Fall 2009 Volume 9, Issue 1

TuftScope

The Interdisciplinary Journal of Health, Ethics, and Policy

Big Pharma: Is the Science of Medicine for Sale?

Interview with Daniel Carlat, MD: Pharmaceuticals and Physician Ethics

Also Inside...

The Use and Overuse of Cesarean Sections in Mexico

Cultural and Access Issues in Sexual Health in Mayan Guatemala

A Publication of TuftScope, the Student Bioethics Organization of Tufts University

JOURNAL HISTORY

Since 2001 *TuftScope: The Interdisciplinary Journal of Health, Ethics, & Policy*, has provided an academic forum for discussion of pertinent healthcare and biosocial issues in today's world. The journal addresses different aspects of healthcare, bioethics, public health, policy, and active citizenship. It is operated and edited by undergraduate students of Tufts University and is advised by an Editorial Board composed of Tufts undergraduates and faculty. Today the journal is one of the few peer reviewed undergraduate published journals in the country.

SUBMISSIONS INFORMATION

Submissions on health, ethics, and policy topics from students, faculty, and individuals are welcomed in *TuftScope*. For more information please visit the *Guidelines* page on the TuftScope Website at www.tuftscopejournal.org.

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Cover Image: As pharmaceutical companies and physicians become more closely intertwined, conflicts of interest inevitably arise. In this issue we explore - Is medicine for sale?

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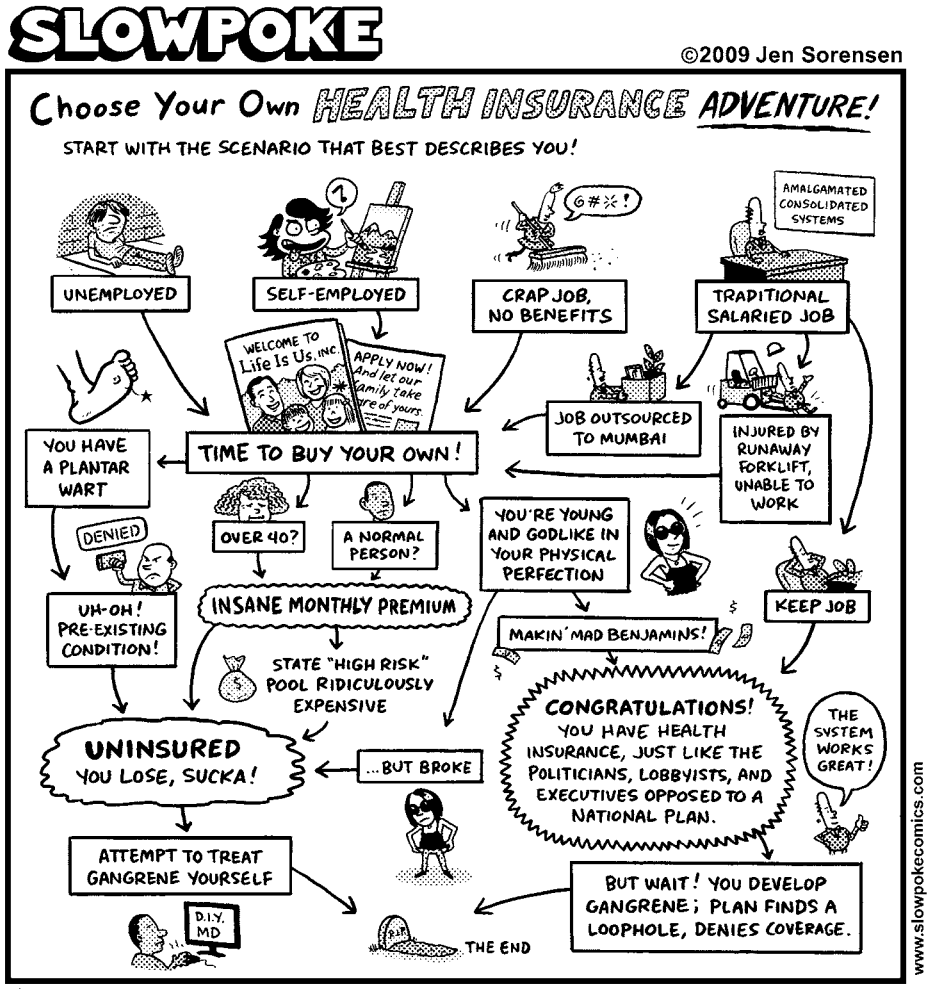
-Special Graphic-

Jen Sorensen, creator of Slowpoke Comics, depicts the convoluted world of health insurance in the United States



LETTER FROM THE EDITOR

Change Comes to TuftScope

Dear Readers,

The Fall 2009 issue marks the introduction of the most significant changes to *TuftScope* since the founding of the journal in 2001. In recent years the journal has faced difficulties in printing all of the worthy papers that it receives. Furthermore, the staff realizes that readers seek for the publication to provide material that is both academically rigorous and accessible - a challenging balance to maintain. With this in mind the journal has decided to pursue several key changes to its print and online publication strategies.

In this issue readers will see the first wave of changes for the print edition, including a new layout style. The Table of Contents has been redesigned to include both print and online content. Our regular sections like News and Views, the Feature Interview, Opposing Viewpoints, and the Book Review return in this issue. At the same time, Opposing Viewpoints has been redesigned. Noticeably the references for the section are now in the online full text version. Complementing these sections are new additions including Editorials, Research Highlights, and an Insights article addressing a contemporary issue of interest. Finally, we include a new academic section known as the Science Report reviewing a major biomedical development. All of this new content reflects our commitment to providing readers with accessible and informative content.

Our Original Articles and Commentaries are also changing. In Spring 2010, readers will notice that some original articles may be condensed into summaries of key insights for the print edition and the full text versions of the articles only available online. Articles will also continue to be made available ahead of time through TuftScope Express at www.tuftscopejournal.org, as two articles in this issue are. Our goal in doing this is to make the most content available for our readers in the limited space we have available, while allowing those who seek greater depth to explore the full text online. Readers will benefit from more content and authors will gain exposure in two formats.

The scale of this transition means that *TuftScope* must maintain a novel and engaging electronic portal. This is exactly what we have done with the introduction of the www.tuftscopejournal.org website. With dynamic article features, a weekly weblog, social media, and an automated submissions system, the web site marks a major developmental goal for the journal. Whether readers are interested in reading News and Views or Research Highlights (now available every week of the academic semester), following the posts of our bloggers, subscribing to the newsletter, engaging with us through social media, or reading our Twitter feed, there is something for everyone on the web site.

It has been a pleasure serving the journal during this exciting time for *TuftScope*. But all of this would not have been possible without the efforts of the *TuftScope* student and faculty staff. There are too many individuals to name and thank who have contributed to this redevelopment (many of them are on the staff list). But some deserve special thanks: Professor Harry Bernheim for invaluable advice; Max Leiserson for designing the new website; Avigya Shrestha, Cole Archambault and Puritan Press for the new layout; Alice Tin and the TCU Senate for managing our finances and providing the funding necessary to publish this journal, respectively.

And so begins a new chapter for TuftScope. We hope you enjoy this issue!

Sincerely,

Michael Shusterman
Editor-in-Chief

Ron Zipkin
Managing Editor

Cost Control and Healthcare Reform

Paulina Zheng

Monetary policy is a primary focus of the current contentious healthcare debate in Washington. Given that America spends more on healthcare than any other nation, it is imperative that healthcare costs be brought under control. The question is how?

The variations and model for medical spending across regions provide government officials with the opportunity to create a unified and successful healthcare system based on what has already been proven to be cost-efficient and effective. Contrary to popular opinion and what is portrayed on many modern medical dramas, current evidence suggests that more is not necessarily better when it comes to medical care. Rather than ordering expensive and often unnecessary tests and procedures, physicians should focus on more conservative treatments and integrated care. Practitioners should also look to preventative measures as a means of containing chronic ailments. Many of the health problems faced by Americans today are aggravated by or are the result of environmental factors. As such, medical practitioners should complement medical treatment with preventative education.

This reasoning does not seem to be consistently considered throughout the country. For instance, consider the case of McAllen, Texas in Hidalgo County.[1] With $15,000 spent per Medicare enrollee in 2006, McAllen boasts one of the costliest healthcare systems in the nation. And yet, in 2006, only $7,504 was spent per Medicare enrollee in nearby El Paso County, where the health demographics were nearly identical. There is little evidence that the additional costs incurred per Medicare enrollee in McAllen resulted in significantly better healthcare. Ranked by Medicare, McAllen's hospitals rated worse on-average, when compared with El Paso's hospitals. The medical culture of the town is focused on quantity rather than quality. With cutting-edge technology available, anxious patients, and financial incentives for medical practitioners, McAllen became a Mecca of spending.

And therein lies the crux of the matter. Medical practitioners have a responsibility to practice appropriate care and not to over-treat. Practitioners should emphasize to patients, such as those with heart disease, the need for lifestyle changes rather than reach for stents and bypass surgeries as the first options. Indisputably, in many cases serious acute conditions require specialized care. However, the current healthcare system in locations like McAllen provides physicians with financial incentives to over-treat patients. The fee-for-service system ensures that the more services are ordered the more money is made.

Another model for healthcare exists in the Mayo Clinic in Rochester, Minnesota. There the priority is placed on patient care. Because physicians in the Mayo system are salaried and not paid fee-for-service, medical practitioners are shielded from the perverse financial incentives that other physicians encounter. Specialists and general practitioners are able to work in tandem and focus on the patient, using evidence-based practices and collaborative efforts. Physicians who have more time to interact with patients are able to emphasize lifestyle changes more effectively. As a result, healthcare quality is increased and costs decrease. The inherent limitation of such a model is that it is not as profitable as the McAllen model. Hospitals and physicians do not significantly profit from the administration of cost-efficient and preventative care. The individualized attention needed in such a model also requires large initial expenditures. Finally, some physicians and medical industries, loyal to the fee-for-service model and the financial benefits reaped from such a model, simply do not support significant change.

The debate over healthcare in Washington offers a unique opportunity for a change in the patchwork healthcare system currently in existence. Every American deserves access to healthcare. But some Americans should not have to pay more than others to get the same quality healthcare. Change is inevitable. But what will this change be? What healthcare model will the nation adopt? Will we continue to spend billions on unneeded procedures and tests? The current Obama administration must not allow special-interest groups, political interests, and ubiquitous lobbyists to stand in the way of meaningful cost reform. It must remember that its responsibility is to the American public and the future health of the United States population – both physically and fiscally.

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HPV Vaccination for Men

Lauren-Elizabeth Palmer

Much of the public has heard of the HPV vaccine and advertisements encouraging women to be vaccinated against HPV. A new study suggests, however, that men should be vaccinated against HPV as well.[1] In 2006, Merck introduced a vaccine against HPV known as Gardasil.[1] The vaccine protects against two strains of HPV, which are known to cause 70% of all cervical cancers and 90% of all cases of genital warts.[2] Because HPV is responsible for 11,000 cases of cervical cancer each year, the CDC recommends that all women ages 11 to 26 be vaccinated.[3] What about men? After all, HPV has been implicated in genital warts, mouth and throat cancers, and rare penile and anal cancers.[4]

Approximately 75% of unvaccinated men and women will get an HPV infection in their life.[2] The vaccine was not originally marketed to men, however, because the health effects caused by the infection were not considered as significant compared to effects in women. Most men will never know that they have been infected with HPV and the few who do will primarily suffer from genital warts. Some men, though, especially those who sleep with other men, experience drastic consequences from the infection. Roughly half of all penile cancers are caused by HPV. and HPV is the primary cause of anal cancers in the U.S.[4] HPV infection also causes cancers of the throat and mouth, both of which have been on the rise especially in young men, presumably because of participation in oral sex.[4] Given these diseases associated with HPV, it would seem reasonable to argue that men should be vaccinated against the infection as well.

Merck, the company which produces the vaccine, has begun to investigate this argument. An ongoing study conducted at the Medical College of Georgia's Gynecological Cancer Center on 5,400 men worldwide aged 16 to 24 who have had few or no sexual partners has so far shown that the vaccine has similar rates of efficacy and side effects in men as it does in women.[5] Gardasil has already been approved for use in men in several countries. Following the release of preliminary results from the study, an advisory panel for the Federal Food and Drug Administration voted in September 2009 to advise that the HPV vaccine be made available to men in the U.S.[6]

Some experts question this advice. The BMJ published an editorial by researchers from the National Institutes of Health in Bethesda, MD, and from the Division of Preventative Medicine at the University of Alabama which questioned the fiscal responsibility of vaccinating men.[6] The vaccine requires three doses and costs 360 USD per person.[2] In light of rising healthcare costs, it is argued that if all women were vaccinated against HPV then the disease could be eradicated in men as well, since men would have no opportunity to encounter the infection. This argument fails to include the risks and spread of infection amongst homosexual men. Vaccinating women would lead to some herd immunity, meaning homosexual men may have a lower risk of being infected if women were vaccinated. The decrease in risk, however, would not be comparable to the decrease in risk observed in the heterosexual population. This disparity is particularly important, as homosexual men are at the highest risk for anal cancers.[4] This analysis is also based on high rates of uptake of the vaccine in women. Only 18% of females aged 13 to 17 had received all three doses of the vaccine in 2008.[6] The researchers note that if this number does not increase, then vaccination of men could be a very beneficial addition to herd immunity.

Vaccination of men and women would be equally in line with our current approach to sexual health- that is to hold both parties responsible for protecting themselves and their partner. Vaccination of both men and women in sufficient numbers could potentially halt the spread of HPV.

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NEWS AND VIEWS

Health, Ethics, and Policy News and Views from the Staff

What Does Healthcare Really Cost?

Lori Fingerhut

The Kaiser Family Foundation's 2009 Employer Benefits survey that was recently conducted amongst employers provided a good look at the actual cost of healthcare for Americans. According to the Kaiser survey, the current average cost of healthcare coverage for Americans is $13,375, and this number is on a steady rise. By 2019, in fact, it is estimated that an average family coverage will cost $30,083. However, Employers pay a large portion of this cost that has resulted in a 300 percent rise in healthcare premiums over the past 30 years and has lowered hourly wage earnings for workers. The millions of Americans on public plans and who are uninsured receive their benefits from taxpayers, thereby increasing the cost of premiums even more. How will the government fix this issue? The public insurance option has been suggested as a way to provide healthcare for the underinsured and uninsured, as well as lower premiums for all Americans. For the average family, Comparative Effective Review is a current White House favorite, calling for the limit of new and expensive medical treatments that haven't yet been proven effective. Another, more unpopular possibility is taxing healthcare benefits in hopes that Americans who have to pay more for healthcare won't use as much of it. While the government is looking at the big picture, however, if small changes, such as replacing paper records with computerized files, were made to the system, millions of dollars could be saved.

Medical Students Learn About Geriatrics

Lauren-Elizabeth Palmer

Medical students at the University of New England in Biddeford, ME can chose to participate in a new program where they live as nursing home residents for two weeks. The philosophy behind the program is to expose medical students to the underserved field of geriatrics and to give them the tools to "speak with institutionalized elders." The medical students are given a diagnosis and expected to live as a patient with that ailment for the duration of their stay, thereby gaining deeper understanding of life within a nursing home. Geriatrics is one of the lowest paid and most underrepresented fields in medicine. With only one geriatrician to every 5,000 geriatric patients, the field is in "a crisis." The hope is that programs like the one mentioned will generate greater interest in this vital aspect of medicine.

