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TuftScope

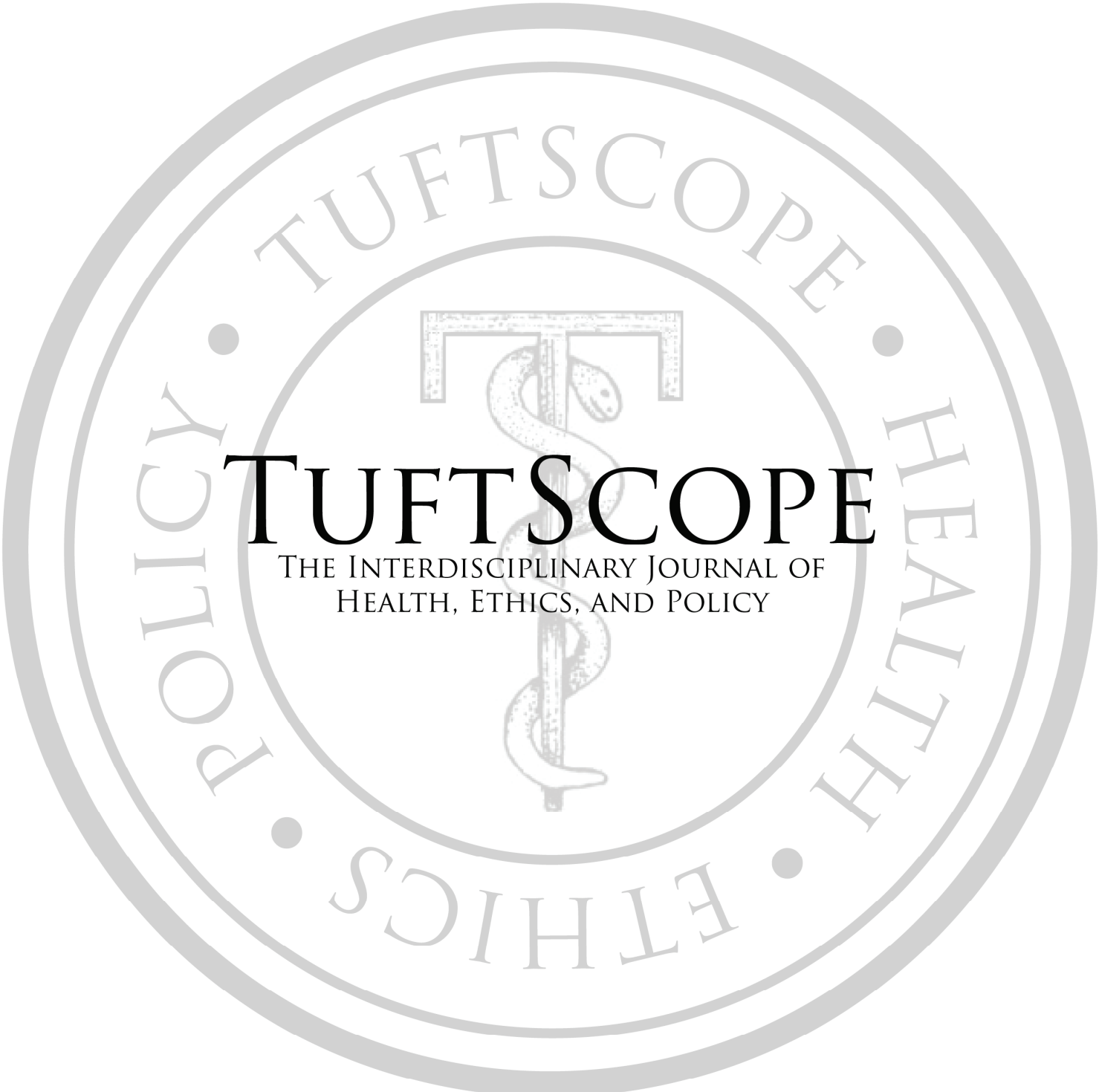
The Interdisciplinary Journal of Health, Ethics, and Policy

Healthcare

Politics

Featured Articles

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



TuftScope

The Interdisciplinary Journal of Health, Ethics, and Policy

Journal History
Since 2001 *TuftScope: The Interdisciplinary Journal of Health, Ethics, & Policy,* has provided an academic forum for discussion of the pertinent healthcare and biosocial debates 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.

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Letter from the Editor

Dear Reader,

Thank you for reading the Spring 2009 issue of TuftScope. This issue marks the 8th consistent year of TuftScope publication and is a sign of our continuing commitment to the improvement and expansion of the journal. With each passing year the TuftScope staff continues to make changes both small and large to the journal, with the goal of making TuftScope an important source of health, ethics, and policy information and discourse.

In this issue we focus broadly on the various facets of healthcare policy and ethics within the United States. The statistics on healthcare are shocking. Between 2007–2008 one in three individuals under the age of 65 found themselves uninsured for nine months or more.[1] In 2007 healthcare spending reached $2.2 trillion dollars and is now expected to reach $4.3 trillion by 2017.[2] The United States spends more on healthcare than any other country in the world, and yet performs poorly when assessed for a variety of healthcare standards.[3] Huge inequities and problems persist within our modern system, yet change seems to come slowly and haphazardly. Multiple solutions have been proposed for healthcare reform since the Great Depression. With this in mind we present a policy brief from the Director of the Center for Healthcare Policy of the Roosevelt Institution at Columbia University detailing one such solution. Jacob Grumbach argues for that the modern system requires radical change with the implementation of a single payer system. Complementing this policy perspective, Ryan Van Ramshorst in a commentary discusses the current inadequacies of our primary care system.

Outside of traditional healthcare policy we present a wide cross section of other health associated topics. Katie Alijewicz comments on prison overcrowding, Teresa Lii addresses the socio-historical nature of circumcision in the United States, and Amanda Harris writes about the modern implications of breastfeeding. Our first featured article by Michael Schecht introduces a different perspective on stem cell politics and California Proposition 71. In our second feature, Lauren Gluck asserts the importance of pediatric drug testing. In light of our commitment towards turning academic discourse into active citizenship, we offer an article on the evaluation of schools gardens by David Bejar and colleagues.

As part of TuftScope's original content, Hyejo Jun conducts an interview with Professor Kevin Irwin of the Tufts University Community Health department, discussing healthcare, academics, and homelessness. In our Book Review section, David Kudlowitz reviews Jessica Sachs' "Good Germs, Bad Germs." In the News section our staff bring you the latest in health, ethics, and policy news briefs. Finally, we continue to provide opposing views on controversial bioethics topics, with a new "Opposing Viewpoints" on the ethics of organ donation. Emily Clark argues for market oriented donation policies, while Benjamin Scoblionko presents an opposing argument for a mandatory organ donor registration system.

This issue offers a wide cross section of viewpoints, perspectives, and ideas on health, ethics, and policy topics. It represents the collective efforts of our authors, staff, and faculty advisers. The TuftScope staff has worked assiduously to develop this latest edition and I am deeply grateful for their commitment and efforts. As always, our faculty advisers have provided reviews and comments that are invaluable to our continued operation and I and the rest of the staff thank them sincerely. This issue was sponsored in part by the Undergraduate Research Fund of the Dean of Undergraduate Education, Professor James Glaser. TuftScope thanks him and his office for their generous donation that allowed for this expanded issue of the journal.

I hope you enjoy the issue!

Sincerely,

Michael Shusterman
Editor in Chief

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2. S. Keehan et al., "Health Spending Projections through 2017: The Baby-Boom Generation Is Coming to Medicare," Health Affairs 27 (2008): w145–w155 (online 26 February 2008).
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Health, Ethics, And Policy News

From Glaucoma to Eyelashes?

Would you pay $120 per month for longer, thicker, and darker eyelashes? Now you can with Allergan's new FDA approved drug Latisse®. Allergan, the maker of Botox®, hopes that their new drug will take a significant share of the five billion dollar mascara market. Latisse's counterpart that has the same chemical formula, Lumigan® (also made by Allergan), is used to reduce the symptoms of glaucoma. The larger eyelashes induced by Lumigan are an inadvertent side effect Allergan hopes to use to its advantage. According to a study of 280 volunteers who took Latisse, eyebrows appeared 25% longer, 106% thicker, and 16% darker, while 3.6% of people had a side effect of darkening eyes. While Latisse seems to have cosmetic benefit to those seeking longer eyelashes, it remains to be seen whether people will pay four dollars a day for nicer eyelashes. - *David Kudlowitz*

A Cure for HIV?

A 42-year-old man suffering from leukemia and HIV was cured of HIV with a bone marrow transplant. While the stem cells given to this man were intended to reduce the symptoms of his leukemia, the marrow he received contained a genetic mutation that provided natural immunity against HIV. The mutation specifically cripples the CCR5 co-receptor on T-Cells. The man has now been HIV free for 2 years since his transplant. While a bone marrow transplant has cured this man's HIV, it is unlikely that transplantation of bone marrow will become a standard in HIV care. Bone marrow transplants are extremely hazardous with 1/3 of patients dying during the immune suppressive stage induced after the transplant is completed. Furthermore, not only would an appropriate match have to be found for a proper transplant into the patient, but the donor would have to have the genetic mutation that prevents HIV (one that only 1-3 % of white Europeans have). This patient's outcome may guide scientists to understanding the disease and ways of treating it better, but the treatment is unlikely to be a panacea cure for the disease. - *David Kudlowitz*

Castration of Sex Offenders

An increasing number of European nations have begun to use chemical castration in efforts to rehabilitate violent sexual predators. The procedure involves the removal of testosterone producing tissues, which the Czech Republic argues is the most foolproof way to curb the urges of dangerous predators. The optional program is not without criticism, the Council of Europe's Anti-Torture Committee called the program mutilating and irreversible. Others have claimed that offering the procedure as a way out of a life-long prison sentence violates informed consent. Despite these critiques, Poland, Spain, and the Czech Republic have, or are considering similar programs. Closer to home, Texas, California, and Florida mandate chemical castration for those convicted of specific crimes. - *Adam Snider*

U.S. to Compare Medical Treatments

As part of the economic stimulus bill passed by Congress in February, more than $1 billion will be directed towards research comparing the efficacy of different treatments for the same illness. The goal of this funding is to accumulate knowledge about which courses of treatment are the most successful. Health care costs were estimated to be 16% of the nation's GDP in 2007 and may rise to 25% by 2025; a reduction in the cost of health care to the economy could have a substantial impact on national savings. Historically, the government has funded research dealing with drug safety and efficacy, but never to compare alternative options for the same illness, even though several European countries do have programs to carry out this type of research. Critics have argued that this new program would allow the government to intrude on a person's healthcare decisions and that it would limit the procedures covered by Medicare and private insurance poli-

cies; however it is not entirely clear yet how the findings of this research will be used. - *Emily Clark*

Stem Cell Restrictions Lifted

On March 9, 2009, via an Executive Order, President Obama lifted the restrictions on use of stem cells extracted from human embryos for scientific research. Previously the Bush Administration had restricted the use of federal funds to support research on any stem cells lines established after Aug. 9, 2001. These restrictions on research fueled initiations such as the three billion dollar California stem cell program (for more information see the Schecht paper in this issue). Stem cells are believed to be capable of being used to regenerate tissues necessary to treat illness such as Alzheimer's disease, Parkinson's, diabetes, and other conditions. At the same time recent advances into stem cell research call into question the need for sweeping policy changes. In 2007 Japanese biologist Shinya Yamanaka was able to reprogram adult cells into their embryonic state, raising the possibility that future research would no longer require embryonic cells. Scientists believe that any clinically applicable therapies that may be derived from stem cell research remain years in the future. – *Michael Shusterman*

The Case of the Octuplets

On January 26, 2009 Nadya Suleman gave birth to octuplets, two girls and six boys, now the longest-surviving octuplets in the country. Ms. Suleman, who had already given birth to six children ages 2 to 7 through in vitro fertilization (IVF), achieved this pregnancy by the same procedure at the West Coast IVF Clinic in Beverly Hills, California run by Dr. Michael M. Kamrava. Although the focus of the media has primarily been on the birth of these children, there has also been a considerable amount of attention given to the surrounding social and ethical issues. Concerns about Ms. Suleman's ability to care for her children with expectedly high costs of raising 14 children have been raised. Furthermore, concerns regarding the doctor who performed the procedure and a legal system that does not restrict the number of embryos placed into a mother's womb exist. Although fertility doctors generally take into account the mother's physical, emotional, and social wellbeing, the number of embryo's implanted by Dr. Kamrava is highly unusual. Financial issues remain a significant problem as well, with the children costing the California Medical System tens of thousands of dollars for their hospital stay alone. - *Hyejo Jun*

Research Highlight: Electronic Medical Records

A recent study in the New England Journal of Medicine has found that only 9% of hospitals in the United States have some form of electronic medical records. The study found that significant obstacles remain in the path of full computerization, with capital costs and maintenance acting as the primary obstructions to implementation. Furthermore, a "perspectives" piece in the same issue by Dr. Kenneth D. Mandl and Dr. Isaac S. Kohane finds that currently available electronics records programs are often outdated and have limited upgradeability. You can find the complete study at, http://content.nejm.org/cgi/content/full/NEJMsa0900592.

Research Highlight: Male Circumcision Reduces Incidence of HSV-2 and HPV

A recent study in the New England Journal of Medicine has found that male circumcision reduces the transmission of HS herpes simplex virus type 2 (HSV-2) and human papillomavirus (HPV). Male circumcision has already been found to reduce the risk of HIV infection in men. You can find the complete study at, http://content.nejm.org/cgi/content/full/360/13/1298. (For a historical perspective on circumcision within the United States, see Teresa Lii's paper in this issue.)

News briefs and research highlights are selected for interesting and potentially controversial health, ethics, and policy topics. Information is compiled by the TuftScope Staff.

Feature Interview

A DISCUSSION WITH PROFESSOR KEVIN IRWIN, TUFTS UNIVERSITY, COMMUNITY HEALTH DEPARTMENT

*Hyejo Jun**

TuftScope is pleased to bring you an interview with Professor Kevin Irwin, Lecturer in the Community Health Department of Tufts University. A former Research Associate at the Yale School of Public Health and member of the Methods and Biostatistics Core of the Yale Center for Interdisciplinary Research on AIDS (CIRA), Dr. Irwin is passionate about his teaching and research stemming from a principle of community involvement. In this abridged interview, Dr. Irwin discusses his work with Housing First, a model for serving the homeless population, as well as his opinions on the current health care system and health care reform in the United States. In addition, Dr. Irwin specializes in substance abuse and is involved in initiatives to expand access to Naloxone, which acts as an antidote to opiate overdose. The entire interview will be available on the TuftScope Weblog accessible via www.ase.tufts.edu/tuftscope.

TuftScope (TS): As a new professor in the Community Health Department, could you tell us what led you to come to Tufts?

Kevin Irwin (KI): I was doing full time research for about 8 years at Yale Center for Interdisciplinary Research on AIDS. Most of that research was HIV prevention focused, substance use focused or both. So, I've done substance abuse research in field settings, clinical settings, treatment related research, disease prevention related research. I was also doing training and support of qualitative research methods at the Center in addition to doing research in the US, Russia, and India. I taught some undergraduate courses at colleges in Connecticut, found it very fulfilling, and then decided to transition to a more full time teaching and a little less intensive research life.

I was really looking for the right fit for me. I've always been in an interdisciplinary environment and so it's important that I remain in one. Also in a health oriented environment, so the community health program is a perfect fit for me because we have great students who are absolutely dedicated to the issue of health and they come to it from a multitude of different disciplines. It's really fertile territory for intellectual exploration and a very well established program. I think there are [many] universities scrambling to try and implement some kind of undergraduate public health type of programs, but this one has been here a long time and especially in the last 10 years under Professor Balbach's leadership [the program] has really grown in stature. So it gives me the opportunity to continue my research to some degree, but to teach and explore with students the things that I'm really passionate about. I teach Social Movements and Public Health, which resonates very closely with my interest in community participation. I teach the seminar in Community Health and Drugs, I've taught some version of that course several times. I don't think I've ever had less than 30 students in that course so it's nice to have a seminar version of it here. I'm also really interested in supporting the internship program so I guide one of the internship seminars in the fall session and enjoy working very closely with the students on those field experiences. Next year I'll be offering a full year research seminar. And the other area that's central to my work is homelessness, and I'm doing that right in Somerville.

TS: Can you discuss your work in the Introductory Course on Healthcare in America (CH2)?

KI: Well, CH2 is slightly different for me, it's a policy class. I haven't done the lion's share of my research specifically on healthcare policy. But, I've always done work in and around policy, whether its healthcare policy, public health policy, drug policy, they're all intertwined. It's a great opportunity to explore US health care policy at this point in history especially when it's so dynamic, so many things are happening. Reform is hopefully happening before our eyes. It's been many years since the last serious effort at reform, which never really got off the ground. I think it's clear to most people in this country that we really don't have a choice. There has to be reform. The country that has by the far the most resources, by far spends the most money, yet has very mediocre and very disappointing outcomes on the whole.

TS: What kind of policy change would you support?

KI: We need universal health care. That can come in a lot of different forms and packages. It doesn't appear that a single payer program is going to be forthcoming from what we've seen so far and the [ongoing] health care policy negotiations. Single payer options seem to be off the table, which is disappointing to me. I mean, I think it at least needs to be part of the conversation. It will be interesting to see how we get to universal coverage. But, it's going to be a long bumpy road.

TS: What do you think would work?

