February 14, 2018

WHITE PAPER

Global Educators Network for Health Innovation Education (GENiE) Conference
"Educating the Global Health Innovator"
Harvard Business School
Boston, Massachusetts
October 6-7, 2017

Abstract

Importance: Global health care faces a threefold crisis of unsustainable economics, erratic quality, and unequal access. Innovation in the large-scale health care delivery and payor sectors is critical to controlling costs and improving both quality and access. Instead, successive consolidations and other attempts at improvement raise prices with uncertain effects on quality and access.
Observations: One reason for the lack of transformational health care innovation is the paucity of education specifically designed to prepare executive candidates to innovate.
Conclusions and Relevance: Even top-ranked schools that educate health care managers are sorely lacking in course offerings that focus on adopting and implementing innovation rather than researching and creating it. We can support world leaders in innovating 21st-century health care if we create unprecedented collaboration among disciplines and between academia and business; revamp outdated curricula; and use academic tools we know to be effective.

Introduction

The Global Educators Network for Health Innovation Education (GENiE) group was organized in 2012 by Harvard Business School Professor Regina Herzlinger to spearhead innovation in health care management education. An informal alliance of diverse, global academic institutions, professional organizations, and health care consultancies dedicated to teaching innovation, GENiE's specific mission is to transform the preparation of future health care leaders by ensuring that all health care management degree students and executives are equipped with the skills, knowledge, and mindset to spur crucial innovations in health care. GENiE's objective is to fulfill this mission in ten years and then disband.

On October 6-7, 2017 the GENiE Group held its annual conference, entitled "*Educating the Global Health Care Innovator,"* in Boston. Well over 100 presenters and participants, including leading lights in health care and thought leaders in related educational fields, converged on Harvard Business School from across North and South America, Europe, Asia, and Africa.

The GENiE conference featured panel presentations on innovation education curricula tailored to a variety of health care stakeholders: providers, payors, those working in the life sciences, as well as investors and policymakers. Other panels were convened to examine the innovative content and delivery of health innovation education as well as "intrapreneurship," or innovation from within an organization. Massachusetts Governor Charlie Baker delivered a keynote dinner address on the current state of health care, with special emphasis on the opioid crisis affecting so much of the United States. (click here for the GENiE website, where you can download the agenda for the 2017 conference)

This white paper is intended not only as an update on GENiE's activities via its annual conference, but also as a mile marker on the road to widespread incorporation of innovation in the education of health care executives. Herein you will find:

- a provocative set of predictions by the 2017 GENiE participants for the coming year, along with research-supported evaluation of those predictions;
- a robust analysis of the curricula offered by the top educators of health care managers in the US, including consumer-focused and patient-centered education, with suggestions for reform; and
- a brief shout-out to programs in the US, Canada, and Europe that GENiE believes are leading the way in health care innovation education.

We hope you are intrigued enough to find out more about GENiE and where we are going, and that you save the date for GENiE's next conference, in Copenhagen: October 18-20, 2018.

In many sectors of the economy, innovation not only raises productivity—controlling costs, increasing wealth, and improving access to goods and services —but also frequently raises quality. Consider the automobile industry, where costs declined relative to income, thus increasing access, and quality was vastly improved by process innovations, the Japanese model a prime example.[1,2]

Innovation in the large-scale health care delivery and payor sectors is critical to controlling costs and improving both quality and access. Instead, successive consolidations and other attempts at improvement raise prices with uncertain effects on quality and access.[3,4] As one example of declining quality, researchers at Johns Hopkins wrote in 2016 that in the U.S., 250,000 deaths per year were caused by medical error,[5] while only 18 years ago, the landmark book *To Err is Human* estimated the maximum number of deaths from medical errors at 98,000.[6] Despite some controversy regarding how deaths are tallied and attributed, this important metric of quality in US health care has shown no improvement, despite massive cost increases.

Where are the Innovations?

One reason for the lack of transformational health care innovation is the paucity of education specifically designed to prepare executive candidates to innovate. At the 2017 annual conference of the GENiE group, researchers solicited predictions about the future of innovation from attendees seeking to make health care more efficient, affordable, and accessible.

The attendees included acknowledged leaders in health care innovation from around the world, including current and former executives at Bain & Company, Centers for Medicare & Medicaid Services, Johnson & Johnson, Evercore, The World Bank, Massachusetts General Hospital, Cancer Treatment Centers of America, EIT Health (EU), Philips North America, Ribera Salud (Spain), TPG Growth (India), and the UnitedHealth Group. In parallel, a formidable array of top-flight educational institutions represented health innovation education leaders from across the Americas, Europe, Asia, and Africa.

Their predictions of the most and least likely innovations in health care included:

1. On the supply side: generation of potential new products and services by life-sciences and technology innovators is highly likely to continue because they are well funded and amply taught.
2. On the demand side: adoption of innovations among payors, providers, and other actors is much more doubtful.
3. Health care financial systems and payers' choices tend to reduce adoption of innovation significantly.
4. Patient/consumer-centric innovation is key to improving outcomes
5. Corporate-backed venture capital in the form of "intrapreneurship"—divisions inside large companies that conduct their own R&D—will continue to increase.

