oversight have led to declining standards, with pass rates as low as 50% in some institutions. The Libyan case highlights broader issues faced by low- and middle-income countries (LMICs), where unplanned expansion of medical schools often results in poorly trained graduates, limited job opportunities, and brain drain.

The World Federation for Medical Education provides a framework of seven criteria for establishing new medical schools, emphasizing the need for adequate faculty, clinical training facilities, sustainable funding, and alignment with national health care demands. Applying these criteria could help LMICs avoid the pitfalls of unregulated growth. Recommendations for Libya and similar contexts include: (1) immediate actions: a moratorium on new medical schools and strict accreditation audits, (2) medium-term strategies: faculty development programs, partnerships with international institutions, and curriculum reforms, and (3) long-term solutions: national licensing exams, consolidation of underperforming schools, and policies to align medical education with workforce needs.

The review underscores that while medical schools are essential for health care development, their establishment must be guided by evidence-based planning rather

Keywords
- ► undergraduate medical education
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than political or emotional motivations. Uncontrolled expansion risks producing inadequately trained doctors, eroding public trust, and wasting resources. Conversely, strategic development—balancing access with quality—can strengthen health care systems, improve education standards, and ensure sustainable physician supply.

المقالة باللغة العربية

كم كلية طب تحتاجها الدولة؟ إطار عالمي مطبق على ليبيا

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تلعب كليات الطب دوراً مهماً حاسماً في إعداد أطباء أكفاء لتلبية الاحتياجات الصحية للدول. ومع ذلك، فإن إنشاء هذه الكليات والحفاظ عليها يتطلب استثمارات كبيرة وتخطيطاً استراتيجياً وتوازناً دقيقاً بين عدد الطلاب والجودة. تستعرض هذه الورقة أربعة أسئلة رئيسية: (1) من يحتاج إلى كلية طب؟ (2) ما المعايير التي يجب أن توجه إنشاء كليات طب جديدة؟ (3) كيف يمكن تحديد العدد الأمثل لكليات الطب في دولة ما؟ و(4) كيف يمكن تحقيق التوازن بين التوسع وضمان الجودة لتجنب التضخم في المؤسسات التعليمية دون المستوى؟

باستخدام ليبيا كدراسة حالة، يناقش المقال الانتشار السريع لكليات الطب في دولة نامية تواجه تحديات اجتماعية واقتصادية وسياسية فريدة. فقد توسع نظام التعليم الطبي الليبي من كليتين في السبعينيات إلى 17 كلية اليوم، لكن هذا النمو لم يرافقه تحسن متناسب في هيئة الإدارة أو قدرات التدريب السريري أو جودة التعليم. أدى التدخل السياسي وعدم تنظيم القبول وغياب الرقابة إلى تراجع المستوى العام لهذه الكليات، حيث وصلت نسبة النجاح في بعض الكليات إلى 50% فقط. تُظهر حالة ليبيا مشكلات أوسع تواجهها الدول منخفضة ومتوسطة الدخل، حيث يؤدي التوسع غير المخطط لكليات الطب إلى تخريج أطباء غير مؤهلين، وفرص عمل محدودة، وهجرة الأدمغة .

يقدم الاتحاد العالمي للتعليم الطبي (WFME) إطاراً يتضمن سبعة معايير لإنشاء كليات طب جديدة، تشدد هذه المعايير على ضرورة توفر أعضاء هيئة تدريس بالعدد الكافي، ومرافق تدريب سريري ملائمة، وتمويل مستدام، ومواءمة مع الاحتياجات الصحية الوطنية. يمكن أن يساعد تطبيق هذه المعايير الدول النامية في تجنب مخاطر النمو غير المنظم.

تشمل التوصيات لليبيا وسياقات مماثلة :

1) **إجراءات فورية:** وقف إنشاء كليات طب جديدة وإجراء مراجعات صارمة لاعتماد المؤسسات القائمة.
2) **استراتيجيات متوسطة المدى:** برامج تطوير أعضاء هيئة التدريس، وشراكات مع مؤسسات دولية، وإصلاح المناهج.
3) **حلول طويلة المدى:** اختبارات ترخيص وطنية، دمج الكليات ضعيفة الأداء، وسياسات لربط التعليم الطبي باحتياجات القوى العاملة.