KI: Well, depends on what you mean by work. Depends on what outcomes you're looking for. The trick is to effect systematic change that addresses cost, access and quality together. Certainly, we have models that work tremendously well. The VA system[1] works quite well. In the VA system, you have a population that by and large experiences more morbidity than a lot of population segments. Older, mostly men, who are often dealing with multiple chronic conditions, yet tend to still have pretty favorable outcomes. I think that is attributable to the way the system is organized around prevention and the management of their health, as opposed to waiting for them to get sick and treating the acute condition after the fact. The whole orientation to the patient is different in the VA health care system. You visit one of the institutions, you can see it, it's observably different. There are a number of other benefits of organizing so many people in one integrated system. The coordination of care is quite good. There are lessons to be learned here.

TS: What do you think are the primary problems with the health care system now?

KI: We still have this bizarre mix of public and private concerns, and as long as we are going to value market based strategies to provide health care, medicines, or any associated goods, then we're always going to be subject to forces of the market. Does market competition lead to innovation? Yes, but not always in the best interests of peoples' health. I think it is fundamentally a question about our values, and how we value health. It continues to boil down to that. When you look outward to other countries, and not that they all have perfect systems by any means, but those countries that value health as a social good more than an economic or market good tend to have better outcomes for less money.

TS: And the uninsured?

KI: It's obscene that there are 47 million people without health insurance at any given time. The thing is that, the uninsured still eventually get care, but it only drives up costs for everybody. That people have to wait until they're really sick to go get care, that people have to put off purchasing their medications, or taking less of their medications as prescribed, or skipping appointments for necessary management of chronic conditions – [there's something wrong with that]. There's something on the order of 10 to 14 thousand people a day[2], an unbelievable number of people, losing their jobs and many losing their health insurance in the current economic downturn. Care will eventually be given, but usually it's going to be more expensive care, uncompensated care. So those costs have to be shifted somewhere, and they eventually get shifted to higher premiums. So everybody eventually pays, one way or another. Americans really haven't seen the picture clearly – we all eventually pay with our pocketbooks, with our own health, or both.

TS: What do you think are possible ways to cut costs?

KI: Clearly, if you ask people, how many of the 2.1 trillion dollars in healthcare costs go to prevention, most people couldn't tell you. Reorienting the system toward prevention and primary care, as many community health centers do, would certainly help. The raw cost of hospitals, the cost of physicians, and specialized types of delivery are simply more expensive in the US and that doesn't get talked about an awful lot. When you compare the US to other developed countries, you find that people see their physician less often, they spend fewer days in the hospital, and yet in countries with comparable economic profile, our care still costs a lot more. Is there money to be saved in tort reform? Yes, a little bit, that's part of the story. But there are a lot of different places we can cut costs.

TS: What do you think would be one of the more effective ways to cut costs?

KI: As long as we have large entities involved [that] are operating on a for profit basis, as long as they are accountable to their shareholders and not to the people

they are servicing, we're not going to control costs. We also use far too much technology. Some point to the imperative to use expensive technology simply because it is there and generates profits, while some argue that a lot of this use is driven by defensive medicine, in fears of malpractice. Thus, you have advocates for tort reform. But there are people on the other side of that argument who say that the understanding of malpractice that we're presented with is really a myth. That it really doesn't necessarily add up in a way we're led to believe, and that malpractice, or poor practice is the culprit, usually absent any litigation, that leads to additional medical need, time lost from work, and so forth. And it's not necessarily clear how much testing is done from a defensive posture, or how much less could be effective. It's hard to project what the savings of tort reform will actually be.

And so health has been re-positioned, in this very consumer driven society, as increasingly commodified. People are moving toward having things like health savings plans. That's all well and good but that doesn't necessarily translate into universal coverage or shared responsibility. That doesn't translate into health as a social good, that's health as a personal good. My having a health savings account is good for me but not for you. So this movement towards health consumer comes at a cost. It's great for consumers who have resources. As it relates to positioning patients as having a choice about what kinds of services they want to go do and so forth, but we don't purchase health care, especially preventive services, like other goods.

TS: Could you tell us what your current research is about?

KI: I'm currently working on a few things. I'm working on an evaluation of a Housing First demonstration project. Housing First is a model started in NYC by Sam Tsemberis for addressing chronic homelessness. It does away with the model we've always used, which is this continuum of care. This system typically makes people go through certain steps, from being homeless to staying in a shelter, and then if they do fine in a shelter, we put them in tenant housing for 30 days or 90 days, then if they do fine there, we might put them in a halfway house for 6 months. Some people have to go through multiple steps to secure permanent housing. But at each one of those steps we tend to make it rather difficult. Working with a chronically homeless population you're also often dealing with mental health issues and/or substance abuse issues. As it turns out, even if you have access to some sort of mental health or substance abuse assistance, usually it's absolutely inadequate, and secondly it's almost impossible to benefit from those resources when you're living in a church basement with 120 other people. Not surprisingly that's not a very therapeutic environment.

And then in each of those steps in the process, we typically establish barriers, kind of stumbling blocks for people. Folks often don't comply with their mental health treatment regimen or they use drugs or alcohol, which is of course a symptom of their chronic relapsing condition. It's not reasonable to expect people to go from chronically addicted to abstinent, it's impossible. So folks are set up to fail, and they continue to cycle through the system. In many respects the current system keeps folks chronically homeless and doesn't alleviate anything. The fact that hundreds of thousands of people are homeless in the US today, everyday, is obscene. Now in the economic downturn you have all kinds of new people who are homeless, espeicially families. And families when they're homeless often don't get counted as homeless because they are bunking with somebody else or staying at somebody's house or staying at a cheap motel or something like that. The number of homeless children in the country now is awful, you're talking close to 1 in 50[3], it's a pretty horrific number. Rapid re-housing is crucial for this population as well.

So, Housing First asks the question, what does a homeless person need the most? Currently we answer the question by saying, they need drug treatment, they need therapy, they need job training, they need a shower, and so forth. If folks comply with all of these things, then maybe they'll be what we call "housing ready." But if you go back to the question, what does a homeless person need the most? The answer is housing. That's what they need. Lo and behold, if you take somebody and put them in their own permanent housing, a safe and secure environment, you remove the unreasonable expectations and you give them the support they need to stay there, they do an awful lot better. That support is self-directed. Folks gain a stake in their own health, they have a say in how they access drug treatment or mental health services or other kinds of services or employment or an education or whatever it is they want to access. And if they do stop taking their medication for a week, if they do have a drink or relapse or whatever you want to call it, they are not punished with losing their housing. It's understood as a symptom of their condition, just like when somebody is trying to quit smoking,

they may sneak outside and have a cigarette. We don't kick them out of their house, we support their efforts and accept that change is difficult. Folks also experience this tremendous empowerment of having a lease, of having a home, it's incredibly empowering to have a home, especially if that has been absent for a long time.

I've consulted on Housing First projects in RI, in CT, and in NJ and we've seen success rates moving people from chronic homelessness, people that have been homeless years, sometimes 15 to 20 years, no documentation, haven't had a checking account in years, move them into permanent supportive housing and they do quite well. Retention rates of up to 80%, which is better than college students. It makes sense. It also saves a lot of money. Because when people are chronically homeless, they're using the most expensive and acute care services, they're at much greater risk for having an acute condition, for getting injured, if they have psychiatric problems for having, an acute psychiatric event, for people who are addicted, gone to jail, going to the ER, all of these things add up to very high utilization of very expensive services. The ER and prison are expensive services. When you use the ER 30 times a year, that's $45,000 you could be paying for a very nice mortgage. Housing First not only conceptually makes a lot sense, it economically makes a lot of sense, and stands to improve folks quality of life drastically, for which there is no price.

TS: Could you tell us how you became involved in community work and working with underserved populations?

KI: I started out in service delivery doing outreach work, doing drug and alcohol counseling, working in housing, transitional housing. I started out more kind of social work side of things.

I felt frustration and disenchantment with the limits with what we were able to do because of various institutional constraints. It doesn't do any good to give somebody drug treatment for a week and send them back to the same environment. Those kinds of frustrations. So I've always been interested in people's health and I've always had a special affinity for people caught up in drugs. That led me to go to sociology, to try to get a bigger picture, in public health and interdisciplinary settings. I've been fortunate to work with a real diversity of different kinds of folks over the years who do terrific work, and always trying to make whatever research efforts I've been involved in meaningful, and serve the needs of the community and not necessarily my own career first. A lot of these terms roll off the tongue, we're going to do "community-based research." What is that exactly? To go to agencies in the community and ask them what their needs are and what kind of research projects would benefit them, it's something that not nearly enough researchers do.

TS: Thank you for your time Professor Irwin.

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1. For more information on health care benefits and services from the Veterans Health Administration, visit www.va.gov/health.
2. For more information on this statistic, visit www.americanprogressaction.org/issues/2009/02/health_in_crisis.html.
3. For more information on this statistic, visit www.cnn.com/2009/US/03/10/homeless.children/.

*Hyejo Jun is a Managing Editor of TuftScope. *Interview abridgements were made with the permission of Professor Kevin Irwin.*

Commentary

SCHOLARSHIP AND BIOLOGY: PROFESSOR ROSS FELDBERG

*Michael Shusterman**

Since 2001, Professor Ross Feldberg of the Biology Department of Tufts University has served as the principle Faculty Adviser for TuftScope. An Associate Professor of Biology, who has taught for over thirty years, Professor Feldberg will soon be retiring from his position. In this special commentary we provide a brief biographical perspective into the career and biosocial interests of Professor Feldberg.

Education and Research

Dr. Ross Feldberg completed his undergraduate studies at the University of Illinois at Champaign-Urbana in 1965, receiving a diploma in chemistry. He went on to pursue graduate studies in biochemistry at the University of Michigan at Ann Arbor and received a Ph.D. from the Department of Biochemistry of the Medical School in 1970. His postdoctoral work took him on a unique journey to the University of Aberdeen in Scotland from 1970 – 1972, and was followed by a second fellowship at Brandeis University in the laboratory of Lawrence Grossman from 1972 – 1975. He worked in DNA repair during his time in the Grossman Laboratory, and continued this work after coming to Tufts as an Assistant Professor in 1975.

During his early research career, Professor Feldberg focused on a "damage-specific DNA binding protein from human cells." Over the years his research interests gradually changed and he found himself involved in a variety of projects. His work has included studies on the ability of chemicals within garlic to retard bacterial/fungal growth and the role of hormones in inflammation. Prior to deciding to close his laboratory several years ago, Dr. Feldberg was involved in studying the effects of estrogen on male rats and how changes to the testosterone/estrogen ratio can induce prostate inflammation in male rats.

Professor Feldberg's career at Tufts included the teaching of courses ranging from introductory biology (serving as course coordinator for many years), to biochemistry, biology research seminars, and his specially designed biosocial problems course.

Biosocial Interests

During the 1970's Professor Feldberg was part of a progressive group of young faculty and scientists known as "Science for the People." The organization produced a bimonthly publication and focused on exposing poorly planned and politically motivated scientific research. These included, among other things, associations made between criminality and race and ideas that XYY individuals had elevated 'aggressiveness.' After the group disbanded in the early 1980's, Dr. Feldberg remained interested in the intersection of biology and society. With the advent of what is now the Tisch College of Citizenship and Public Service, he became inspired to offer a course on the intersection of politics, society, and biology. "Biosocial Problems in Contemporary America" (Bio 97) has been offered since 2001, and Dr. Feldberg has called this course the "hardest course" he has had to teach, because the "issues are complex, and not obvious."

In addition to his early science activism, his interest in the subject stemmed in part from a series of publications in *Science* on topics that appeared to be highly appealing, but in fact were poorly researched and designed studies. For instance, work had been published stating that XYY individuals were prone to aggressive behavior based upon analysis of prison inmates. This led to the assumption that XYY individuals are more violent socially, yet larger studies demonstrated that most XYY males live perfectly normal lives, never running afoul of the law. Thus, the course was designed to analyze the research methodologies of such claims, look at myths generated by poorly constructed studies, and examine the social biases and complexities of biological explanations of social problems.

Bio 97 has covered topics ranging from genetic determinism, gender and biology, behavioral genetics, homosexuality, and race and medicine were covered. Each of these issues, Professor Feldberg notes could take up an entire semester of study and are comprised of intricate subtleties. Many of the topics challenge standard perceptions of social and biological connections, often leading to conclusions that raise new and more difficult questions. In part, this was one of the reasons that Dr. Feldberg supported the creation of TuftScope, so as to develop a vehicle for the publication and discussion of complicated issues ranging from health to ethics and biosocial concerns. In his retirement, he hopes to devote more time to these concerns and address the serious implications of science as tool for understanding society and public policy.

TuftScope is honored to have had Professor Ross Feldberg serve as its adviser for these last eight years and is deeply grateful for his contributions to the expansion and development of the journal. We believe that his work both within the fields of biological research and his interest in science activism and biosocial concerns reflects a model for others to follow. As our modern world continues to face increasingly complicated concerns and scientific discoveries, individuals who can bridge these areas will continue to be necessary.

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*Michael Shusterman is the Editor in Chief of *TuftScope*.
Quotations and biographical information within this commentary were provided by Professor Ross Feldberg.

Commentary

PRIORITY NUMBER ONE: EASE OVERCROWDING IN PRISONS

*Katie Alijewicz**

Globally, the prison population suffers from infectious diseases, including respiratory infections and sexually transmitted diseases, more frequently than the general population.[1] In countries like India, Ghana, and China, 25% of tuberculosis cases in the country are due to prison-acquired TB. Efforts have been made within the United States to improve these problems, including the work of California Receiver Robert Sillen who has attempted to improve health in the California State prison at San Quentin by building new and larger health care facilities, raising the salaries of medical staff, and increasing the pharmacy's drug supply. While these enhancements in inmate treatment and rehabilitation are necessary to improve the health of the prison population, they are not sufficient. In order to improve inmates' health, overcrowding of prisons must be addressed and investments into easing overcrowding should be the priority world-wide.

Remodeling the health care infrastructure of a prison, as was done at San Quentin, will not necessarily improve prisoners' health. Overcrowding results in the efficient spread of diseases vectors. Even if a diseased inmate is able to be diagnosed and treated, he will have been in contact with many other susceptible inmates and have potentially infected them.[2] This is especially true of respiratory and skin infections, which are easily spread by close contact.[2] According to a study of prisons in Russia, even with health care professionals able to prescribe and deliver antibiotics, there is no way to guarantee that an infected individual will take the antibiotics regularly or complete the treatment course.[2] Assuming that upon diagnosis an infected individual is told the severity of his disease, it then logically follows that for his own benefit he will attempt to make his treatment as effective as possible.[3] However, infected individuals often do not complete antibiotic treatment because their symptoms appear to resolve themselves before the prescription is completed.[2] Furthermore, the prison environment may make other options more appealing for an infected inmate than completing his prescribed antibiotic treatment. For example, some infected prisoners fear that a diagnosis will delay their release. In an effort to get treatment without seeing a doctor, inmates may threaten violence against fellow infected inmates, who must then either give up their own treatments or risk injury or death.[3] In an overcrowded prison, the threat of such violence is real, as inmates know that there are too many prisoners for the guards to effectively watch.[3] Direct monitoring of treatment, involving the prisoner taking his daily dose of antibiotic in the presence of a heath care professional, has been shown to be effective in treating TB. In overcrowded prisons, however, the ratio of health care staff to prisoners makes this option unfeasible and instead antibiotics are usually distributed as they are to the general public.[3]

Incomplete antibiotic treatment of an infected inmate is not only an issue for the inmate being treated, but poses a health risk for the general prison and surrounding community population. Treatment terminated prematurely allows for the selection of strains resistant to that antibiotic, limiting future treatment options.[2] Additionally, when an individual does not take antibiotics to completion, he suffers from a prolonged infection. In certain diseases, like tuberculosis, this is particularly dangerous as prolonged infection increases the risk of coinfection with two or more different circulating strains of TB.[1] This leads to genetic recombination between the strains and the development of multidrug-resistant TB (MDR-TB) which cannot be treated with easily accessible and affordable antibiotics.[1] Such strains can infect fellow inmates and guards, and, if infected prisoners are released, the general public.[3] Additionally, sexually transmitted diseases develop drug resistance when their treatment is interrupted, as evidenced by the development of drug resistance in gonorrhea.[2] In overcrowded prisons, STD's, including these drug resistant strains, spread quickly due to the high rate of sexual assaults,[1,3] which presumably occur because of the lack of guards to effectively monitor inmate behavior.

With a lower ratio of inmates to guards, guards will be able to more effectively police prisoner- to- prisoner violence and sexual assault. This will ease the risk of violence against prisoners receiving treatment and will also decrease the spread of sexually transmitted diseases.[1] Additionally, with a lower ratio of inmates to

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health care professionals, doctors and nurses will be able to practice direct monitoring of treatment. This will allow for prisoners who receive treatment to do so safely and will take the burden of monitoring drug related violence off of guards.[3] Efficient diagnosis and effective treatment of disease can elicit positive health benefits, but only if overcrowding can be addressed.

Easing overcrowding can have other positive effects on inmates' health. In a longitudinal study of one prison in Zaire, a correlation between the population of the prison and both the death rate and the prevalence of mental illnesses was observed; the years when the prison had more inmates, its population suffered from a greater amount of both.[4] The study also found that inmates' blood pressures were positively correlated with the level of overcrowding.[4] Relieving overcrowding may therefore reduce the prevalence of mental illness, lower the demand for psychiatric drugs, and create less demand for cardiac care.[4] It is important to note that because the health needs of inmates change as overcrowding is relieved, investments made into improving inmate health care before overcrowding is eased will be improperly allocated. Thus, investments should be made into easing overcrowding before investments are made into treatment and rehabilitation services so that resources are properly rationed to provide maximum benefits.