6. Major regulatory reform, while strongly needed, is unlikely

To evaluate the extent to which these predictions were reflected in academic offerings for health care executives, the researchers drew upon diverse sources of information on the current role of innovation in their education: curriculum content analysis, interviews with CEOs and recruiters, and surveys of academics self-identified as committed to teaching innovation in health care.

Curriculum Content Analysis of Health Care Innovation Courses

The content of more than 3,000 online descriptions of courses taught at 32 schools within the top seven U.S. universities offering courses in medicine and health care management was analyzed.[7] (Universities are not identified with their respective results but are listed at the end of this document.)

We constructed our analysis along two axes: **focus** (narrow vs. broad) and **orientation** (implementation vs. research).

- **Focus** refers to the approach taken to target subjects. Generally, schools focus on medical or health care management courses either narrowly (i.e., deep study of a few specific activities such as biomedical engineering or pharmacology) or more broadly (such as anatomy or digital health), primary for purposes of familiarization.

- Courses with an implementation **orientation** are concerned with a tangible product, service, or result that is often commercializable. The relevant search terms included *entrepreneur, hatch, innovate, invent, patent*, and *startup*. Courses that approach innovation with a "research" orientation, on the other hand, focus on experimentation and development of knowledge; the eventual result may be commercialized, but that is not the immediate goal. Relevant search terms included *adopt, commerce, develop, experiment, incubate, research, science, service*, and *technology*.

Only 6% of the course offerings were oriented toward implementation. The remaining 94% fell into the "research" category, i.e., the accumulation/analysis of knowledge (see Figure 1, Curriculum content analysis of top US medical and health care programs). Only in one large institution in New England (the bubble showing 22 courses) had a more encouraging 26.3% of course offerings fall into the "implementation" category. Thus, even top-ranked schools that educate health care managers are sorely lacking in course offerings that focus on adopting and implementing innovation rather than researching and creating it.