Debate Over the Sugar Tax

Kanupriya Tewari

The deliberation over tax on sugary soft drinks — billed as a way to fight obesity — is starting to "fizz over". The chief executive of Coca-Cola calls the idea outrageous, while skeptics point to political obstacles and question how much of an impact it would really have on consumers. However, a team of prominent doctors, scientists and policy makers says it could be a powerful weapon in efforts to reduce obesity, in the same way that cigarette taxes have helped reduce smoking. The group's review of research on the topic cited research on price elasticity for soft drinks that has shown that for every 10% rise in price, consumption declines 8 - 10%. The scientific paper found that a beverage tax might not only raise revenue but have significant health effects, lowering consumption of soda and other sweet drinks enough to lead to a small weight loss and reduced health risks among many Americans. President Obama has said that a tax is justified in part because conditions like obesity and diabetes are often treated with public funds through programs like Medicaid and Medicare. He further emphasized that revenue from the tax could help pay for such care. Nevertheless, critics of the tax continue to voice their concerns about the potential consequences of implementing such a reform.

E. Coli and the Beef Inspection Process

Marina Bartzokis

We have all heard about *E. coli* contamination of meat products, but who knew the cause for such contamination lies with poor sanitation and inspection practices of slaughterhouses and meat processing companies? The *New York Times* reports a growing problem of severe illnesses caused by contaminated meat, particularly ground beef. Despite the fact that the United States Department of Agriculture, USDA, orders random inspections of all meat products, it appears that not all of the dangerous strains are being caught before being sent to market. Ground beef often contains a mixture of beef products from various slaughterhouses. By the time a contamination risk is discovered, distributors claim that the source is almost impossible to identify. Meat packing companies claim that the fault lies with the slaughterhouses, some of which refuse to sell to distributing companies that require screenings for *E. coli*, in an attempt to hide their unsanitary factory conditions. On the other hand, meat product distributors object to the USDA required *E. coli* testing, claiming it would put unfair strain on smaller distributors. It appears that despite attempts being made by the USDA, the problem with preventing and catching contamination early still remains, due to a lack of cooperation by both suppliers and distributors. **More at:** *NY Times*. 10/04/2009. "*E. coli* Shows Flaws in the Beef Inspection Process."

Healthcare Policy for Medical Students

Priya Larson

Medical students do not receive much education on health care policy, which determines who receives how much care and for what cost. Students pack their schedules with requirements, so that even if they wanted to take a class on managed care or health disparities, they could not. In a movement to train doctors to treat individual patients while keeping the good of the health care system in mind, several medical schools have begun to take steps to encourage students to diversify their class load. These schools recognize that highly competitive students might not voluntarily steer away from the standard curriculum when selecting courses. The George Washington University School of Medicine offers the equivalent of a minor in health policy for students who want to learn about, and possibly write, legislation. Harvard Medical School now requires a class in health care policy, which teaches about insurance, managed care, Medicare and Medicaid, and reform. Both schools integrate policy-related topics into their regular classes. In a time when health care policy is so polarizing, medical schools recognize that health care providers must be engaged in the reform process. **More at:** *Slate Magazine*. 06/23/2009. "Is Our Doctors Learning?"

The End of the White Coat?

Michael Shusterman

The white coat was adopted by the medical profession from laboratory scientists as a symbol of cleanliness and professional authority. Recent studies, however, have indicated that unclean white coats may harbor significant colonies of germs that are transferred to at risk patients. The American Medical Association has recommended that white coats be gradually phased out due to these risk factors. Strong opposition is certain to arise within the medical community and potentially even among patients themselves.

Massachusetts Health Commission Advocates Global Payments

Michael Shusterman

A panel of experts has recommended that the Massachusetts legislature pass a reform to the current state healthcare system that would remove the fee-for-service payments that doctors and hospitals currently receive. Instead, global payments would be paid to healthcare providers for providing care for a patient. Providers would organize into coherent health networks and distribute care to patients with the incentive of offering necessary care, rather than ordering excessive testing and procedures. Some have argued that this model is similar to the much maligned capitation payments of the 1990s that both doctors and patients argued led physicians to provide fewer services in order to save money. The proposal is still in the early stages, with more developments likely to follow.

RESEARCH HIGHLIGHTS

Summaries of Medical Research of Interest

Michael Shusterman, Editor in Chief

Significant Discrepancies in Clinical Trials

Mathieu and colleagues report in a Journal of the American Medical Association study that the 2005 requirement that clinical trials be registered prior to publication in most medical journals has been widely flaunted by investigators. Of the 323 reviewed trials, 89 were not registered and 31% (46/147) of the properly registered trials showed discrepancies between registered and published outcomes. Furthermore, those trials with discrepancies favored statistically significant results. *JAMA*. 2009. 302(9): 977-984

European Drug Makers Ahead of the USA

Donald Light reexamines 1982 - 2003 chemical research data to find that European drug makers never fell behind US companies in production and innovation. Indeed many of the American innovations like Nexium™ and Lipitor™, cited as models of innovative discoveries, are either chemical imitators (Nexium™) or have not been proven to be any more effective than comparable compounds (Lipitor™). Light argues that pharmaceutical companies have produced imitators and incrementally useful drugs, instead of funding research for novel chemical compounds for clinical treatments. *Health Affairs*.2009. doi:10.1377/hlthaff.28.5.w969.

Vertebroplasty Not That Useful

Kallmes and colleagues show that a common procedure used to seal vertebral fractures with cement is no more effective in relieving pain than a placebo incision and injection with a rapidly acting analgesic. The treatment, known as vertebroplasty, costs between $2,500 - $3,000 and requires an additional $1,000 - $2,000 MRI scan. Currently significant regional discrepancies in use of the procedure exist, as noted by the accompanying editorial to the study. As with all evidence based medicine, the question is whether this work will lead doctors to change their behavior in the future. *NEJM*. 2009. 361:569-5

TuftScope Blog: Spread of Viruses Occurs Faster than Originally Thought

*Linda Le**

When it comes to viruses, the definition of 'living' and 'non-living' becomes a complicated issue. Some would argue that merely having a protein coat and genetic material does not qualify a living thing. However, when we look at virus' structural variety and incredible ability to replicate in a wide range of hosts, it is undeniable that they are indeed responding to their environment and evolving alongside other life forms.

Viruses have viral receptor proteins on their surface, which recognize specific host cells. They then insert their genetic material into the cell, and either create additional copies of their genome on their own (in the case of RNA viruses), or rely on the host cell's machinery (DNA viruses) for the same purpose. Of course, the host cell has its own ways of recognizing these foreign invaders. A method called RNA interference cuts off the production of viral mRNA, hindering the reproductive cycle. In humans, killer T-cells recognize viral fragments on the surface of an infected cell and mark it for apoptosis. Interestingly, the HIV virus undergoes rapid mutations that change the amino acid sequence on its viral coat, enabling it to escape both vaccines and the killer T-cell response.

Researchers at Imperial College London have recently captured a new video of the vaccinia virus spreading throughout cells over the course of 16 hours. The virus appears to spread at a faster rate than its replication cycle allows; it apparently has evolved a mechanism which allows it to recognize which host cells have and have not yet been infected, thereby saving time and effort. This new information could change the way we approach viral propagation, and hopefully, it will lead to more advanced medical strategies in treating viral diseases.

**Linda Le is a contributing writer on the TuftScope Blog. Read more of her posts at: www.tuftscope.blogspot.com.*

Read weekly Research Highlights at the TuftScope Blog at www.tuftscopejournal.org

FEATURE INTERVIEW

A Discussion with Daniel Carlat, MD

*Ron Zipkin**

Daniel Carlat, MD, is a practicing psychiatrist and an Associate Clinical Professor of Psychiatry at the Tufts School of Medicine. As founder and president of Clearview Publishing, he established and continues to be the Editor in Chief of *The Carlat Psychiatry Report***, an independent newsletter accredited by the Accreditation Council for Continuing Medical Education (ACCME) as a Continuing Medical Education (CME) Provider. He is a Massachusetts Representative of the American Psychiatric Association (APA) and is also a member of the Massachusetts Psychiatric Society (MPS). In addition to his role as editor of** *The Carlat Psychiatry Report,* **he maintains a presence as a widely-read commentator on the influence of the pharmaceutical industry on medical education, via the Carlat Psychiatry Blog and Twitter, and is an occasional contributor to the** *New York Times.* **His forthcoming book,** *Unhinged: The Trouble with Psychiatry***, will be published in May 2010 by The Free Press. His two prior books are** *The Psychiatric Interview* **and** *Drug Metabolism in Psychiatry***.**

After completing your medical residency at Mass General in 1995, what was the nature of your practice and academic authorship prior to your involvement with Wyeth Pharmaceuticals?

After my residency I went into a combination of private and hospital-based practice as an inpatient attending at Anna Jacques Hospital in Newburyport, MA. During that time, I built up a private practice, also in Newburyport, and got involved in writing and editing textbooks for psychiatrists. I wrote a textbook called the *Psychiatric Interview: A Practical Guide*, which was published by Lippincott Williams & Wilkins, and started a series of short practical guides on different aspects of psychiatric practice that would be useful for residents, early career psychiatrists, and anybody that needed a quick, handy reference book.

Can you briefly describe your involvement with Wyeth Pharmaceuticals and how that led to your current views on the industry-physician relationship?

I was approached in 2002 by a representative from Wyeth who asked if I would like to be a promotional speaker for the company. I accepted his offer and went to the speaker training meeting held in New York. After that I gave talks for primary care doctors, primarily on antidepressants and the management of depression, always with the focus on the drug Effexor. Ultimately, I found that the problem with giving those talks was that, because I was paid so much –about $750 for about an hour long talk– I felt a subtle pressure to highlight the positive aspects of Effexor and to downplay any of the negative aspects, side effects, or other liabilities of the drug. Because of that feeling, I ultimately decided to quit the speakers bureau.

What events stand out in your mind in the development of the prescription culture associated with the practice of psychiatric medicine?

Probably the first big event that stands out in my mind was the introduction of Prozac as an antidepressant in 1988, which very quickly became a blockbuster because, not only was it effective for treating depression, but it had very few side effects compared to some of the other antidepressants available at that time. Shortly after Prozac was introduced, a fascinating book was written by a psychiatrist at Brown University, Dr. Peter Kramer.[1] Dr. Kramer described that patients he treated with Prozac not only benefitted from the antidepressant action of the drug, but experienced positive personality transformations as a result of its use. For example, patients who had previously exhibited hesitant or shy personalities would come out of their shells and were very comfortable with other people. The book enhanced the popularity of Prozac and motivated other drug companies to create their own competing products to Prozac; since Prozac's introduction at least ten 'me-too' versions of Prozac have been developed over the years. Almost every similar drug has become a blockbuster in its own right, not because they were any more effective in treating patients, but as a result of their demand induced through the marketing machinery of the drug companies which made many of these drugs best sellers.

The Carlat Psychiatry Report, which you publish, offers its physician readership CME content independent of industry influence. Why did you feel another journal would be an effective vehicle for addressing what you have referred to as a "corrupting" influence? How would you characterize the response of the medical community?

I came up with the idea of creating another publication during the time I was speaking for Wyeth, toward the end of 2002, as I became more and more uneasy with the promotional nature of my talks. I noticed that many of the publications sent to me in my private practice office

*Ron Zipkin is the Managing Editor of *TuftScope*.

were funded by drug companies. I don't mean simply that the drug companies put ads in journals, but some journals and newsletters actually appeared to be wholly commissioned by drug companies that would hire medical communication companies to produce the journals. In some cases, well known academic doctors were paid simply to put their names on articles that were in fact ghostwritten by anonymous medical writers. It bothered me, because I, as a practicing doctor, am always looking for good comparative effectiveness information in treatments and yet so much of the literature in some ways was influenced by drug company promotional messaging.

How might the influence of industry biases affect patient outcomes?

My impression is that the promotional programs and the CME programs funded by drug companies have emphasized the newest drugs, which are not always necessarily better for patients. In psychiatry, which is a somewhat different field in this regard from some other areas of medicine, many of the newer drugs have actually not been any better than older drugs and have had various disadvantages that have been downplayed. Well how does that affect patient outcomes? I'll just give you an example from the antipsychotic market: Zyprexa is a new antipsychotic, which was created by Eli Lilly –incidentally the same company that marketed Prozac– which was marketed as a big advance in antipsychotic treatment. But what was downplayed in the marketing, at least initially, was the fact that Zyprexa can cause enormous weight gain in patients… as much as one pound per week of treatment. So we were beginning to see our patients gain weight on Zyprexa. Obesity, in turn, leads to a number of other problems such as diabetes and cardiovascular disease. So my concern is that in cases like Zyprexa, the over-hyping of some of these newer agents has led to negative instead of positive outcomes.

What roles do CME providers including "Medical Education Communication Companies" (MECCs) play in this?

The role that MECCs have played is that they have supercharged an entirely new form of pharmaceutical advertising- industry-funded CME. This has over the last decade gone from being about a $300 million per year to a $1.2 billion per year industry.[2] What that means is that the drug companies pay grants to the MECCs to put on CME programs for doctors and then the MECCs, knowing the marketing messages the drug companies are trying to convey, hire doctors, who they already know have bought into those particular marketing messages. Those doctors will then give talks or write articles which are usually subtly biased in favor of the sponsor's product.

In addition to statements in the Annual Report of the ACCME indicating the decline of Industry funds for MECCs2, how do you interpret the change going on at the levels of the APA, AMA[3], and drug companies themselves?

What has happened over the last couple of years is that the issue of drug company bias in education programs has come front and center, due to a number of developments. In some cases there have been high profile physicians, some of whom have been psychiatrists, orthopedic surgeons, and cardiologists, doctors who have been caught not disclosing millions of dollars in payments received from drug companies. This has caused very bad publicity for those doctors, the universities with which they are affiliated, and for some medical societies. In turn there have been institutional reforms, where, as in the case of the APA, the association has decided that it will no longer allow drug company-sponsored courses at its annual meetings. And that is only one example, but when you multiply that by other medical societies and academic medical centers, this has resulted in a $200M decrease in industry funding of CME from 2007 to 2008.[2]

Among others, Senator Grassley (IA-R) has recently been involved in exposing conflicts of interest between the medical and research communities and the pharmaceutical industry. What role do you think he has played in bringing this issue into the public sphere?

Senator Grassley has become interested in the influence of drug companies on medical practice, because he found that a number of high profile doctors that had received publically-funded NIH[4] grants for research were at the same time giving promotional talks for the very same drug companies that would benefit from the NIH grants. That in itself is a bad enough conflict of interest, but what made it worse was that many of these same doctors had not disclosed the funds or payments they had received from drug companies. In some cases, these payments ran into the millions of dollars over the course of several years. These kinds of disclosures have encouraged journalists, bloggers such as myself, and attorneys to look into the behaviors of drug companies and doctors, which has led to large legal settlements in which companies have admitted to illegally marketing some of their products. The largest such settlement was the recent Pfizer settlement for $2.3 billion.[5]

These settlements may sound large, but in fact $2.3 billion is not really a lot of money for a company like Pfizer, which makes about that much in income every three weeks. The financial penalties are little more than slap on the wrist for the large companies. But a more significant result of the settlements is that the companies are required to sign corporate integrity agreements, which are blueprints for how they must reform their promotional practices. They will also be required to report the oversight activities of their marketing programs to a

certain authority on a regular basis. That I think is the real contribution of some of these settlements.

You have made it a point that health-related institutions need to be actively scrutinized, openly criticizing institutions you have been involved with when they receive pharmaceutical money, show lapses in transparency, or suppress independent voices. Tufts is no exception. Recently Tufts University rescinded an invitation to Paul Thacker, a member of Senator Grassley's staff, originally invited to be a keynote speaker on conflicts of interest in medicine and research, due to an ongoing inquiry from the Senator's office regarding a Professor at Tufts University Medical School.[6] Can you explain to our readers what you think Thacker would have brought to the discussion?

Paul Thacker, while he now works for Senator Grassley, was an investigative journalist prior to taking that position, famous for having written some very high profile articles for different magazines on issues like the way tobacco companies had created certain scientific findings in order to convince consumers that tobacco is not really dangerous. Thacker is known for his expertise in writing about the ways that large corporations have manipulated science in different fields, not just medicine. For that reason I think he would have been an excellent addition to the program, simply because of his breadth of experience. He can talk about the ways that drug companies manipulate science and doctors, but can also talk about how companies in other fields have done things and used techniques that drug companies might have borrowed. I think the Tufts community missed out on some great education by preventing him from speaking.