تؤكد المراجعة أن كليات الطب ضرورية لتطوير القطاع الصحي، لكن إنشاءها يجب أن يستند إلى تخطيط قائم على الأدلة بدلاً من الدوافع السياسية أو العاطفية. فالتوسع غير المنضبط يعرض الدول لخطر تخريج أطباء غير مؤهلين، وتآكل ثقة الجمهور، وإهدار الموارد. في المقابل، يمكن للتطوير الاستراتيجي - الذي يوازن بين الأعداد والجودة - أن يعزز النظم الصحية، ويحسن معايير التعليم، ويضمن إمدادات مستدامة من الأطباء .

الكلمات المفتاحية: التعليم الطبي الجامعي، كليات الطب، الدول النامية، ليبيا، معايير WFME، ضمان الجودة، تخطيط القوى العاملة الصحية.

Introduction

The fundamental goal of undergraduate medical education is to produce competent physicians who can effectively serve their nation's health care system.[1] Consequently, strategic decisions regarding when to establish new medical schools and determining the appropriate number of institutions are critical for every country. However, medical education represents a complex and resource-intensive undertaking that requires meticulous planning to maintain equilibrium between societal needs, educational quality, and financial sustainability. Impulsive decisions driven by political motives, nationalistic fervor, or emotional appeals may lead to detrimental outcomes.[2–4]

Objectives

This perspective article examines four interconnected questions:

- Which nations or regions require new medical schools?
- What standards should guide the establishment of medical schools?
- How should countries determine the optimal number of medical institutions?
- How can we maintain quality while preventing excessive proliferation of medical schools?

Libya serves as our case study due to its distinctive socioeconomic context and rapid expansion of medical education institutions.

Methodology

Our mixed-methods approach incorporates:

- Analysis of WFME accreditation standards as the foundation for policy recommendations.
- Review of undergraduate medical education challenges in developing nations.
- Evaluation of Libya's medical education landscape using:
  - WHO's (World Health Organization's) list of 17 accredited medical schools.
  - Published data on enrollment trends, pass rates.
  - Evidence of quality deterioration amid institutional expansion.

Who Needs a Medical School?

Global demographic trends—including population growth, increased life expectancy, and advancing medical complexity—continue to escalate demand for physicians worldwide.[1–3] While developed nations often address physician shortages by recruiting international medical graduates as a cost-effective solution,[5] most developing countries lack this option due to constrained resources. Consequently, many developing nations established undergraduate medical education programs decades ago, while others have initiated them more recently.[6–8] However, the distribution and quantity of medical schools within countries often reflects socio-political influences rather than logical planning.

Determining the need for new medical schools requires careful evaluation of three key factors:

- Current and projected physician requirements at national and community levels.
- Existing medical graduate output from current institutions.
- Domestic and international physician migration patterns.[9–11]

For nations without medical schools, establishing domestic training capacity represents an urgent priority.[10] While common objections cite national poverty, small population size, or opportunities for foreign training,[11,12] sustainable health care workforce development cannot depend indefinitely on other countries. Tsinuel et al[13] specifically examined the challenges of creating and maintaining quality medical education during rapid expansion in resource-limited Sub-Saharan African settings, identifying essential minimum requirements for new institutions. Their consensus recommendations stress that governments must create detailed strategic plans for medical school development and institutions require autonomy in student selection, curriculum design, and resource management.[13]

When properly implemented, new medical schools generate significant benefits beyond physician production, including health care system strengthening, academic advancement, and local economic growth through job creation and community development.[14,15]

However, these outcomes depend on thorough needs assessments and meticulous execution of establishment plans.

What Are the Criteria for Establishing a New Medical School?

In 2016, the World Federation for Medical Education (WFME) established evidence-based criteria for founding new medical schools through expert consensus.[9] This seven-point framework (►**Table 1**) serves as a decision-making tool to assess both the necessity and feasibility of new institutions, ensuring only essential, high-quality medical schools are developed. The guidelines address critical planning considerations—from initial needs assessment to long-term implementation—requiring meticulous preparation years before program commencement.