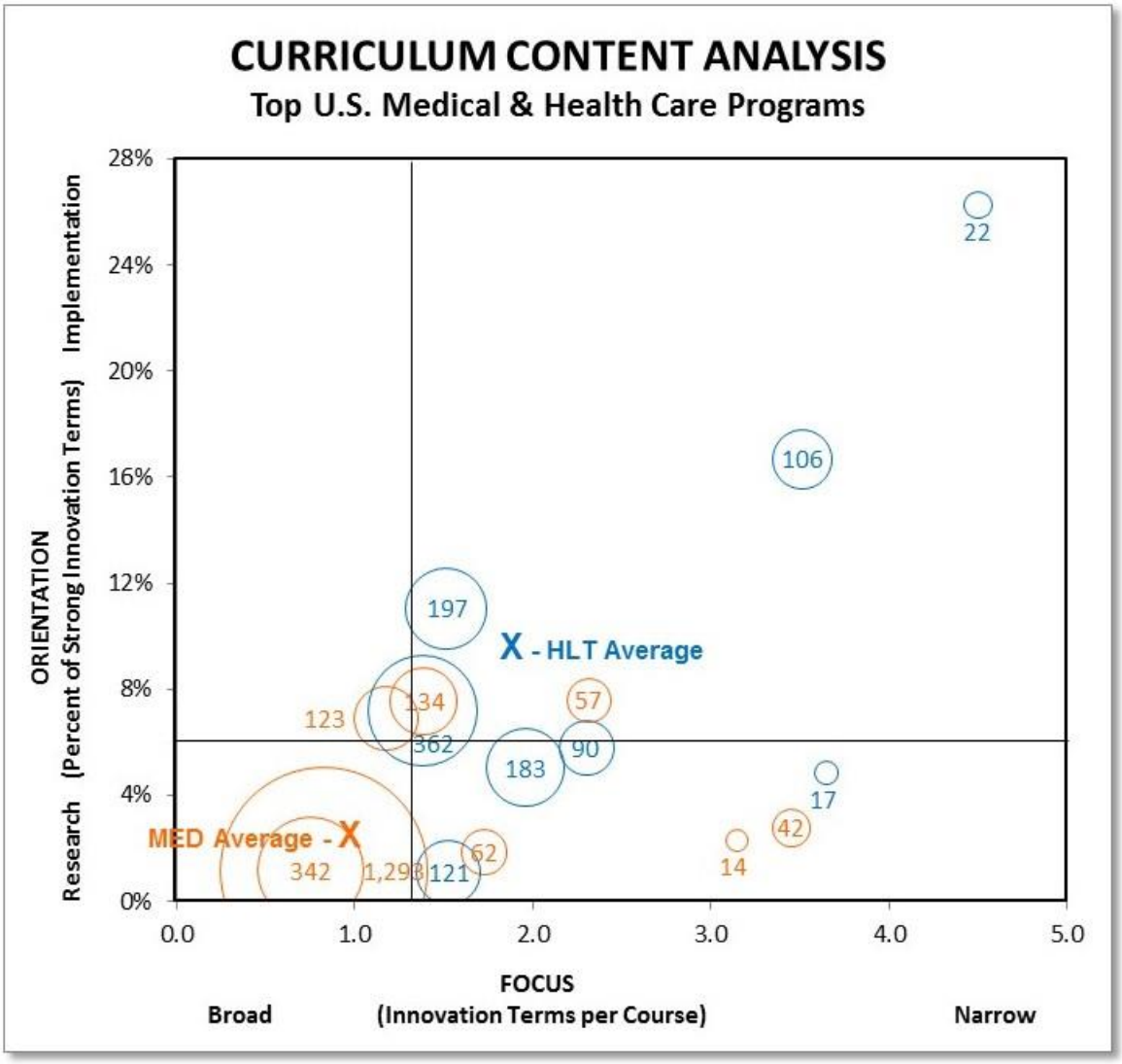

Figure 1. **Curriculum content analysis of top US medical and health care programs**.*

N = 3166 courses across 33 schools at the nine top universities offering courses in medicine and health care management.[5]
Blue = schools of health care management (HLT); Orange = medical schools (MED)
Bubble size/number = number of courses analyzed at that university
Quadrants: The vertical bar at 1.3 is the average of the occurrence of any innovation term (implementation/research) per course; the horizontal bar at 6.0 is the average percentage of terms per course denoting a focus on innovation implementation (rather than research).
*One university had health care management courses but no medical school; another had a medical school but no non-medical health care management courses. Thus, despite the inclusion of 9 universities, there are 8 blue bubbles and 8 orange bubbles.

Medical schools are more oriented toward broad-based, research-oriented courses than schools of health care management (Figure 1). The word clouds in Figure 2 demonstrate differences in the frequency of top search terms. The progressive decreases from large to smaller type are proportional to the frequency of a word, e.g., in health care management curricula (left), 'develop' comes first but is closely followed by 'manage,' then 'science,' and 'technology' in a cluster. In contrast, medical school curricula have 'manage' far out in front of 'science,' with another dramatic decrease before 'service,' 'develop,' and 'experiment.' Health

care managers seem to be taught a more-balanced mix of skills led by 'develop,' indicating some predisposition to change, while the training of doctors concentrates more on managing what is already in place, with less emphasis on innovation education.

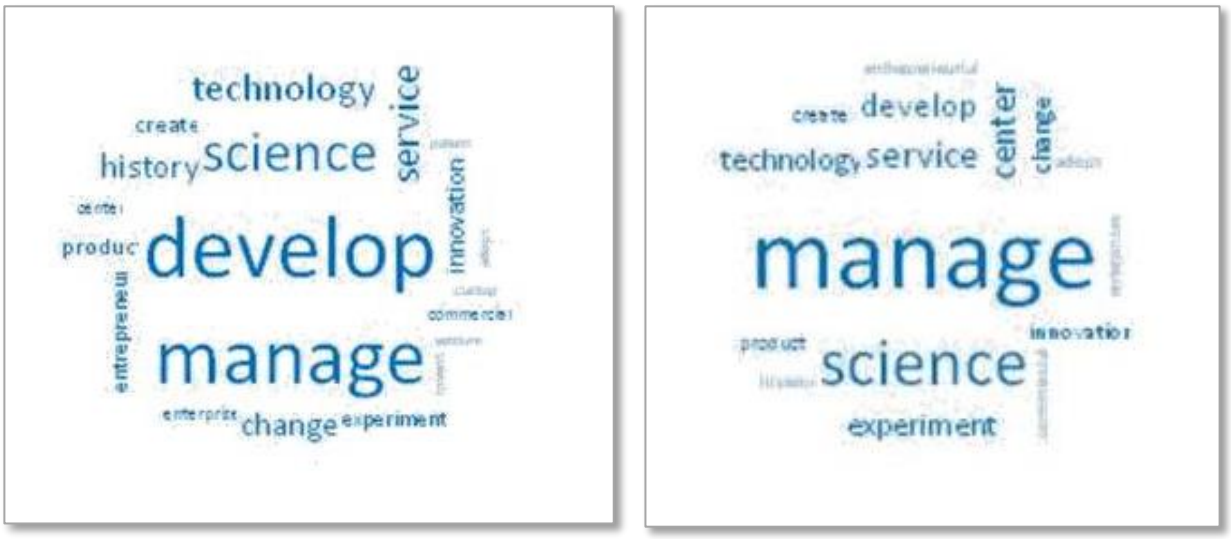

Figure 2. Word-cloud representations of curriculum content analysis of top U.S. health care management schools (left) and medical schools (right).