There are means to relieve overcrowding that are less expensive than building many large, new prisons. Studies in the UK have shown that inmates around the world are often repeat offenders; thus, a cost effective way to decrease prison population overseas is to decrease the rate of re-incarceration.[5] Re- incarceration is strongly correlated with the lack of vocational skills and illiteracy and thus, the inability to find a job, the lack of employment and income drives many criminals to commit another crime.[5] To break this cycle, inmates should be given technical jobs while in prison to learn useful skills that will gain them employment upon release. Investments should also be made into improving adult literacy programs in prisons so that upon release each inmate will be functionally literate.

Forcing prisoners to live in overcrowded prisons is inhumane,[1] as it is known that easing overcrowding decreases death rates, improves inmates' mental health, and decreases blood pressure.[4] Dealing with overcrowded conditions hinders the spread of infectious diseases and allows for easier treatment delivery. Investments to improve the health of prison populations should be aimed at easing overcrowding because as prison commissioner Alexander Paterson said: "Men are sent to prison as punishment, not for punishment."[3]

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Commentary

A MEDICAL STUDENT PERSPECTIVE ON THE PATIENT-CENTERED MEDICAL HOME: REAFFIRMING PRIMARY CARE IN A TIME OF CRISIS

*Ryan D. Van Ramshorst**

As a medical student at the Baylor College of Medicine in the heart of the world's largest medical complex, the expansive Texas Medical Center, I am continually witness to the triumphs of the US health care system: hospitals with state-of-the-art ICUs, cutting-edge imaging centers, and the emergence of personalized genomic medicine. For the people who can access this premier level of care, medical miracles seemingly happen with regularity. However impressive the best of 21st century medicine may be, this world is not reality for most of our nation's health practitioners and patients. Amidst the towering private hospitals, on the outskirts of the Texas Medical Center, Houston's largest public hospital is home to an entirely different tier of medicine – providing for an interesting juxtaposition of both the greatest strengths and weaknesses of American health care.

In fact, 45 million Americans do not even have the security of health insurance (i.e. the uninsured), and an additional 16 million have insurance which provides inadequate or sporadic coverage (i.e. the underinsured).[1] In addition to this most visible problem of the US system, American health care is further troubled by racial, ethnic, and socioeconomic health disparities[2], access barriers, uncontrolled costs, diminishing emphasis on primary & preventive care, and challenges to patient & physician autonomy.[3]

Considering these shortcomings of American health care which have only continued to grow, the topic of health care reform has once again entered US public and political forums. Enhancing this discourse have been solutions for reform from numerous interested organizations, among these patient advocacy groups, medical societies, insurers, and policy think-tanks.[4-8] Such proposals vary according to factors such as topic area (access, quality of care, etc.), timeframe (radical vs. incremental reform), and degree of impact (comprehensive vs. piecemeal). This essay will focus on one such solution which has recently been gaining in popularity: The Patient-Centered Medical Home.

In an effort to address the rapidly growing number of Baby Boomers over age 65, an increased need for the management of chronic medical conditions, and an anticipated physician shortage[9,10], the Patient-Centered Medical home was proposed jointly in 2007 by the American Academy of Family Physicians (AAFP), the American Academy of Pediatrics (AAP), the American College of Physicians (ACP), and the American Osteopathic Association (AOA). The principles of the Patient-Centered Medical Home address numerous topic areas, including access, quality, primary care & prevention, and physician reimbursement.[11] Briefly, these principles include a personal physician, physician-directed medical practice, whole person orientation, coordinated/integrated care (the aforementioned known as the "care principles"), higher quality and safety standards, enhanced access, and appropriate provider payment (these known as the "infrastructure principles").[11, 12] It should be noted that the medical home is not a novel concept, as it was first introduced by the AAP Council on Pediatric Practice in 1967 as part of an effort to bolster care for children with special health care needs.[13] Furthermore, the patient-centered medical home is built upon the foundation of primary care medicine, a concept similarly developed in the 1960s.[14, 15] Initially proposed as a way for the federal government and medical community to cooperatively provide adequate care, primary care has remained central to health care systems across the world.[15] To further highlight its importance to quality, integrated, and accessible health care, it was subsequently defined by the Institute of Medicine in 1994, sharing striking similarities to the Patient-Centered Medical Home.[16]

For the past decade, mounting evidence in support of the medical home model in medical literature has gradually increased the visibility of this proposed solution for reform. Although an in-depth review of studies presenting evidence in favor of the patient-centered medical home is beyond the scope of this commentary, it is important to highlight some of the most salient data. Starfield and Shi (2004) and Rosenthal (2008) effectively summarize the literature[17,18]; the most striking of which describes the correlation between the availability of primary care, mortality, life-expectancy[19,20], and cost of health care in the context of a medical home.[21,22] The sweeping conclusions of both review articles cited above further emphasize the need for a medical home model in American health care: Rosenthal (2008) concluded that "evidence…supports the ability of medical homes to advance societal health;"[18] Starfield and Shi (2004) closed by affirming that "a medical home…provides better effectiveness as well as more efficient and equitable care to individuals and populations."[17] Considering the wealth of supporting studies, it appears that the medical home model will only continue to garner momentum as medicine moves in the direction of evidence-based practice. However, despite the clear in favor of the model, it seems that the patient-centered medical home model will undoubtedly be limited in implementation until we recognize the barriers to care which might be seemingly absent on paper, but very present "on the front lines" of everyday practice. To expound on this subject, I would like to deviate from the scientific literature and enter a slightly more tangible world. The last four weeks of my medical school train-

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ing have taken me to a large public community health center in a small industrial satellite city of Houston. While completing my family & community medicine clerkship at the clinic, I have found myself leaving the clinic nearly every day insired. This is due to the profound dedication and compassion of nurses, physicians, and other staff at the clinic who strive each day to deliver much-needed health services to some of Houston's most underserved. Admittedly, this inspiration has somewhat faded with time as I saw the the barriers which plague our health care system: lack of health insurance, expensive prescription medications, increasingly short visit lengths, long wait times, and not enough physicians, just to list a few.

As part of our clerkship experience, medical students are required to conduct an evaluation of the clinic's effectiveness as a medical home[23], the results of which were quite interesting. After completing the survey, I was surprised to find that the clinic received a "good progress" rating, indicating that the clinic was "well on its way to becoming…a true medical home." Although this particular survey was only one out of several possible evaluation tools, and the survey results indicated that "continued improvement" was necessary, I found it hard to believe that the clinic was in any way actively transforming to become a primary care home for its patients. I subsequently found myself wondering "If this is good, then what does not-so-good look like?" Surely, there is much more work to be done, as a true medical home is much more complex.

As an aspiring primary care pediatrician hoping to work in an underserved community, I most sincerely believe that there is much that needs to be done to improve our ailing health care system. The medical home model is an evidence-based solution to treat some of American's health care problems – and its importance should not be overlooked. I believe that it should be at the core of any proposal for reform. As physicians-in-training, we are charged with assuring the future health of a nation. How can we make sure that sound proposals for reform such as the medical home become reality? What issues need we address now to secure a sure foundation for progress in the future? It seems to me that the "limiting reagent" in the equation for effective reform does not require the analyses of an economist or a politician, but is actually quite straightforward; the limiting reagent is you and me – the supply of future physicians - specifically those who decide to pursue a career in primary care medicine. This is not meant to oversimplify the issues facing this crucial juncture in American health care, but to emphasize a clear way in which students can lead us towards better health as a nation.

Primary care in the United States is in crisis at a time when we need it most. Overall, medical students are less interested in primary care,[24] and fewer students are becoming primary care practitioners.[25] As described above, the medical home model, along with other proposed solutions for health care reform, are founded upon those same principles of primary care conceptualized nearly 50 years ago. The patient-centered medical home, in particular, is a clarion reaffirmation of the need for primary care in the US. Although primary care medicine may not receive front page notoriety in today's media, its clear importance to our health and well-being resonates throughout communities nationwide. As students, we are not only called to learn, but also to act; if we are to approach an ideal system which assures quality, affordable, health care for all, we must work cooperatively to develop incentives for primary care medicine, expand the primary care workforce, and ultimately ensure all Americans a medical home.

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Opposing Viewpoints

THE ETHICS OF ORGAN DONATION

Tuftscope Staff

Organ donation represents one of the most contentious and important topics in bioethics and modern biomedical discourse. As of 2009 more than 100,000 candidates were waiting for a compatible organ from a donor. Many individuals die before receiving an organ and outside of major advances in biotechnology allowing for *in vitro* organ development, no current technological solution exists for alleviating the shortage. In this Opposing Viewpoints we present two perspectives on alternatives to the current organ donation system. A free market system compensating organ donors is presented in the first viewpoint and a required donation-benefits viewpoint is presented in the second. TuftScope welcomes letters on your opinions and thoughts on this issue.

The Free Market Solution

Emily Clark

A wide range of possibilities exists for how to procure and allocate organs for transplant in a society, and a variety of policies regarding transplantation are used across the globe. Every system of organ procurement upholds certain societal values and disregards others. Our current system relies almost entirely on the altruism of individuals to give away an organ they do not need (such as a kidney), or to denote themselves as postmortem donors. This policy supports individual autonomy as well as cultivating altruistic behavior in society, however it also violates the principle of preserving human life because it fails to supply enough organs. More than 100,000 people are currently on the waiting list for an organ, and in 2008 nearly seven thousand died before they could get a transplant.[1] The best solution for resolving the organ shortage crisis must at once increase the supply of organs and uphold other relevant societal values. Allowing organs to be sold in a free (though not unfettered) market, with prices based on supply and demand is the most ethical solution to the current crisis, and is a policy with high potential for success.

Not only does our system create organ shortages, but the lack of available organs often drives people to more dangerous solutions. Medical tourism, in which individuals go abroad to buy an organ for transplant has flourished.[2] The quality of these surgeries often below western standards, and by sanctioning this practice we are supporting the exploitation of those whose organs are used in countries like India and Pakistan where black markets thrive.[3] Unrestricted black markets are dangerous for live donors because the harvesting operations themselves are often lethal, taking place in illegal facilities.[3] The health of the donor is largely ignored.

While not widespread, the policy of a free market for organs has already come into practice in several countries including Iran. A free market solution would by definition raise the level of organ supply to the necessary level by virtue of "the invisible hand". Demand for organs would determine the price level, which would in turn lead to enough people wanting to sell their organs. In the case of kidney donations, it would be possible for "living donors" to be paid for their organ. For other types of organs, a free market system would either compensate the person while still alive (via a futures transaction) or compensate their family. Since the implementation of this program in Iran, there have been no organ shortage associated deaths.

The idea of allowing human organs to be bought and sold seems horrifying and debasing to many. As a society, we often express disgust at the thought of commoditizing the human body, and to do so this blatantly would undoubtedly challenge some of our deepest cultural values. Yet before rejecting outright the proposal for an organ market, it is interesting to question why we feel this disgust. There are already many examples of the body being objectified and commoditized without engendering public outrage. Do we not allow people to buy and sell sperm and eggs? Or allow a surrogate mother to "rent" her uterus? Perhaps the risks are not as severe in these cases, but the benefits are also not nearly as urgent.

The proposal of a free market solution also raises several other ethical considerations, including potential exploitation of the economically disadvantaged, as well as concern over whether it is acceptable for people to sell the organs of a deceased family member. In practice, the latter would be a nonissue, since any wishes an individual expressed while still alive would be respected regardless of the family's financial need. Secondly, the outcome of a free market system, whereby potential donors would be carefully screened by doctors, is much less exploitative than is the current practice of allowing Americans to fuel the exploitation of destitute members of less developed countries through the black market.[4] One final concern involves those who must "buy" an organ. Would a free market system make getting an organ transplant prohibitively expensive for some? The answer seem to be no, mostly because the cost of getting any transplant operation already accounts for purchasing the organ from a procurement agency. Additionally, in the case of the Iranian system, a common government fund pays for organs.[4]

Various alternatives to a free market solution do succeed in reducing some of the negative effects of our current system, but they have ethical considerations of their own. One policy that has already been put into use in this country is "paired" or "cross" exchanges whereby the incentive for donating an organ is that an individual or a family member is more likely to get an organ of their own. Yet this system has clearly not succeeded in solving the shortage crisis. Another proposal is to offer indirect benefits for donating an organ (such as compensation

for funerals, tax credits, insurance).[5] However this policy is essentially a way for the government to "buy" organs while evading the question of whether or not commoditization of the body is acceptable to society. In addition, it is not clear that such a policy would substantially raise the supply of organs to the necessary level. A final policy that has been put into place in many European countries is a system of "presumed consent" whereby people are automatically assumed to be donors unless they specify otherwise.[5] Ethically, this policy clearly violates the respect of an individual's wishes and the wishes of their family. After a thorough review of many policy options, it seems clear that pursuit of a free market policy has the greatest potential to resolve the many ethical dilemmas surrounding the issue of organ procurement and allocation.

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Expanding the Role of Organ Donors

Benjamin R. Scoblionko

In 2008, over 100,000 people needed an organ transplant, but only a quarter of those waiting on the transplant list received one. Every day, over a dozen people whose illnesses or diseases have been diagnosed die because they do not receive a transplant in time.[1] Less than half the people in America who qualify to be donors actually are.[1] The current transplant system needs reform. Some feel that the organ donation and transplant system should be a free market system. This idea, however, would not address the main problem which is that there are consistently not enough organ donors. The free market system is an attempt to solve a social problem with an economic solution, without addressing the underlying issues. In times of high demand and prosperity, the free market system has potential to work, however, in a recession, most people on the recipient list might not be able to afford such transplants.

The underlying problem is simply that not enough people are registered organ donors. One way to change the current system would be to implement a system of presumed consent, in which individuals are considered donors unless otherwise stated.[2] Currently, most people do not consider organ donation until the question comes when they are receiving a driver's license. Without considering about the repercussions of their actions, many give a quick answer, not thinking that one day this decision may help save a life.

The presumed consent system would have many advantages over the current system. Not only would presumed consent increase the number of donors in the country, but it would also raise awareness of the current organ crisis and educate people more about the transplant system.[3] This system would remove the burden of making the important "to be or not to be" decision that currently plagues families already dealing with the death of a family member. Such a system has been proven to work in multiple countries around the world including France, Spain, Portugal, Italy and Belgium.[3] To complement the presumed donor system, an addition change that would help increase the number of available organs would be to give priority to those people who are organ donors themselves.[2] Doing so would encourage individuals to remain donors in the event that they ever were to need a transplant themselves.

The combination of presumed consent and donor priority would directly increase the number of organ donors in an ethically and morally acceptable way. Many do not consider that one donor can save up to fifty lives.[4] As the current framework for organ transplantation is governed by legislation, the presumed consent – priority combination would not call for significant legislative changes and could be rapidly implemented. This is compared to the free market system, which would require a substantial paradigm shift in the organ donation system. Furthermore, since many of the major religions in America favor medical acts that save lives, such a system has the possibility to avoid religious conflict.[5]

Every twelve minutes another name is added to the transplant waiting list.[5] The United States faces an organ donor shortage. A free market system may potentially increase the amount of donors, but it would not be the most efficient, consistent or ethical way to do so. The best way to effectively change our current system would be to implement a presumed consent-priority system. This system would reinforce that priority would be determined by moral guidelines as opposed to financial criteria. Tens of thousands wait every day, hoping for a transplant. The current system must be changed.

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Healthcare Review

A POLICY BRIEF ON THE SINGLE PAYER SOLUTION

*Jacob Martin Grumbach**

This proposal outlines the negative costs, both economic and human, of the current employer-based health insurance system in the United States and offers a single payer solution that expands Medicare to the entire population. Though President Obama's proposed healthcare plan might marginally improve our current system, reformers must continue to push for change that will improve and expand access to care. The Obama plan has been attempted on the state level in Massachusetts, Vermont, Tennessee, and Minnesota. All four attempts have failed, proving to be ineffective and leaving behind considerable statewide deficits. In a single payer system, on the other hand, private industry remains intact. Funding is provided by raising estate and income tax levels by 2 percent. A single payer solution would streamline health insurance funding and put an end to the regressive costs imposed on lower-income families and individuals by the current system. Though the single payer solution might not currently be politically viable in the United States, the potential it has to cure the fundamental problems of our employer-based system makes it the best long term option.

Introduction

Although health care has reemerged as a major issue with the election of Barack Obama as the 44th President of the United States, the current debate misses a critical point. Few remember that in 1971, President Nixon proposed that employers either provide required health insurance for their workers or help subsidize their Medicaid, ideas virtually identical to the main tenants of the Obama plan. In truth, Nixon's plan was meant to undercut more progressive proposals made by Democrats like Senator Ted Kennedy, who called for compulsory national health insurance in his 1972 book, entitled "In Critical Condition."

Today, the health care debate seems more antiquated and irrational than it was in 1971. The modern progressive President and his party support an ineffective, Nixon-like reform, while only a handful of Congressional members call for an overhaul of the broken system.

Reformers must face reality. Our current health insurance system, or lack thereof, is a poor solution to a problem that affects millions of Americans. There have been a number of unsuccessful state-level attempts to fix the system in the style of Obama's proposal. Yet, the only way to stop growing health care costs and provide affordable, comprehensive insurance coverage to all is to remove private profit from the system. Currently, insurance companies attempt to minimize costs, thereby maximizing profit, by covering the healthiest and weeding out those who need care most.

