

# Students' conception of local responses to global problems for a more peaceful and sustainable world: A collaborative education project between Brazil, Canada, Qatar, and New Zealand

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## Abstract

**Background:** The concept of global citizenship aims to prepare learners to be able to function and be competitive within a global environment. Successful learners may effectively “think globally” but “act locally,” aiming to contribute to positive global change.

**Objective:** The goal of this project was to develop research-informed curricular content for global citizenship tailored to pharmacy students using a pre-established pedagogical framework. The intended learning outcome for the content was for students to “generate local responses to global problems for a more peaceful and sustainable world.”

**Methods:** This study occurred over three phases. Phase 1 consisted of semi-structured interviews with practicing pharmacists in Brazil (n = 4), Canada (n = 4), New Zealand (n = 4), and Qatar (n = 4) to identify global issues for case development. Phase 2 consisted of pilot testing developed cases from Phase 1 via individual interviews with target students in Canada (n = 2) and a focus group in New Zealand (n = 5). Phase 3 consisted of implementation of a 1.5-hours teaching event in New Zealand using the refined case material and formative assessment of final-year pharmacy students (n = 120).

**Results:** Phase 1 resulted in five case scenarios (antimicrobial resistance, drug shortages, ocean pollution, climate change, and rise of nationalism) across three categories (global health and wellbeing, climate and environment, and geopolitics and power) that were tested and refined in Phase 2. Phase 3 resulted in student groups being able to achieve the intended learning outcome on a median of 4 (range, 2-5) of the developed cases. Students' interventions included new dispensing models, use of technology, community engagement, education initiatives, and others.

Kyle John Wilby was at the School of Pharmacy, University of Otago, Dunedin, New Zealand at the time of this study.

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**Conclusion:** Findings support the notion that when tasked to “think globally,” students are able to “act locally” by designing pharmacy practice interventions to reduce the impact of political, environmental, and health-related global problems.

**KEYWORDS**

climate change, curriculum, global health, pharmacy, sustainable development

## 1 | INTRODUCTION

There are increasing calls and guidance to incorporate global competence within postsecondary education curricula worldwide.<sup>1-3</sup> The concept of global competence, and in particular global citizenship, aims to prepare learners to be able to function and be competitive within a global environment.<sup>4</sup> If done successfully, learners may effectively “think globally” but “act locally,” aiming to contribute to positive global change within their own work and social circumstances.<sup>5</sup> These concepts align with the International Pharmaceutical Federation (FIP) workforce development goals and even more broadly, the United Nations sustainable development goals by aiming to develop a workforce that considers care beyond the individual and works toward sustainability of populations as a whole.<sup>6,7</sup> There is a paucity of information to date regarding curricular content for global citizenship in health care training programs, including pharmacy. Some efforts have included proposing competencies, strategies, and entrustable professional activities, but specific curricular interventions are yet to be seen.<sup>2,3</sup> As the workforce continues to encounter new challenges (eg, pandemics, supply shortages, and antimicrobial resistance), global citizenship education embedded within pharmacy training programs may result in practice change that promotes pharmacy as a leading profession for health care sustainability efforts.

The concept of global citizenship is multi-faceted and has many definitions. The common thread to most is that a “global citizen” has both inward (awareness and commitment) and outward (action) dimensions that work together to foster both personal and societal change.<sup>8</sup> The New Zealand Centre for Global Studies explains global citizenship to be the idea that individuals perceive their reality and challenges from a global perspective and act in the interests of the planet and humanity as a single group.<sup>9</sup> A global citizen is one that removes stereotypes associated with certain countries or cultures and works to solve problems by maintaining a global view. As such, global citizens promote cultural understanding and strengthen the ideals of global laws and governance. Medication access, counterfeit medications, generic medication substitutions, disaster management, vaccine acquisition/distribution, refugee health, and medicines in migration are just a few examples of global topics that relate to pharmacy practice. For example, pharmacists' appreciation and understanding of how medication access differs worldwide may help improve therapeutic relationships with patients that come from other settings by offering compassion and advice to patients faced with drug or brand changes. Curricula must therefore be developed to equip pharmacy students with the skills to solve these problems using global

perspectives and the concept of global citizenship upon graduation and licensure as a practicing professional.