You recently submitted written testimony before the Senate Special Committee on Aging regarding Industry influence on doctors.[7] Currently, we have a patchwork system of regulation that varies state to state. Do you see a future for efforts to regulate this at the federal level, especially now within context of the healthcare reform debate?

I would say that my reading of the Senate and the entire Congress in terms of these issues is that there is broad support for increased transparency. One component of the current healthcare reform bill is something called the Physicians Payment Sunshine Act, which would require on the national level all drug companies to post on the internet all payments they make to doctors, particularly for any marketing or consulting.[8] Is that going to reform to any degree companies that are inducing doctors to do this? I would think so, because when you know that the payments of thousands and in some cases millions of dollars you receive are going to be published on a public website that anybody has access to, you are going to be a little more cautious of what you are doing to gain that money. I think what will happen is that fewer doctors will be willing to give blatantly promotional talks. You will have doctors that perhaps decide to do research or consultation for a drug company to help them in developing a product or designing research, which in my opinion can be entirely appropriate, but it really is not okay to become a drug representative and give talks to drive up drug sales.

Lastly, I wanted to hear your reflections on the debate about ghostwriting in biomedical literature and the relationship between research, the practice of medicine, and the influence of the industry.

Ghostwriting continues to happen. It's a practice that has been rampant in science, and in psychiatry in particular, there have been estimates that up to half of all articles written about certain medications were actually ghostwritten rather than written by the identified authors. Recently there have been estimates that that about 10% of all articles in bigger journals are still ghostwritten. Because of the publicity and the increasing transparency about what's happening, journal editors are putting policies in place to prevent ghostwriting from occurring; essentially they are saying if you submit an article with your name on it, they want to know what you did to write the article and if anyone else was involved, from now on you must divulge who it was and who paid them, such as if they were paid by a drug company.

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CME, COIs, and the Spectre of Big Pharma: Is the Science of Medicine for Sale?

*Ron Zipkin**

CME

On the patient end of medical care and treatment, there is often the assumption that the decision-making process behind that care is based on the factual and applicable principles of the clinical degree training process. Within the biomedical community, however, the absolute necessity of assimilating current findings and up-to-date practices into the care that reaches patients is indisputable. Continuing medical education (CME) is not only a logical step in the ever-more-embraced transition to evidence-based medicine, it is an enforced practice required for medical licensure in the US on a state by state basis.

This process is overseen by state medical licensure boards, which usually require practitioners to complete on a biannual basis a minimum number of continuing education credits, attained from providers certified by the Accreditation Council for Continuing Medical Education (ACCME).[1,2] Certified providers of CME range from academic centers and medical journals to the more recent, so-called medical education communication companies (MECCs). A combination of these might as well be incorporated into CME activities sponsored by physician societies like the American Medical Association (AMA). CME credits are thus obtained through the completion of coursework, participation in sponsored events/lectures, and assessment of medical literature read (most CME-accredited journals include short tests dealing with recent articles).

COIs

With the expansive successes of pharmaceutical companies and medical device manufacturers in recent decades, their realm of influence has grown into nearly all facets of the health service sector. Outside the contribution of many essential medical developments, the influx of for-profit commercial players has consequently generated the myriad of conflicts of interest (COIs) which now plague the landscape of medical practice and related research and academia. It is widely accepted that a central dilemma of the pharmaceutical industry is whether to "develop new drugs or promote existing ones"[3], but it remains to be questioned what its role is in the development and dissemination of useful, valid medical science.

That these sizeable commercial entities expect to maintain their revenues to support any of the aforementioned is understandable. However, when looking at the vast amounts of revenues that are invested in production and distribution, research and development, and promotion, it is understandable that the overwhelming sums invested in promotion, in particular, are the subject of controversy. Enough to raise the eyebrows of bioethicists alone, the $57.5 billion total spent on promotion in the US in 2004, according to one estimate, was almost twice the generally accepted amount spent on R&D.[4]

COIs arise at the intersection of industry efforts with the efforts of health professionals and medical educators due to certain obligations which, at times to the detriment of patient care, have proven in many cases to be mutually exclusive. Within the scope of CME, academic centers/research institutions as well as publishers of medical literature are obligated to provide doctors with the information that best enables them to treat their patients. MECCs and pharmaceutical companies, on the other hand, are vulnerable to circumstances in which they are inclined towards serving their own corporate fiscal interests and have in numerous cases confused these interests with those of CME consumers and the patients affected by this information. Commercial support for CME in excess of $1 billion in 2008, as reported by the ACCME[5], represents just a fraction of the industry funds used in reaching out to physicians.

MECCs AND CME

The problem of COIs is further illustrated by the level of industry funding of MECCs involved in CME activities. ACCME-certified MECCs, which are independent for-profit companies in many cases established by advertising or marketing agencies, plan and organize CME events where doctors are often paid as speakers.[6] Since it is understood that MECCs depend on pharmaceutical company support for more than 80% of their revenues[7], it is difficult to understand how these organizations are able to provide unbiased CME content. Is it unreasonable to expect these companies to utilize physicians with whom they –the MECCs and/or their sponsors– are familiar, and therefore have congrous vested interests?

COIs IN ACADEMIC CME SETTINGS

Academic institutions, such as universities and medical schools, are a central front in providing both the research that fuels medical developments for and the conferring of medical knowledge to future and current medical professionals. Medical researchers and lecturers are not only subject to academic commitments under the mission/policies of their own institutions, but may take

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on other pledges in the solicitation of additional support of their teaching or research efforts from external public or private sources. These are in many cases the people responsible for organizing courses and events for which CME credits are awarded. The 2008 Harrison Survey of North American Medical Colleges by the American Association of Medical Colleges and the Society for Academic Continuing Medical Education found that 56% of revenues used for academic CME at reporting US schools came from commercial sources.[8] It is naturally confusing and difficult for each of these entities to separate their obligations and responsibilities, since the majority of the funding is provided by companies with vested interests in promoting their own products.

A much publicized example is the case of psychiatrist Charles Nemeroff, who was forced to step down as Chair of the Department of Psychiatry and Behavioral Sciences at Emory University School of Medicine, and became the subject of national investigation. Interest focused on COIs brought to light stemmed from his failure to disclose financial relationships and ties to industry, at one point having consulted for as many as 21 drug and device companies simultaneously.[9,10] As surprising was Emory's position subsequent to their internal COI investigation; after uncovering unreported income in violation of university policies amounting to over $800,000 from just one company willing to cooperate with the investigation, GlaxoSmithKline, he "…[was] limited to accepting payment for ACCME-accredited speaking engagements sponsored by academic institutions or professional societies."[11] One wonders what occurs within comparable academic CME settings. This was further exacerbated by the fact that he acted in violation of conditions governing his receiving of taxpayer-supported NIH funds for his research activities.[12] As a result, Nemeroff, though a renowned physician in his own right, has also become a figure symbolic for the wider systemic problem of COIs among academics involved in medical education and research.

COIs IN CME LITERATURE

The area at the epicenter of academic bioethical contention is also at the heart of medical knowledge –documentation in the form of biomedical literature, which has more and more been the target of industry promotion efforts. It is this packaging and presentation which is the substance of continuing education materials represented by current research and review. COIs stem from two major problematic practices in medical literature content and authorship: misrepresentation of authorship/findings and support for research by profit-oriented commercial parties. Nowhere is this more apparent than in the controversial practice of industry-supported "ghost" authorship, whereby the messages attributed to reputable authors are generated or influenced by subcontracted private parties not cited as contributors. In perhaps the most convoluted manifestation of ghostwriting, drug companies fund studies through contract research organizations.[13] In some of these cases, MECCs paid by pharmaceutical companies will then prepare or shape manuscripts for publication in medical journals and pay doctors to submit the work under their names.[13,14] It is not altogether uncommon that input in such cases comes from "honorary" authors who are not the principle researchers.[15] Nonetheless, major journals that serve as sources of CME content continue to fall prey to ghostwriting "campaigns," forcing journals to come together to change editorial practices, as in the case of the International Committee of Medical Journal Editors (ICMJE).[16] In findings presented to the September 2009 International Congress on Peer Review and Biomedical Publication, editors of the *Journal of the American Medical Association* (*JAMA*) gauged the prevalence of ghostwritten articles in six of the major medical research journals, ranging from 14% at the *New England Journal of Medicine (NEJM)*, ironically the focus of current furor, to an astounding 39% in *Nature Medicine*.[17]

CONCLUSIONS

Patients and medical professionals deserve to know the unbiased findings of legitimate medical research in the generation of a consensus regarding medical practices. So too should the scientific record be maintained. These basic tenants are reflected in the public outrage over industry manipulation of medical education. Public outcry in the US is forcing hands to promote oversight, such as the extensive investigative work by Senator Grassley (IA-R)[9-12,18,19], revealing the prevalence of corrupted medical academia and the lack of basic disclosure policies at institutions like the NIH, which even last year did not require disclosure of COIs from grantees.[20] This and related scrutiny has had an effect, driving pharmaceutical companies from supporting MECCs and directing more of their CME-sponsorship funds to physician societies.[5,21,22] Academic institutions have heeded the public outrage and pressure of investigations, exposing biases in medical education activities for which they are responsible and branding misrepresentation of research as "on a continuum with plagiarism," in the words of University of Pennsylvania Center for Bioethics Director Arthur Kaplan.[19]

When it comes to sources of CME literature, the responses of academic journals to the overwhelming presence of COIs have included the stringent new *JAMA* policies that likely led to their drop in "commercially funded papers…from 60% to 47%."[16] This might reflect increased rejection of such articles and, potentially, that industry-influenced players are avoiding submission. Editors worldwide are taking a stand and taking a microscope to their submissions, from outspoken *British Medical Journal (BMJ)* editors castigating drug company-biased articles[23] to the *Chinese Medical Journal* investigating ghostwriting[24], culminating in the in October 2009 arrival on a policy for the uniform disclosure

of COIs in paper submissions to ICMJE journals.[25] From Merck to GlaxoSmithKline to Wyeth (now part of Pfizer), drug companies have also instituted reforms seeking to improve upon disclosure practices. Still, abuses continue, according to editors of major publications, who claim to still receive large numbers of suspicious papers that "offer favorable reviews for new drugs apparently penned by authors who had not previously published on that topic" or others seeming "to market off-label uses of drugs."[16]

The evolution of these standards is essential to ensuring patients receive the objectively-researched treatments and care that non-biased CME should offer doctors. This is not compatible with the bias that affects the CME process at every level- be it at the basic science level, where only certain projects are funded and certain outcomes reported, or in lecture form, where educators allow the novelty marketing of products to influence their presentations. The bioethical implications are immense when COIs are left unchecked and individuals are driven by obligations that would lead them to transgress against the best interests of patients. If doctors are bound by the Hippocratic Oath, under what code need researchers, producers of medical supplies, educators, and publishers of biomedical literature swear?

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From Roosevelt to Obama: The Political Context of US Healthcare Reform

*Theodore Minch**

In 1912, the RMS Titanic struck an iceberg and sank in the frigid North Atlantic and the Boston Red Sox opened an oddly-shaped stadium named Fenway Park. It was in this era that a nationally-based healthcare reform movement first gained major political exposure, courtesy of former President Theodore Roosevelt.

Historical Perspective

In 1912, Theodore Roosevelt campaigned on the Progressive Party ticket, attempting to wrest the presidency from President William Howard Taft. Roosevelt campaigned on unprecedented promises of national health insurance for all workers, overtaking Taft in the election, but ultimately unable to gain enough support to beat Woodrow Wilson. Roosevelt's healthcare platform marked the first time in US history that such measures made it to the political mainstream.

The Wilbur Commission of 1932 called for the expansion of group medical practices and prepayment systems as a result of the rising healthcare burden in the midst of the Great Depression. The American Medical Association (AMA) denounced the recommendations as "socialist." Then came President Franklin Roosevelt's New Deal in 1934, a sweeping policy that implemented Social Security but not health insurance legislation, in part due to continued AMA opposition. In 1945, President Truman called on Congress for a complete healthcare overhaul. He proposed a 10-year plan with compulsory coverage that would have doubled the number of healthcare professionals nationwide and dramatically enhanced US healthcare infrastructure. The AMA again took the lead in shutting the door on reform, raising concerns of "socialized medicine" and stalling the plan in Congress.

President John F. Kennedy was also unsuccessful with his bid for healthcare reform, but several years later, President Lyndon B. Johnson changed the US health system with the successful passage and creation of Medicare and Medicaid, major components of LBJ's Great Society. After Lydon B. Johnson came a bevy of reform ideas – Ted Kennedy's universal-single-payer health reform plan under the Health Security Act, Richard Nixon's mandating a minimal amount of employer healthcare provision, Jimmy Carter's calls for "universal and mandatory coverage," Bill Clinton's plan for "managed competition" in a tightly-regulated private marketplace, and Barack Obama's current set of healthcare reform options under review on Capitol Hill.

Incremental Change

The reason why healthcare reform has been so incremental and slow in occurring is as complex as the idea of healthcare reform itself; however, several historical trends are evident. The health insurance lobby, exemplified by America's Health Insurance Plans (AHIP), has been integral in keeping the changes that occur in US health insurance policy incremental as of late. Formed in 2003, AHIP claims that health insurance costs for those already insured will inevitably rise as a result of the current reform plan before Congress. The claim ultimately pits politicians demanding healthcare reform against their own constituents, many of whom allegedly stand to see their healthcare costs rise significantly upon passage of a reform bill. The insurance lobby also can woo politicians with financial support. For instance, Senator Ben Nelson has received over $2 million for just his election campaigns. Not by coincidence, the two term Nebraska Democrat is vehemently against a public option.

Public Emotions and Cost

Often lost in the discussion of healthcare reform's history is the fact that healthcare represents much more than healthcare alone. Healthcare is the cross-sectoral, politically-charged confluence of ideology, pragmatism, and profit-making. Healthcare coverage directly addresses key ideological issues of redistribution and welfare, race, socioeconomic status, promises of a "just" society, and the very ideals upon which the US was founded. Historically, little consensus has ever been reached over such highly-charged issues. People did not turn town hall meetings into contentious debates this past summer because of disagreements over health insurance technicalities. Instead, individuals fought over the perceived direction of the country, the role of the government in everyday life, the state of US socioeconomic inequity, and a host of other issues. Emotions got the better of much of the nation, people lost track of the actual reform-related policies in their arguments, and popular upheaval ensued.

The cost of comprehensive healthcare overhaul has been another major stumbling block for reform proponents. Even though US healthcare costs now reach almost $2.5 trillion annually, the notion of investing more than a trillion dollars over the course of ten years to potentially save money later remains politically unpalatable, particularly when considering the government's other immediate tasks at hand, including two wars, a flagging economy, and a large Federal deficit. However, calls for healthcare reform have not only come during periods of economic downturn, but also occur at the same time as other major political issues as well. From the Great Depression to the Cold War to the days of stagflation, the healthcare reform movement has, among other things, been a victim of unfortunate political timing.

Conclusions

Ultimately, the chance of dramatic US healthcare reform occurring in the near future is small, given historical trends as well as the current set of tasks facing the Obama Administration. The US government is neither suited for, nor advocates dramatic changes in institutional structure over a short period of time. This aversion to change, systemic as well as personal, has played a key role in the slow evolution of the healthcare movement. As per the lessons of the past, the current political-economic situation the United States faces, and the popular upheaval seen this year over healthcare reform, the slow pace of reform looks to remain for the foreseeable future.

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OPPOSING VIEWPOINTS

Should Sugar in Beverages be Taxed to Improve Public Health?

Jeremy Novak* *argues that taxing sugar will improve public health and reduce obesity, but* ***Lauren Elizabeth Palmer**** *believes that such a tax will unduly burden lower income individuals and have detrimental effects*

Image: Flickr (Poolie)

YES

A tax on fructose corn syrup in soft drinks should be initiated by our government. A "sin tax" is a tax placed on so-called "sinful" items like cigarettes, cigars, and alcohol. A tax on the sugar in soft drinks would help raise awareness of the seriousness of American obesity and increase the funding for healthcare reform programs.