A single payer system, in which insurance is paid for by taxes to the Federal Government, would save enough money to cover all Americans, lower costs for those who have insurance, and improve medical care. This is not the same as socialized health care because practices and hospitals remain private, a single payer system only streamlines the payment process. Though such a plan may not be politically viable in the United States today, it will become clear several years after the implementation of the Obama plan that the insurance system needs a heart transplant, and not another Band-Aid.

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Economic Costs

Although many Americans believe that the free market is more cost-efficient than government, our employer-based health insurance system is a severe economic drain. The United States spent $6,102 per capita on health care costs in 2007, and in total since 2000, health care costs have risen 40 percent.[1] These figures dwarf those of the rest of the world, including the next highest spender, Switzerland, which only spends $3,847 per capita on health care.[2] Our 1.9 trillion dollars in health care spending was not only 16 percent of the U.S. GDP in 2004 - almost twice the Organization for Economic Cooperation and Development (OECD) average - but even the public portion of the expenditure alone ($2,468 per capita or 7 percent of the GDP) was above the OECD average. Private insurance accounts for 56.2% of health care expenditures and public insurance for 43.8%; the U.S. health care system is not as market oriented as much of the rhetoric would suggest.[1] But what has this spending accomplished?

Higher spending has not brought about higher life expectancy rates. Denmark spends significantly more on health care than Japan does, but the average life expectancy for a Japanese citizen is 81.25 years, compared to 77.79 years for a citizen of Denmark. The average life

expectancy of a U.S. citizen is 77.85 years, ranking 48th in the world. To put this in perspective, the average life expectancy in Cuba, which only spends $236 annual dollars per capita on health care, is 77.41 years, less than half a year behind the United States.[3] Although certain variables lower the average U.S. life expectancy, such as the average American's higher exposure to fast food and gun violence, Cuba has nearly twice as many daily smokers as the United States.[4]

A 2007 Commonwealth Fund study ranks Australia, Canada, Germany, New Zealand, the United Kingdom, and the United States based on the quality, access, and other measures of health care.[5] From this study, one can see that not only have the world's largest annual health care expenditures failed to make U.S. life expectancy competitive with other countries that spend less, but the U.S. also has noticeably higher rates of patient dissatisfaction. According to the Roper Center polls, these dissatisfaction rates doubled between 1997 and 2000.[6] In addition, the employer-based American health care system is often confusing and difficult to manage. This includes dealing with HMOs, which require determining pre-existing conditions, and eligibility and provider issues resulting from job changes.

Middle-income Americans, even when insured, spend a much larger proportion of their income on health care costs than wealthy Americans do. In 2003, 14 percent of all health care spending in the U.S. came from private, out-of pocket payments to health care providers from patients' insurance premiums, deductibles, co-pays, and coinsurance.[7] This type of expenditure is a regressive tax; a high income earner pays the same dollar amount as a low-level worker. Even with employer-based insurance, each worker in 2005 paid an average of 18 percent of the costs of his or her health insurance, approximately $564 per year.[8]

The current health care system also generates economic waste via a hidden tax levied by the uninsured. This "tax" occurs when hospitals must provide emergency care for anyone, regardless of the person's ability to pay the cost of care. The annual cost of emergency care for uninsured patients is almost $100 billion, not only raising taxes for all Americans, but also out-of-pocket hospital costs for all patients. In addition, uninsured Americans are about 50 percent more likely than insured Americans to go to the hospital for a condition that could have been treated or prevented.[9] This hidden tax is especially relevant to uninsured children. Nearly 10 percent of uninsured children are taken to the emergency room to avoid costs their parents cannot pay. In 1996, Florida instituted a program to insure children. In the areas covered by the program, taxpayers saved $13 million because emergency room visits dropped by over two-thirds.[6]

An uninsured patient could go to the emergency room with a mature stage of cancer, which could have been treated more quickly, easily, and cheaply had it been detected in its earlier stages by a general practitioner. Thus, the lack of preventative care for the uninsured is cost-inefficient. Free clinics, while helpful, usually do not fill this gap for the uninsured, as many people cannot miss work for an entire day to stand in line for a simple referral to another physician. After an emergency room visit, the uninsured patient is often charged a substantial fee that he cannot pay, hundreds of dollars for room fees or over $50 for a bandage. To compensate for the cost of treating those who are unable to pay, hospitals may overcharge those who can pay. Thus, even though the uninsured poor can go back to the hospital and explain that they cannot pay the exorbitant bill; people with inadequate insurance are hit with enormous costs as well, though their insurance will only cover expenses up to a certain limit.

Human Costs

Not only is our current health care policy economically irresponsible and inefficient, but the system also carries moral repercussions. The number of uninsured Americans is staggering. In 2005, that number rose to 46.6 million, or 15.9 percent of the population.[11] This figure only accounts for Americans uninsured throughout the entire year of 2005; the statistic drastically rises if the temporarily uninisured are included.

Of those 46.6 million Americans, 8.3 million are children under the age of 18, indicating that 11.2 percent of minors lack health insurance.[11] This number has been constantly rising. In 2005, 360,000 more children lived without health insurance than in 2004.[11] In this case above all others, the words of Franklin D. Roosevelt ring true: "The test of our progress is not whether we add more to the abundance of those who have much; it is whether we provide enough for those who have too little."

The ineffectiveness of current healthcare policy leaves many children without proper health care. Minors are often the most negatively affected by a lack of insurance. Many may go without crucial immunizations. Preventable and treatable conditions such as asthma, become major problems. The majority of uninsured children with asthma will not see a doctor once this a year, and preventable asthma attacks force these children into the emergency room at an astonishing rate.[12] When parents cannot afford

simple drugs like antibiotics, children stay home sick from school, causing them to fall behind for weeks or more due to treatable infections. Uninsured children also lack a family doctor and the stability that comes with personal care, which helps promote a healthy lifestyle, encourages a balanced diet, and discourages destructive habits like smoking.[13]

Furthermore, it is very difficult to pay for health insurance for an entire family. Eighty-eight percent of all American employees contribute to their employer-based health insurance costs. For family coverage, the payment averaged a full 29 percent of the total costs—much more than the 18 percent the same employee would pay on average for his own health insurance alone.[8]

Although certain government programs have been designed to help families insure their children, these programs are flawed in a number of ways. Medicaid, a safety net providing low-cost health insurance for economically qualified children, seems like a viable solution. Unfortunately, it only covers a small proportion of children who cannot afford insurance. Though the program has made considerable strides in providing health care for some of America's lower-income minors, it has been unable to solve the egregious problems that plague our current system. Two major plans to fill the gaps in the American health insurance system are to expand Medicaid to help those who are eligible to receive coverage and to allow more people to become eligible. With this Medicaid safety net already in action, though, why are 11.2 percent of children and 15.9 percent of the overall population currently uninsured?

The first problem is that many of those eligible do not have the means to apply. This can include the lack of an internet connection, lack of a car to drive to a government office (especially where public transportation is lacking), lack of knowledge of Medicaid, or lack of sufficient English skills to apply. For example, 2.9 million Latino children do not have insurance (about 20 percent of the entire demographic population in the U.S.), yet over 70 percent of these minors are eligible for Medicaid.[13]

The second problem with Medicaid is that many who should be eligible are not. Children living just above the economic cutoffs of the program can go without insurance for years while the family experiences financial difficulties. At the same time, middle-income children often lose health insurance when a parent changes jobs or shifts his or her health care plan. When the child turns 18, Medicaid ends. This is one reason young adults are one of the most uninsured demographics in the United States.

An important human cost of having 46 million uninsured Americans is that our country's infant mortality rate is the second-worst in the industrialized world, with only Latvia having more deaths within the first 24 hours following birth. The level of some 5 deaths per 1,000 births is primarily due to the lack of prenatal care for uninsured mothers; those in at-risk communities receive fewer checkups and more complications thereby arise. In this trend, the African American community has an infant mortality rate of almost double the national average, with 9.3 deaths per 1,000 live births. With a better system to insure soon-to-be mothers, we may be able to cut the level to that of Scandinavian countries and Japan, 2.5 to 3 times lower than ours.[14]

The most important statistic we should be aware of is that 18,000 people in America die unnecessarily each year due to a lack of health insurance.[15] This staggering figure certainly contradicts the Federal Government's commitment to the overall health of its citizens.

A Single Payer Proposal

As shown, our current health insurance system is not only inefficient, but also immoral in its treatment of average Americans. It is an incredibly inefficient system in need of serious reform. But what is the way forward? How can we improve overall care that we receive, while allowing health insurance to cover more people? A Medicare style single payer system appears to be the most efficient way to fund health care in the United States. Details of the plan to implement single payer health insurance in the United States are as follows:

All 300 million American residents will be insured with a plan that covers all forms of care—prescription drugs, dental care, rehabilitation, home care, mental health services, vaccines, and work-related health care. Individuals in the new system will have insurance comparable to an employer-based or private healthcare plan.

The new program, like Medicare, will only affect insurance payments, retaining our current private health care system. Doctors and hospitals remain private and free of government influence. The only significant change in a single payer system would be the way that we pay for health insurance in the United States. Through an estimated estate and income tax increase of just 2 percent, we will be able to both streamline our health insurance funding and effectively put an end to regressive costs imposed on lower-income families and individuals by our current system of health insurance.

A Harvard Medical School and Public Citizen study has found that the United States spends $399.4 bil-

lion on health insurance bureaucracy each year—31 percent of all health care spending in our employer-based insurance system goes to overhead, paperwork, advertising, and other related expenses. The same study also found that universal health care, of virtually any type, would save Americans $286 billion dollars annually. In other words under a single payer plan, Americans could save 72 percent of the money that is lost to administrative expenditures under the current system.[16]

Just $80 billion is enough to expand coverage to all uninsured people, meaning funds will remain to provide prescription drugs for seniors, and drastically improve the quality of care we receive in the United States.[17] This will alleviate concerns with the prescription drug benefit Medicare Part D, particularly if Medicare has the ability to negotiate prices with drug companies, a separate but important issue.

After providing adequate plans to those currently without insurance, over $100 billion would still remain from the regained administrative costs and could be used to improve hospital facilities, hire more family doctors and nurse practitioners, and digitize medical records. Money could also be used to improve the accessibly of care to those most underserved by the current system, by allowing for the hiring of more translators and the creation and enhancement of health programs in underserved areas.

The Canadian health insurance system, a general model of this single payer plan, only spends 16.7 percent of health care spending on administration, compared to the 31 percent under the American employer-based private insurance system.[17] However, many conservative voices in the United States denigrate Canadian health care, arguing that Canadian citizens often have to wait in long queues for care. This argument is inherently flawed and misleading, because while, on average, Canadians do wait longer after being referred to a specialist, they actually receive significantly more care from general practitioners than individuals do in the United States.

Unfortunately, the people who would stand to lose the most under these kinds of pragmatic and cost-saving reforms are also those whose opinions are most visible in the media, by virtue of the considerable wealth of the American healthcare establishment. Middle to lower-income citizens who do not have either the financial capital or personal connections to spread their story in the media are largely ignored. The privatized system allows blame to be shifted from the market to individuals for their inability to afford health insurance, even if these individuals legitimately cannot afford insurance.

As previously stated, under the proposed single payer system, doctors remain medically independent. Doctor-patient confidentiality will remain intact, and every American will still be able to choose his or her own doctor. The manner in which we currently decide to visit a particular physician will not change; the most popular doctors will have longer waiting lists, and most people will have family physicians for years at a time.

Medicare's basis for reimbursing doctors form the foundation of the single payer plan's reimbursement system. Medicare Part A (Hospital Care) pays hospitals based on their projected expenses after a physician issues a diagnosis to a patient. Since 1992, Medicare has been instituting the Medicare Fee Schedule (MFS), a method of determining how much to pay doctors for their services for Medicare Part B (Medical Insurance). MFS then quantifies each medical practice in terms of Relative Value Units (RVUs) based on the estimated cost of the treatment. The RVUs also vary slightly depending on the Geographical Adjustment Factor (GAF), which makes sure hospitals are adequately repaid when the specific procedure is more expensive in their area due to factors such as transportation or climate.[18]

This Medicare Fee Schedule will maintain its role in the newly expanded Medicare program, determining the correct amount to compensate hospitals for their equipment and labor. The Medicare officials will review the paper or electronic forms that doctors fill out after procedures and verify the RVUs of the treatments. This will simplify the work of physicians and hospital employees, because they will only have one party to bill, and hospitals will not have to look into a patient's insurance history before agreeing to treat him or her. For example, doctors in Canada's single payer system spend a fraction of the time on billing forms compared to our physicians' average of 134 personal hours each year.[19]

Under the system new governmental administrative positions will be created for Medicare workers, whose jobs will pertain solely to health insurance, including jobs such as processing payments and reimbursing the expenses of hospitals and doctors. This will compensate for individuals previously employed by private insurers. The new health insurance system will employ individuals from insurance corporations skilled at examining claims and also experienced healthcare economists.

Average physician income will stay about the same and will keep pace with inflation, as seen in examples from other countries. In Germany and Canada, for example, average physician income is above the average worker's income by the same ratio as in the United States.[20] Although the average physicians income will stay

relatively constant, there will be smaller gaps between the incomes of primary care and specialist physicians. Currently, the U.S.'s ratio of primary care/specialist income is 0.62, while Germany and Canada's are 0.73 and 0.74, respectively.[20] Today, Medicare still preferentially reimburses specialists compared to primary care physicians, a practice that will be altered under a new single payer system.

Any health care reform intended to expand coverage and access must also include sufficient primary care physicians and nurse practitioners for three critical reasons. First and foremost, primary care is more cost-efficient. Second, the most common health issues facing Americans today, heart disease being the most significant, are better managed by long term primary care than by more costly post-symptomatic treatments performed by specialists. Finally, it is crucial for children to grow up with access to a family doctor and maintain a relationship with a doctor throughout their life. Family doctors not only treat symptoms, but also instill in their patients better life habits with regards to nutrition, exercise, stress management, sexual health, and smoking.

Critique of the Obama Plan

The Obama plan includes a number of components. First, it aims to stop insurance companies from discriminating based on pre-existing conditions, a common practice under the current system. This law would have a significant impact, by allowing for a significantly larger number of people to be eligible for private coverage.

Second, it provides a tax credit to small businesses worth half of their care costs, encouraging them to cover their workers. If a small business has "catastrophic" health care costs due to serious health issues among employees, the Obama plan helps cover them.

Finally, the plan forces medium to large-sized companies to 'play or pay,' meaning that they either provide insurance for their employees, or pay into a federal fund to subsidize a new government health care plan. According to President Obama, this legislation will reduce costs for those who already have insurance and provide an affordable plan for those without.

This type of employer mandate has been tried and has not succeeded on the state level in Massachusetts, Vermont, Tennessee, and Minnesota. In 1988, Massachusetts implemented a mandate for employers to buy coverage, including students and the self-employed. As a result, the number of uninsured citizens of Massachusetts continued to rise. It is currently significantly higher than the number of uninsured in 1988. Even the current Massachusetts reform is a stopgap measure and not a comprehensive solution. In another case, the number of uninsured in Oregon has stayed constant, even though the state created an employer mandate and expanded Medicaid in 1989.

Like Obama's plan, these employer mandates offer subsidies for low-income people to purchase insurance, but health care costs inevitably continue to rise. The subsidies then must grow to help low-income citizens buy coverage, straining the budget. In Massachusetts, for example, the subsidies have cost some $150 million more than the original projection.

Overall, the Obama plan is a small net positive for reform. That said, the plan fails to target what makes health insurance expensive in the United States: the corporate insurance system that wastes more than a quarter of every health care dollar. In order to make a profit, the insurance industry must do whatever possible to cut costs, which means covering as many healthy people and as few sick people as possible. This is faulty logic and immoral. The only real solution to improve health care is to largely eliminate the roughly $400 billion industry that is corporate insurance.[21]

Conclusion

Today's discussions of health care reform are dominated by myths and irrational fears as reason appears to sit by the wayside. Unfortunately, the continuing debt incurred by health care costs may one day force drastic reform. For now, the system remains dysfunctional, at best. Past attempts to fix the corporate insurance system have failed. A single payer plan may not be politically viable in the United States for a number of years, but it remains the best alternative. This is not socialized medicine, but rather socialized insurance, following the legacy of the two greatest social policies in U.S. history: Social Security and Medicare. Health care reform is a moral and economic necessity for the United States in the 21st century.

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Historical Perspective

CULTURAL AND MEDICAL INTERPLAY IN SHAPING CONTEMPORARY VIEWS ON CIRCUMCISION

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Western civilization has come to deem male circumcision an acceptable, normal medical practice and female circumcision as a violation of human rights. The religious roots of the former can be shown to have had a significant impact on the acceptance of male circumcision in society prior to comprehensive scientific studies favoring the practice, while the absence of female circumcision within religious works and its negative connotations within later medical studies have caused the practice to be largely avoided. This essay seeks to explore the underlying culture, religious, and medical factors that have led to the growth of male circumcision and the modern characterization of female circumcision.

In Western society, Judeo-Christian religious notions remain dominant and influential forces. From these stem many seemingly irrational social and individual practices that go unquestioned in a post-Enlightenment world. One may argue that these practices continue to hold sway even in the domain of contemporary medicine, the model bastion of science and reason. One such practice with deep religious roots is circumcision. Male circumcision continues to be practiced in Western nations, while female circumcision (or female genital mutilation [FGM] as it is known in the Western world) has largely disappeared worldwide except within certain nations and amongst particular religious sects. Male circumcision has long been regarded as a normal, even necessary practice to preserve hygiene, morality and health, while female circumcision has acquired the reputation of being a violation of female sexuality and an infringement on a woman's rights. Both types of circumcision involve the removal of healthy tissue from the genitalia of individuals who are often too young to give informed consent and, yet, in most of the Western world, male circumcision came to be seen as potentially beneficial, while female circumcision was denoted as categorically, unquestionably barbarian and criminal.