Instruction and assessment of global citizenship within a curriculum must be done carefully and methodically to prevent harm through reinforcement of cultural bias and stereotypes. A pedagogical framework, as proposed by Blackmore, consists of four interrelated dimensions: critical thinking, dialogue, reflection, and responsible being/action.<sup>10</sup> Each of these dimensions is deemed to be essential for the learner and interact with each other to create transformative change in a learner's values and beliefs. Using this framework, examples such as cases or roleplays can be created to stimulate learning processes within each dimension. A case developed about inclusivity in health care from the United States, for example, can be strategically designed to prompt learners to use critical thinking, dialogue, and reflection to understand the case content and how it may be addressed from different global perspectives. It is therefore important to capture these global perspectives (such as through international collaborations) during learning material development and implementation. Discussions and feedback from these dimensions may therefore inform transformations in learners' values and beliefs that may relate to responsible being and action and provide learners with a greater global perspective. The key to achieving success with this model, however, is the development of relevant learning materials that can be used to stimulate these dimensions across topics in line with the global citizenship framework.<sup>11</sup>

## 2 | OBJECTIVE

Given the increasing focus of global citizenship in postsecondary education and recently published guidance for curricular programming, the goal of this project was to develop research-informed curricular content for global citizenship tailored to pharmacy students using a pre-established pedagogical framework.<sup>2,3,10</sup> Specific aims were to identify issues of global concern to pharmacists across international settings, to develop and refine teaching material for global citizenship for pharmacy students, and to investigate students' ability to propose local-based solutions to global issues of relevance.

## 3 | METHODS

This study had three phases. Research ethics board approval was required and obtained from the University of Otago (D19/251) and

Dalhousie University (Dal REB 2019-4909 and 2019-4983). The project was initiated by a funding partnership between the University of Otago and Dalhousie University, however the project was expanded to Brazil and Qatar based on collaborative relationships between investigators in these countries.

### 3.1 | Phase 1: Identifying issues of global concern to pharmacists across international settings

This phase consisted of a narrative qualitative study utilizing verbal or written structured interview data in 2019. A total of 16 English-speaking practicing pharmacists were recruited across four countries: Brazil ( $n = 4$ ), Canada ( $n = 4$ ), New Zealand ( $n = 4$ ), and Qatar ( $n = 4$ ). Pharmacists were purposively sampled by the local investigator and identified based on diversity in practice sites and professional experiences. Four pharmacists were targeted in each country to provide differing perspectives and elicit varying examples of global issues, as attempting to achieve saturation was not a realistic goal of this study. Invitations and study information were sent via email and interested participants were instructed to contact the lead investigator (K.J.W.). Invitations were sent until four pharmacists were recruited from each country. Recruited participants provided written informed consent and agreed to a structured interview with the lead investigator (K.J.W.). A question set was designed through a literature review to elicit the narrative relating to the research aims (Table 1). These questions were asked after interviewees had been asked to “identify a global issue facing pharmacy practice in [their] country” in order to have a discussion based on their own experiences. All interviews for Canada and New Zealand were conducted face-to-face (New Zealand) or via audio call (Canada). Two interviews in Qatar and one interview in Brazil were conducted via audio call. The remaining two interviews in Qatar and three interviews in Brazil were conducted by supplying the participant with the structured questions and having them write or

**TABLE 1** Question guide for interviews and student learning activity

1. Based on the information provided and your own knowledge of this global issue, please discuss the importance for global populations as a whole.
2. What do you believe are to be the main contributors for this global issue?
3. Do you believe the profession of pharmacy has a direct or indirect contributory role for this global issue?
4. What do you believe are possible general solutions to help solve this global issue?
5. To what extent do you think the profession of pharmacy can contribute to solving this global issue?
6. Please provide examples of how you may locally implement programming or change that could help to contribute to the solving of this global issue.
7. Do you believe there to be a link between this global issue and provision of care to patients by pharmacists?

audio record their answers. This was done to account for both time zones and English language proficiency. All interviews were conducted in English.