A sugar tax on soft drinks would likely be noticeable to the average consumer. John Sicher, the publisher of *Beverage Digest,* has stated that the average two-liter bottle of soda costs about $1.35.[6] If one version of the tax was passed, this price would increase by about 50%. The price of a 12-can case of soda would rise by about 44%.[6]

But, is the extra price for sodas and other soft drinks not worth a reduction in obsesity? The answer to this question is yes.

In the 1960s, 24.3% of American adults were overweight.[5] This percentage has increased in recent decades, with men being an average of 17 lbs heavier now than they were in the 1970s and women being an average of 19 lbs heavier.[5] Soft drinks and other sugar-filled beverages are among the numerous causes of this problem. Due to their inexpensive price, soft drinks account for approximately 7% of all the calories ingested in the United States.[5]

Taxing the sugar present in such soft drinks would be a good start in decreasing the number of overweight Americans. By instituting this tax, our government would raise awareness about the severity of our battle against obesity. Americans may not wish to spend the extra money to enjoy their favorite sugar-filled beverage, and instead switch to healthier alternatives. An American who switches from a typical soda with 1 gram of sugar per ounce to another healthier beverage will consume approximately 174 fewer calories a day.[3]

NO

Is soda bad for you? A study recently released by the *New England Journal of Medicine* shows that there is a correlation between soda consumption and obesity rates.[1] Americans consume roughly 125-150 calories a day in the form of sugary or sweetened beverages.[1] The excess weight Americans are putting on as a result of this intake is leading to heart disease, diabetes and even some forms of cancer.[2] So yes, soda does seem to be bad for you. Should we do something to decrease rates of obesity and consumption of sweetened beverages in this country? This seems an obvious and responsible conclusion so the next natural question is – what can we do? Some think they have found an answer in the form of taxing sweetened beverages. Unfortunately, taxation is not the solution both because taxing sweetened beverages would ultimately be ineffective and because such a tax would unfairly target lower income individuals.

Proponents of the tax cite the dangers and high health costs of obesity and refer to the success of cigarette taxes. There seems to be little evidence, however, that taxing soda will significantly decrease obesity rates or even lead to weight loss among Americans. Those individuals with the highest rates of obesity will not be greatly affected by cutting out only 125-150 of their calories. Based on a 10% tax, the average person would lose about 2 pounds a year.[1] Does this number seem significant enough to halt or even slow the obesity epidemic? This tax would not include diet beverages which would encourage their use and not necessarily lead to decreases in weight as consumers may see the consumption of a diet drink as an excuse to consume other, caloric foods.[3] The frequent use of artificially sweetened drinks also leads people to have cravings for higher sugar foods which in turn contribute to increased weight gain.[3] One of the reasons why cigarette excise taxes are so effective at reducing the smoking

Creating this tax would also bolster our nation's health-care system. One version of the tax would add three cents per twelve ounce serving of beverage, and the accumulation of these tax dollars would be approximately $24 billion in four years.[1] This money could be utilized in a variety of government health care reform programs in order to heighten our nation's awareness to and development of an appropriate response to the obesity crisis.

"Creating this tax would also bolster our nation's health-care system"

Some advocates against the implementation of this tax argue that a sin tax will not educate the American youth that sugary beverages unhealthy.[1] However, it is the parents who go to stores and buy their children these drinks. If the prices are too high, parents will not buy the drinks. It does not matter if children realize that these drinks are bad for their health; what matters is the parents realize that they should not be buying these beverages for their children.

Medical studies have shown clear connections between the consumption of beverages with high sugar or fructose corn syrup levels and health conditions such as obesity, diabetes, heart disease, and dental decay.[4] Women who drink two or more cans of soda per day double their risk of showing early signs of kidney disease, and men have an increased risk of gout and joint pain.[2] It has also been hypothesized that consumption of these beverages may contribute to the development of diabetes, especially in children.[2] The medical cost for treatment of obesity-related diseases is estimated at $147 billion, or approximately 9.1% of U.S. health care expenditures.[3] A tax on soft drinks would lower the number of individuals with these health conditions. Dr. David Ludwig, associate professor of pediatrics at Harvard Medical School and director of the Optimal Weight for Life Program at Children's Hospital Boston, also believes that a tax on the sugar in these beverages should be implemented. He has stated with respect to this issue, "What better way to accomplish both lowering health care costs through obesity prevention and funding expansion of health insurance coverage than to add a tax to unhealthy foods?"[4]

If Americans wish to consume soft drinks, then they should have to pay the price, both literally and figuratively. There is no doubt about the benefit a sin tax on sugary beverages would have on the health of American citizens. A tax on sugary beverages would reduce the number of people drinking them, thus contributing to an overall healthier American population.

rate is because tax increases target price-sensitive youth.[4] While this is a successful mechanism for tobacco use, it is a mute point for soda use among many consumers, especially those of lower socio-economic status. While cigarette use does not typically start until adolescent, soda consumption tends to begin in young children, far before an age of price awareness. It is more typical for parent's to give soda to their children before children are old enough to go out and buy it themselves. Given this circumstance, adolescents who are old enough to be considered price-sensitive youth may already be addicts and thus more willing to purchase sweetened beverages regardless of price.

"There seems to be little evidence, however, that taxing soda will significantly decrease obesity"

Of course efficacy is not the only consideration when it comes to any policy decisions, we must also ask if there would be any negative repercussions of this decisions and if it is ethical. With the tax on sweetened beverages one cannot help but notice that a tax on soda will be a tax on the poor. It is known that the primary consumers of soda are poor, nonwhite individuals.[5, 6] Is this the population we want to tax? Advocates of the tax indicate that the revenue will go to health care thus if lower income individuals contribute greatest to this revenue, they also benefit the most as they constitute the majority of the uninsured. Thus the soda tax would be an ineffective end to obesity, but a very effective means for taxing the poor to pay for healthcare. Simply taxing our food and drink seems to neglect an important aspect of healthy living- education. Taxation is an attempt to tell people what to do. It does not explain why and it doesn't empower people to learn to make their own healthy decisions. Education is a vital part of nutrition and has shown to be a particularly effective tool in lower income individuals.[7]

The question remains why we would particularly want to tax soda and sweetened beverages. This may not necessarily be a very effective mechanism for decreasing obesity rates. Taxation of soda is disproportionately burdensome to lower income individuals and neglects attempts to educate and thus empower. We should be giving people the means to make healthy decisions and the enable them to choose for themselves instead of limiting the amount of money in their pocket and control in their hands.

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References for Opposing Viewpoints are availible in full-text online.

COMMENTARY

Under-Regulation and the Food and Drug Administration

*Kathryn Reiser**

The Food and Drug Administration (FDA) states that its mission is "to promote and protect the public health by helping safe and effective products reach the market in a timely way, to monitor products for continued safety after they are in use, and to help the public get the accurate, science-based information needed to improve health."[1] Current concerns regarding the FDA's inability to monitor foreign imports and the inadequacy of post-approval safety requirements have called into question the ability of the FDA to remain the world's leading consumer protection agency, especially in light of recent scandals involving the cases of heparin and Avandia. This commentary will explore these issues and suggest potential solutions.

OPERATIONS ABROAD

Inadequate inspections abroad represent a key difficulty for the FDA. Whereas the agency was once well equipped to conduct inspections of drug manufacturing plants, globalization has outpaced the agency's present capabilities. According to the *New York Times* (NYT), "Eighty percent of the active pharmaceutical ingredients of drugs consumed in the United States are manufactured abroad," although less than one percent of imports are actually inspected by the FDA.[2,3] The low inspection rate is mainly due to a shortage of inspectors, a consequence of insufficient funding. Understaffing prevents overworked inspectors from adequately conducting routine inspections of manufacturing sites. In the past decade, Chinese and Indian plants have posed the largest challenges to FDA inspectors for two reasons. First, rapid growth and industrialization in those countries has generated large numbers of factories in a short period of time. Second, American and European pharmaceutical companies have outsourced significant portions of their manufacturing operations to these countries to cut costs. As a result, the U.S. currently imports 40 percent of its drugs from China and India.[2] The FDA has not been able to keep pace with this growth; the annual inspection rate of Chinese pharmaceutical plants that export drugs to the United States is on average 15 out of 714 (less than two percent).[3] The outcomes from this under-inspection have been particularly evident in recent cases involving contaminated heparin imported from China.

Heparin is an anti-coagulant derived from pig intestines that is primarily used during kidney dialysis to prevent the formation of blood clots. From November 2007 to February 2008, the FDA received thousands of reports of severe allergic reaction to the drug, which is imported primarily from China.[4] By April 2008, reports linked the contaminated heparin to at least 81 deaths in the United States alone, while 11 other countries were also affected.[5] Because the contaminant remained unidentified, FDA deputy commissioner Janet Woodcock insisted, "At this point, we do not know whether the introduction was accidental or whether it was deliberate."[4] The agency responded to the crisis by halting heparin imports, admitting "it violated its own policies by failing to inspect the China plant" where the affected drug had been manufactured.[2] The following month, the FDA acknowledged that the contamination was likely intentional because as much as one third of the substance was not blood thinner but another compound known as oversulfated condroitin sulfate; the contaminant costs only one hundredth the price of the same amount of pure heparin.[6] The plant in question was later found to fall far short of industry standards, and has since been banned from providing U.S. drug imports.

More foreign inspections are needed to ensure the safety of imported drugs. Gardiner Harris of the NYT found that although "the volume of U.S. imports has increased by more than 900 percent" since 1990, "the number of personnel financed by Congressional appropriations remained unchanged at the FDA between 1992 and 2007."[3] This demonstrates that the government has not provided the funding necessary to maintain an adequate workforce to conduct inspections abroad. An independent estimate from April 2008 suggested that the FDA would need to hire at least 500 new inspectors to equalize the inspection rate between foreign and domestic companies.[5] Moreover, representatives from both the Democratic and Republican parties have called for more FDA inspections of foreign drug plants.[7] In November 2008, the FDA opened its first overseas office in Beijing in an effort to increase its presence in China.[8] This is an important step in the right direction, but the future of the endeavor remains unclear.

THE PRESCRIPTION DRUG USER FEE ACT: A DOUBLE-EDGED SWORD

Globalization of the pharmaceutical industry has adversely affected the FDA's ability to effectively screen drugs and medical devices for approval. But safety concerns are not the only pressing priority. In the 1980s and early 1990s, demand grew for shorter approval times for pharmaceuticals to accelerate market availability. These demands culminated in the introduction of the Prescription Drug User Fee Act (PDUFA) in 1992, which requires pharmaceutical companies to pay a portion of the costs of FDA approval. The initiative was designed "to reduce drug approval times by financing the evaluation process with user fees levied on entities applying for FDA approval."[9] PDUFA has had two major consequences: drug approval times have fallen since its inception and more of these rapidly approved drugs have later been discovered to have undesired adverse effects.

Shorter drug approval time has helped pharmaceutical companies gain support from investors and facilitated rapid patient access to treatments. Indeed, PDUFA was passed in part because AIDS activists argued that the FDA was preventing patients from receiving newly developed and potentially

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life-saving drugs.[10] As a result, the duration of the review process for new drugs has been estimated to have fallen by 50 percent since the passage of PDUFA in 1992.[10] However, this effect has also decreased the incentive for drug companies to conduct large-scale safety trials after their products have been approved for market. Thus, adverse drug reaction (ADR) rates have been on the rise since the introduction of PDUFA. Mary K. Olson, an economist at Yale University, found that "a 1-month reduction in a drug's review time is associated with a 1 percent increase in expected reports of ADR hospitalizations and a 2 percent increase in expected reports of ADR deaths."[10] Her study was based on data for all new drugs approved between 1990 and 1995, the period during which PDUFA was introduced.

To achieve shorter review times, FDA approval is often granted without significant evidence that the drug performs as stated.[9] Rather, approval is frequently based on a drug's immediate effects, if they are believed to correlate with the overall intended outcome. For example, the FDA approved the drug Avandia in 1999 for the treatment of diabetes. The agency came to this decision because the drug had been shown to lower blood sugar, a so-called "surrogate endpoint" for the effect Avandia was claimed to have. [11] Eight years later, a meta-analysis of clinical studies found the drug had increased the rate of heart attacks in patients, an adverse drug reaction that could potentially have been prevented had the agency required more extensive pre-approval safety trials.[11] Alternatively, longer approval time would have deprived some patients of Avandia's real benefits.

In an interview, an FDA policy advisor stressed that although accelerated approval may be an appropriate short-term strategy to push new treatments into the market, reaching a surrogate endpoint does not ensure a quality drug.[12] Whether or not to approve a drug based on such information and when to recall a drug that has been demonstrated to cause adverse effects, the advisor noted, is an emotionally difficult decision because many patients are desperate to try any drug that might work to treat them, regardless of guaranteed safety or efficacy. Philipson and colleagues, in an analysis of drug approval policies, have similarly noted that "It is very likely that the optimal balance between speed and safety allows for the possibility that some unsafe drugs will reach the market."[9]

The FDA may soon be able to mitigate the dilemma of rapid approval and safety through a new proposal known as the Sentinel Initiative. Proposed in May 2008, this initiative would employ Medicare claims records to gather evidence of adverse drug reactions. While the current system relies on voluntary reports, the new approach is believed to be able to provide more reliable and accurate information regarding drug risks because it would entail the formation of a comprehensive database including all Medicare patients who have been prescribed a given drug.[13] However, tracking adverse events relies on data extracted from an unhealthy population, making it difficult to discriminate between pre-existing health conditions and the problems that directly result from using a drug prescribed to treat the disease.

Whether or not the Sentinel Initiative is developed into a fully functioning system, the FDA must require more post-approval double-blinded clinical safety trials to monitor adverse drug reaction rates. Continuing the regulation process past the point of market introduction would allow new drug review times to remain low, thereby granting patients access to the drugs from which they might benefit. Proper post-approval studies and the realization of an adverse drug reaction database as proposed by the Sentinel Initiative would greatly increase the safety monitoring of drugs already on the market. This combination of FDA regulation is likely to result in an optimal balance of drug availability and drug safety.

CONCLUSION

The ability for patients to receive medications without having to question their purity, safety, or effectiveness is essential to the stability of the healthcare system. However, this security is dependent on the ability of the FDA to properly regulate drug approval and importing. Presently, the agency is not able to effectively perform these duties. The FDA is unable to adequately inspect foreign drug plants; and the agency has not found the optimal balance between rapid drug approval and safety. Increased budgeting, more foreign inspection facilities, and initiatives like the Sentinel database could help to alleviate some of these issues. The challenges facing the FDA in the early 21st century are daunting and complex. Yet, it is critical that the agency receive the support and infrastructure necessary to restore consumer confidence and maintain a safe and effective healthcare system.

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COMMENTARY

Poverty, Development, and Mental Disability: A Need For Greater Attention At the International and Community Level

*Michele O'Shea**

The rights of mentally disabled individuals have been internationally recognized since the second half of the 20th century, from the 1971 UN resolution on the Rights of Mentally Retarded Persons to the 1991 Principles for the Protection of Persons with Mental Illness and the Improvement of Mental Health Care. In the ensuing years, many developed nations have made advances in addressing the needs of mentally disabled individuals. However on a global scale, progress has been slow, and individuals with developmental and psychiatric disorders remain seriously neglected. Given the challenges of development today, it is important that we recognize the linkages that mental disability shares with poverty and the potential approaches by which the correlation can be effectively addressed.