How did the two procedures develop such subjective judgments, even before medical evidence noting beneficial aspects of male circumcision existed? This question can only be answered by tracing the past of each practice, which reveals that both long-standing and transitive cultural values have shaped male circumcision into a positive promise of wellbeing, while a different and sometimes overlapping set of values has caused female circumcision to become regarded as an expression of backwardness and human injury. As this paper aims to illustrate, it is possible that largely due to this cultural and religious background, and significantly less so due to medical reasons, that male circumcision came into widespread acceptance, while the lack of such supporting factor for female circumcision led to the rejection of the practice in the United States. Ultimately, however, it is important to realize that the cases for or against either practice were historically built on subjective grounds and have been far more influenced by the interplay of cultural norms and religion with medicine than is generally acknowledged.

Historically, the first mention of either type of circumcision occurs in ancient Egypt, as a practice performed by high-ranking religious figures and royal family members (Knight 332). According to the Greek geographer Strabo, circumcision of both sexes was regularly performed on Egyptian adolescents of marriageable age. It has been posited that these procedures were originally practiced for religious and ritualistic reasons in ancient Egypt. Evidence that circumcision was a ritual practice may echo in the ongoing uses of circumcision in Egypt today, with that of the male's being publicly and widely celebrated, while that of the female's (when it was still legal) being quiet and confined entirely to the female domain, with no male participation allowed (Knight 332). Writers such as Herodotus, Aetios, Galen and the Jewish philosopher Philo Judaeus later explained male circumcision as a way to maintain hygiene and physical flawlessness, to allow for the removal of "the seal on the physical generative organ, permitting reproduction to take place (Knight 336)." In the female, circumcision was seen as necessary to remove an overly large and therefore deformed clitoris, which was also seen as a source of bodily irritation and inappropriate sexual desire due to constant chafing from clothing. Centuries later, Ambrose, bishop of Milan, suggested a moral cause, in that adolescents would "begin to experience sexual desire (Knight 333)," around the age of the circumcision. Here, the interaction between ancient custom and contemporary medico-scientific thought

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can clearly be seen, as an ancient practice was given new meaning by foreign observers and, furthermore, a mixing of different theoretical views occurred. Historian Mary Knight posts,

"New reasons mixed with old ones to favor continuation of a practice whose original motivation most likely had long been forgotten. Medical, clinical and curative motivations probably mixed with ritual, social and moral reasons to favor the continuation and spread of a practice that initially may have been narrowly performed. (Knight 334)"

It is precisely this type of ideological development that can be used to explain the eventual judgments passed on male and female circumcision in the Western world.

Thus, in order to fully understand the contextual background for circumcision, one must seek the original source for the practice, the Old Testament. In Genesis 17, Abraham is commanded by God to circumcise himself and all the male members of his household in order to display the sign of the covenant between God and the Israelites. The religious nature of the procedure is then passed down through the generations, with all males being circumcised at birth, until the advent of Christianity, when circumcision is no longer explicitly required. Thereafter, circumcision is held to be a quintessential symbol of religious belief, through which a man's trust in his God, as theorized by St. Augustine of Milan, "faith that enables humanity to be purified of sin (Cohen 84)," can be bodily expressed at all times. Other causes were gradually ascribed to circumcision by other philosophers, including Philo and Maimonides, who both viewed the procedure as a way to reduce sexual lust and improve man both morally and bodily. As for why females were not required to participate in circumcision, answers range from the comparative lack of importance of females in ancient Jewish society, to the higher natural spiritual plane of the female relative to the male, or to the ability of females to fulfill covenantal responsibilities unavailable to the male, e.g. "to bring a sacrifice to the temple after childbirth (Cohen 190)." Thus, the foundation for normalization of male circumcision is well laid-out, while females are never required to undergo the procedure. The abnormality of female circumcision was already in the process of being established by the time of Philo, who made certain to note that "Jews circumcise[d] only the males, while the [foreign] Egyptians circumcise[d] both males and females (Cohen 63)."

Male circumcision as solely a Jewish religious ritual continued until the 18th century, when the Western world underwent a significant paradigm shift. Mysticism and myth were set aside for rational thought, and science and logic became the new, enlightened principles by which the world was evaluated. The subsequent Victorian era encouraged propriety, hierarchy and social awareness of cleanliness and personal hygiene; from this period stemmed the famous John Wesley quote: "cleanliness is next to godliness," which came to be interpreted in America to mean that "dirt was… a moral, and thus a social, hazard whose dangers people would strive assiduously to avoid (Gollaher 12)," for fear of being seen as of a lower social standing.

It was in this era that Dr. Lewis A. Sayre, a prominent New York physician who would later become the president of the American Medical Association, came to the conclusion that circumcision was a panacea for all medical ills. On February 9, 1870, Sayre was introduced to a male toddler with lower limb paralysis, and the toddler's nurse told Sayre that the child was suffering from a "very sore" penis, which seemed to be constricted in its foreskin and suffered from painful erection resulting from any touch of clothing (Gollaher 6). Upon this revelation, Sayre determined that the child was suffering from "excessive venery… a fruitful source of physical prostration and nervous exhaustion, sometimes producing paralysis (Gollaher 6)," and proceeded to circumcise the toddler, who soon regained his ability to walk. Stunned by the success of this operation, Sayre began to test circumcision as a cure for his male patients, beginning with sufferers of paralysis and continuing to perform the procedure on those with epilepsy, hernia and even mental illness (Gollaher 8, Sayre was ultimately unsuccessful in his attempts to cure any of his patients from the Manhattan State Hospital's Idiot Asylum).

Sayre's preexisting credentials and prestige paved the way for his work to be considered academically rigorous. By the turn of the century, his theory of the foreskin causing "pathological agitation of tissues (Gollaher 8)" had become well-accepted and applied in the United States, with Sayre having trained doctors "to look for genital irritation or phimosis when they were confronted by confusing, seemingly unrelated, symptoms (Gollaher 9)." In a significant number of recorded cases, genital surgery was seen as an effective treatment for penile cancer, venereal disease and, perhaps most importantly, masturbation. Very quickly, male circumcision became the standard cure for anything that might be caused by "irritation" or "adherent prepuce;" soon enough, doctors began to recommend that circumcision be performed as a preventative measure on newborn infants, who suffered from diarrheal diseases that seemingly could be cured "by eliminating a source of irritation on the nervous system – the foreskin – [thus] improving [their] chances for survival (Gollaher 19)." The

practice of circumcising neonates became common procedure, and is in modern times the most commonly performed surgery in the United States (Gollaher 5).

Even though medical history offers a perspective on circumcision, it is also illuminating to trace the cultural influences of the transition of circumcision from cultural-religious to a medical practice. Although Sayre's irritation theory may seem to have stemmed from a new scientific understanding of biology, it is important to note that the Victorian era was also a period of extreme apprehension regarding sex and sexuality. Masturbation was vilified and blamed for diseases ranging from insanity to asthma in important literary texts such as the *Onania* and Tissot's *L'Onanisme*. Pressure to reduce the likelihood of this dangerous practice made it socially and medically acceptable to establish that "circumcision helped cured the tendency to masturbate (Bell 131)." Sayre's own comments about his first case of therapeutic circumcision were based on an assumption of "excessive venery" due to a swollen penis, illustrating prevailing social concepts of disease. Furthermore, the recorded description of this circumcision mentions that Sayre finished the operation by "seizing the thickened mucous membrane [foreskin] with the thumbs and fingernails (Gollaher 6)" to tear it off, a procedure similar to periah, a ritual portion of Jewish circumcision (Darby 307). Although this may have been purely coincidental, it must be acknowledged that the medical community looked to religion in the following decades for justification of circumcision. One academic at the time linked circumcision to good samaritanism, saying that "if circumcision was more generally practiced… I believe we would hear far less of the pollutions and indiscretions of youth (Gollaher 10)," and various other prominent doctors and surgeons provided similar opinions as to the excellent example that Moses set in the practice. When a study of American Jews was published in 1890, showing that they were healthier than the rest of the American population, "a number of physicians theorized that [this] reflected the benefits of circumcision (Gollaher 15)." Along more secular lines of thought, the Victorian world saw the advent of germ theory, and the human body was seen as "a conveyance for all manner of dangerous microbes (Gollaher 13)." Thus, "genital organs were closely identified with 'dirty' waster products of the body… from this premise it followed that circumcision should be considered preventative medicine and practiced universally as a matter of public health (Gollaher 13)." These social and religious pressures on the medical community regarding moral preservation, public health and individual wellbeing allowed for the social normalization of male circumcision as standard practice.

Soon the medical world began to pass its own value judgments on circumcision. As early as the 1890s, physicians condemned circumcision in its religious form as "primitive, unsanitary and potentially dangerous (Gollaher 16)." The goal became to hospitalize all cases of circumcision so that it could be performed "only by medical men and in a surgical manner (Gollaher 16)," ensuring the relative security of the procedure and patient. Cleaner and safer surgical environments, as well as the widespread use of anesthesia, further fostered the shift into the hospital (Gollaher 17). Now physicians could justifiably make the case that only in hospitals, under the care of trained physicians, with the appropriate facilities, was any procedure relatively safer – circumcision included. Thus, while religion and culture shaped the beginnings of circumcision as a medical practice, the medical realm soon internalized the procedure and transformed it into a mark of the elite: only those who could afford hospital care could be circumcised safely. In short, male circumcision became "a symbol of the rising authority of the medical profession over the laity (Gollaher 23);" and it was this "social significance… which allowed circumcision to flourish long after the sanitary movement had lost its way (Gollaher 23)."

While these beginnings of male circumcision led to its widespread acceptance as a commonplace practice, female circumcision shared a different fate. It came to be seen by the World Health Organization (WHO) as an operation that "destroy[s] female sexuality (Bell 130)" and is "fundamentally more damaging to health (Bell 130)." Modern female circumcision stems from the Victoria era as well, where it was promoted to help "shield children from the dangers of masturbation (Bell 132)" in much the same way as male circumcision was. Yet, although the procedure was therapeutically prescribed in the United States into the 1960's, it never achieved the same level of popularity or acceptance as male circumcision did. Certainly, Sayre and his colleagues were not afraid to utilize the female version of the surgery as simply another form of "cutting the body to cure the mind (Gollaher 9)," and that "in an age prone to denigrate female sexuality, they found women more pliable when it came to the dictates of medical authority (Gollaher 9)." Yet, why then did female circumcision suffer decline and backlash, while the male version became a normalized positive? The answer lies in the "traditional constructions of male bodies as resistant to harm… and female bodies as highly vulnerable and thus in need of greater protection (Darby 304)." As the Enlightenment progressed, a new model of human design came to the forefront that depicted the female not as

an inverted version of the male body, but rather as something completely separate, of "a different order altogether (Bell 133)." When Theodor Bischoff showed in 1843 that female sexual pleasure is not correlated to reproductive capacity, he opened the door to a new interpretation of female sexuality: the clitoris, far from serving as a simple organ of reproduction, had its own purpose and served to provide pleasure to the female. In fact, many Victorian obstetricians lamented that so few of their patients seemed to understand the potential of the organ and "considered it part of their duty to enlighten women as to its importance (Darby 312)." In the Freudian period, the clitoris even became a pseudo-medical cure for hysterical women, with doctors performing "clitoral massages (Bell 133)" as a form of desexualized medical treatment. Thus, the clitoris gained an overall increase in appreciation through the Victorian period and onward, while the foreskin had become "reconfigured… as a source of moral and physical decay (Darby 312)" by the same medical practitioners. In 1890, a British proponent of female circumcision was forced to admit that it "had been found 'ineffectual and unsatisfactory' (Darby 312)." Medical physicians attempted to establish female circumcision as a panacea similar to male circumcision, but were unable to succeed in the face of changing attitudes toward the female body. Far from desiring to eliminate the clitoris, doctors incorporated its stimulation into their medical regimen. In modern society the clitoris has only gained in its social significance as it has become regarded as an essential part of the complicated and mystifying essence of female sexuality, which is sharply contrasted to the straightforward, urgent, evolutionarily-driven sex desires of males. Some have come to accept the theory that "genital surgery is far less likely to impair a man's sexuality… a women's sexual instincts, being fundamentally more delicate, will be crippled by any form of genital surgery (Bell 136)."

The histories of the two types of circumcision are clearly wrought with different tensions between societal and medical interests and, in many cases, seem to have collided in the past to produce new interpretations of male and female sexuality. Male circumcision has been subject to considerable attention as a valid medical practice, with claims of its effectiveness in reducing rates of venereal disease transmission, penile cancer and partners' ovarian cancer, urinary tract infection and, currently HIV/AIDS transmission. However, many of these assertions were only recently validated and the statements instead historically came "to acquire an aura of dependability through repeated and uncritical citations (Bell 129)." Even by World War II, although "no scientific research validated the theory that circumcision inhibited the spread of venereal disease (Gollaher 25)," physicians continued to promote the view that it did. As David Gollaher writes, "given how few weapons physicians possessed to fight venereal diseases, their hopes that circumcision might provide prophylaxis are understandable (Gollaher 15)," illustrating that the Victorian doctors took to the practice more out of desperation than faith in its ability to cure. In recent decades male circumcision has fallen out of favor with the American Medical Association as a therapeutic practice, and the organization has stated that "there are no medical grounds for routine infant circumcision (Gollaher 26)." Yet the declamation of the practice by socially creditable organizations has been limited and quiet, possibly because circumcision is now so deeply entrenched within American culture and, in at least one instance, because the American Academy of Pediatrics was "concerned about dissent within its own membership (Gollaher 26)." This illustrates all too clearly the omnipotent role attributed to medical authority by society and the desire by physicians to preserve this authority, even in cases where medical opinions may be irrationally constructed. In a keen analysis of the culture-medicine interaction, Gollaher further observes,

> "Most doctors discover that pressure to conform to what is considered standard within the local medical community is irresistible. In turn, these practice standards, imbued as they are with medical authority, shape patients' preferences. For patients normally presume that what doctors accept as medicalpolicy is also the best thing to do (Gollaher 24)."

The social pressures of conformity and the cultural acknowledgment of medicine as an all-powerful authority have contributed substantially to the institution of male circumcision as a routine practice.

Proponents of male circumcision are led by centuries of acceptance of the practice, evidencing the incredible force of interpretive power on any ostensibly "scientific" situation. At the same time opponents of female circumcision are often guilty of holding too narrow a mindset. While organizations such as WHO struggle to provide evidence that the practice causes permanent mental and bodily damage, there is doubt as to the ultimate reliability of the data that they have collected: "the current state of the evidence does not allow hasty pronouncements about all the harmful effects attributed (Obermeyer 408)." Further, women from a variety of backgrounds in which female circumcision is routinely practiced have accused American standpoints of emphasizing the clitoris far too much, claiming that their pleasure has not been substantially decreased by the procedure (Darby 310). The west-

ern cultural background from which female circumcision is viewed does not contain any historical, religious or traditional reason for the practice and, therefore, "it was always easier to win acceptance for [male genital alternation as opposed to female genital alteration], because it was mentioned in the Old Testament (Darby 312)." This fact restricts modern healthcare workers and prevents a truly objective study of either type of circumcision. Indeed, Western health associations have often been accused by the countries they wish to "modernize" of perpetuating an unforgivable double standard, of circumcising their own male children but refusing to allow African nations to do the same to their female children (Darby 313). This refusal of the Western world to acknowledge its own cultural bias "actually makes the task of eradication female genital alternation more difficult (Darby 313)."

Today, male circumcision is unfailingly promoted as a positive, routine, and simple medical procedure that can be performed with little risk and great potential benefit, while female circumcision is unfailingly decried as offensive to the idea of human rights. Both procedures stem from a rich history dependent on the interplay of religion, cultural values and medical attempts to internalize such values. The example of male circumcision illustrates that the standards of any historical period can be conflated with the scientific theories of the time to create an inflated subculture of "medical authority" that provides enough impetus to continue a tradition with no proven medical value, while the story of female circumcision illustrates the power of medical authority to shape cultural values with regard to sexual and overall wellbeing. The theological and cultural history of male circumcision has contributed greatly to the practice's current wide acceptance. Religious references abound in the ostensibly purely medical usage of male circumcision, echoing centuries of cultural normalization, despite evidence as to the procedures medical propensity to heal or cure any disease being lacking until recently. On the other side of the issue, female circumcision, on the merit of not having the same religious background and reference, has been deemed unusual and abnormal. Both forms of circumcision promote strong opinions, from ethical, medical, and cultural viewpoints. The western perspective promotes one form and discourages the other, while other cultures may have disparate views on the issue. In order to understand both our own Western perceptions and those of other cultures regarding the two forms of circumcision it is critical to recognize the long standing cultural, religious, and medical background underlying both procedures.

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Editors Note: This paper contains parenthetical citations. Please refer to the titles below.