Match Between Predictions of Where Health Care Innovation is Heading and Current Innovation Curriculum

Below is a comparison of the October 2017 conference participants' predictions regarding where health care is going with the education offerings gleaned from our content analysis.

Prediction: Generation of potential new products and services by life-sciences and technology innovators is highly likely to continue because they are well funded and amply taught.

Response: There is extensive teaching about innovation in medical technology, with notable hubs of innovation education; but much less education on the *implementation* of such improvements.

Prediction: The adoption of innovations among payors, providers, and other actors on the demand-side is much more doubtful.

Response: There is very little education on innovation for delivery and insurance; of more than 3000 courses, there was not *one* on payors.

Interviews with recruiters indicated that they found the hospital sector actively resistant to hiring innovators: "Where you're getting innovation is everything outside of our hospital institutions." At least among employers who are health care providers, they see little "out-of-

the-box thinking" and unwillingness to reward the risk required for substantial innovation. Recruiters also squarely blamed academia for recruiting the wrong kinds of students and teaching them the wrong things in the wrong way. One noted that academia is "…still teaching people who want to be hospital administrators…. You don't get people who are really gung-ho… to do entrepreneurial things."[8]

Prediction: Health care financial systems and payers' choices tend to reduce adoption of innovation significantly.

Response: This is another area in which innovation education is sorely lacking.

Prediction: Patient/consumer-centric innovation is the key to improving outcomes.

Response: Evidence of the growth of consumer-driven health care is found in the increasing popularity of high-deductible plans among well-informed consumers;[9] but, again, appropriate education about how to disseminate consumer-driven health care is sparse, as indicated in Figure 3.

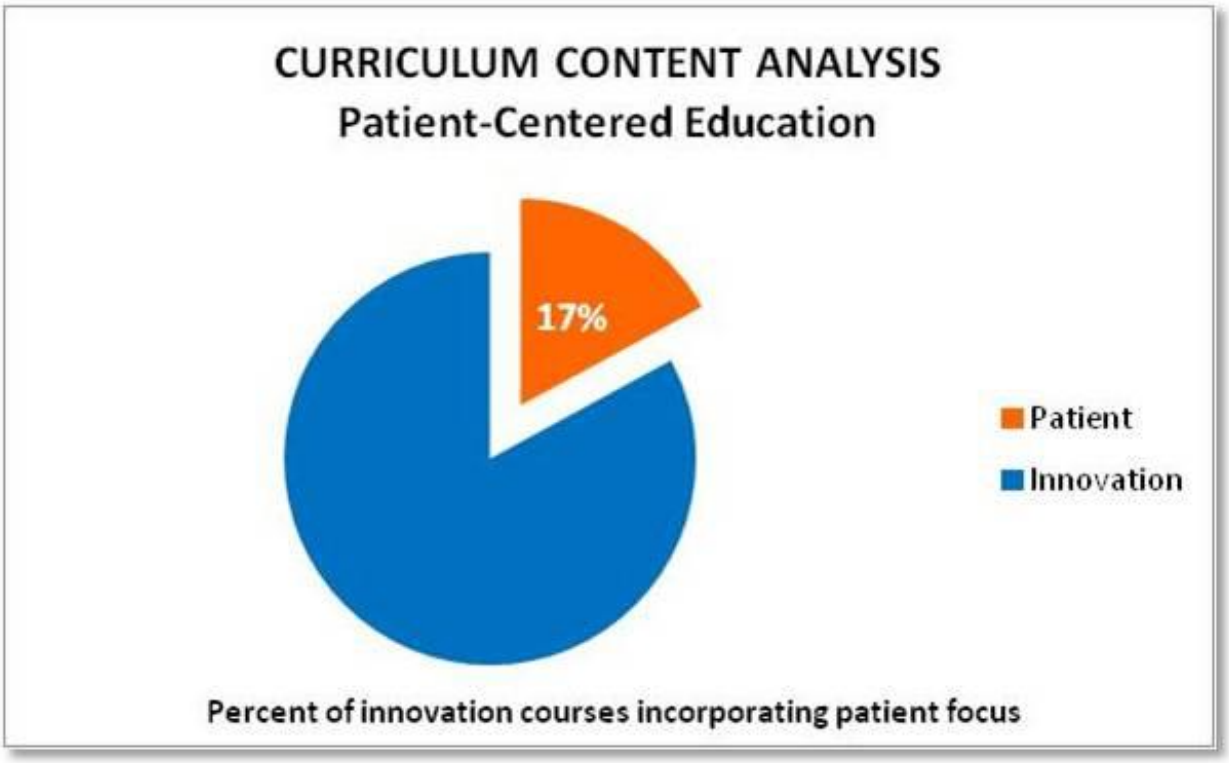

Figure 3. Percent of innovation courses incorporating patient focus.