Mental disability, according to the social model of disability, is not an innate characteristic, but rather a result of the environment in which an individual with a particular disorder operates with the ultimate effect of disabling his or her function in 'normal' activity.[1] Risk factors for mental disability include malnutrition, exposure to toxins (such as lead, PCB, and alcohol), and low birth weight – all interrelated factors that can be further aggravated by poverty.[2] Take the case of intellectual disability, for example. Prevalence of intellectual disability is as much as four times greater in developing countries with low resources.[3] Poverty and malnutrition are distinctly linked. Malnutrition affects brain development due to protein-energy and dietary micronutrient deprivation and hunger has been shown to have negative psychological effects in children.[4] Poverty also prevents access to mental health and therapeutic services, and early stimulation is not readily accessible for essential development. Furthermore, long-term effects of exposure to environmental toxins, tropical diseases and infections, and substance abuse, especially during pregnancy, are risk factors to which individuals of lower socioeconomic status are exposed to a greater extent. Additionally, mental health is a determinant and consequence of limited vocational opportunities and unemployment as employers discriminate against the hiring of mentally disabled workers due to unwillingness to provide expensive accommodations.[5] This ultimately leads to an economically deprived individual with serious mental health complications.

Alarmingly, mental disability has yet to be given the wide-spread consideration it merits. Mental health disorders account for 14% of the global burden of disease and have even greater effects when considering their relationship with physical health, vocational productivity, and social inequality.[6] Governments have failed to offer the protection that mentally disabled individuals require from often egregious abuses and unnecessary institutionalization, while the remainder of society perpetuates a cycle of malignant neglect and obliviousness to the situation of the disabled.[7] It is through this process that a mentally disabled individual whose needs go unrecognized by his or her community becomes invisible.[8] This should be of acute concern to the international community, due to evidence which suggests that popular understanding and recognition of mental illness and intellectual disability actually determine an individual's prognosis independent of access to medical treatment.[9,10]

There are independent organizations and movements that have been working to turn mental health into a truly global issue. The Movement for Global Mental Health, established by a special *Lancet* series on mental health in 2007, focuses on three main goals: scaling up treatment efforts, protecting the human rights of affected persons, and increasing research in low and middle income countries. The movement itself has spurred the Lancet journal into making mental health one of its 'campaign focal points.' Meanwhile, the mental disability human rights advocacy group, Mental Disability Rights International, has taken a great deal of responsibility in reporting human rights abuses of the mentally disabled around the world, including but not limited to cruel and unusual conditions of institutionalization. The organization works at both the international and national levels to ensure the legal recognition and enforcement of the rights of disabled persons.

There is still much work to be done in before the mental disability movement can be recognized on the same scale as HIV/AIDS, other 'emerging' infectious diseases, and maternal and infant health. The United Nations Millennium Development Goals (MDGs) are a key example of the vitality of global partnerships in efforts to eradicate inequalities and impoverishment. Unfortunately, these goals currently fail to address the linkage between mental disability and poverty. Disability is neither mentioned nor considered in the context of the MDGs, the framework upon which current global development efforts are based. To address this rift, efforts are being made to include disability in all MDG policies and processes.[11] In October 2008 the WHO launched its Mental Health Gap Action Program in order to scale up services for mental, neurological, and substance abuse disorders in low and middle income countries, with the philosophy that adequate care, psychosocial assistance, and medication could allow for treatment of low income individuals and allow them to remain healthy and productive.

In most cases, the movements and efforts that are being made to address mental health as an international issue pertinent to development cite the need for increasing access to treatment. But the question remains, is this treatment focus

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enough? Will medically treating an economically disadvantaged individual with a mental disorder and giving him or her proper therapeutic intervention ensure proper functioning in society? If we consider the individual's transition from disorder to disability, is it the individual who requires treatment and intervention, or the society that has disabled him? During a Spring 2009 study conducted by myself in Lima, Peru, interviews of members of three socioeconomically distinct communities were conducted to acquire a perspective on the perceptions and attitudes of the society towards mental retardation. While historical records of active stigmatization exist with various conditions and issues such as in HIV/AIDS and homosexuality, these interviews revealed a passive negligence of mental disability due to a lack of awareness of the issue. Unfortunately, in areas with scarce resources, societies prioritize resources for more productive members and ignore the needs of those who cannot readily contribute. It is precisely this practice that sustains the interminable cycle of invisibility of the mentally disabled.

Any successful intervention strategy must thus begin with increasing awareness among those who are 'normal' and for this reason not cognizant of the importance of the inclusion of mentally disabled individuals as socially active members of their community. Open engagement and consistent contact between community members and mentally disabled community members disintegrates pre-existing perceptions and attitudes towards their status. This can be propagated by making already functioning community-based activities accessible for these individuals, enabling their participation. Another method is to use elements of the very environment one is trying to change as mediums for building awareness. This can be accomplished by infusing messages into daily communication channels such as movies and posters, and dispersing information on mental disability while emphasizing humanity, and the potential to be empower individuals.[12]

Mental disability is a critical issue that has a direct connection with poverty. Therefore, it is vital that there be serious focus at the international level for mental disability to be treated as an issue tied with development. But the movement must not stop there. It must reach the attention of those who feel they are least affected by the losses we face from the exclusion of a crucial component of our society. This requires work at the local level to raise awareness of mental disability and active promotion of the integration of affected individuals into every aspect of the community. Society must recognize the prevalence of mental disability and form international collaborations to catalyze the introduction of innovative community-level interventions to counter the exclusion that continues to leave the mentally disabled an invisible population.

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COMMENTARY

Addressing the Problem of Unisured-but-eligible Children: A Policy Approach

*Thomas Hou and Alan Hsu**

INTRODUCTION

The issue of uninsured and underinsured children remains serious. Data from the 2006 Kids Inpatient Database of the Agency of Healthcare Quality and Research suggest that children who lack insurance are at a greater risk to die during inpatient stays than those who have private insurance.[1] This association is consistent with numerous other studies, which demonstrate that uninsured children have reduced access to and lower utilization of basic medical services.[2,3] The solution is to provide health insurance to these children.

Certainly, the infrastructure to do so is in place. Government-run programs, such as Medicaid and the State Children's Health Insurance Program (SCHIP), have increased the coverage of children over the past decade. Furthermore, the role of these public insurance options in filling the gaps of private insurance coverage has increased; expansions and redefinitions have increased the percentage of children covered by public insurance from 21.3% in 1996 to 32.8% in 2007.[4] However, encouraging as this increase might appear, the trends discount that the total number of uninsured children remains significant - more than 7 million in 2008.[5] Even more troubling is that nearly 75% of these uninsured children are eligible for either SCHIP or Medicaid, yet remain unenrolled.[6]

Increasing coverage for these uninsured-but-eligible (UBE) children remains an important and practicable goal. We shall discuss a range of options to tackle the administrative and structural barriers to enrollment propose solutions in this commentary.

IMPROVING RETENTION AND TAKE-UP

The numerous reasons for non-enrollment in public programs such as SCHIP and Medicaid include distrust of and unfamiliarity with the programs, the complexity of navigating the system and required paperwork, unawareness of the programs' existence, and unaccommodating enrollment rules.[7] The preponderance of UBE children has been attributed to two main factors: poor retention leading to disenrollment, and poor initial take-up.

In 2006, a third of uninsured children nationwide were shown to be enrolled in either Medicaid or SCHIP the previous year, indicating that retention was a major issue.[8] One factor inhibiting retention is the renewal process. States that switched toward a process requiring proof of qualification from the applicant have experienced disenrollment rates nearly ten times greater than those without such requirement.[9] One possible solution to this is the suggestion of pre-printed forms with patient information from the previous year's enrollment.[14] Additionally, we propose that state employment data be used to identify families with children who could be at risk being uninsured or disenrollment and that notices be sent prior to the renewal period.

Tied with the problem of poor retention due to renewal is the increasing frequency of renewal periods, which also leads to disenrollment.[10] Several states, including California, faced with impending limitations on strained SCHIP budgets, have proposed more frequent re-enrollment periods, which increase the risk of foregone deadlines and subsequent disenrollment from SCHIP.[10] Hence, we propose that periods between reenrollment be fixed at one year without any pause of coverage. Furthermore, states should institute a fixed reenrollment date for all SCHIP beneficiaries. Marketing this date to beneficiaries would ensure that any ensuing confusion is diminished. Beneficiaries would have a minimum of 12 months after the start of coverage without needing to reenroll. In case beneficiaries enroll fewer than 12 months before the fixed reenrollment date, they can wait until the next reenrollment period before needing to reenroll.

In order to increase the take-up of eligible children who are not yet in the system, we propose that states and the federal government invest in community-based efforts towards increasing awareness of public programs among potential beneficiaries. "Covering Kids and Families," a campaign instituted in 2006 by the Robert Wood Johnson Foundation, used television ads, phone hotlines, and community events to raise awareness of public coverage.[11] The federal government should provide grants to encourage these types of community awareness efforts on a national scale.

STREAMLINING THE SYSTEM

In establishing SCHIP, the Balanced Budget Act of 1997 allowed three options for the creation of public programs for children: a targeted expansion of Medicaid, the creation of a separate SCHIP program, and varying combinations of both.12 With states given the freedom to choose, an amalgam of SCHIP programs has arisen with various degrees of federal-state partnerships, distinct funding and reimbursement structures, and a multitude of eligibility requirements. For example, SCHIP income eligibility in Idaho is 185% of the federal poverty level, while in Pennsylvania, eligibility for the same program is 300% of the FPL.[13] Furthermore, withdrawal rates among children previously enrolled in either Medicaid or SCHIP have been shown to be 45% higher in states that run the two programs separately.[14]

We propose that federal and state governments prepare to combine Medicaid for children and SCHIP under one administrative unit. Streamlining the programs would help cut the administrative costs of running them separately and incorporate shared resources, such as databases of beneficiaries. Furthermore, running joint applications and reenrollment requests for Medicaid and SCHIP, already done in most states, would

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reduce much lingering confusion among applicants. Computer systems can be configured to automatically sort the applicant toward the appropriate program.

PRIMARY CARE AND REIMBURSEMENT REFORM

We also propose to reform the reimbursement mechanisms of SCHIP to favor pediatricians and other primary care physicians. Primary care and preventive medicine play a crucial role in not only increasing the overall wellness of the children but also reducing costly avoidable pediatric hospitalizations.[15] We urge that states be allowed to explore creative means of SCHIP reimbursement, including capitation methods like those employed in managed care that favor pediatricians and primary care providers. The federal government should provide oversight and advice but allow states flexibility in experimenting with new reimbursement structures. Moreover, states can mandate periodical primary care visits for children under SCHIP. States can offer additional loan forgiveness for medical school graduates who become primary care practitioners, similar to those in place under various National Health Service Corps programs.

We believe that states should be the main experimenters in reimbursement reform, as they have greater leverage over local SCHIP policies and can act as laboratories for primary care and insurance reform.[16] We also believe that states' experimentation with reimbursement would not interfere with streamlining or assimilation, as states' autonomy is still maintained under our proposals and the states can explore innovative policies while reorganizing their administration of public programs. Overall, primary care reform should accompany SCHIP reform, especially since the primary care system, including the pediatricians, will need to handle effectively and efficiently the additional patients after any increased coverage.

FUNDING

Successful implementation of our plan will no doubt require a great amount of financial capital. However, it is important to note that the proposed changes do not call for a structural or fiscal expansion of the SCHIP or Medicaid program. Rather, we want to make the existing programs more efficient. We strongly believe that our plan will use more effectively the money already allocated to SCHIP by the Congressional Budget Office, and would not require a significant amount of additional funding.

In particular, savings in the system will arise from the diminished administrative costs of redundant paperwork and processing. With combined Medicaid and SCHIP administration, there exists the potential for more savings due to economies of scale. Furthermore, increased coverage of children who previously would have been uninsured will likely reduce their reliance on the emergency department as a source of primary care and thus, many preventable hospitalizations. Providing insurance to currently uninsured children has been shown to be cost-effective, with up to an additional $36,330 per Quality-Adjusted-Life-Year.[17] On a scale of millions, this would amount to significant cost savings.

CONCLUSION

The subject of providing health insurance for children has been debated for decades, even with the February 2009 passage of a SCHIP expansion bill. Despite the political wrangling, it does appear that in the minds of voters and in the current political environment, further SCHIP reform is politically feasible. In Washington, SCHIP expansion and reform enjoy unusual bipartisan support.[18] According to Mark Peterson of the University of Pennsylvania, the early years of the Obama presidency are a historic moment conducive toward reform, especially in health care. Obama enjoys much political support and inherits a strong mandate, despite the condition of the economy.19 Furthermore, Peterson notes that primary care reform, like children's health insurance, generally has bipartisan support, which strengthens the feasibility of our plan, since we target both systems. Combined with our dual emphasis on federal oversight and states' experimentation, our plan will be agreeable for both political parties and many constituencies. For example, elements of our plan can be used to build bipartisan support for or add to the current health care reform proposals. Even outside the current debate, the issue of uninsured-but-eligible children deserves its own attention, and in our opinion, holds high stakes for America's health care system and the lives of its future generations.

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ORIGINAL ARTICLE

Culture and Access Issues in Sexual Health Care in Mayan Guatemala

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The 1996 Peace Accords, which officially ended the 36-year conflict between the Guatemalan government and the guerilla forces, affirmed the right of all indigenous people to health care. As part of its reconstruction plan, the Accords provided for health sector reform and highlighted the government commitment to extend health care to previously neglected indigenous areas. Nevertheless, health care standards in Guatemala are lacking in several areas, from vaccinations to sexual health. Contraceptive use and family planning knowledge are two especially sensitive and significant topics in rural areas. To date, the necessary sexual health resources have not reached highly indigenous Mayan areas. Several non-governmental organizations, including APROFAM and USAID, have implemented various intervention strategies to access these Mayan areas. In doing so, they confront socio-cultural barriers that make this work uniquely difficult. This paper explores those barriers, which include religious restrictions, Mayan cultural practices, and general Guatemalan attitudes.

Suffering from insufficient maternal, child, and natal care, infant malnutrition and morbidity, and a rise in HIV/AIDS rates, Guatemala's indigenous Mayan population desperately needs improved medical attention. Throughout Guatemala's recent history, these people have survived in the country's lowest economic quintiles, separated ethnically, socio-economically, and geographically from the wealthier Ladinos. This physical division of the two groups has led to differential access to modern health care. Family planning (FP), family planning knowledge, and basic sexual health care provisions reach very little of the Mayan population; however, due to nongovernmental organization (NGO) efforts, this is changing. But even the NGOs dealing with family planning issues in Guatemala, Asociación Pro Bienestar de La Familia (APROFAM) in particular, struggle with the issue of extending sexual health care to the indigenous Mayan populations in rural areas. The challenge can be divided into two categories: access factors and cultural factors. To succeed in serving Mayan populations, NGOs must address these two issues. Numerous studies have analyzed the difficulty of access. Several others have discovered certain characteristics in Mayan culture that lead to an aversion to family planning. Indeed, to successfully implement sustainable FP programs, organizations must first grapple with indigenous Mayan medical attitudes, while increasing services.