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Featured Article

PROPOSITION 71: HOW THE DEBATE IN CALIFORNIA OPENED UP A WIDER RANGE OF DISCUSSION ON THE FUTURE OF STEM CELL RESEARCH IN AMERICA

*Michael Schecht**

Proposition 71, an initiative that was passed by California voters in 2004, created a system of funding for stem cell research in the state of California. During that time, the use of federal money to fund such research was banned by executive order of former President George W. Bush. Proposition 71 created the California Institute of Regenerative Medicine (CIRM) to distribute funds to research institutions in California. To oversee this distribution, the Independent Citizens Oversight Committee (ICOC) was created. This paper examines the issues surrounding Prop 71 before its passage. Counter to the image largerly presented by the media, the opponents of Prop 71 were not solely religious conservatives. Many opponents focused on the large amounts of money involved and questioned the potential effectiveness of the ICOC. Additionally, there were concerns that supporters of Prop 71 exaggerated the benefits of stem cell research to the state of California. With the election of Barack Obama however, many foresee a change in the federal government's attitude towards stem cell research. A lifting of the previous ban on federal funding will provide a further argument against the infrastructure created by Prop 71. Many now question the need for the California program and want to do away with it unless major reforms are enacted.

When people think of stem cells, they typically think of the debate between science and religion. On the one hand there are the supporters of stem cell research, who say it could cure many terrible diseases. On the other there is the opposition, who claim that stem cell research requires the indiscriminate taking of human life and is immoral. This classical debate was turned on its head in 2004: in November of that year, California voters took to the polls to decide whether to create a statewide program to fund stem cell research. The campaign leading up to that decision encompassed a range of arguments, both for and against. I shall examine how the issues surrounding the status of stem cell research in the US were played out in this experiment in California, and how they reflected at that time on stem cell research at a national level. Additionally, I shall look at the current state of California's program, now four years after its inception, as well as its future under the new president.

Stem cells are a class of unspecialized cells in the human body that have the ability, in varying degrees, to develop into diverse types of tissues. There are two main classes of stem cells: embryonic stem cells and adult stem cells. Embryonic stem cells arise from the very earliest stage of the human embryo and are prized in research because they are pluripotent, meaning they can develop into almost any type of cell in the human body. Adult stem cells are cells that have reached later stages of development, and can be obtained from fetuses through adults. Unlike embryonic stem cells, adult stem cells are only multipotent, meaning the tissue types they can differentiate into are limited. For example, hematopoietic adult stem cells can only develop into different blood tissues.[1]

The controversy over stem cell research surrounds the use of embryonic stem cells. Embryonic stem cells are typically obtained through two methods. The first method is in vitro fertilization (IFV). IFV is the fertilization of an egg with a sperm in a laboratory setting and is an infertility treatment. The process, however, usually creates more embryos than needed, and these are sometimes donated to research. The second method is somatic cell nuclear transfer (SCNT), wherein a somatic cell nucleus is implanted in an enucleated egg and allowed to develop. In both cases the embryo must be destroyed to harvest the stem cells. Individuals who believe that all stages of human development constitute a life view this as a serious problem. Additionally, SCNT is -in the technical sense- a cloning technique, and brings with it the controversial prospect of human cloning.[1]

In 2001, President Bush banned the future use of federal funds for stem cell research. Federal funds would only be available for research on stem cell lines (cells grown in culture and sustained in laboratory conditions) existing as of August 9th, 2001. Although research was not banned outright, several limitations were inherent within the policy. Researchers complained that the number of stem cell lines was insufficient, some contaminated, and that for successful research, new lines were needed to provide more genetic variation.[2]

The California program was thus a response to the freeze on federal research funding. The program was put forward via the 2004 ballot initiative, Proposition 71

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(Prop 71), which set aside $3 billion dollars in state funds over ten years for stem cell research in California (With interest, the total estimated cost to the state was $6 billion). Additionally, Prop 71 created the California Institute of Regenerative Medicine (CIRM) to handle the distribution of these funds to research institutions in California.[3] To govern the institute, the Independent Citizens Oversight committee (ICOC) was established. The ICOC was a 29-member committee consisting of "patient advocates, research institutes, and the business and general community of California."[4] Additionally, and possibly most contentiously, Prop 71 amended the state constitution of California to make stem cell research a protected right.[3]

Supporters of Prop 71 encompassed an array of scientists, academics, and social liberals. The most frequently used argument in favor of the proposition was the potential of the research to cure multiple diseases. An oft-quoted figure by proponents was that 70 diseases had the potential to be cured by stem cell research in the future. This number was most strongly endorsed by "strategic participants, including many of its political and institutional supporters, patients and their families/friends, and patient advocacy groups."[5] Although outlining some of the most widespread arguments surrounding Prop 71, the summary offered by the attorney general to voters did not cite the 70 diseases figure, it mentions the potential to cure "cancer, heart disease, diabetes, Alzheimer's, Parkinson's, HIV/ AIDS, multiple sclerosis, lung diseases, and spinal injuries."[3]

A smaller scientific community sought to downplay the exaggerated claims of some supporters. However, it was not until after passage of Prop 71 that these voices were able to come to the forefront, as Lysaght et. al note:

"More cautious voices emerged in the discourse following the passage of Proposition 71 which expressed reservations about raising public expectations about short-term therapeutic outcomes and warned against 'overselling' the science... Dr. Stuart Newman, from the New York Medical College, stated that 'from the way that the campaign was conducted...[it is clear that] the people who were funding the ballot initiative often didn't have scruples in how... they were portraying the promise of the technology.' "[6]

Thus, from a scientific standpoint, California voters were lead to believe that Prop 71 would open the gateway to cures for many debilitating diseases diseases. Experts in the field, however, note that we are not close yet to being able to apply stem cell therapies to humans without many additional years of research.[6] The curative potential of stem cells was clearly overstated by Prop 71 supporters. Considering the controversy surrounding both stem cells and Prop 71, it is unsurprising that supporters would resort to exaggerated claims. Yet, it is detrimental or both society at large and the scientific community for these exaggerated claims to be disseminated. If the public does not see the results it was promised, the resulting backlash against stem cell research would limit future funding opportunities.

Supporters of Prop 71 also claimed it would benefit California economically. This line of argument was also marked by hyperbole,

"It was argued, particularly by proponents of the proposition...that the initiative would yield substantial economic benefits to the state of California, both in terms of direct taxation revenues and royalty income and directly 'building an enormous industry in California, creating countless new jobs and driving our economic engine.' " [6]

Supporters cited, "5,000 to 22,000 new jobs in California per year...spending would generate $240 million in income and sales tax revenue...$537 million to $1.1 billion from patents and royalties...reduced health care costs of $3.4 billion to $6.9 billion annually."[7] The health care savings were especially touted by supporters as being one of the greatest economic benefits of Prop 71. What should be apparent to the discerning observer, however, is that many of these economic benefits depend on assumptions that the program would produce new therapies both successfully and in a timely manner. Yet, as mentioned above, many of the therapeutic benefits of stem cells will not be realized for some time.

Thus, Prop 71 was sold to California voters as a being scientifically, medically, and economically beneficial. The opponents of Prop 71 were aware of this, and it is clear that they were not just from the religious right. They encompassed a broad range of people, including some groups who stem cell supporters may have believed to be their allies.

Religious and social conservatives still made up the core of the Prop 71 opposition. This group believes that destruction of a human embryo is the taking of a human life. Carol Hogan, of the California Catholic Conference in Sacramento was quoted saying that: "you can't take a stem cell out of an embryo without killing, and the embryo is the earliest form of human life."[6]

Although there is a scientific component in the "humanity" of an embryo debate, this argument divides mainly along ingrained religious beliefs. What are more important to the discussion of Prop 71 and to the future of stem cell research in this country are the other arguments of the opposition movement. First, there was the economic opposition. The costs of funding stem cell research had been little debated in the public arena. However, with a cost of $6 billion to the taxpayers, Prop 71 brought the economic component to the forefront. Much of the debate

surrounded the idea that public money was benefiting private companies at almost no cost, without assurance that taxpayers would see viable returns on their investments.[6] This concern grew out of the fact that the only program designed to govern the outlaying of the $3 billion in grants was the ICOC. There was the worry that the ICOC was not as independent as it was claimed to be, with business executives, university researchers, and disease group advocates making up much of its roster.[8] While it may be cynical to say that all the members of the committee would be self-serving, it is clear that there were conflicts of interest. Vested interests pose serious ethical concerns, especially when the individuals involved (i.e. scientists and industry executives) stand to benefit from the proposed spending. In California and across the nation, balancing interests of experts, private investors, and impartial parties, will be key in creating a successful stem cell research program.

Yet another line of argument was the ethics surrounding egg donation, since, as noted above, SCNT requires eggs. A group known as the Pro-Choice Alliance Against Prop 71 spearheaded this issue. The group, "includes university professors, women's health activists and feminists and is backed by the California Nurses Association in Oakland, the National Women's Health Network in Washington D.C and Our Bodies Ourselves, the Boston-based women's health advocacy group that produces the popular health-book series."[9] While the group supports stem cell research itself, it did not support Prop 71 because of fears about the exploitation of egg donors,

"Opponents of Prop 71 say the ethical guidelines are hazy. For instance, California law currently calls for 'reasonable' reimbursement of expenses to egg donors while Prop 71 calls for 'permitting reimbursement of expenses.' Beeson [a medical sociologist at California State University at Hayward and Prop 71 opponent] says it is critical to retain the terminology 'reasonable' so women aren't driven by large cash payments to give up their eggs, or otherwise be exploited."[9]

The concerns about exploitation may be overstated, but it remains a point of contention for some. Nationally, there is currently much debate about egg donation. In 2005, the National Academy of Sciences issued a new set of ethical guidelines, one of which limited compensation of egg donors to just the costs of the harvesting procedure. But many now question why there is not greater compensation for egg donation, since donation of other tissue, such as corneas, is compensated.[10] Egg harvesting is a particularly invasive and stressful procedure for donors. However, raising compensation also creates concerns about the selling of organs for profit. The potential compensation can be quite substantial, and may be an inducement to impoverished women, who would be risking their health so that they may provide for themselves. With the imminent release of federal funds for stem cell research, egg donation may become a much more publicized issue and the issue of compensation will become more contentious.

Despite the opposition, voters passed Proposition 71 in November 2004. A little over a year after the passage, in January 2006, the Center for Genetics and Society issued a "progress report" on the California stem cell program. Among the numerous criticisms levied on the program, one was that conflicts of interest within the ICOC remained: "The relationship between the ICOC and the institutions it funds can be seen in the first round of training grants announced on September 9, 2005. Of the 16 institutions that were awarded almost $40 million, 14 are represented on the ICOC. Viewed another way, all but two of the 17 ICOC members affiliated with an institution eligible for this round of funding saw their institutions receive grants."[11] Additionally, there was concern on the return on investment for California voters,

"...some ICOC members have argued against policies that would provide a share of revenues to the state...In its deliberations to date on the kind of IP [intellectual property] agreements it will adopt, the leadership of the CIRM has consulted only a narrow range of stakeholders...Experts in public health, consumer and public interest groups, and critics of current policies have not been invited into the discussion in any meaningful way."[11]

It may seem unfair, however, to criticize the program after only one year. But four years have since passed, and new assessments of Prop 71 are emerging. As recently as November 2008, Jesse Reynolds, Director of the Project on Biotechnology in the Public Interest at the Center for Genetics and Society, gave testimony before the Little Hoover Commission on California State Government, a commission which evaluates the effectiveness of California's governmental programs. Among his concerns were that the ICOC was still rife with conflicts of interest. Additionally, CIRM was still funded by essentially unquestioned handouts of money from the government. Furthermore, the language on financial returns to the state of California via intellectual property rights remained vague.[12]

To its credit, CIRM has issued several reports assessing its own activities, including annual reports for 2006 and 2007. However, in September 2008, CIRM also issued a report assessing its economic impact, both current and future. Despite some lawsuits early on, which prevented CIRM from using federal monies in its grants, they claim to have now issued "over $614 million to 27 institutions."[13] In its report, CIRM concedes that many of its potential benefits will not be realized for some time, including tax and intellectual property revenue. There have been some concrete developments as well. A good ex-

ample is University of California, Davis, where, "the Stem Cell Program... has developed significantly, receiving over $100 million in grant approvals...allowing the program to develop new NIH free facilities, explore novel cell lines, and conduct high risk/ high impact studies and train new scientists."[13] Additionally, "faculty have expanded from 35 to over 100."[13]

Thus, after four years, the program's results have been mixed. Research infrastructure in California has clearly benefited, as can be seen by the developments at UC Davis. However, flaws in CIRM's infrastructure and oversight still exist. California must find a way to restructure the program, such as by addressing the conflict of interest issues at the IOC. Additionally, financial returns on the program continue to be slow in coming, as was expected. The program clearly requires more time, but it does not appear that the costs of the program, as it is currently structured, will be outweighed by the far off benefits.

A new challenge in the future of Prop 71, however, is that the new administration under Barack Obama may change the relationship between the federal government and stem cell research. "[Obama] has pledged to lift the Bush administration's restrictions on federal funding for stem cell research that uses embryos created but not used for reproductive purposes, and aides have suggested that he'll do this by executive order immediately after taking office."[14]

What does this mean for the California program? It is mostly speculation now, but many are pessimistic. The San Fransisco Chronicle notes that, "Now that a federal policy shift seems imminent, however, watchdog groups are questioning whether California taxpayers should be laying out millions of dollars for stem cell research every year while the state's budget deficit ... is forcing painful spending cutbacks." The financial crisis may further prevent the allocation of federal funding towards stem cell researchers even if the current federal policy is changed.[15] Thus, the California program's future is uncertain, but not doomed. It will depend on the state of the nation's economy, the state of California's budget, and whether or not the numerous flaws in the program's structure are ever addressed. Nonetheless, when federal money is opened up to stem cell research, the program will be forced to present tangible results to merit continuation.

The most important lesson to be learned from Prop 71 is that the stem cell debate can potentially encompass more than just scientists versus the religious right. The Prop 71 debate showed that there are also other substantive ethical and economic issues to be addressed when dealing with the financing of stem cell research, whether on a state or federal level. Unfortunately these issues are usually under-publicized. The California experience may offer important insights into how issues of scientific progress, finances, and ethics may play out on a national scale as President Obama brings the issue of stem cells back into the spotlight.

Editors Update: On March 9, 2009 President Obama signed an Executive Order lifting the ban of federal funding for human embryonic stem cell line research. See the news brief in this issue for more information.

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Featured Article

TESTING DRUGS ON CHILDREN: THE PHARMALOGICAL AND ETHICAL RATIONALES FOR PROVIDING A BETTER STANDARD OF CARE TO PEDIATRIC PATIENTS

*Lauren Gluck**

Children have been dubbed "therapeutic orphans" due to limited labeling of drugs with pediatric uses. The FDA has made strides to combat this with the Best Pharmaceuticals for Children Act of 2002 and the Pediatric Research Equity Act of 2003, which provide incentives and mandates, respectively, for conducting pediatric drug trials. Such studies are necessary for determining appropriate pediatric dosages; the physiological and pharmacological differences between adults and children render it dangerous to estimate doses based on size alone, though this is common practice. The greatest differences exist between adults and newborns/infants, thus more studies must target the latter group. Opposition to pediatric testing can be resolved by applying the Pediatric Pharmaceutical Research Unit model to increase patient recruitment and to utilize more child-friendly techniques, by understanding the financial advantages of pediatric trial, and by ensuring that patients are exposed to minimal risk of physical and psychological harm. Overall, pediatric studies are key in increasing the knowledge regarding pediatric drugs and improving the pediatric standard of care.

Introduction

Reacting to the thalidomide tragedy of the late 1950s, the United States Congress passed the Drug Amendments of 1962. These laws required a drug's safety and effectiveness to be established before marketing,[1] in effect mandating clinical trials for all drugs sold in the United States. While this legislation was a milestone in medical history, physician Harry Shirkey found the lack of attention given to pediatric drugs unacceptable.[2, 3] Pediatric testing, unlike adult testing, was not explicitly mandated, and pediatric disclaimers could be added to drug labels in order to circumvent the new legislation. Shirkey called this disclaimer labeling "orphaning," and in turn called children "therapeutic orphans."[2, 3] He believed that the medical field had shirked its responsibility to provide safe and effective treatments for pediatric patients. Significant change would not come for nearly 30 years, with new Food and Drug Administration (FDA) regulations in 1994.

Due to new legislation and increased authority of the FDA over the last decade, hundreds of drugs have been assessed for pediatric use.[4] Doctors can now prescribe many more drugs to children, from antimicrobials to antipsychotics,[4] based on clinical pediatric data and not trial and error guesswork. Pediatric drug trials have paved the way for safer, more effective pediatric medicine. The FDA has made significant progress in getting the medical industry to recognize its accountability to children, but all parties are a long way off from relieving children of the designation as therapeutic orphans. For instance, only five of the 80 most commonly prescribed drugs to newborns and infants are labeled for pediatric use.[5] To achieve drug standard parity with adult dosages, pediatric trials must continue and expand for pharmaceutical products.

In this paper, I will explore the issues of pediatric drug testing. First, I will present a brief history of the legislation regarding pediatric testing and discuss how recent laws have increased testing due to incentive programs and mandates. Second, I will examine the rationale for continued testing, which is that the physiological and pharmacokinetic differences between children and adults make it dangerous to prescribe children drugs that are not listed for pediatric use and to extrapolate data regarding pediatric drug dosages from adult drug trials. In particular, I will emphasize the importance of testing on very young children, including newborns and infants, who stand to gain the most from age-specific data since their physiology is most different from adults. Finally, I will evaluate the arguments against pediatric testing and establish the critical need for testing.