This kind of education can yield important, actionable results, such as the findings by Leslie K. John and colleagues on the importance of consumer focus.[10] Neither of the text warnings at the top of the figure below produced a significant effect on purchase of sugary beverages. However, the graphic label at the bottom of the figure reduced daily purchase of sugary drinks by 15.5 percent and the average calories per drink purchased from 88 to 75.[11]

Figure 4. Consumer-focused experimental labels for sugary drinks.

Prediction: Corporate-backed venture capital in the form of "intrapreneurship"—divisions inside large companies that conduct their own R&D—will continue to increase.

Response: Organizational design is of great importance, as evidenced in the many failures of innovation in most large, seemingly well-resourced organizations.[12] An experienced health care venture capitalist at the October 2017 conference opined that some organizational innovations—accelerators and innovation labs—fail, "... because they mute the sharp point of a free market. If an idea is good enough, all the things that accelerators provided will come along anyhow. In the breeding ground for ideas they created, the bad ones take resources away from the good ones."

As shown in Figure 5 below, our content analysis revealed much greater focus on corporate management than on entrepreneurship.

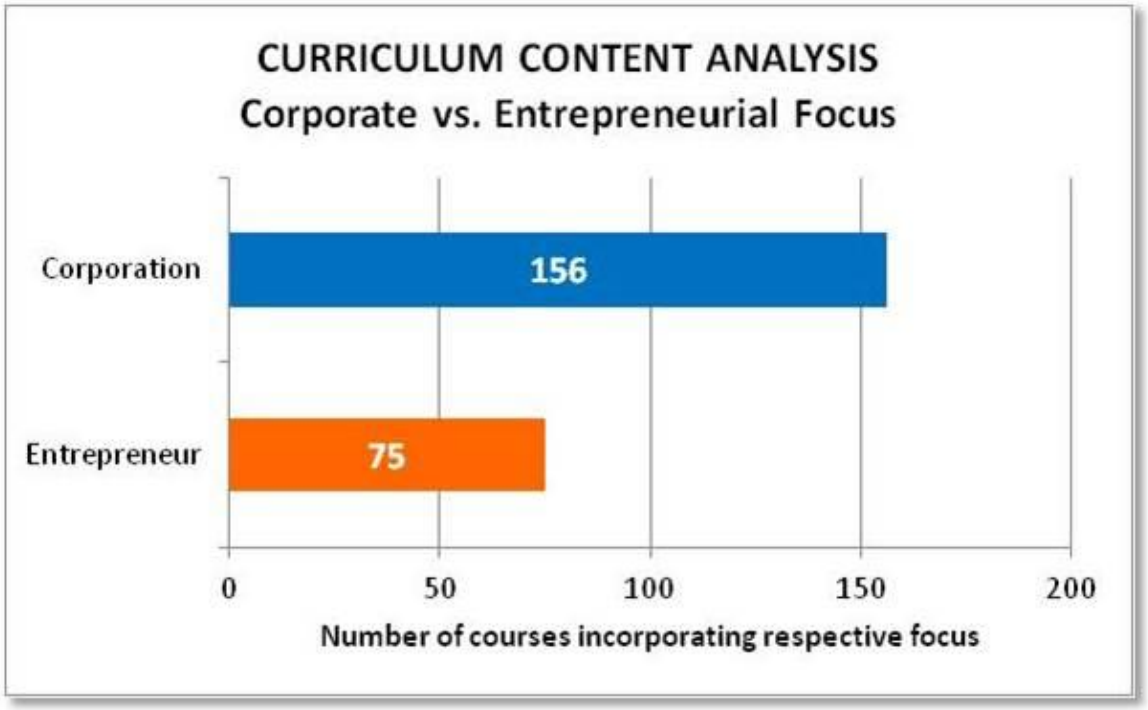

Figure 5. Number of courses incorporating corporate vs. entrepreneurial focus.

Yet, some conference panelists spotlighted novel intrapreneurship divisions, largely separated from the parent company to protect them from the "bear hug" that can stifle innovation. The parent company's size and infrastructure can be leveraged when it's time to implement and disseminate.

- *Bruce Rosengard, Chief Medical, Science, and Technology Officer, Johnson & Johnson*: "We started the medical device effort from scratch. I pulled together conceptual and operational approaches from J&J Innovation and JLABS and added elements tailored to the device industry to create a platform for new device ventures inside J&J. This allowed us to increase our own investment in early-stage funding, while traditional sources of seed funding decreased by 85% over the last decade. In addition, our efforts are intended to address challenges in medical device development that will make external investments more attractive, thereby reversing this troubling trend."

- *Tommy Hawes, Managing Director, and Sandbox Industries*: "We were trying to figure out how to innovate a function in a mature segment of the industry, i.e., venture funding in the Blue Cross Blue Shield system. We did this by ceding control of the investment decision to our investors, a unique concept in venture funding... and it worked because of our culture. We insisted on complete transparency, and over three funds, we moved from 11 to 29 of the 36 Blues plans as investors, and our results have followed this trend."