FAMILY PLANNING DISPARITIES

Although Guatemala has had an active private family planning program for over 30 years, it has, as of 2004, the second lowest level of contraceptive use of any Latin American country.[1] A disparity in family planning use is evident between the Westernized and socio-economically dominant Ladino populations and the indigenous Mayan populations. Statistics on contraceptives and fertility rates reveal drastic differences between the Ladinos and Mayans. For example, the total fertility rate from 1983-1987 among Mayan women was 6.8 life-time births, compared with the 5.0 births among Ladino women. Further research shows that contraceptive use among Ladino women has increased considerably from 22% to 34% from 1982-1992 while only from 4% to 6% among married Mayan women.[2] By 1998, these statistics grew to 13% among in Mayans. Among Ladino women, contraceptive use increased to 50%.[3]

Another trend in comparative awareness of birth control is explored in the 1999 Guatemalan Migration and Reproductive Health Survey, which found that Mayan migration to urban areas is "positively associated" with increases in contraceptive knowledge in these peoples. It detailed how "Rural-to-urban migrants eventually achieve a level of modern contraceptive use slightly below that of urban non-migrants, with the level of contraceptive knowledge being an important factor associated with use of modern methods."[4] The nation's fertility rates over the past three decades reveal that:

"Guatemala is lagging behind other Latin American countries on the socio-economic characteristics that have traditionally caused fertility to decline…Ethnic inequality has been recognized to affect the pace of the demographic transition."[7]

Mayan fertility rates have declined, according to national estimates. The total Mayan fertility rate gap decreased from 6.8 to 6.1 between 1987 and 2002. Studies also show that the fertility rate between the Mayans and Ladinos is widening. The total Ladino fertility rate decreased from 5.0 to 3.7 from 1987-2002. Furthermore, "fertility rates differ greatly between rural and urban areas and at the local level."[7]

But, why is the rate of family planning use growing slower among Mayans than among Ladinos? Studies attribute the low use to various access factors: NGO effectiveness and reach, poor governmental care, relative high cost of and accessibility to contraceptives, low promotion of contraceptives, and indigenous beliefs, religious attitudes, institutional allegiances, family traditions, etc. As for the high Mayan fertility rate, significant factors include "an earlier age of marriage, lower educational attainment, and generally lower socioeconomic status."[5]

To synthesize an effective intervention strategy in Guatemala, both cultural and access factors must be considered. Primarily, it is critical to examine the prevailing attitudes towards family planning, as well as which organizations provide services and how effective they are. The following report will analyze the comparative importance of these two factors.

ACCESS FACTORS

The 1996 Peace Accords, which officially ended the 36-year long conflict between the Guatemalan government and the

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guerilla forces, affirmed the right of all indigenous people to health care. As part of its reconstruction plan, the Accords provided for health sector reform and highlighted government commitment to extend health care to previously neglected indigenous areas. The product of this commitment was the Integrated Health Care System (SIAS), which "leveraged existing indigenous NGOs and assigned operational responsibility and funding to them."[6]

The Peace Accords helped ease the way, providing a safe environment for extending family planning services to indigenous areas. APROFAM, the primary provider of these services, is a private Guatemalan NGO. Faced with financial troubles, they have had to implement major cost-reducing strategies over the years. Their major source of funding is USAID. It was not until 2001 that the Guatemalan government made a substantial move to improve family planning services. This came about through the Redproductive Health Programme in January and the Social Development and Population Law in October. These two laws "made reproductive health part of a national policy and instigated several initiatives to improve access to FP services."[7]

The Ministry of Public Health and Social Services (MSPAS) moderates all government-provided health services. The MSPAS covers 25% of the population, while the social security system covers another 15%.[8] MSPAS services include hospitals, health centers, and health posts. Modern family planning methods are available at these locations, though the MSPAS supplies less contraceptives than the private sector does:

"APROFAM…distributes about 36% of the contraceptives used in the country. In contrast, the entire public sector, including the social security system, provides about 25%. Moreover, the public sector distributes most contraceptives from hospitals – less than 5% of contraceptives distributed by the public sector were distributed outside of hospitals. This means that the government provides very few contraceptives outside of major urban areas."[8]

The statistics have clear implications: the government is not a sufficient provider of family planning services for the Mayan population and NGOs are reaching out to the neglected indigenous areas. APROFAM has been proven to be the most used by Mayans. Likewise, the government health centers and health posts are the closest facilities but among the least used. Despite the lack of government aid, studies have found that there is some level of contraceptive knowledge among the Mayans. A study in 2005 in the Ch'orti area reported that: "Nearly all women in the town of Jocotán had heard of FP…around 40% had heard about it through APROFAM or through a doctor, and about 20% had heard about FP…at school or in the pharmacy."[9] Furthermore, a 1995 study in the highland department of El Quiché found that, though men had a low level of contraceptive knowledge, they were interested in learning how to plan their families.[6]

CULTURAL FACTORS

Because of sociocultural barriers, it is difficult to implement a Western model of birth control in rural Guatemala. This structure would have to provide for:

"1. Reducing the birth rate through better spacing of children through the use of birth control, thereby allowing each child greater access to family resources with which to acquire strength and viability, 2. Preventing disease through education regarding the importance of hygiene, vaccination programs, and nutritional supplements (mostly vitamins and minerals), 3. Curing infants of acquired diseases."[10]

Such straightforward techniques ignore the prevailing beliefs of the indigenous Mayans, however. At the heart of the matter is the Mayan attitude towards childbirth. As in other agricultural societies, fertility is a God-given attribute; God creates the pregnancy, and thus it should be carried out. Moreover, God decides how many children a woman should have. The Catholic and Protestant institutions, often strong influences in Mayan communities, are a powerful opponent to family planning movements. One Mayan Catholic explained, "[family planning]…is a sin because the Virgin Mary has put a necklace on each of us and we have to fulfill this obligation [to have children]."[2] This sort of attitude clearly conflicts with efforts to advance birth control use among the Mayans.

Any health organization in Guatemala must consider another significant point: native attitudes towards the concept of appropriate family size. Guatemalans tend to react more positively to the idea of larger families.[2] As one young married Maya-Quiché study participant remarked, "Our fathers say we are weak now because we only have six or eight kids; before it was normal to have 14 or 15 kids."[2] Furthermore, having larger families allows for caretaking of the parents in old age as well as increased economic assistance.[2]

Indigenous attitudes towards chemical means of birth control are much stronger than those towards birth spacing. Indeed, the most suspicion is reserved for the pill. A study of the Nahaulenses revealed that the top five concerns against participating in birth control were: "1. Contraceptive pills/injections cause cancer, 2. Contraceptive pills/injections make a person sick, 3. Contraceptive pills/injections make a person impotent, 4. Contraceptive pills clog up the stomach, 5. Contraceptive injections stop menstruation."[2] A study focused in an area in the northwestern highland area of Guatemala near Santa Cruz del Quiché (the capital of the Department of Quiché) found that "Several adverse health effects were associated with the pill. The belief that it causes both weight gain and loss, and general debilitation, appeared to be widespread; several groups also mentioned that the pill causes cancer. Some participants felt that the pill is 'toxic' and kills children in the womb, and causes illness or death for the mother."[2]

Such beliefs are rooted in the basic Mayan belief in health. In an almost Galenic manner, the Mayans regard sickness as an imbalance in the body, often as a result of excess heat or cold. Another study of the Nahaulenses revealed that "the pill and Depo-Provera injections used in birth control are feared by many people to be so excessively 'hot' that they have the power to cause cancer or severe sickness and stop menstruation permanently. The pill is not only hot, it suppresses the ability to digest corn. Even worse, the pill accumulates in the pam (a word for both the stomach and the womb)."[10] In terms of current users, Mayan women often tend to not to choose the pill because of the cost. One interviewed Mayan woman said, "We don't even have enough money to buy food, much less to buy

those."[2] Another dangerous cultural characteristic of the pill is its weight gain side-effect. Mayan women taking the pill without notifying their husband worry that their sudden weight gain will lead to their unmasking.[10] Abrupt weight changes "are considered proof that a woman is using contraceptives, and this can trigger criticism from the community."[2]

Additionally, the Catholic Church remains a powerful institution in many Mayan communities. With alternative sexual health education unavailable, the Catholic Church has become the sole source for such information:

"Within these Mayan communities, the principal source of family planning information appears to be the Catholic Church, represented primarily by the local lay workers. These individuals offer premarital classes, in which they encourage prospective couples to have all the children God sees fit to send. The participants claim that the catechists preach that family planning is murder, and that one of the principal purposes of these classes is to convince people not to use modern contraceptives…Religion is particularly influential in this culture, since young Mayans receive almost no guidance or information concerning sexuality and family planning in their families."[2]

As a result of this indigenous mentality, Western biomedical arguments may not be valid among Mayan communities. Surely, an effective intervention strategy must harmonize with their traditional thinking. These sociocultural barriers considered, very few birth control options remain. The biochemical method cannot be implemented in rural Guatemala so long as their current conception of health dominates. Which choices, then, are available?

The best option, it seems, is the practice of birth spacing. Birth spacing, does not employ any chemical impositions and is the easiest to adapt to long-held Mayan customs. Population Reports cites a 2002 study by the Demographic and Health Surveys (DHD) "that children born 3 years or more after a previous birth are healthier at birth and more likely to survive at all stages of infancy and childhood through age five."[11] Furthermore, it promotes maternal health, as it reduces chances of anemia, third-trimester bleeding, and increases likeliness of surviving childbirth.[11] The previously mentioned DHS study found that younger women, women with no education, women in rural areas, women with lower status, and unemployed women are more likely to have shorter birth intervals than their respective counterparts.[11]

What are the Mayan objections to birth spacing? Morally, the people's Catholic beliefs lead to the view of family planning as sin, as it goes against God's determined number of children per couple. Furthermore, several interviews with groups in a Quiché community determined that "the term 'family planning' is commonly translated in Maya-Quiché as 'to cut off the children.' Thus, it was specifically associated with having few children: in none of the groups was spacing births considered related to family planning."[2] One of the interviewed women asserted, "Those who plan their families do so because they are lazy." Others believed that family planning would diminish the Mayan population. Population Reports specified common cultural norms that can influence women's birth spacing practices. These include a pressure on a couple to prove fertility, breastfeeding practices, which determine how long women will remain amenorrheic, postpartum abstinence, and the preference for a son after a birth of a daughter.[11]

Regardless of these restrictions, Mayan culture does allow for a level of tolerance for birth spacing. Though the Mayans do not intentionally try to space births, many believe that it is unsafe to quickly have children in succession, as the practice could lead to the first child stopping breastfeeding prematurely. Moreover, "after childbirth, the womb is considerably weak, needing sufficient time to recover between births."[2] Also, raising two young children concurrently requires full attention of the mother. Finally, the method of postpartum abstinence is widely used. Women are often suggested to remain abstinent for 40 days following childbirth, and "men who do not 'hold out' during the postpartum period are though to be irresponsible and inconsiderate of their wives."[2] Indeed, then, birth spacing can be adjusted for assimilation in Mayan practices.

The Population Reports study presented evidence of women with positive birth spacing attitudes who attribute to the practice the benefits of healthy children and having older children help raise younger siblings. A male respondent in Jordan described that birth spacing "gives each child born his rightful level of caring and attention, and they give your wife the time to rest and regain her health."[11] He also cited advantages to the husband, saying, "They give the husband the chance to weigh his financial situation and plan his family's future".[11] Certainly, birth spacing has proven well-received in other countries, and can be successful in Guatemala especially if promoted among young couples provided with prenatal and postpartum care.

Table 1. Family Planning Guideines. Adapted from reference 2.

1. To be credible and understandable to the Mayan population, family planning information should be provided by Mayans. Promotional messages should be carefully worded to indicate that the agencies are suggesting options, not insisting that methods be used.
2. Guatemalan agencies must focus more attention on the individuals and groups that influence family planning decisions and have an impact on women's choice, specifically church leaders, husbands and community leaders.
3. Promoting family planning for birth spacing has more relevance to Mayans than promoting it for limiting births. Family planning messages should focus on the health benefits of longer intervals between births and of postponing childbearing to later ages.
4. The widespread knowledge of periodic abstinence offers some hope for methods of fertility awareness. The image of family planning associations in Mayan areas can be improved by the promotion of more acceptable tradition methods, which could eventually open the way to providing Mayans with information on more effective methods.

How should family planning strategies be promoted? An aforementioned study in Santa Cruz del Quiché established a series of guidelines for maximum effectiveness (Table 1).[2]

Two main family planning strategies are promoted in experimental intervention strategies: birth spacing (having children less frequently for the health of the mother and child) and responsible parenthood (having fewer children in order to provide better for them). A study by APROFAM (which, in Guatemala, delivered 25% of the supply methods and 41% of clinical methods[2]) from 1992 to 1996 called for the Quiché Birthspacing Project to test the effectiveness of the former method by enhancing the following aspects of health care reform:

"Improving access to services by increasing the number of volunteer promoters…improving quality of services through training, supervisory visits and continuous supply of contraceptives…improving the acceptability and image of APROFAM by forging ties to other development agencies that had gained the trust of the community…[and] increasing awareness of the benefits of birth spacing through information, education and communication (IEC) activities".[5]

Over the four years of the project, the proportion of volunteer promoters increased from 24% in 1993 to 49% in 1995. The APROFAM clinic where the project centered offered six different methods of family planning to the Maya-Quiché area: pills, IUDs, injectables, condoms, female sterilization, and vasectomy. The promoters (who could reach remote areas) engaged in the project only offered three of these methods to their constituents: pills, condoms, and spermicides. The Guatemalan Ministry of Health also offered three methods in 1993, but only two (pills and condoms) in 1995. Actual use of these services revealed that the most used was the pill, followed by the condom.[5]

CONCLUSIONS

When facing the access and factor barriers, it seems the most efficient option for NGOs is to synthesize a non-confrontational, and more importantly, adaptable method of intervention. In order to incorporate birth control techniques into the indigenous society, NGOs cannot follow a Western model of intervention. First, as the APROFAM study showed, a variety of techniques must be offered. With injectable contraceptives growing more popular, this possibility should be explored and promoted. Second, the movement towards family planning must be presented to communities by Mayans themselves; a foreigner's influence is not only inherently limited, but often mistrusted. Modes of disseminating birth control information must be structured so that they are promoted by community and religious leaders. Radio broadcasts, informative talks and pamphlets, and visual aids have proven extremely helpful in promoting family planning and health discussions among people. Methods and communication must also be sensitive to the nuanced Mayan belief system. This aspect of intervention ought to be of highest importance. Birth control methods are best integrated by being systematically meshed with sociocultural standards. NGOs must not underestimate the level of Mayan family planning knowledge. They must intervene with a sense that Mayan peoples may already have some understanding of the issue, and must thoroughly understand their attitudes and awareness towards it before implementing any promotion strategies. To meet the needs of the community, more health NGOs should make their documents and information more accessible to the Mayan population, in terms of language and complexity of official forms. There is a need for more Mayan speakers in the national health care as well as the health NGO system.

If met with conflicting attitudes, NGOs may wish to opt to support existing practices of birth spacing and postnatal care. As these practices are strengthened, concepts such as birth spacing may be promoted, and can well lead to an increase in contraceptive use. Indeed, a sufficient health care system must be operating in the remote areas of the Mayan regions before any of these designs can be carried through. Access to resources thus is a priority, and birth control promotion cannot take place without the increased reach of such NGOs as APROFAM, which requires further economic and political support, especially from the Guatemalan government.

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ORIGINAL ARTICLE

The Use and Overuse of Cesarean Sections in Mexico

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The internationally accepted standard for cesarean section rates per percentage of live births per country, as outlined by the World Health Organization and the Pan American Health Organization, is 10-15% of the country's birth rate. Mexican national health care data from 2006 estimates the cesarean section rate to be at approximately 37.6% of all births. This makes Mexico one of the highest users of cesarean section globally. High rates of cesarean section increase the health risks for both mothers and children. This paper will explore the reasons why cesarean sections have become so prevalent in Mexico. In doing so, it will consider the clinical, financial, and psychosocial factors that contribute to Mexico's overutilization of cesarean sections.