History of Pediatric Drug Testing

The FDA first targeted pediatric drug testing in 1994 with regulations that "encouraged" drug companies to conduct pediatric studies of new drugs that seemed to have pediatric applications.[6,7] Since the passage of the 1962 Drug Amendments many drugs commonly prescribed to children had never been tested on children in a clinical setting. Even morphine, "which is a standard, necessary pain medication," was given to children despite the fact that its safety and effectiveness was not established.[7] Because of this, doctors have been forced to "blindly grope" for appro-

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priate pediatric drug dosages, notes Dr. Gloria Troendle, a medical reviewer from the FDA.[8] Dr. Paula Botstein, deputy director of the FDA's Office of Drug Evaluation, when the 1994 regulation began, explained:

"Pediatrics textbooks usually give drug dosages, but the source and reliability of the information are seldom specified. Mostly, pediatric doses of drugs that have not been formally studied in children are simply established by experience. Some drugs are used all the time in children. Anesthesia drugs would be a good example. They may not be labeled or approved specifically for children, but children routinely need major surgery. So physicians build up the experience in using the drugs. It's not the ideal way."[7]

Botstein responded to the question of why pediatric regulation had taken so long in a 1995 interview, saying that the new regulation was due to "pediatricians infiltrating the FDA."[7] Pediatricians' increased influence on the FDA, whether by employment or lobbying, forced the administration to pay attention to the overlooked needs of children.

While there was an increase in the number of studies in the years following this initial regulation,[7] the FDA developed real authority in moving drug companies away from disclaimer labeling through the enactment of the FDA Modernization and Accountability (FDAMA) Act in 1997.[9] A particularly critical piece of the legislation was the Better Pharmaceuticals for Children Act (BPCA), a section of FDAMA that created a voluntary incentive-based program for drug companies.[10] In exchange for conducting pediatric studies on new and already marketed drugs, drug companies would receive a six-month extension on patent and marketing exclusivity for their drug.[11]

Where the FDA's carrot is market exclusivity, its stick is the Pediatric Rule. The 1998 Pediatric Rule required not-yet-approved drugs as well as already marketed drugs to be studied in pediatric patients. However, in 2000 the Association of Physicians and Surgeons sued the FDA arguing that the Pediatric Rule exceeded the FDA's statutory authority. The rule was suspended, but, following the enactment of the BPCA as an independent piece of legislation in 2002, Congress decided to continue to enforce the rule.[6] The Pediatric Research Equity Act (PREA) of 2003 codified the Pediatric Rule, and both BPCA and PREA were reauthorized in 2007 under the Food and Drug Administration Amendments Act (FDAAA).[9]

The pairing of the FDA's exclusivity incentive and the "pediatric rule" has had marked success in getting drug companies to conduct pediatric drug studies, which provide invaluable information to guide doctors in prescribing appropriate doses of prescription and over the counter drugs (i.e. ibuprofen) for children. The pediatric-related legislation encouraged drug studies that established the safety and efficacy of ibuprofen as an antipyretic and analgesic for children from six months to two years old,[12] whereas previously information was only available for children over two. It was important to expand the pediatric labeling for ibuprofen because it was routinely used in children under two without appreciating possible side effects.

The laws have met with criticism as well. In 1999, the generic drug industry sued the FDA over its incentive program's patent extension and exclusivity,[13] since the regulations apply not only to the product studied in the pediatric trials, but also to "any of the drug company's formulations, dosage forms, and indications" that contain the same moiety.[4] For example, a 1998 study that showed the efficacy of an injectable form of Zantac to be used on premature newborns granted all Zantac products six more months of market exclusivity. This included over the counter Zantac products that are primarily used by adults.[13] In response, a spokesman for the Elizabeth Glaser Pediatric AIDS Foundation, which strongly supports pediatric testing, said, "We went in knowing we were rewarding the drug companies too richly. But our past history shows that was the only way of motivating them."[13] This broad interpretation of BPCA impacted consumers, with the exclusivity rule preventing low-cost generic drugs from becoming available.[4]

Looking beyond the financial burden of the exclusivity rule, the success of its financial incentives shows that money is an important consideration for whether drug companies will conduct pediatric tests. A pediatric study can cost some one million dollars, but a six-month patent extension can yield an average of $50 million in profit.[13] Dr. Ralph Kauffman, director of medical research at Children's Mercy Hospital in Kansas City, Missouri, said, "Once the economic disincentive [of pediatric testing] was removed, the dam broke completely open."[4] As of 2006, more than 100 drugs had been granted exclusivity. As of 2004, 691 pediatric studies had been proposed to the FDA and 298 approved. Additionally, BPCA provides for government funding of pediatric studies in older drugs that are not eligible for patent extensions.[4]

Pediatric Pharmacokinetics

The generous incentives program demonstrates how strongly the government and the scientific community support pediatric studies. The main impetus for conducting these trials is to improve the standard of care applied to pediatric patients and consequently their well being. Too many drugs prescribed to pediatric patients do not have scientifically established protocols for how the medication should be used in children. These types of drugs are considered off-label, or used for "an indication, age, dose, or route of administration outside the terms of the product

license."[14]

Prescribing off-label drugs is legal and common, but can be very dangerous for children. Generally, when doctors prescribe an off-label medication, they reduce the adult dosage to fit a child's smaller body.[4] However, children are not tiny adults. There are many significant physiological differences in the way children's and adults' bodies process drugs. Pharmacokinetic (PK) dissimilarities exist in how individuals absorb, distribute, metabolize, and excrete drugs. For example, neonates and infants have different body compositions than adults. Neonates/infants are comprised of 70-80% water, compared to 60% in adults, and adults have greater body fat composition. Therefore, the babies require higher doses of hydrophilic drugs and lower doses of lipid-soluble drugs to achieve necessary serum concentrations. Additionally, the blood-brain barrier is not complete at birth, so newborns can have enhanced central nervous system drug effects due to increased permeability of chemicals across this membrane. These are only two of the many considerations, aside from size, that physicians must be wary of when altering dosages of off-label drugs.[15]

The most significant PK differences are observed during the neonatal/infancy stages as compared to adulthood. Physicians must be conscious of the level of organ maturation as well as the slower rates of metabolic processes. This latter consideration affects the half-life of a drug, since it stays in the body for a longer period of time. Therefore, a baby needs a lower dose of a drug over a longer interval than its body size might suggest, in order to prevent toxicity.[16] While variability for drug half-life does exist between individuals at the same developmental stage, the range of newborn to adult variability ratios "exceeds the 3.16-fold factor commonly ascribed to inter-individual PK variability."[17] The substantial differences between these age groups highlight the need for more pediatric drug testing, specifically in the youngest of patients. In fact, adverse reactions to drugs untested in children are a major cause of death and injury in children less than two years old,[18] which demonstrates how vital pediatric testing is for this age group. With the development of neonatal intensive-care units and survival of premature babies there is a dire need for safe and effective treatments. One recent success for premature infants involves pulmonary surfactants, which treat respiratory distress syndrome in preemies whose lungs are underdeveloped at birth.[7]

However, it is especially difficult to design studies around infants and newborns. Obstacles include recruiting a sufficient number of babies for the study, adequately measuring pain and quality of life in children so young,[19] and the ethical issues surrounding the inability of children to be informed of their participation in a trial. While researchers must take these issues into consideration, the complexity involved in altering doses for this age group makes clinical trials a necessity in order to reduce the unknown risks of using untested drug therapies.

On the whole, the appreciable differences between pediatric and adult patients' physiology and pharmacokinetics make it inappropriate to extrapolate drug data from adults to children. Requiring doctors to guess about doses, safety, and effectiveness of drugs due to lack of information makes children vulnerable to unknown side effects and adverse drug reactions. While BPCA and PREA have made great strides toward encouraging pediatric studies, 75% of the drugs found in the Physician's Desk Reference and 27% of those in the Harriet Lane Handbook, which is used specifically in pediatric practice and lists older medications, are still not labeled for pediatric use.[15] Increased pediatric labeling would provide evidence of the safety, efficacy, and age-dependent dosing indications in infants, children, and adolescents. It would also help protect physicians from malpractice suits that involve off-label drug use. Furthermore, increased labeling would make the drugs on-label, so insurance companies would potentially cover the cost of many additional medications.[2, 15]

Arguments Against Testing

Despite the advantages offered through increased pediatric studies, many individuals oppose testing drugs on children. The arguments against pediatric testing fall into three main categories: logistical issues, financial issues, and ethical issues.

First, the logistical issues generally relate to methodology and the difficulty of designing and completing clinical trials using children. On a practical level, pediatric studies are prone to recruitment problems.[14,19] In 2002, Patient Quest, an agency that recruits patients for clinical trials, claimed that over half of "[their] studies are in crisis mode due to failed patient recruitment efforts."[20] This problem is due to many factors. First, the pool of potential subjects is inherently small. Most children who participate in trials have the disease in question, and there are relatively few children with any specific disorder. Scientists also need to study different age groups and different formulations of drugs for proper control and variable conditions, but that requires even more division among the few subjects.[14, 21] A small sample size reduces a study's statistical power, so the researchers, the drug company, and the FDA will have more difficulty in identifying whether the study's conclusions can be applied to a wider population or are significantly affected by chance and small numbers.

The only area of pediatrics that does not have a recruitment problem is oncology. An important element of this is the high level of collaboration between researchers and the prevalence of multicenter trials. Applying these two aspects of research to other fields of pediatric medicine could alleviate some of the recruitment problems, since subjects from multiple study sites can be included in research data.[19] This kind of infrastructure does exist in the form of the Pediatric Pharmaceutical Research Unit (PPRU) Network, which was established in 1994 and now includes 13 pediatric research centers supported by the National Institute of Child Health and Human Development.[4] The PPRU focuses on "delineat[ing] the effects of childhood development on the pharmacokinetics of drugs, the influence of age-specific changes in drug disposition and pharmacodynamics, and the interplay between disease states and stages of development." The network attracts pediatric subjects because of its combined outpatient capabilities. Its many sites working together can "ensure prompt recruitment for clinical trials" and shortened study periods.[22] Adding more facilities to the network would further improve its ability to conduct large trials and contribute information about pediatric pharmacology to drug companies and to the FDA.

Once a study has recruited an acceptable number of subjects, researchers must take into account technical issues including how the study is performed, what procedures are used, and how the staff interacts with children. For example, routine testing procedures in adults like drawing blood and collecting urine samples can be difficult in pediatric subjects, especially young children.[19] Non- or minimally invasive techniques must be utilized, and in many cases first developed, to assess PK and pharmacodynamics of children, which then allow scientists to determine accurate dosages to be used in the trials.[14] Another important consideration in pediatric studies is making the subjects feel comfortable, since a clinical research environment can be frightening to children. Excessive stress is placed on pediatric patients from a disease in itself as well as from procedures and doctors. Employing researchers and practitioners that can make a child feel more comfortable may seem like an afterthought, but is an imperative condition for a pediatric study.

Whereas the logistical issues are most relevant to the scientists conducting the studies, the financial issues of pediatric testing are of main concern to drug companies. In addition to the cost of setting up a study, drug companies view pediatrics as a small financial market, therefore less worthy of the time and effort of research compared to more profitable markets.[4] However, more and more children are taking prescription drugs.[19] The annual percentage increase in spending on drugs is higher among children than among adults.[21] Due to the growing market, it would actually be fiscally wise for drug companies to target the pediatric market.

Finally, there are ethical issues. The main concern is that children are a vulnerable population, both physically and mentally. On a physical level, drug studies can be hazardous. In randomized trials, a patient might not receive the drug therapy and his health might not improve. On the other hand, a patient might receive the drug therapy and his health might decline. The question is, "Should children be exposed to these risks of research so that others can benefit?"[11] A pediatric drug study is an opportunity to test drugs on children in a controlled setting, instead of on a case-by-case basis at the will of an under-informed practitioner. While many in the medical and scientific fields believe that the risk of drug trials is less than the risk of remaining ignorant of how drugs function in children, others are appalled that children can be subject to "medical experiments."[23] Because children are inherently vulnerable and do need to be protected, the level of risk accepted in pediatric trials must be less than that in adult trials.[11] For this reason, the FDA requests that pediatric studies are only conducted during Phase III of a study, which is when comparative clinical trials are run and after baseline safety and efficacy are established.[15]

Pediatric studies also run into problems because of the formalities of informed consent. Minors cannot legally give consent, and only children over the age of seven can assent (agree) or dissent (disagree).[4] But, how informed can a young child be? It is difficult to explain the study itself, along with the risks and possible benefits, to an adult, let alone a child of lesser developmental maturity. For this reason, opponents of pediatric studies believe that children are being exploited by the biomedical industry to make a profit.[23] This is a valid concern. Due to a child's inevitable developmental disadvantage, researchers must put significant trust in the parents ability to make responsible choices. However, another issue surfaces regarding the influence of a child's parents when deciding whether to participate in a study. A child who does not completely understand the situation may look to his parents for guidance and agree with whatever they suggest. This is especially true in acute or life-threatening situations when both child and parents are exposed to high levels of stress. In some cases, the family may be unduly persuaded toward participation due to compensation. Whether or not the compensation is intended for the parents, it can act as an incentive for parents to include their child in a study. To counter this, trials should either not compensate families or not inform them of compensation at the outset. Providing a small reward at the middle or the end of the study, and not advertising such compensa-

tion at the beginning, may reduce the occurrence of parents forcing unwilling children into drug trials.[11]

Conclusion

It is imperative for drug companies to conduct pediatric drug studies in order to establish the safety and efficacy of such drugs in children. The substantial physiological and pharmacokinetic differences between children and adults require adequate drug testing for children, as it is often dangerous to apply clinical data from adult-based studies to children. The Best Pharmaceuticals for Children Act and the Pediatric Research Equity Act, along with other legislation of the past 14 years, have significantly aided this effort by both incentivizing and mandating drug companies to carry out pediatric studies. The medical community has improved its level of patient care due to the new information regarding treating children, and children have likewise benefited because of this more regimented practice of pediatrics.

The technical and practical problems associated with pediatric trials can be solved by putting pediatric subjects at ease, utilizing minimally invasive techniques when possible, and expanding the PPRU Network to deal with recruitment problems. Financial issues are less significant as the pediatric drug market grows every year and the FDA's exclusivity incentive program allows for substantial profits for drug companies. While ethical issues are of concern to all parties, the dilemmas come down to a choice: Would society rather see sick children treated in clinical, scientific settings or at random without guidelines for treatment in their doctor's office? One must also consider that inhibiting pediatric studies would make children's access to drug therapy even more inequitable compared to adults' access. Society wishes to protect children, but limiting a pediatric practitioner's knowledge of drug therapies can only cause more harm to come to these "therapeutic orphans." Increasing pediatric studies and, effectually, knowledge regarding pediatric drugs are important measures in improving the pediatric standard of care.

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Original Article

CHILDREN'S DIETS & THE BENEFITS OF SCHOOL GARDENS A REPORT FOR THE PRINCETON SCHOOL GARDENS COOPERATIVE

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The objective of the Princeton School Gardens Cooperative is to establish gardens at every Princeton public school in order to "re-connect students to the earth's bounty in the garden, classroom, and cafeteria."[27] The members of the Cooperative hope that the gardens will increase students' appreciation and intake of healthy foods such as vegetables and fruits. With the collaboration of principals, teachers, parent volunteers, and students, the organization has successfully designed and sustained gardens at six Princeton public schools. In addition, the Cooperative has written a guide to promote the integration of the gardens with the classroom curriculum. The guide details the steps for composting, planning, and planting and also includes lesson plans and curriculum links for math, social studies, language arts, science, visual arts and health. In order to assist the Cooperative in its efforts to encourage healthy eating among the community's schoolchildren, this paper: 1) outlines the unhealthy nature of child food preferences in schools; 2) provides an overview of the detrimental effects of poor nutrition on health, with an emphasis on the obesity epidemic; 3) offers evidence that healthy eating is correlated with increased cognitive performance; and 4) describes the success of garden projects across the country to highlight the importance and viability of the Princeton School Gardens Cooperative.

Recommended Dietary Habits

The Center for Nutrition Policy and Promotion, a department under the United States Department of Agriculture, establishes the national dietary guidelines. These guidelines are updated every five years, with the last revision conducted in 2005. The guidelines provide Americans who are two years and older with advice on good dietary habits that can promote good health and reduce the risk of chronic diseases.

The nutritional guidelines for children are usually presented in "My Pyramid."[53] There are six groups: grains, vegetables, fruits, milk, oils, and meats & beans. A person's allowance for all food groups depends on age and gender as follows.

Food Group	Ages 4-8	Girls 9-13	Boys 9-13
Grain	4-5 ounces	5 ounces	6 ounces
Vegetables	1.5 cups	2 cups	2.5 cups
Fruits	1-1.5 cups	1.5 cups	1.5 cups
Dairy	2 cups	3 cups	3 cups
Meat & Beans	3-4 ounces	5 ounces	5 ounces
Oils	4 teaspoons	5 teaspoons	5 teaspoons

Table 1. USDA serving recommendations per age group.

Food Environment and Eating Behavior in Schools

Unfortunately, over the past 50 years, our children's diets have changed significantly. They currently consume more sweetened carbonated beverages, fruit juices with added sugars, and fast foods rich in fat than ever before.[51] Because students spend many of their waking hours at school, a significant portion of their daily food intake is consumed there. In fact, in a study of U.S. children's diets from 1994-1996, researchers found that children in elementary schools ate more meals at school than at any other away-from-home place.[31] Along with experimental and observational studies indicating that child dietary behavior[44] and body weight[27] are directly related to school food environments, these findings indicate that school cafeterias are a valuable and controlled setting in which to study the current state of unhealthy eating practices among our nation's youth.