- *An experienced innovator from the health care analytics sector who served in the venture capital component of a large insurer:* " Shortly after my company was acquired by a larger

entity, I [stated] at a conference, 'We're going to innovate at scale. We're going to use the money, resources, and access to customers of a large company to accelerate our innovation, which is very hard for a small startup."

Prediction: Major regulatory reform, while strongly needed, is unlikely.

Response: Our content analysis revealed a greater focus on studying the nature of present regulation than on considering a patient-oriented system.

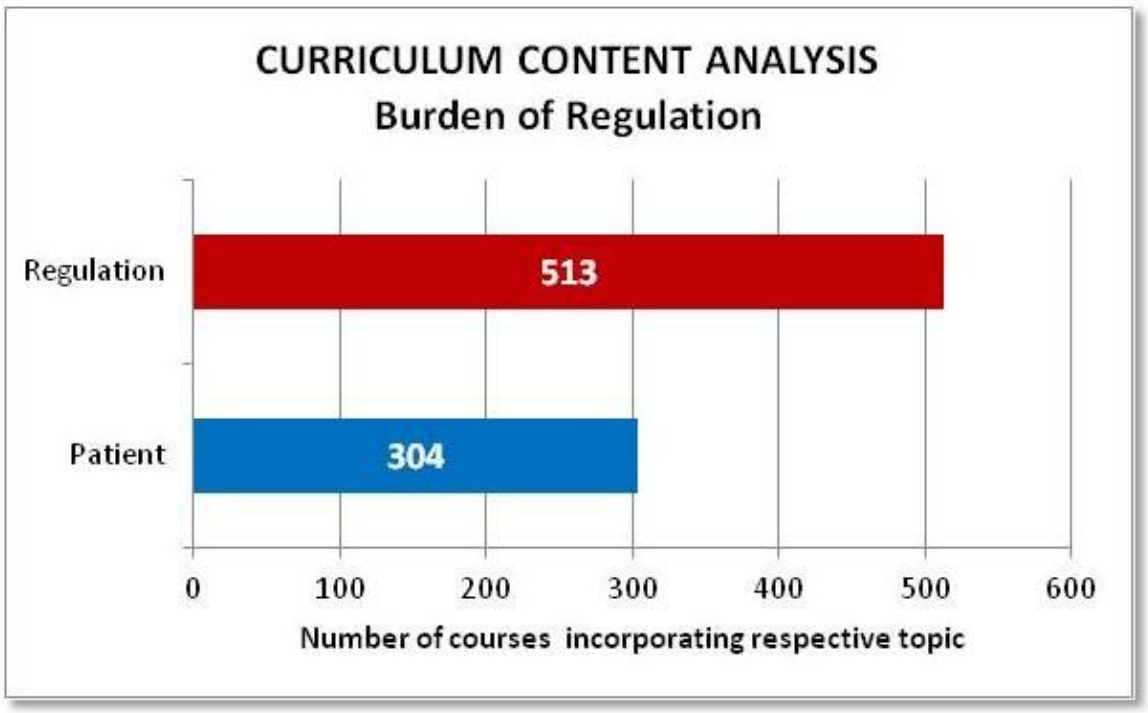

Figure 6. Number of courses with regulatory or patient-centered focus.

CEOs and Recruiters: Desired Qualities of Health Care Innovation Executives

To determine desirable qualities in future health care innovation leaders from the perspective of employers, the researchers worked with a market research consultancy to interview 56 CEOs from the world's largest and most innovative health-sector companies; those transcripts then underwent content analysis.[13] In addition, interviews with 16 leading U.S. health care recruiters provided insights regarding what they look for in senior-level candidates.[14] Unsurprisingly, content analysis revealed 'health care' as the most frequent search term; but some form of the words 'innovate' or 'entrepreneur' came in second, ahead of 'company,' 'industry,' and 'system.'

Both recruiters and executives wanted candidates with deep knowledge of the health care domain, including a "strong strategic sense of the inter-relationships of manufacturers, distributors, providers, insurers and patients," as well as comfort with finance, venture capital, and data/IT. They were especially eager to find candidates prepared to take the risk of

predicting and driving the future, who are self-reflective and self-directed; the type of people "not content to have good jobs, but who want to run and build their own companies." In a word: entrepreneurs.

Academic Leaders' Views of Health Care Innovation Education

Academics feel the need to educate students skilled in innovation—but encounter roadblocks, including a shortage of business educators knowledgeable about health care delivery and insurance, health IT, and medical technology.[154] They believe that public health and health administration faculty often lack appropriate managerial skills and entrepreneurial approaches to global health, venture capital, and the case method. These shortcomings are exacerbated by resistance to curricular changes and incentives to conduct and publish only traditional research. Additionally, scholars may have little access to data on real-world organizations or course material that integrates health care and business curricula.

Conclusions

Those who educate health care innovation executives face a daunting task and an exhilarating opportunity. Global health care faces a threefold crisis of unsustainable economics, erratic quality, and unequal access. We find that CEOs are keenly aware of this crisis and of the vital role of innovation in finding our way out of it. The same is true of many academics, but they face considerable obstacles in reshaping curricula.