INTRODUCTION

The use of cesarean section has been increasing steadily worldwide for the past two decades. Mexico stands out as a leader in the Americas and in the world for high use of cesarean sections. While in many cases cesarean sections can save lives and reduce birth defects, overutilization of cesareans can lead to increased morbidity and mortality for both the infant and the mother.[1] The international average for cesarean section rates per percentage of live births per country, as outlined by the World Health Organization (WHO) and the Pan American Health Organization in 1985, is between 10-15% of the country's birth rate.[2] While this rate was decided upon in 1985, it is still seen as the accepted cesarean section rate internationally.[3] In 1991, the Mexican Official Standard for the Care of Pregnancy, Delivery, Puerperium, and Newborns stated that the ideal rate for the country should fall around 20% of the national birth rate. However, the actual rate is still much higher.[4]

Throughout the 1990s, the national Mexican cesarean section rate was projected to encompass 30% of all births within hospitals.[4,5,6] From 1995 to 1996, the cesarean rate was calculated at 31.3%.[5] By 1999, the national cesarean section rate was slightly above 35% of births, with 53% of private sector births and 38.2% of public institution birth being by caesarian section.7 This upwards trend has continued within the past decade, with cesarean section rates rising from 32.53% in 2001 to 36.42% in 2005.[8] The most recent national data available from 2006 estimates the national cesarean section rate to be 37.6% of all births.[9]

MEDICAL DANGERS

While the use of cesarean sections is crucial for safely delivering complex and high risk births, its overuse is dangerous and potentially harmful both to the mother and child.1 Cesarean section is a major abdominal surgery and like any significant surgery, it increases the risk for medical complications and death for the mother. A study by Waterstone and colleagues found that cesarean section quadruples a mother's risk for morbidity compared to vaginal birth.[10] According to the World Health Organization's 2005 Global Survey on Maternal and Perinatal Health in Latin America, which included Mexico, cesarean delivery was positively and significantly associated with severe maternal morbidity and mortality compared to vaginal birth, even after adjustment for confounding risk factors.[1] There are often complex long term and short term complications from a cesarean section. Common short term complications for cesarean section include excessive blood loss, blood clots, infection, injury to bladder, bowel or adjacent organs, pulmonary embolism, and fever. Long term complications can include infertility, ectopic pregnancy, miscarriage, placenta accrete, placenta previa, and death.[11] Cesarean delivery also comes at high risk to the baby. Cesarean delivery was associated with increased fetal mortality rates and higher admittance into intensive care for 7 days or longer, even after adjustment for preterm delivery.[1] A study by MacDorman and colleagues concluded that the neonatal mortality rate for infants delivered by cesarean section (1.77 per 1,000 live births) was higher than vaginal delivery (0.62 per 1,000 live births).[12]

CLINICAL FACTORS

On a national level, the reasons given by a provider for why a cesarean section was given between 1998- 2001 included dystocia (32.3%), previous cesarean section (15%), fetal distress (15%), breech presentation (8.5%), maternal request (6.3%), emergency (3.1%), and other (19.7%).[13] In many circumstances, the increased use of medical technology to aid in birth can change and alter the natural process of birth such that a cesarean section may be necessary.

INDUCED LABOR VIA PITOCIN AND OXYTOCIN

The hormone oxytocin is released naturally during labor when the baby produces pressure on the cervix and pelvic floor tissues. Hormone bursts induce labor contractions, which aid in cervical dilation and limit blood loss.[14] In the hospital setting, the drug Pitocin (synthetic oxytocin) is given to patients to induce the same contractions. According to the WHO and the Pan American Health Organization, "The induction of labor should be reserved for specific medical indications. No region should have rates of induced labor higher than 10%."[2] However, few physicians follow this standard. Studies of obstetricians in Mexico City have shown that Pitocin is given to the majority of mothers who come into the hospital to speed up and regulate delivery.[15]

Oxytocin is normally released in bursts as opposed to

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Pitocin, which is administered at constant rate through an intravenous drip.[14] As such, Pitocin use can create circumstances in which a cesarean section may be needed. The WHO 2005 Global Survey on Maternal and Perinatal Health found that 28% of women with induced labor had to have an emergency cesarean section.[1] Another study found that 19% of nulliparous women (women who had never before given birth) who were given Pitocin compared to 10% of nulliparous women who were having natural contractions underwent cesarean sections.16 This study also found that labor induction (via Pitocin drip) caused an increase in the risk of instrumental delivery and shoulder dystocia. Another study, which traced 65,000 births, found that labor induction also increased cesarean rates in nulliparous women, with relative risks of cesarean delivery with labor induction of 1.38 for nulliparous women, compared to 1.0 for parous women with no previous cesarean.[17] Furthermore, Cammu and colleagues found similar conclusions regarding a correlation between labor induction and cesarean section. Their research concluded that significantly more mothers who were induced using Pitocin had first-stage dystocia (stalled pregnancies, which later required cesarean section).[18] Induction of labor can also lead to decreased uterine blood flow, hyperstole, hypostole, and uterine hypertonia. These situations can cause premature separation of the placenta, fetal distress, rupture of the uterus, and hemorrhaging - conditions which may require cesarean section.[15]

ELECTRONIC FETAL HEART MONITORS

The electronic fetal heart monitor (EFM) is another example of medical technology that is often overused in Mexico. This overuse can increase the number of cesarean sections performed. The electronic fetal heart monitor is now considered the standard of care to evaluate fetal health during labor.[19] EFM is used routinely on all high risk pregnancies throughout Mexico and when resources are available, EFM is used as a monitoring device on low risk pregnancies.[15] While fetal surveillance can be useful in high-risk pregnancies, improper use can be problematic due to common technological defects in the electronic fetal heart rate monitor. Banta and colleagues note, "There is, at best, limited evidence of the benefit of EFM, while there is substantial evidence of harm and significant financial costs."[19] One potential harm that Banta et al. describe is the increase in cesarean section rate caused by electric fetal heart rate monitors. The WHO outlines that there is little evidence for the positive effect of fetal monitoring and it should only be carried out in cases related to high perinatal mortality rates.[2] The correlation between cesarean section rate and EFM usage may be a result of subjective interpretations of how to read EFM results and the false positive EFM readings of fetal distress. Consequently, doctors may suggest unnecessary cesarean sections and potentially increase the cesarean section rate.[20]

PRIOR CESAREAN SECTIONS

It is widely accepted among medical professionals that once a woman has a cesarean section, she must continue to have cesarean sections. Roughly 15% of all cesarean sections in Mexico are performed because the mother has had a prior cesarean section.[13] A second cesarean section is often recommended because doctors fear scar rupture if the mother were to deliver the baby naturally. However, according to the international conference on appropriate technology for birth, "There is no evidence that caesarean section is required after a previous caesarean section birth. Vaginal deliveries after a caesarean should normally be encouraged wherever emergency surgical intervention is available."[2] Nevertheless, repeat cesarean sections are considered the standard of care by many medical practitioners in Mexico.[6] A Mexican national health survey found that 80% of women who had a cesarean section with their first birth had a cesarean with their second birth.[21]

DYSTOCIA

One of the most common reasons doctors cite for reasons to induce cesarean section is failure to progress, or dystocia. Dystocia was responsible for 32.3% of all cesarean sections in Mexico between 1998 and 2001.[13] Dystocia can occur due to uterine contractions that are not sufficient to induce natural labor, cephalopelvic disproportion (when the woman's pelvis is not large enough for a baby to pass through), malpresentation of the infant, or blockage of the birth canal.[22] Dystocia can also be difficult to diagnose. Over-diagnosis of dystocia is believed to account for some of the increase in cesarean section rates. A study in Los Angeles and Iowa found that 68% of all unplanned cesarean section were caused by dystocia. Additionally, this study found that many of these cases did not conform to the published standards for dystocia diagnosis. For example 16% of the cesareans performed due to lack of progress were still in the latent phase of labor according to ACOG guidelines. Similarly, 36% of cesarean sections that were denoted as not progressing did not have a prolonged second stage of labor.[23] In Mexico, guidelines exist for practitioners to determine when dystocia is occurring.[15] However, studies such as this suggest that even when there are clearly defined criteria for diagnosing dystocia, guidelines are not necessarily followed and may contribute to caesarian section use.

FINANCIAL FACTORS

Many believe that the Mexican increase in cesarean sections is influenced by the reimbursement structure for physicians who perform cesarean sections privately. The price of a cesarean section in 2001 was found to be between 3,900 - 13,000 pesos (approximately 520 - 1,733 U.S. dollars).[6] Physicians may be encouraging unnecessary cesarean sections in order to make a larger profit. Additionally, private Mexican insurance companies are believed to have contributed to the cesarean section rate by only reimbursing cesarean section deliveries and not vaginal deliveries (this policy has recently changed).[24] Such policies could have affected how cesarean section was viewed by a generation of women and doctors. While reimbursement structures for private doctors and insurance companies may have influenced cesarean practices for the upper socio-economic brackets, this reason does not explain the increase in cesarean within the majority of the population that does not have insurance.

SOCIAL FACTORS: STANDARD OF CARE

Besides monetary and medical factors, social and cultural ideas about cesarean section have been influential in making the practice of elective cesarean section socially and culturally acceptable, and in some instances preferred as a mode of childbirth. Cesarean sections are becoming more popular within Mexican society because they minimize the pain associated with labor and can be scheduled to accommodate the needs of the family and the mother.[25] In higher socio-economic levels, cesarean sections are considered ideal for delivery and are often requested. There is a perception that cesarean births are the safest mode of birth available and that natural birth is dated or old fashioned.[6] In some states within Mexico, there is also a social significance associated with the luxury of having a cesarean section. An interview with an obstetrician in Monterey conveyed this notion, "My maid has natural births" he stated, "but Mrs. X of the upper class doesn't."[25] This perception of cesarean birth as the ideal mode of birth for upper class women supports the finding that the majority of births in private hospital settings are cesarean births.[2]

SOCIAL FACTORS: GENDER AND POWER RELATIONS

An analysis of gender power relations within Mexico may also help to explain the high rates of cesarean section. Traditionally, in Mexican culture, men seek to embody the concept of machismo, which expresses the characteristics of virility, power, and authority. A Mexican woman's gender identity is often explained using the term marianismo, which embodies the characteristics of moral purity, subordination to men, and domesticity.[26] These gender relationships are important to understand within the context of cesarean section in Mexico as, although more women are entering medical school in Mexico, the majority of practicing physicians are still male.[27] A recent study in the United States found that minority women are more likely to give birth by cesarean section than white or Asian women, controlling for clinical indicators. Women who are unmarried and who have little education are more likely to have cesarean sections than women who are married and have high education levels.[28] The author of the study credits stereotypes and social distance between the doctor and the patient for potential reasons as to why physician convenience overrides patient care in these contexts.[28] She also states that these patients may be more likely to not question the doctor's recommendations because of the power relationship between the patient and the provider.[28] A study in Italy focusing on education and cesarean sections found that mothers with a primary degree had a 24% higher risk of cesarean section than mothers with a university degree when age, birth weight, and presentation were accounted for.[29]

The way that social power relations impact cesarean section rates is a phenomenon that may be especially important when evaluating cesarean section in Mexico. Theoretically, in a medical system where female patients are subordinate to male doctors, cesarean sections could be accepted in excess because of these gendered relations of power. When the doctor is clearly in power over the patient, the patient will be less likely to question a cesarean section if one is suggested, and in turn, the doctor may be more willing to perform a cesarean section because it is the easiest thing for him to do.

CONCLUSION

The discourse surrounding the use and overuse of cesarean section as a method of birth is a complex and multi-faceted issue that is influenced by multiple medical, social, and financial factors. The medicalization of the birthing process through drugs and technology has significantly contributed to the high cesarean section rate. Financial incentives surrounding cesarean section as opposed to vaginal birth have also influenced the conversation on cesarean section. Lastly, psychosocial issues, such as doctor convenience, patient-doctor power relationships, and cultural acceptance, may all contribute to the high cesarean section rate in Mexico.

The problem of overuse and misuse of cesarean section in Mexico must be reduced in order to save lives of infants and mothers, as well as reduce medical spending. It is estimated that in 1996, excessive cesarean section in Mexico were projected to have cost public health-care institutions $12,204,774 USD.[4] Since public health-care institutions are funded in part or in whole by the government, the people and government of Mexico are subject to millions of lost dollars each year by paying for unneeded cesarean sections.

Additionally, stricter guidelines related to Pitocin and EFMs, as well as national standards regarding dystocia diagnosis and the medical necessity of cesarean section, if followed, could help to greatly reduce the number of cesarean sections in Mexico. An increased focus on patient autonomy and the dangers of cesarean section for the infant and mother in public health campaigns could help to change the social factors that influence cesarean section rates. Nevertheless, cesarean section overuse remains multifaceted and in order to reduce the rates in Mexico, a united effort must be made by the government, the medical community, public health officials, patient's rights groups, and the mothers themselves for substantial change to occur.

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SCIENCE REPORT

VEGF, Dll4, and the Clinical Inhibition of Angiogensis

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Angiogenesis is the process by which new blood vessels are formed in normal development, wound healing, and pathological tumor growth. Because of its role in the growth and metastasis of tumors, a great number of research efforts have sought ways to treat cancer by inhibiting angiogenesis. This was accomplished with great success through the inhibition of vascular endothelial growth factor (VEGF), a protein that mediates the endothelial cell proliferation and sprouting that culminates in the formation of new blood vessels in both embryonic and pathological angiogenesis. The inhibition of VEGF has been displayed to be widely effective in limiting tumor growth through hindering angiogenesis, and due to this it has been approved for use as chemotherapy. While VEGF inhibition has been largely successful in this role, there have been definite problems in its clinical application, the most troubling of these being the ability of cancers to acquire drug resistance. Resistance to VEGF inhibition has prompted increased research into angiogenesis, and currently many of these efforts concern Delta-like ligand 4 (Dll4). Dll4 is a protein that inhibits endothelial cell proliferation while promoting effective angiogenesis, its inhibition resulting in larger and more complex but dysfunctional vascular networks. The inactivation of Dll4 in murine cancers has been observed to result in increased, yet 'nonproductive' angiogenesis in that the resulting vasculature does not support significant tumor growth, and because of this Dll4 inhibition is considered to be a serious candidate for future use as cancer treatment in humans.

INTRODUCTION

In its treatment of the various forms of cancer, chemotherapy is typically thought of as the targeted killing of malignant cells in order to combat tumor growth and prevent metastasis. While it is true that the majority of cancer therapies are directed at tumor cells, in recent years there have been significant efforts in both basic and clinical research aimed at treating tumors through attacking cells of the surrounding stroma, that is, normal cells that are hijacked by their cancerous neighbors so that the latter may survive and grow. Among the stromal cells that can function to facilitate tumor growth, a great deal of work has gone into the disruption of tumor-associated cells involved in the blood circulatory system (endothelial cells) and the process by which these cells proliferate and form new vessels, angiogenesis.

Angiogenesis is the branching of arterial and venous blood vessel components, resulting in the formation of a functional vascular network.[1] It is integral to embryonic development, during which it facilitates endothelial cell sprouting after the formation of primitive vascular structures by vasculogenesis. The necessity of angiogenesis to these early developmental processes is displayed by the fact that genetic abnormalities compromising it *in utero* have often been observed to result in embryonic lethality.[2-7] Angiogenesis is also important in later development, as well as for the repair of damaged blood vessels that occurs in wound healing.[8] It is thus clear that angiogenesis has an important physiological role in normal mammalian growth and survival; however, like many other bodily processes it can go badly awry. Pathological angiogenesis has been observed in a variety of diseases, but it is most commonly associated with cancer, given that it is often largely responsible for the rapid growth and invasiveness that is characteristic of aggressive tumors.

Cancer cells, like their normal counterparts, require access to actively circulating blood so that they may obtain the oxygen, nutrients, and removal of metabolic waste products that they need in order to survive, grow, and ultimately spread throughout the body in metastasis. Due to the fact that the diffusion limit of oxygen is only about 100 to 200 μm, cancer cells located at the periphery of rapidly growing tumors may quickly spread beyond the point of effective oxygenation by the nearest blood vessels.[9] Because of this, aggressive tumors are dependent on constant angiogenic vessel sprouting, given that in the absence of sufficient blood availability peripheral cells may become hypoxic and subsequently undergo necrotic cell death.[10] Disruptions in angiogenesis can thus hinder tumor growth and metastasis, and due to this many efforts aimed at inhibiting key angiogenic promoters have been undertaken. Recently, some of the most successful research efforts in this field have concerned the inhibition of the protein vascular endothelial growth factor (VEGF).