Audio recordings were intelligently transcribed, and the data set was reviewed by one investigator (K.J.W.) and a research assistant. Transcripts were inductively coded by one investigator (K.J.W.) and a research assistant according to “global issues” identified by each participant deemed relevant for pharmacy practice.<sup>12</sup> Coding discrepancies were resolved through discussion between coders. Identified issues and the context surrounding them (as described by the participants) were extracted and categorized according to a global issue framework.<sup>13</sup> Once all data were coded and categorized, the final data set was reviewed for global issues that were mentioned by participants across at least two geographical regions. Short cases based on each of these global issues ( $n = 5$ ) were then created by one investigator according to the pedagogical framework using examples provided by interviewed participants. The investigator designed cases to define the global issue, provided examples raised by participants, and introduced potential implications. Any factual information was checked with relevant resources. All cases were designed to stimulate reflection, as well as address one other component from the pedagogical framework. Cases were reviewed by all investigators, with minor modifications being made before Phase 2.

### 3.2 | Phase 2: Pilot testing of teaching material across two international settings

The cases created in Phase 1 underwent two forms of pilot testing to determine the ability of the cases to stimulate reflective thought, address the pedagogical framework components, and support the intended learning outcome (to “generate local responses to global problems for a more peaceful and sustainable world”).<sup>14</sup> A pilot occurred at Dalhousie University in January 2020 through individual interviews (facilitated together by E.K.B. and K.J.W.) with final year pharmacy students ( $n = 2$ ). Interviews were chosen for practical reasons based on student availability and scheduling conflicts. Participants were recruited via email and an in-person announcement. Recruitment was unfortunately hindered by a winter storm that prompted the university to shut down during designated study days followed soon after by implementation of pandemic restrictions in Canada. Participants provided written informed consent and met with investigators for up to 1 hour to review case material. All interviews were audio recorded and investigators took notes. Participants read the first case and then verbally responded to a series of questions (Table 1). Investigators were prompted for clarity in responses or for further explanation. Participants were asked to rank the cases from most interesting to least interesting.

The second pilot occurred as a virtual focus group in May 2020 (due to the coronavirus disease 2019 [COVID-19] pandemic) with five final year pharmacy students at the University of Otago in New Zealand. Based on the success from the interview pilots,

investigators wanted to ensure group settings would elicit similar responses and learning outcomes would be achieved. The five students were purposively selected by one investigator (K.J.W.) to participate based on known varied professional experience and academic standing. It was deemed that one focus group would be sufficient to elicit the information required for continuing with the program, however more could be planned if required. Participating students provided written informed consent. The focus group occurred over 1.5 hours and was facilitated by the primary investigator (K.J.W.). The focus group was recorded and notes were written. Students were provided with the intended learning outcomes before the session. Once online, a brief introduction to global citizenship was provided and then students were asked to review Case 1. Discussions were facilitated by the guiding questions and continued until all cases had been reviewed. Feedback on the cases, relevance to the pedagogical framework, and structure of the learning activity was provided by students at the end.

Pilot exercises were reviewed by the investigator team and modifications were made to cases and exercises based on the notes and data obtained.

### 3.3 | Phase 3: Implementation of a global citizenship learning event for final year pharmacy students

The cases developed through Phases 1 and 2 were implemented into the final year of the Bachelor of Pharmacy program at the University of Otago in September 2020 (PHCY432—Applied Pharmacotherapy and Patient Care). This project was designed for the University of Otago with other institutions planning for incorporation later when feasible. The overarching intended learning outcome (adapted from The United Nations Educational, Scientific, and Cultural Organization) of the teaching sessions was for learners to “generate local responses to global problems