We can support world leaders in innovating 21st-century health care if we create unprecedented collaboration among disciplines and between academia and business; revamp outdated curricula; and use academic tools we know to be effective. Several noteworthy academic programs in health care innovation have been created in the US and Canada.

- Harvard Business School launched its Health Care Initiative (HCI) in 2005, offering courses, industry speakers, career coaching, treks, and alumni engagement for aspiring health care innovators. MBA and Executive Education courses on Innovating Health Care have been offered for decades, helping to launch the careers of many important health care entrepreneurs.[16]
- The University of Alabama Collat School of Business offers a Graduate Certificate in Technology Commercialization and Entrepreneurship, blending classroom and experiential learning to move scientific discovery and inventions from the lab to the marketplace.
- The University of Texas at Austin's Dell Medical School's mission reads, "We will revolutionize how people get and stay healthy." Specifically, "Improving health in our community as a model for the nation; evolving new models of person-centered, multidisciplinary care that reward value; advancing innovation from discovery to outcomes; educating leaders who transform health care; and redesigning the academic health environment to better serve society."

- Duke University's Masters of Management in Clinical Informatics program features concepts and practices at the frontier of digital health.[17]
- The University of Toronto's Rotman School of Management launched a Global Executive MBA program in Health Care and the Life Sciences, focused on engaging experienced leaders from across the health sector and helping them learn how to navigate the interfaces of traditional silos.[18]

Across the Atlantic, the European Institute of Innovation and Technology (EIT) formed EIT Health, a consortium that promotes research, education, and business expertise to "accelerate entrepreneurship and innovation in healthy living and active ageing with the aim to improve quality of life and health care across Europe."19 The Copenhagen Business School has both a Department of Innovation and Organizational Economics and an affiliation with the Innovation Growth Lab, "A global laboratory for innovation and growth policy, bringing together governments, researchers and foundations to trial new approaches to increase innovation, accelerate high-growth entrepreneurship and support business growth."20

All the stakeholders – providers, payors, life sciences, investors, and government – must support educational innovators like these in disseminating their efforts to create the executives health care needs.

However, these are only a few points of light: all-too-rare instances of the successful teaching of innovation. Unless they are enthusiastically energized —and consistently, adequately funded—health care will continue its moribund, bi-directional spiral: upwards in cost but downwards in terms of both access and quality.

We are hopeful. If any scholars should believe in their ability to spearhead substantial change, it is those in health care. Their area of expertise has more than once vanquished the seemingly impossible, whether by substantially increasing life spans or revoking the death sentence of AIDS in the developed world. Will our crowning achievement be to broaden access to health care across the world through cost-effective managerial innovations?

Appendix

TOP NINE U.S. UNIVERSITIES* TEACHING HEALTH CARE MANAGEMENT COURSES

Baylor University
Boston University
University of California, San Francisco
Harvard University
Massachusetts Institute of Technology
University of Michigan
University of Minnesota
University of Washington
Yale University

*According to U.S. News and World Report. These are presented in alphabetical, not ranked order. Methodology for arriving at this list is as follows: First, "health care management" refers to anything concerned with health care *outside* the delivery of medicines. When universities had both a medical school and taught health care management, the rankings for those two schools were averaged to produce the university's ranking.

2017 GENiE CONFERENCE ATTENDEES

Boston, Massachusetts

October 6-7, 2017

LAST NAME	FIRST NAME	AFFILIATION	COUNTRY
Anglim	Paul	BioInnovate Ireland	Ireland
Angood	Peter	American College of Physician Executives	United States
Applegate	Lynda	Harvard Business School	United States
Astier	Cristina	Universidad Barcelona	Spain
Bali	Vishal	TPG Growth	India
Barlow	James	Imperial College	United Kingdom
Bell	David	Harvard Business School	United States
Bhanji	Shaira		United States
Bodnar	Katharine		United States
Bonner	Steve	Harvard Business School	United States
Boutet	Christine	UPMC, Paris	France
Bove	Sylvie	EIT Health	Germany
Brindley	David	Université Pierre Marie Curie	United Kingdom
Cahill	Ed	HLM Ventures	United States
Carroll	James	CC Angel Investing	United States
Cesar	Alexia		United States
Chandler	Maria	University of Pennsylvania	United States
Chu	Michael	Harvard Business School	United States
Codina	Montserrat	IESE Business School	Spain
Cohen	Aaron	Argenta Advisors	United States
Cyr	Linda	Harvard School of Public Health	United States
Cyrén	Henrik	EIT Health	Sweden
de Rosa	Alberto	Ribera Salud	Spain
Dharan	Mahesh	CEMOSoft LLC	United States
Emmons	Willis	Harvard Business School	United States
Errasti Lopez	Ander	EIT Health	Spain
Falken	Aanchal	Change Healthcare	United States
Faucon	Felix	IGAS	France
Foalea	Ina		United States
Frassica	Joe	Philips North America	United States
Frick	Jan		Norway
Furlong	Bob	Bulfinch Group	United States
Furlong	Lily		United States
Gilbert	Tal	Vitality Group	United States
Gottlieb	Bruce	Oscar Health Care	United States
Govers	Mark	Maastricht University	United Kingdom
Grahling	Jeff	Florida Atlantic University	United States
Guram	Jeet	Center for Medicare & Medicaid Services	United States
Gurdala	Mikolaj	EIT Health	Poland
Hamacher	David	Get Better Sales	United States
Hawes	Tommy	Sandbox Industries	United States