These criteria, developed in collaboration with WHO regional experts from the Eastern Mediterranean and

Table 1 Highlights of the 2016 World Federation for Medical Education criteria for establishing a new medical school[a]

Criteria for establishing a new medical school
Criterion 1. Need assessment
Supplementary Criterion 1a: Is the purpose of the medical school to serve special groups, such as culturally defined groups? Are there any imbalances in the availability of medical doctors?
Supplementary Criterion 1b: What is the assessment of possibilities for substituting medical doctors in the health workforce of the community, region, or nation by other health care professionals?
Criterion 2. The certainty of providing appropriate clinical settings and sufficient patients for the clinical part of the educational program should be essential for agreeing to establish a new medical school.
Criterion 3. The necessary economic resources for the medical school are essential each year until they are fully developed (corresponding to the duration of the program in years) and for the subsequent years.
Criterion 4. There must be a plan to provide the physical facilities necessary to deliver the program.
Supplementary criterion 4a: There must be plans for the provision of other specialized facilities such as science laboratories, clinical skills laboratories, and library and IT facilities.
Criterion 5. A financial and business plan must cover all expected staff costs, such as salary, benefits, training, and faculty development for the academic staff (including teaching and research staff) and administrative staff.
Supplementary criterion 5a: What is the assessment of the recruitment possibilities of qualified staff locally, nationwide, and internationally?
Supplementary criterion 5b: Is the leadership of the proposed medical school in place, with competent and experienced academic and administrative leadership?
Criterion 6. What is the plan for student numbers and the wide range of student support such as student housing, dining and catering facilities, sports facilities, and academic and social counseling?
Supplementary criterion 6a: Are qualified student applicants likely to exist in the number expected from the local area or other national and international areas? Is it the intention to recruit students from special groups?
Criterion 7. What is the assessment of the local political and popular support of the plan to establish the medical school?
Supplementary criterion 7a: Is the existing local infrastructure sufficient, and is it possible to connect a new medical school to existing systems (for water supply, power, and electricity supply, a public sewerage system, and public transportation)?

Note: We propose that these criteria be used to revisit the justification of pre-existing medical schools to justify their existence using our proposed tool in ►**Supplementary Table S1**.
[a]Derived from the World Federation of Medical Education.

Southeast Asia,[9] offer practical guidance for national governments, regulatory bodies, and university administrators. The framework consists of two key components: a *needs assessment* (Criterion 1), which evaluates projected physician workforce demands based on a proposed medical school's size and location, and *implementation feasibility* (Criteria 2–7), which examines critical operational factors. These feasibility considerations include curriculum design (covering program structure, student intake, and evaluation methods), clinical training infrastructure (ensuring sufficient patient exposure across primary and secondary care settings), financial sustainability (accounting for startup and operational costs for facilities, equipment, and staffing), physical resources (such as teaching spaces, simulation labs, information technology systems, and utilities), human resources (including faculty recruitment, leadership training, and administrative support), and student support systems (encompassing admission policies and academic resources). By methodically addressing these components (as outlined in ►**Table 1**), the WFME guidelines seek to curb the expansion of low-quality medical schools while encouraging strategic, well-planned development of medical education programs.

Determining the Appropriate Number of Medical Schools

Determining the ideal number of medical schools involves carefully balancing the need for broad educational access with the ability to uphold rigorous standards in both medical training and health care services (►**Table 1**). This intricate assessment must consider several critical dimensions.[9–15] First, *demographic factors* play a fundamental role, including population size, growth trends, and current and future physician-to-population ratios—a crucial WHO health system metric.[16] Second, *health care system* needs must be evaluated, accounting for disease prevalence, health care accessibility and infrastructure,[17] and alignment with national priorities such as addressing rural health care gaps or incorporating traditional medical practices.