**TABLE 2** Identified categories and global topics with associated narrative

Category	Topic	Narrative
Global health and wellbeing	Antimicrobial resistance	“With international travel, antimicrobial resistance is becoming a major issue. We are seeing many infections imported into Qatar from other places that is changing our antibiograms and the susceptibility of our antibiotics to common infections” (Participant 9, Qatar)
		“Antimicrobial resistance is happening more. We traditionally have low resistance and can use many drugs that other countries cannot, but this is changing and changing fast” (Participant 7, New Zealand)
	Drug shortages	“We are starting to see shortages of drugs here. Why? Why can we not get these drugs into the country? If there is a material shortage in Asia, for example, it affects South America. We need a solution for this” (Participant 14, Brazil)
		“Drug shortages are a massive problem. It seems like every day we are dealing with this. This is going to be a major issue facing the profession and health care in the future” (Participant 1, Canada)
Climate and environment	Climate change	“Extreme weather patterns around the world are affecting our supply of medications in New Zealand. I remember when a typhoon hit Japan and we lost our supply of certain medications for months because the manufacturing site was hit. It seems these weather events are becoming more common” (Participant 5, New Zealand)
		“Climate is affecting raw materials, especially for natural and plant-based products. You never really think about how changing weather in China could influence the drug supply here” (Participant 3, Canada)
	Ocean pollution	“I have never really thought about this before but the amount of plastic we use in pharmacy is outstanding. We hear of these islands in the Pacific Ocean made up of rubbish. I wonder how much of that is from pharmacy waste” (Participant 8, New Zealand)
		“Plastic, plastic, plastic! And do we have proper recycling facilities? I have no idea. I'm sure it goes into the ocean. I would say we need to recycle in pharmacies but there is likely no national infrastructure currently” (Participant 11, Qatar)
Geopolitics and power	Rise of nationalism	“Changes in government mindsets here and elsewhere are making people more individualistic and not thinking about the greater good of communities. I think it is a real problem and people will start looking out only for themselves” (Participant 13, Brazil)
		“Maybe not in Canada but definitely elsewhere, we are seeing a rise in Nationalism as a political ideology. This is already affecting individuals - hoarding medications, hoarding toilet paper in the pandemic. I worry that these attitudes will persist and eventually impact pharmacy practice” (Participant 2, Canada)

for a more peaceful and sustainable world.”<sup>14</sup> The session was run four times over 1 day in 1.5-hours blocks as per standard scheduling of sessions to account for the 120 students. Twenty-eight groups were formed consisting of four to five students (7 groups per 1.5-hours block). Four facilitators were present during the learning activity. Students were briefly oriented to the concept of global citizenship and procedures for the session before breaking into their assigned groups. Once in small groups, students were tasked to review all five cases one by one and answer the questions listed on the guide (Table 1). Students were informed their answers would be formatively assessed to determine their ability to “generate local responses to global problems for a more peaceful and sustainable world.”<sup>14</sup> Facilitators circulated between groups but allowed students to discuss cases without a facilitator present at all times to increase open dialogue between students. Facilitators offered advice or clarification about the cases, when asked. Students spent approximately 20 minutes discussing each case and submitted an electronic document with their responses at the end. Submissions were deemed to meet or not meet the intended learning outcome by one investigator (K.J.W.) based on two criteria: the applicability of the response to the global issue and the practicality of implementing actions at a local level. Submissions did not contribute to summative grades but students were informed concepts may be applicable for further course assessments and general class feedback was provided. For the purposes of this study, the proportion of responses deemed to achieve the intended learning outcome was calculated (Microsoft Excel) and reported.

## 4 | RESULTS

### 4.1 | Phase 1: Identifying issues of global concern to pharmacists across international settings

A total of 16 participants were recruited ( $n = 4$  from each country). Pharmacists worked in community, primary care, and hospital settings. The majority of pharmacists had adjunct academic appointments or leadership roles within local, national, or international professional organizations. Examples of global issues were broad and were categorized as global health and wellbeing, climate and environment, and geopolitics and power. Examples of health issues included drug shortages, antimicrobial resistance, and health professional shortages. Examples of environmental issues included climate change, ocean pollution, and air quality. Examples of political issues included the rise of nationalism, and counterfeit medication policies and laws. Table 2 provides an overview of these categories and narrative examples of associated global issues mentioned by participants. Five cases were developed from these examples and refined through Phase 2. Final cases are provided in Table 3.

### 4.2 | Phase 2: Pilot testing of teaching material across two international settings

Minor modifications for wording and clarity were made to cases after completion of the interviews. Both interviewees ranked Case 2: Rise