LAST NAME	FIRST NAME	AFFILIATION	COUNTRY
Herzlinger	Regi	Harvard Business School	United States
Höög	Jan-Olov	Karolinska Institute	Sweden
Huang	Charles	Lynchpin Tech	United States
Kane	Nancy	Harvard School of Public Health	United States
Karwal	Vijay	DaVita Inc	United States
Kazberouk	Alexander		United States
Kelley	Laura		United States
Kester	Carl	Harvard Business School	United States
Khanna	Tarun	Harvard Business School	United States
Kohli	Japees	Harvard Business School	United States
Krevolin	Janet	Einstein/Westmed	United States
Kumar	Pratap	Strathmore Business School	United States
Lane	Jane		United States
Lavespere	Aaron	Connell and Curley	United States
Lewis	Maureen	Georgetown University	United States
Lopez	Beto	Dell Medical School	United States
Lottenberg	Claudio	UnitedHealth Group	Brazil
Lutz-Paynter	Nancy		United States
Machiels	Alec	Pegasus Capital Advisors	United States
Macon	James	Future NeuroSpine Inc	United States
Maisonrouge	Francois	Evercore Partners	United States
Malafronte	Frank	Harvard Business School	United States
Malik	Ana Maria		Brazil
Matsson	Per		Sweden
McDonough	John	Harvard School of Public Health	United States
Meinert	Edward	EIT Health	United Kingdom
Mesbah Oskui	Shirin	Global Business School Network	United States
Miller	Tony	Lemhi Ventures	United States
Mitchell	William	Duke University	United States
Mobisson	Nneka	mDoc	Nigeria
Mogefors	Daniel	KTH Technology	Sweden
Mühle	Ursula	EIT Health	Germany
Murray	Janet	Royal Institute	United Kingdom
Naidoo	Roshini	Discovery Healthcare	South Africa
Palten	Patricia	University Hospital Bern	Switzerland
Parulekar	Ajit	Goa Institute of Management	India
Paynter	Nancy		United States
Perdereau	Véronique	UPMC - Paris	France
Pillay	Rubin	University of Alabama at Birmingham	United States
Pracyk	John	Johnson & Johnson	United States
Prada	Carlos	Meso America	Colombia
Pretorius	Johan	Universal Healthcare	South Africa
Restuccia	Joe	Boston University	United States
Ribera	Jaume	IESE Business School	Spain
Rohlen	Duke	Spirox, Advanced Cardiac Therapeutics	United States

LAST NAME	FIRST NAME	AFFILIATION	COUNTRY
Rooney	Mark	Parexel	United States
Rosengard	Bruce	Johnson & Johnson	United States
Rosenmöller	Magda	IESE Business School	Spain
Rotenberg	Fay		United States
Sadun	Rafaella	Harvard Business School	United States
Sallar	Anthony	GIMPA	Ghana
Sammut	Stephen	University of Pennsylvania	United States
Savage	Grant		United States
Schlesinger	Len	Harvard Business School	United States
Schulman	Kevin	Duke University School of Medicine	United States
Sen	Kaushik	Health Spring	India
Sharan	Alok		United States
Siegrist	Rick	Harvard School of Public Health	United States
Sikka	Diya		United States
Silvers	JB	Healthcare Leadership Academy	United States
Snyder	Greg		United States
Somai	Melek	Imperial College	United Kingdom
Sternshein	Heather	HarvardX	United States
Suriaga	Armiel	Florida Atlantic University	United States
Szócska	Miklós	Semmelweis University	Hungary
Tan	See Leng	Parkway Pantai	Singapore
Tanner	Michael	Cato Institute	United States
Teel	Allan	Full Circle America	United States
Terra	Claudio	Albert Einstein Hospital	Brazil
Tramuto	Donato	Tivity Health	United States
Tuneu	Xavier	IESE Business School	Spain
Valentin	Finn	Copenhagen Business School	Denmark
Wadhwa	Gurinder		United States
Wallace	James	Harvard Business School	United States
Weintraub	Michael	Optum Ventures	United States
Xia	Anna	Market Ignition & Advisory	United States
Yauto	Faye	ISM Dakar	Senegal
Zanetti	Randall	Bradesco	Brazil
Zhang	Wei	Peking University	China

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