Economic realities form a third essential consideration, encompassing a nation's ability to finance physical infrastructure, attract and develop qualified faculty, and sustain ongoing educational investments,[12,13] while also managing competing budgetary demands. The fourth factor focuses on *educational infrastructure*, particularly the availability of high-quality clinical training facilities like hospitals and clinics,[18,19] robust faculty development initiatives,[9] and maintaining an appropriate equilibrium between the number of institutions and their educational quality.[11,12] Finally, adherence to *global standards* is vital, including compliance with WFME's internationally recognized medical education benchmarks[9] and contemporary trends that emphasize educational excellence over rapid, scaled-up training models.[20]

This comprehensive planning process must weigh both short-term requirements and long-term viability, as an oversaturation of medical schools without sufficient resources could compromise educational standards and overburden health care systems. Strategic planning is therefore essential to ensure that medical education expansion aligns with actual health care needs and sustainable development goals.

Balancing Quantity and Quality: Addressing Medical School Oversupply

Achieving an optimal distribution of medical schools requires careful consideration of three fundamental scenarios.

Absence of Medical Schools

While establishing quality medical institutions requires substantial investment, the long-term costs of having no medical school may be greater.[10–12] Beyond physician training, medical schools contribute to knowledge generation through research and publications (evidenced by limited medical literature from nations without schools),[10–12] and enhanced health care quality through faculty expertise and clinical innovation.

Single Medical School Systems

A monopoly in medical education presents several challenges,[10,11] including lack of competitive pressure, potentially fostering mediocrity, restricted opportunities for resource and expertise sharing, limited research capacity compared to multiple-institution systems, and reduced educational alternatives for students and faculty.

Excessive Medical School Proliferation

The expansion of medical schools must align with three critical factors: socioeconomic development, population needs (including those of neighboring regions), and *WFME* establishment criteria.[9] Oversupply becomes evident when institutions fail to meet WFME quality standards,[9] when graduate output surpasses postgraduate training capacity, or when inadequate faculty and resources compromise educational quality.[21,22] Additionally, physician migration patterns can significantly distort workforce planning.[21–24] The 2023 foreign graduate policy changes remain contentious, presenting both potential benefits for undergraduate education and risks of exacerbating brain drain.[23,24]

In conclusion, strategic planning for medical education systems should carefully consider three essential elements: maintaining a quality–quantity equilibrium, recognizing the benefits of multi-school systems, and accounting for key demographic factors, including population size, development indicators, and migration trends. This balanced approach ensures sustainable development of medical education infrastructure that meets both current needs and future challenges.

Case Study: Libya

Using policy documents and WHO/WFME criteria, we analyze Libya's medical school proliferation since 1970, highlighting how political instability led to a 200% increase in schools without proportional faculty or clinical training capacity. Lessons apply to low- and middle-income countries balancing workforce demands and educational standards.

Historical Background

Young country, although its national state was established early in the second half of the 20th century. In short, Libya's postcolonial political history can be readily divided into three stages.[25] The constitutional monarchy under King Idris I (1951–1969) suffered limited resources before the discovery of oil in 1963 but was characterized by a conventional government style supported by Western technical advisors. Libya under Muammar Gaddafi times (1969–2011) enjoyed access to huge oil revenue at high prices but had poor management with an ideologically driven government. The post-Arab Spring uprising stage (2011 to date) is still in turmoil, characterized by the loss of central government and waves of military and civil unrest.[25]

Medicine in Libya

The first generation of modern Libyan medical graduates can be traced to when Libya was part of the Ottoman Empire. The few Libyan Ottman doctors were trained in Istanbul, mostly under the military services. Italian doctors were from the settlers in the main cities.[26] The country's socioeconomic status would not have allowed medical schools to be established.[27] Surprisingly, even after independence, starting undergraduate medical education in Libya took over 2 decades. Small numbers of people who wished to study medicine in the 1950s and 1960s were sponsored by the State to go abroad for extended periods. The first Libyan medical school was opened in the early 1970s in Benghazi. The ministerial decree to establish a medical school in Benghazi came as sudden news to the first intake of 40 students, who were directed to this new school instead of their plans to seek scholarships in various other countries like their predecessors. From that year onward, medicine has been excluded from the state-sponsored undergraduate scholarships. The second medical school was opened in Tripoli 4 years later in 1973. The first two medical schools enjoyed a lot of support and funding that facilitated advisory services and visiting faculty from established colleges abroad. This had overcome the missing classical preparatory phase recommended for establishing medical schools.