**TABLE 3** Final cases according to topic and pedagogical framework<sup>10</sup>

Topic and focus	Case description
Case 1—Ocean pollution Focus: Reflection/responsible action	There is an increasing amount of plastic accumulating in our oceans. The effects of this phenomenon have been shown to negatively impact sea life, including both plants and animals. It is suggested that 100 000 marine mammals and turtles, and 1 million sea birds are killed by marine plastic pollution each year.
Case 2—Rise of nationalism Focus: Reflection/dialogue	Recent years have seen an increase in the number of populist and nationalistic movements across traditionally democratic countries worldwide. These movements are known to promote inward focused mindsets that may support actions deemed to be selfish and foster a “fend for yourself” mentality. This mindset may be present at all levels from an individual person to a country as a whole.
Case 3—Climate change Focus: Reflection/responsible action	Climate change is causing alterations in weather patterns around the world. Changing climates may increase the incidence of severe weather and cause disruption to manufacturing of health products, supply chains, or shipment routes. Other implications of climate change may include altered food supplies, raw material shortages, and access to clean water.
Case 4—Antimicrobial resistance Focus: Reflection/critical thinking	Antimicrobial resistance is increasing in many parts of the world. Pathogens that were previously susceptible to antimicrobials are now developing mechanisms to negate the killing effects of these agents. There is a widespread prevalence of resistant gram positive infections throughout the world and increasing reports of resistant gram negative infections in many countries.
Case 5—Drug shortages Focus: Reflection/critical thinking	Drug supplies have been challenged in recent years from raw material shortages, supply chain break downs, and other reasons. Also, there appears to be a greater interest of pharmaceutical companies to develop niche drugs that may offer higher profit margins, as compared with more common drugs that may not offer the same economic benefits. Pharmacists and other health care professionals are therefore challenged by seeking alternative sources and/or products to manage patient conditions.

of Nationalism as the case with the lowest utility largely due to a lack of understanding about the case's purpose. Upon deliberation between investigators, it was deemed that this may be a regional effect and the case should be further tested in the focus group phase.

The focus group participants and investigators confirmed that the cases were able to effectively stimulate discussion and learning that



**TABLE 4** Student achievement of learning outcome with example work

Case	Topic	Number (%) of groups achieving learning outcome	Examples
1	Ocean pollution	24/28 (86)	Use of biodegradable packaging, incentive-based recycling programs, and pharmacy-led beach clean-up days
2	Rise of nationalism	23/28 (82)	Restricting sales per patient for OTC products and community engagement
3	Climate change	24/28 (86)	Energy-efficient appliances, reduce delivery frequency, and electric vehicles
4	Antimicrobial resistance	25/28 (89)	Community antimicrobial stewardship, patient, and provider education campaigns
5	Drug shortages	20/28 (71)	Deprescribing and interprofessional communication

Abbreviation: OTC, over-the-counter.

matched the learning outcomes of the session and the pedagogical framework. Cases were well-received by students and feedback on the session was positive. Students unanimously stated that Case 2: Rise of Nationalism should be included, as it “made them think and discuss” (ie, promote dialogue) and was an important issue to consider, especially based on recent experiences providing pharmacy services during the COVID-19 pandemic. This case was therefore included in the final case set (Table 3).

### 4.3 | Phase 3: Implementation of a global citizenship learning event for final year pharmacy students

A total of 120 students divided into 28 groups completed the learning activity and provided responses for each case. Results are provided in Table 4. Example responses are provided for each case reviewed (Table 4). Students performed best on the case relating to antimicrobial resistance and worst on the case relating to drug shortages. Groups were deemed to achieve the learning outcome on a median of 4 cases (range, 2-5). The most common reason for not achieving the learning outcome on a given case was the practicality of implementing the solution at a local level. These responses typically relied on increased governmental funding for environmental initiatives or development/expansion of a pharmaceutical industry in New Zealand. While these initiatives may support global issues, the purpose of the exercise was to have students propose initiatives that they could contribute to in their own practice environments.

## 5 | DISCUSSION

This study aimed to develop and implement a learning activity to foster global citizenship among final year pharmacy students. Learning material was based on practice experiences described by pharmacists across four countries and refined through pilots with target learners. The learning activity was implemented, and results show that students

were able to meet the intended learning outcome of the session. The learning material and/or topics of global issues may therefore be considered for use by other programs. Results have implications for future global citizenship curriculum activities and international collaborative approaches to learning material development, as discussed below.