VEGF: A KEY PROMOTER OF ANGIOGENESIS

VEGF is a protein mitogen that promotes the endothelial cell proliferation and sprouting that is characteristic of angiogenesis.[11] Since its identification in 1983 and characterization as a mediator of angiogenesis in 1989, the gene encoding VEGF has been localized to the short arm of chromosome 6.[12-14] During the expression of the VEGF gene from this locus, its mRNA transcripts can be processed via alternative splicing to give rise to several isoforms of the protein, the most important of which are VEGF-A, which mediates angiogenesis through the tyrosine kinase receptors VEGFR 1 and 2 (vascular endothelial growth factor receptor), and VEGF-C and -D, which are involved in the production of lymph vessels in lymphogenesis.[10] Due to its central role in both normal and pathological angiogenesis, this report will focus on VEGF-A, which from here forward will be referred to simply as VEGF.

In normal development, VEGF is essential for the formation of the blood vascular system both *in utero* and during

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later growth. One of the best studied examples of fetal VEGF activity involves the development of retinal vasculature via angiogenesis. During the development of the retina, star-shaped glial cells of the nervous system called astrocytes gradually migrate away from neighboring blood vessels as the young sensory organ increases in size. As the retinal astrocytes move farther away from their blood supplies, they begin to suffer from hypoxia, a condition which causes them to produce the protein hypoxia-inducible factor 1 (HIF-1).[15] Once released, HIF-1 mediates a hypoxic response, and central to this is the expression of the VEGF gene, which contains a HIF-1 binding site in its promoter region.[16] VEGF proteins are then released by the hypoxic astrocytes towards existing blood vessels, where they initiate angiogenic vessel growth toward regions of low oxygen tension.[17] Finally, after the formation of new vessels, VEGF production by the now properly oxygenated astrocytes is downregulated; however, a certain concentration of the protein remains in the vicinity of the nascent vasculature in order to prevent endothelial cell apoptosis.[17] Similar mechanisms of vessel growth have been observed in the development of other organs, and the importance of VEGF to these processes is evidenced by the fact that loss of only one of the two VEGF alleles has been observed to cause embryonic lethality in mice.[2, 3] This indicates that sufficient amounts of the protein are needed for survival beyond the very early stages of development (i.e. the amount of VEGF produced from one allele is not enough for viability).

In stark contrast to its vital role in embryonic survival, VEGF can also be exploited by aggressive forms of cancer, which often upregulate its expression in order to facilitate sustained tumor expansion. In a manner that is remarkably similar to the vascularization of the retina, cancer cells on the periphery of growing tumors respond to hypoxia due to lack of a nearby blood supply by expressing HIF-1 and consequently VEGF. As in retinal development, VEGF is released from hypoxic cells in order to stimulate the growth of existing tumor vasculature towards oxygen-deprived regions.[10] In this way, VEGF-mediated angiogenesis provides tumors with the vasculature that they need in order to expand beyond their initial blood supplies. It is important to note that this not the only way that aggressive cancers can employ VEGF, given that, in addition to its role in stimulating angiogenesis and promoting endothelial cell survival, it has been observed to act as a powerful vasopermeability agent, that is, one that increases the permeability of blood vessels.[12] By upregulating VEGF expression tumors can increase the permeability of surrounding vessels and this serves to facilitate metastasis via the blood circulatory system. VEGF is therefore essential for both sustained tumor growth and expedited cancer metastasis, realities which made its inhibition an attractive avenue in the search for new chemotherapeutic methodologies.

Since its characterization as a mediator of tumor angiogenesis in 1989, a great deal of basic and clinical research has gone into identifying and testing potential inhibitors of physiological VEGF function. To date, VEGF activity has been suppressed in vitro and in murine models by methods including but not limited to the use of anti-VEGF monoclonal antibodies, RNA interference, and the expression of soluble VEGF receptors.[18-20] While not all of these strategies are at this point clinically viable, there have been major successes with anti-VEGF antibodies. Like any other antibody, these agents inhibit the activity of VEGF proteins by binding to and initiating an immune response against them. Currently there are two anti-VEGF monoclonal antibodies that have been approved for use as chemotherapy in humans, bevacizumab (Avastin) and ranibizumab (Lucentis), both of which have been shown to successfully inhibit tumor angiogenesis.[21, 22] In the abscense of VEGF activity and the angiogenesis that it mediates, tumors treated with either bevacizumab or ranibizumab have been observed not only to grow more slowly but in many cases to undergo significant regression.[23] Since its FDA approval, antibody-mediated VEGF inhibition has successfully treated a variety of humans cancers; however, its clinical application has not been without problems.

VEGF inhibition has been proven effective for and used extensively in the treatment of lung, breast, gastrointestinal tract, renal, and ovarian carcinomas.[21] As is expected with such a wide clinical application, a variety of side effects have been observed in patients treated in this manner, including but not limited to nausea, headache, fatigue, hypertension, proteinuria, menstrual cycle abnormalities, and bleeding at tumor sites.[21, 24] While some of these adverse effects can be cause for concern, at present the major problem facing the use of VEGF inhibition as chemotherapy deals with the ability of cancers to acquire drug resistance, a phenomenon that has been reported in both clinical and research settings.[25, 26] Tumor resistance to therapeutic VEGF inhibition has made alternative methods of angiogenic regulation an attractive avenue in the search for new cancer treatments, and a promising molecule by which this may eventually be accomplished is Delta-like ligand 4 (Dll4).

DLL4 AND THE CRITICAL INHIBITION OF ANGIOGENESIS

Delta-like ligand 4 or Dll4 is a membrane-bound ligand involved in the developmentally significant Notch signaling pathway.[27] Since its discovery by Shutter and others in 2000, the 4.3 kilodalton protein has been classified as a downstream target of VEGF that promotes ordered and productive angiogenesis by preventing an excessive response on the part of endothelial cells to angiogenic stimuli.[28-31] Dll4 is thus technically an inhibitor of angiogenic vessel growth; however, the inhibition that it mediates is often crucial to proper angiogenesis leading to the formation of a functional vascular network.[4-7] In the absence of Dll4-mediated angiogenesis inhibition, effective blood vessel growth is impossible in a number of physiological contexts, one of these being early vascular development.[4, 5, 7] It has been established that Dll4 protein activity is central to this early angiogenesis through the study of murine embryos lacking sufficient expression of the dll4 gene.

The essential role of Dll4 to early vascular development has been displayed through a series of experiments in which the development of mouse embryos lacking one or both of

the dll4 alleles (haploid or homozygous null for the gene, respectively) was observed.[4, 5, 7] Murine embryos lacking a functional copy of the dll4 gene have been found at normal Mendelian frequencies until approximately E9[5] (that is, 9.5 days after fertilization); however, by E10[5] all such homozygous null individuals suffer embryonic lethality.[5] It is thus clear that some level of Dll4 activity is needed for embryonic viability, and a number of studies have sought to access this level through the use of mice heterozygous for the dll4 gene.[4, 5, 7] Embryos haploid for dll4 develop normally until about E9.5, after which abnormalities including reduced recruitment of vessel-sheathing pericytes, reduction of blood vessel size, absence of yolk sac arterial organization, and vessel patterning defects due to hyperbranching have been observed.[4, 5, 7] These abnormalities typically result in embryonic lethality, and because of this dll4 has been properly classified as a haploinsufficient gene.[5] With few exceptions, murine dll4$^{+/-}$ embryos are not viable, and this indicates that the Dll4 protein is essential for proper angiogenic vascular development *in utero*.[7, 28]

In addition to early vascular development, Dll4 is also essential for effective angiogenesis in growing tumors. The role of Dll4 in pathological angiogenesis has been studied extensively in recent years through experiments in which its activity has been manipulated in tumor-bearing NOD-SCID (nude) mice.[29,30,32] Overexpression of the dll4 gene in nude mice has been observed to result in improved tumor vascular structure and more rapid tumor expansion, as compared to control mice expressing normal levels of the protein, indicating that the inhibitory effect of Dll4 paradoxically functions to facilitate tumor angiogenesis and growth.[32] Conversely, experiments in which Dll4 has been inhibited in murine models have shown that its regulatory effect is crucial for effective tumor angiogenesis.

Through the expression of a genetic construct encoding an inactive, soluble version of Dll4, the development of tumor vasculature in the absence of its inhibition of angiogenesis has been observed *in vivo* in mice.[30] Expression of this inactive form of Dll4 in tumor-bearing mice resulted in tumor vasculature that was significantly more branched and interconnected than in control tumors as a result of excessive endothelial cell proliferation and sprouting.[30] The inhibition of Dll4 activity therefore increased angiogenesis and gave rise to larger, more complex vascular networks; however, it is clear that these networks were not fully functional, given that they did not support significant tumor growth, with histological assessment displaying that peripheral tumor cells exhibited extensive hypoxia.[30] These results, combined with those obtained through inhibition via Dll4-targeted antibodies, indicate that tumor vasculature formed under Dll4 inhibition is nonfunctional and the angiogenesis that engenders it "nonproductive."[29-30] Dll4 is thus a negative regulator of angiogenesis that, when inhibited, results in decreased tumor growth despite increased vessel proliferation. Because of this, Dll4 inhibition may represent an avenue toward new cancer treatments.

It has been established by the studies cited above that Dll4 inhibition results in angiogenesis that is nonproductive and characterized by excessive endothelial cell sprouting leading to the formation of nonfunctional and poorly perfused blood vessels.[28-30] When its expression is induced by VEGF, Dll4 acts as a critical negative regulator of endothelial cell proliferation in actively growing vasculature, and this fact makes its inhibition especially attractive as a future chemotherapy, given that normal, fully developed tissues would not be adversely affected.[28, 29] Additionally, Dll4 inhibition has been proven effective in treating human cancers resistant to anti-VEGF therapy *in vivo* in mice, suggesting that it could eventually serve to hinder angiogenesis in tumors in which a VEGF-targeted approach is not possible.[29] There certainly appears to be many advantages to targeting Dll4 in the treatment of cancers; however, it is apparent more research has to be done before this is possible.

The inhibition of Dll4 has been shown to hinder tumor growth, but it has not yet been established that the malformed vasculature resulting from such inhibition would allow for the perfusion of chemotherapeutic drugs required to fully eliminate the tumor in question. If it is found that Dll4 inhibition does in fact lower the efficacy of other chemotherapies, it may become much less attractive as a mode of cancer treatment, and thus studies seeking to answer this question would be of great interest. In addition to this, more research must be conducted to access the extent to which, if any, Dll4 is involved in the angiogenesis that occurs during wound healing. Such studies would be helpful in predicting what adverse side effects would be expected, should Dll4 inhibition undergo clinical trials as a means of chemotherapy. These and other research efforts concerning this protein are warranted, given that Dll4 may eventually succeed VEGF as the principal target in anti-angiogenesis chemotherapy.

CONCLUSION

The formation of new blood vessels is required for the sustained growth of aggressive tumors, and because of this the ways to inhibit angiogenesis have been researched extensively in the search for new cancer treatments. In recent years, great successes have been had with the antibody-mediated inhibition of VEGF, a key promoter of the endothelial cell proliferation and sprouting that is characteristic of angiogenesis. While VEGF inhibition has been shown to be efficacious in treating a of variety of cancers, problems with its clinical application including but not limited to treated tumors acquiring drug resistance have prompted renewed efforts in angiogenesis inhibition research. At present, the inactivation of Dll4, a molecule that inhibits vessel proliferation and sprouting while at the same time promoting effective angiogenesis, appears promising. Tumors in which Dll4 has been knocked down have displayed increased angiogenesis; however, this angiogenesis has been called "nonproductive," given that it does not give rise to a vascular network that can support significant tumor growth. Dll4 inhibition thus has the potential for successful therapeutic application, but before this is possible more research is needed into the potential advantages and pitfalls of such treatment.

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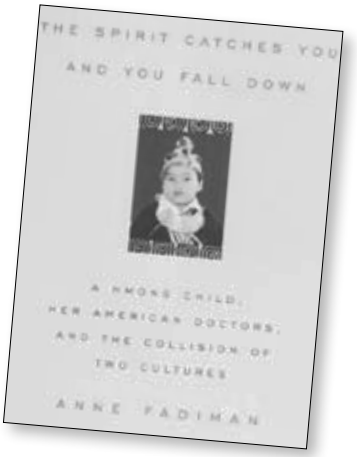
BOOK REVIEW

The Spirit Catches You And You Fall Down, by Anne Fadiman

*Reviewed by Marina Bartzokis**

352 pages; Farrar, Straus, and Giroux; 1998; $15.00 Paperback



What Anne Fadiman originally intended to write as a short magazine article turned into years of research and investigation, which she eventually crafted into one of her most widely celebrated books. The Spirit Catches You and You Fall Down details the story of a Hmong family's clash with the American medical world as their daughter, Lia, suffers from severe epilepsy.

The Lee family was from a mountain region near Laos in Southeast Asia, from which the Hmong culture hails. Many Hmong immigrated to the U.S. in the 1970s in an attempt to escape encroaching communist forces. A private people who possess no written form of their language, the Hmong hold many traditional oral beliefs. Therefore, when the Lee's daughter, Lia, born in 1982, began having fits and convulsions at three months old, they attributed it to an occurrence known in their culture as *qaug dab peg*. In other words, a spirit was attempting to take the soul of their daughter. In the Hmong culture, this is both an affliction and a gift, as possessing this condition is deemed a qualification for most Hmong shamans and healers. Lia became a revered member of both her family and her neighboring Hmong community in California.

Despite this, out of concern for their daughter's well being, the Lee's took Lia to the nearby physicians of Merced Community Medical Center. Physicians disagreed with the Lee's explanation for Lia's condition and diagnosed Lia with severe epilepsy. Lia was prescribed several different medications and underwent multiple dosage adjustments (a common practice). Consequently, the Lee family assumed that these frequent changes and alterations in Lia's medical regimen were an indication that the doctors were incompetent. As such, the Lee's felt it best to cease supplying their daughter with the medication deemed necessary by her physicians. Lia once again began to experience seizure after seizure.

The pediatricians overseeing Lia noticed this drastic change in response to the medication and immediately ordered a drug screen. The results confirmed what they had suspected: the Lee family was not dispensing the medication prescribed to Lia. The physicians of Merced decided to alert child protective services. Lia was placed into foster care, where she was able to receive the appropriate doses of medications as prescribed. Her parents, however, were devastated.

After a period of time had passed, the Lee's regained custody of their daughter, as a result of promising to provide Lia with the strict regimen of medications as ordered by the court and physicians. Despite the Lee's cooperation, in November of 1986, Lia suffered a severe nonstop seizure, known as status epilepticus. She developed septic shock from a serious bacterial infection and ultimately suffered brain death. While Lia appeared to be physically alive and was no longer suffering from seizures, her mind was no longer functional.

Upon hearing the news from the doctors, Lia's parents refused to listen. They still believed that their daughter's soul would one day be returned to her.

Fadiman's book not only details the tragedy that resulted due to a cultural barrier, but also addresses the way in which doctors communicate with their patients. Lia's pediatricians had the same interest at heart that Lia's parents did; they wanted to help her get better. The physicians, however, felt that their medical expertise overruled the spiritual beliefs of an unfamiliar culture. Interestingly, Fadiman's visit to one of Lia's physicians uncovered that Lia's acquisition of the bacterial infection that killed her could have come from a common bacteria prevalent in many hospitals. In addition, over-prescribing of anti-seizure medications could have had impeded her immune system, making her body more susceptible to such bacteria. The same science that tried to save Lia's life may have also contributed to her death.

Fadiman brings to light the issue of communication between doctors and their patients. The importance of doctors relating to their patients is critical, be they patients from a small village in Laos or suburban California. While Lia's physicians might not have been able to identify with Lia's parent's spiritual beliefs, the physicians might have been able to understand the fear of losing a child. Part of caring for the patient should include the doctor learning to understand the point of view and concerns that the patient and their family may have regarding treatment. When a patient or the family becomes resistant to recommended medical treatment, attempts should be made by the physician to comprehend the reasons for such opposition. When physicians pursue an understanding of a patient's perspective, they are more likely to achieve the ultimate goal- healing.

**Marina Bartzokis is a contributing writer for TuftScope Journal for Fall 2009*

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