Current Medical Education in Libya

The current medical education represents a unique area worth a critical look. The initial medical schools were professionally developed on the Egyptian model of a premedical year followed by a 5-year medical course and an internship year. In their early days, they were supported by seconded faculty from Egypt, Serbia, and India and visiting doctors from the United Kingdom and the United States. On their return from scholarship, Libyan specialists joined as clinical teachers in the new schools. For many years, entry was well-controlled to a number that matched the faculty and resources. They have attracted the top students from the high school graduates. The good performance of these schools is indicated by a large proportion of their graduates achieving training positions in the West and progressing to senior positions worldwide.

Between 1987 and 1997, four medical schools were established in four distant cities (Sebha, Zawia, Misrata, and Sirte). In at least three of these cities, population and socioeconomic circumstances could justify establishing of medical schools by the WFME criteria. Yet they may have not received similar support as the first two schools. However, in 1999, the regime interfered with medical education for no obvious reasons. Entry to medical schools was deregulated, with students being forcefully accepted way beyond the educational capacity of the medical schools resulting in low performance with pass rates down to 50%.[28] Many more medical schools were opened in cities without proper assessment of the needs nor the capacity to house medical schools with international standards.[29,30] Many voices criticized the progressive deterioration in undergraduate medical education, mostly from Libyan practitioners abroad and medical academics inside the country.[31–34] The greatest disappointment was that the trend continued even after the demise of the former regime.

►**Table 2** illustrates the current status of undergraduate medical education in Libya. It lists the currently recognized medical schools in the World Directory of Medical Schools. Careful examination of the data reveals both positive and negative observations. First, the dates of the establishing of medical schools reveal an early slow phase where the schools wisely limited to the largest cities. Second, between 1973 and 1998, four medical schools were started in reasonably sized cities. Third, from 1999 onwards, newer medical schools were established in smaller cities where it would theoretically be impossible to meet criteria 4 and 5 for establishing medical schools (►**Table 1**). Fourth, some cities and private entities grasped the opportunities of the post-2011 uprising and loss of central government control to establish new medical schools unjustifiably. Fifth, the single listed private medical school continues to be a successful venture. Its independence and strong leadership made it survive during the armed conflict by contracting places for the students in an Egyptian university for 2 years.

Several pitfalls can be identified in the current state of undergraduate medical education resulting from interference and deregulation, post-2011 anarchy due the armed and civil unrest, and also, the complacency and self-centered behavior within the medical institutions coupled with the lack of public accountability. It is common knowledge that many students depend on private coaching by a mixture of qualified and unqualified doctors who simply reiterate summaries from lecture handouts to prepare people to pass examinations rather than become real physicians. Furthermore, at the time of writing of this commentary, more medical schools, both state-owned and private, have been developed but do not appear in the World Directory so we did not include them in our analysis.

What Is the Way Forward?

The time for action to explore a way forward is long overdue.[28–34] Several actions are required to adjust the quantity and improve the quality of the undergraduate medical education with interim measures to resolve some of the

Table 2 The 17 Libyan medical schools listed in the WHO Directory of Medical Schools, their geographical distribution, and the locality's population as a measure of clinical training opportunities and economic and professional viability

Medical school name[a]	Location	City population[b]	Start year
University of Benghazi Faculty of Medicine	Benghazi[c]	650,629	1970
University of Tripoli Faculty of Medicine	Tripoli	1,150,989	1973
Sebha Medical University	Sebha	130,000	1987
Sirte University Faculty of Medicine	Sirte	128,123	1991
Misurata University Faculty of Medicine	Misrata	386,120	1997
University of Zawia Faculty of Medicine	Zawia	200,000	1997
Elmergib University Faculty of Medicine	Al-Khums	201,943	1999
Omar Al-Mukhtar University Faculty of Medicine	Al-Bayda	74,594	1999
University of Gharyan Faculty of Medicine	Gharyan	85,219	1999
University of Tobruk College of Medicine	Tobruk	121,052	1999
Libyan International Medical University Faculty of Medicine (Private)	Benghazi[c]	650,629	2007
Al Asmarya University Zliten Medical School	Zliten	109,972	2013
University of Zintan Faculty of Medicine	Alzintan	33,000	2015
University of Sabratha Faculty of Medicine	Sabratha	102,038	2016
Azzaytuna University Faculty of Medicine	Tarhuna	210,697	2016