The topics identified across international settings for the learning activity had varying perceived relevance to pharmacy practice yet all were able to successfully promote global citizenship through a pedagogical framework.<sup>10</sup> Results show that cases not explicitly relating to health or medications (eg, environmental and political issues) can stimulate critical thinking and support the dialogue needed for students to brainstorm responsible actions in support of a peaceful and sustainable world. The results provided in Table 4 demonstrate that students were able to reflect on the global issue and link learning with local pharmacy practice examples, which are in line with results from other disciplines.<sup>5</sup> These findings align recent calls for the profession to consider environmental sustainability and with previous studies that state that, students must have a broad understanding of global issues before being able to relate concepts to local environments.<sup>15-17</sup> Specifically, there is a call for understanding of all types of global issues including those relating to environment, economics, politics, and health.<sup>17</sup> Relating to the United Nations sustainable development goals, these findings go beyond health outcomes and may work to improve global sustainability as a whole.<sup>7</sup> Future activities should therefore explore the extent of learning that can occur when introducing pharmacy students to these concepts not perceived to be directly related to pharmacy practice.

The findings of this study help to inform future directions in global citizenship education and research for pharmacy. To date, data are mostly limited to guidance that does not provide practical examples of curriculum design and evaluation.<sup>2,3</sup> This project was designed to create a one-time event to stimulate critical thinking and learning that offered a practical solution to these calls for action. As programs move to incorporate global competencies into curricula, longitudinal and integrated approaches should be considered to maximize impact and normalize learning of global competencies throughout a program.

Challenging students to think about environmental, political, or economic issues when planning care for patients in simulated or experiential settings or health promotion activities may help to broaden their perspectives and lead to innovative and creative problem solving within pharmacy practice.<sup>17</sup> Incorporating global issues into usual curricula content, such as written cases, may also assist in increasing complexity and help students develop and refine clinical decision-making skills. With respect to research, studies should be conducted to determine the extent of critical thinking, dialogue, reflection, and responsible being/action of case material as it is continually developed and refined. Curricular impact studies should also be considered to determine how global competency development facilitates practice change initiatives upon students' graduation and entrance to the workforce.

In addition to the positive finding that students were able to achieve the intended learning outcome of the global citizenship activity, a strength of this paper and additional contribution to the field lies within the approach to learning material development. Global citizens are meant to think globally yet act locally.<sup>5</sup> Educators attempting to instil these skills within students must also strive to become global citizens and develop a strong understanding of global issues and their relevance to pharmacy practice.<sup>18</sup> The international collaboration described in this paper allowed investigators to identify and reflect on issues facing other nations and to critically reflect on how to best facilitate similar learning with students. In other words, educators working in this field should also focus on developing themselves as global citizens and work toward establishing international partnerships that can promote the exchange of ideas and dialogue required to solve educational problems relating to global citizenship and global competency development.

This study has limitations that should be addressed. Although Phases 1 and 2 were collaborative across countries, Phase 3 was limited to New Zealand. The ability of learning material to foster global citizenship outcomes in other locations is therefore unknown and should be tested. Second, findings are based on formative assessments completed in groups with no specific grades assigned to students' responses. Future studies should consider an individual summative assessment on global citizenship competencies to determine gaps or deficiencies in student learning. Third, the intervention was an isolated educational activity and the impact of integrating global issues throughout a curriculum is not yet known. Fourth, purposive recruitment of participants in Phase 2 may have introduced selection bias for students who were known to be familiar with global concepts. However, major refinements to cases did not result from this phase and the discussions observed during Phase 3 were similarly as rich to those constructed for Phase 2. Fifth, only one investigator assessed the learning outcome of interest in Phase 3 according to a "yes/no" approach and as such, this may have introduced investigator bias. Efforts were made to reduce this bias by having the two criteria explicitly stated. Finally, the richness of data collected in Phase 1 was likely disrupted by the multi-modal approach to obtaining participant responses. Future studies should attempt to use the same approach but adopt strategies to overcome language and time zone barriers.

## 6 | CONCLUSION

The learning material developed from international collaboration was successfully able to stimulate global citizenship mindsets through a pedagogical framework aimed at stimulating critical thinking, dialogue, reflection, and responsible being/action. Findings support the notion that when tasked to "think globally," students are able to "act locally" by designing interventions to reduce the impact of political, environmental, and health-related global problems. Longitudinal and integrated approaches to curriculum development should be explored and studied to maximize impacts of global citizenship training for pharmacy students.

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## CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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