Note: The data are derived from the websites of the World Directory of Medical Schools and World population Review.
[a]Listed in the World Directory of Medical Schools (last seen 5.12.2024).
[b]https://worldpopulationreview.com/countries/cities/libya (Last seen 5.12.2024).
[c]The city of Benghazi harbors two medical schools.

chronic problems. These may be based on observation made on the Libyan situation or drawing on experiences elsewhere.[28–34]

A phased approach is critical for instance, a short-term phase (of 0–2 years) should include a moratorium on new schools and implementation of a strict WFME criteria-based audits. A medium-term phase (of 2–5 years) should focus on faculty exchanges with national, regional, and international universities. The long-term phase (for 5+ years) should include establishing a national licensing exam aligned with international standards and comparable to Arab countries of similar context. This should create an internal competitive attitude between various "remaining" medical schools.

A comprehensive assessment and a plan of action is required. Actions need to be prioritized by feasibility as described above. However, solutions targeting school systems and curriculum, faculty and staff development, and students (both current and future) should consider the following urgent measures:

- In the first instance, the government must impose an immediate ban on creating new medical colleges and freezing or even better downscaling of the numbers of students based on the available facilities.
- The basic criteria for a medical school must be revisited and applied to the current situation of all existing medical schools. "Less is more" cannot be truer, i.e., to enhance "viable" schools and close "failing" schools. Amalgamation of geographically related schools may be advisable to enhance their academic strength by pooling of resources and expertise. Faculty development programs should be introduced as mandatory requirement of full-time faculty for all academic and clinical subjects.
- Strict implementation of the schools' "pass or leave" strategies that restrict the resit times should encourage more a serious attitude among students. Also, support of delayed students by short revision courses in parallel with the main program as prerequisites for any resit exams rather than coming back to resit exams simply to fail again.
- Innovative solutions may need to be considered to ease stagnation and the slow progression of students. For instance, creating new conversion BSc to cater for those students who are not progressing or who are having "second thoughts" about medicine as a career. These exit programs can be in the form of a 1 year of applied biomedical courses building on their 3 preclinical years.
- Incorporating "intercalated research BSc degrees" in the MBBS program to attract those who are passionate about research and academia. Both of these can be incorporated as intercollegiate degrees.
- Converting one of the schools to Military Medical School by adopting suitable models from various countries to support the health care needs of the Armed Forces. By its nature, such a school secures employment for all its graduates.
- Introducing a pre-internship national licensing exam and publicizing pass rates per school as a measure of credibility.

The potential role of the philanthropy workers, Libyan medical diaspora, and post-retirement volunteers should not be underestimated. Their contribution may help bridge the gaps in the short term and set a good precedent for the future.

►**Supplementary Table S1** provides a reflective scoring tool for the assessment of the needs and readiness for establishing a new medical school based on the 2016 WEME criteria. However, it can also be used reappraisal of on the status of existing medical schools. The tool provides detailed narrative criteria, a scoring system, and an interpretation grid of the total score. Optimal use of this tool is based on transparent reflection of a multidisciplinary nature including all stakeholders and independent peer reviewers.

Conclusion

Determining the optimal number of medical schools requires a multifaceted approach that balances demographic needs, health care system demands, economic feasibility, educational infrastructure, and global accreditation standards. Strategic planning must prioritize sustainable growth over rapid expansion, ensuring that medical education quality remains high while meeting the nation's health care workforce needs. By aligning institutional capacity with long-term health care goals, policymakers can foster a robust medical education system that delivers excellence in training and equitable patient care without compromising standards or overextending resources.

Conflict of Interest
None declared.

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