The National School Lunch Program (NSLP) of the U.S. Department of Agriculture's Food and Nutrition Service is a federally assisted meal program charged with "safeguarding the health and well-being of the Nation's children" by providing "nutritionally balanced, low-cost or free lunches to children each school day."[40] In the year 2000, it was estimated that the NSLP provided meals to 95% of U.S. schoolchildren.[9] The NSLP, however, fails to cover the full cost of preparing healthy, USDA-approved meals, and schools are forced to recover their losses by providing vending machines, school stores, and snack bars that offer less healthy alternatives.[6] For example, in 2008, the government subsidy to schools was $2.57 per meal, while the average cost to prepare these meals rose to $2.88.6 This 31-cent deficit provides a huge incentive for schools to sanction the sale of non-NSLP foods that raise revenue. Unfortunately, these foods lure children into making dietary decisions that favor taste over proper nutrition.

In 2005, a survey by the American Federation of Teachers revealed that nearly 60% of U.S. cafeteria workers agreed that when children are given a choice, they tend to choose prepackaged foods that are high in fat as opposed to healthier, more natural options.[26] In particular, vegetable and fruit dishes are among the most likely options to be dismissed in favor of foods that include pizza, chips, soda

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and french fries.[10] Researchers at the Baylor College of Medicine recently published a study that quantified the effect of having greater food options in school cafeterias on fruit, vegetable and milk consumption in Texas elementary schools.[10] The study compared fourth graders with access to only NSLP meals with fifth graders who had additional access to snack bar foods. The results indicate the extent to which children prefer less healthy foods: given snack bar options, student fruit, vegetable and milk consumption decreased by 33%, 42% and 35%, respectively.[10] Moreover, by the time the students reached the sixth grade, 35-40% of all meals were purchased exclusively from less healthy snack bars.

Studies conducted by researchers in the United Kingdom also portray the extent to which schoolchildren choose unhealthy foods more frequently than more nutritious options. Using smart card technology that recorded student food purchases to quantify the eating habits of children, Lambert et al. found that "fatty buns" (including cookies, muffins, and donuts) were over ten times more popular than fresh fruits and yogurt as the lunch dessert choice.[28] Additionally, fizzy drinks and artificial fruit drinks containing greater amounts of sugar were over 20 times more popular than milk or fresh fruit juices.[28] The researchers also found that over a given school month, the amount of fat and added sugar intake could be reduced by 200 g and 800 g, respectively, if healthier drink and dessert choices were offered at lunchtime.

Given this information, there is no doubt that influencing eating behavior and food preferences, particularly when it comes to school lunches, are key factors to consider when implementing programs that improve the nutritional input of our children. Along with wider efforts to reduce the availability of unhealthy food options in school cafeterias, the Princeton School Gardens Cooperative's mission of forging physical connections between students and the foods actively grown in school gardens represents a viable mechanism for encouraging students to eat more fruits and vegetables.

The Obesity Epidemic

Since the late 1970s, obesity rates have more than doubled among children 2 to 11 years of age and more than tripled among those of ages 12 to 19.[41] From 1963 to 1970, about 4.5% of children were obese. From 1999 to 2002, the number had increased to 16%, and continues to rise (Figure 1). Obesity is a complex phenotype which results from the interaction of multiple genetic, environmental, cultural, nutritional and lifestyle factors.[11] Although recent research has found that genetic factors are important in determining an individual's susceptibility to obesity, our genes have not substantially changed during the past decades to account for the observed obesity epidemic. An important cause of the obesity epidemic is an environment that encourages behaviors (e.g. over consumption of calories and physical inactivity) that lead to obesity.[25]

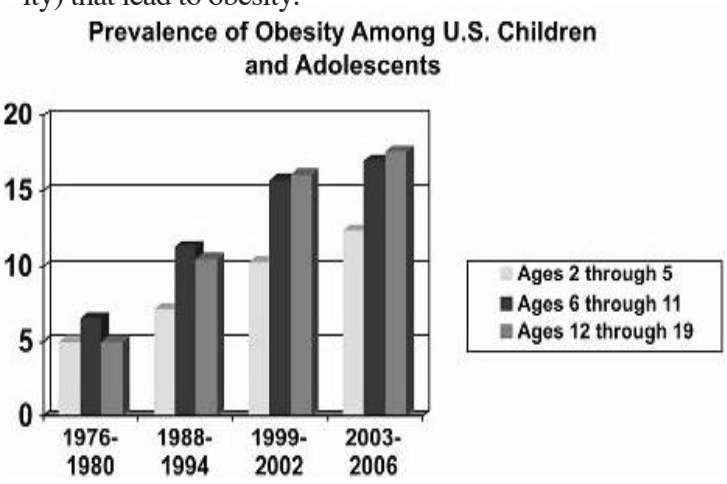

Figure 1. Prevalence of Obesity* Among U.S. Children and Adolescents (Aged 2–19 Years). *Sex-and age-specific BMI ≥ 95th percentile based on the CDC growth charts.

Unfortunately, obese children and adolescents are more likely to become obese as adults.[57,47] One study found that approximately 80% of children who were overweight at ages 10–15 years were obese at age 25.[57] Meanwhile, another study found that 25% of obese adults were overweight as children.[17] In addition, the latter study also found that if overweight begins before 8 years of age, obesity in adulthood is likely to be more severe.

Rising obesity is of great concern due to the serious health problems associated with it. For example, a study conducted by Weiss and colleagues examined the effect of different degrees of obesity in children on the prevalence of the metabolic syndrome and its relationship to insulin resistance. The metabolic syndrome is a group of risk factors including high blood pressure, high blood sugar, high cholesterol levels, and belly fat that increase the risk of heart disease and diabetes. The researchers found that the prevalence of metabolic syndrome is high among obese children and adolescents and that it increases with worsening obesity.[56] The direct link between obesity and the metabolic syndrome explains the rise of type II diabetes, a once rare disease in children and adolescents. In 1985, experts estimated that about 1-2% of children with diabetes had type II. By 1995, the number increased to approximately 17%. More recently, in some areas of the United States, 30-40% of children with diabetes have type II.[58]

In addition to having a higher risk of acquiring type II diabetes, obese children are more prone to experience cardiovascular diseases, pulmonary diseases (such as sleep apnea), gastrointestinal problems, metabolic diseases (such as dyslipidaemia), coronary heart disease, and osteoarticular diseases.[3,4] Furthermore, there is substantial evidence that obesity is associated with risk for some of the most common cancers including adenocarcinoma of the esophagus

and the gastric cardia, colorectal cancer, postmenopausal breast cancer, endometrial cancer, and kidney cancer.[24]

Unfortunately, not only does obesity affect the physical health of children and adolescents, but their mental health is also affected as obese children and adolescents are more likely to experience victimization than children with a normal weight.[22] A review of the literature on stigmatization of overweight children and adolescents indicates that overweight girls experience a higher degree of stigmatization than overweight boys.[49] This finding may explain why overweight girls are associated with a lower degree of academic and social competencies.[12] In addition, certain studies demonstrate that for both boys and girls, obesity results in psychosocial consequences since the stigmatization of "fat" children by peers may lead to low self-esteem, social isolation, depression, and eating disorders.[49]

Finally, obesity contributes substantially to health care expenditures. Obesity accounts for 5-7% of the national health expenditure in the US and presently surpasses both smoking and drinking in its harmful effects on health and health costs.[55] In 2002, the costs of treating obesity-related conditions such as diabetes, heart disease, renal failure, and hypertension were estimated at $92 billion to $117 billion. Thus, whether paid by Medicare, Medicaid, or by private insurances, obesity-related health problems impose substantial costs not only on the obese but also on the general public.[23] Federal, state, and local policymakers must be aware that childhood obesity is a grave national problem and actions including strict measures that target the fundamental causes of obesity must be implemented.

One such measure is the establishment of programs that encourage our children to eat natural, healthy foods. As mentioned earlier, the Princeton School Gardens Cooperative maintains sustainable gardens in Princeton Public Schools and emphasizes the importance of learning through gardening. By encouraging students to eat the foods they grow, the Cooperative promotes eating habits that help prevent the onset of obesity and other related diseases.

Diet and Learning

Diet plays an important role in shaping cognitive capacities. When ingested food reaches the gut, the molecular systems involved in synaptic plasticity (the ability of the synapse to change in strength) and learning are triggered via the vagus nerve.[19] In addition, gut hormones and peptides, such as insulin and glucagon-like peptide 1 (GLP1)[35] are released after ingestion and travel to the hypothalamus and hippocampus. Here, the hormones activate signal-transduction pathways that modulate learning and memory through neural circuits connecting the gut and the brain. Furthermore, leptin signals from adipose tissue (fat) can activate certain receptors in the brain that impact learning and memory.[30,43,48] Additionally, insulin-like growth factor 1 (IGF1) produced by the liver and muscle in response to food metabolism and exercise can signal to neurons in the hypothalamus and the hippocampus and eventually influence learning and memory performance by supporting nerve growth and differentiation, neurotransmitter synthesis and release, and synaptic plasticity.[14] Certain dietary factors can affect neural pathways associated with synaptic plasticity and can positively or negatively affect the brain. Thus, diet plays a critical role in shaping the cognitive capacities of the developing brains of children and adolescents.

Of course, not all foods are healthy - there are certain "brain foods" that are vital for healthy cognition. Dietary factors can affect the regulation of several brain processes, such as neurotransmitter pathways, synaptic transmission, membrane fluidity, and signal-transduction pathways. According to Dr. Gómez-Pinilla of the University of California – Los Angeles, people should consume more foods containing antioxidants, such as berries, nuts, and green leafy vegetables.[19] These antioxidant-rich foods are believed to protect synaptic membranes in the brain, which are very susceptible to oxidative damage.[34,59] Synapses connect neurons and are the site of much learning and memory activity. Accordingly, the Princeton School Gardens Cooperative should continue to plant antioxidant-rich berries, green leafy vegetables such as chard, kale, and spinach, and should also consider adding spices such as oregano, and nuts such as hazelnut.

A diet rich in polyunsaturated fatty acids, such as omega-3 fatty acids, has also been shown to be beneficial for the brain. Omega-3s, which are found in walnuts, flaxseed, winter squash, olive oil, fish, and soybeans, are known to improve learning, memory and concentration, and help prevent a range of mental disorders including depression, bipolar disorder, schizophrenia, dementia, attention-deficit disorder and dyslexia.[18] These fatty acids seem to have a positive effect on the expression of several synaptic molecules involved in learning and memory. A study performed in England showed that when children diagnosed with learning difficulties received omega-3 supplements for 6 months, they "tested a year higher in reading skills and 6 months higher in spelling" and were more focused than those who did not receive the supplements.[46] However, research indicates that more nutrition can be obtained from natural products than from the capsule supplements.[19] To grow foods that are rich in omega-3s, the Princeton School Gardens Cooperative should plant winter squash, soybeans, grains, and walnut trees.

Studies have shown that diets with a high concentration of trans and saturated fats can negatively impact brain function and reduce the abundance of compounds involved in cognitive processing.[21] Trans and saturated fats are found in many of the foods schoolchildren eat, such as crackers, candies, cookies, snack foods, fried foods, baked goods, and other processed foods made with partially hydrogenated vegetable oils.[13] Studies testing the effect of "junk food" on rodents have shown that three weeks of a diet

high in saturated fat and sucrose intake leads to a decline in cognitive performance. Reduced levels of brain-derived neurotrophic factor (BDNF)-related synaptic plasticity were also observed (BDNF is a signaling molecule that utilizes metabolic signals to influence cognitive function).[54] These findings were significant because they implied that diet has a direct effect on neurons independent of insulin resistance or obesity.[19]

This connection between "junk food" and impaired cognitive abilities has direct relevance to the diet of American children. The 2008 School Lunch Report Card developed by the Physicians Committee for Responsible Medicine (PCRM) indicates that foods served in schools are too high in saturated fats and cholesterol and too low in dense nutrients that are present in whole grains, legumes, fruits, and vegetables.[45] The following case studies provide examples of schools that have introduced more nutritional foods in their lunches and have witnessed a positive association between quality diet and academic performance.

Case Study 1: California Schools

Schools in California have been very active in promoting healthier lunch options. Both low- and high-performing schools with students who eat healthy foods on a regular basis experience significantly higher gains in test scores compared to other schools.[2] "Healthy eating" was quantified by determining the average percentage of nutritious intake. This value was based on the number of times during the week the students drank 100% fruit juices and ate fruits, green salad, potatoes, carrots, and other vegetables. In contrast, undernourishment and skipping breakfast led to a decrease in test scores. The results suggest that more schools should mandate policies addressing the health needs of youth in order to improve academic performance. Although this study is purely retrospective and lacked a control group, the sample size consisted of an impressive 500,000 students; thus, the results cannot be ignored.

Case Study 2: Nova Scotia schools

In 2003, the Children's Lifestyle and School-Performance Study surveyed 4,589 fifth grade students and their parents in Nova Scotia to determine the relationship between indicators of diet quality and academic performance.[16] The study found that specific dietary factors, such as dietary fats (which are rich in omega-3s) and fruits and vegetables (which are rich in antioxidants) were crucial in lowering the risk of failing an elementary literacy assessment, independent of socioeconomic factors. The results also suggest an association between overall diet quality and academic performance.

Case Study 3: Agatston Research Foundation

Cardiologist Arthur Agatston conducted a two-year study which found that improving the nutritional quality of school food also improves students' standardized test scores.[5] The study involved 1,197 elementary school students participating in the Healthier Options for Public Schoolchildren (HOPS) program. HOPS was designed to "integrate healthy dietary offerings, nutrition and lifestyle educational curricula, increased levels of physical activity, and school gardens" in central Florida schools.[1] During the study, the kids ate holistic foods – foods containing less saturated fat, no trans fat, and more whole grains, fruits, and vegetables. The results showed that the students' math scores increased significantly.

Both scientific research and these three case studies provide preliminary evidence that improved diet quality is associated with improved cognition and academic performance. However, more research with additional controls needs to be conducted in order to confirm this link, especially with food that has been grown in school gardens. All of the case studies described above indicate that a diet including grains, fruits and vegetables contributed to increased academic achievement. These foods can be easily grown in Princeton school gardens and integrated into school lunches.

School Gardens

Positive Effects of School Gardens

Because healthy eating can positively impact the physical, mental, social, and academic aspects of children's lives, schools can play an important role in influencing children to eat healthier. Incorporating school gardens into the curriculum allows children to have the opportunity to discover fruits and vegetables, make healthier dietary choices, and become better nourished. Several schools around the nation have implemented garden projects because principals and teachers believe they have the following benefits: increased nutritional awareness and physical activity, increased environmental awareness, higher learning achievements, improved life skills (teamwork, developing patience, responsibility, etc.), better youth development and leadership, and more community involvement.

Research reveals that school gardens influence children to eat healthier. Anecdotal evidence from teachers, including representatives from the Princeton Regional School District, indicates that students enjoy eating what they grow and are more enthusiastic about eating healthy foods. Studies corroborate these claims. Children who grow their own fruits and vegetables tend to have a positive attitude towards these foods and thus are more likely to eat them.[37,38,39,32] A recent study by McAleese and Ranklin indicates that garden-based nutrition education increases adolescents' consumption of fruits and vegetables.[33] School gardens also increase children's knowledge of nutrition. Schools have recognized that school gardens can benefit their students and communities in several ways. In order for school gardens to gain more popularity, educators and policymakers need to be convinced through more research that school gardens are a

cost-effective resource for educating students.

The Successes of the Princeton School Gardens Cooperative

In the Princeton Regional School District, the Princeton School Gardens Cooperative has established school gardens in order to promote the benefits of connecting children to the food they grow. The Cooperative, started in 2006, has been successful in establishing a garden in every elementary school in the district. Middle and high schools in the district also have started their own gardens. The gardens contain a variety of fruits, vegetables, and herbs – everything from raspberries to parsley to cucumbers. One of the Cooperative's most important accomplishments was to examine the district curriculum and match classroom and garden activities to the state standards. This has helped teachers integrate their lessons around the school gardens. The Cooperative has also been successful in garnering support for the school gardens despite the fact that "there are no education standards driving them" (D. Mullen, personal communication, December 22, 2008). This stands in contrast to California, where the California Department of Education has published several lesson guidelines and plans to help teachers include school gardens in their lessons.

Many teachers and schools have found creative methods to integrate the gardens into the school environment. There are activities and lessons for several subjects: visual and performing arts, science, foreign languages, language arts, writing, math, and social studies. In Littlebrook Elementary School, for instance, sixth graders along with their first grade buddies created their own pizzas using the tomatoes from the garden. As part of their science class, students grew beans in varying degrees of sunlight exposure to learn about the effect of light on plant growth. In addition, students in clubs and extracurricular activities have been active in maintaining the gardens.

The Princeton school gardens have been very successful in gaining support from the community. Many parents and children volunteer to establish and sustain the gardens. Local businesses have also supported the Cooperative. The Bent Spoon, for instance, has donated proceeds and has used the herbs grown in the gardens for its ice cream.

Other School Garden Models around the United States

While the Cooperative has made tremendous strides over the past seven years, it can continue to benefit from other examples of school gardens in states around the U.S.. As mentioned earlier, California is a great example of a state that supports a school garden network.

At the school-level, the Cooperative should investigate the possibility of hiring permanent staff members and including a kitchen in its schools. The Edible Schoolyard at Martin Luther King Jr. Middle School in Berkeley, California currently has permanent staff members. Along with an enormous garden, the middle school has its own kitchen where classes are held so that children can use the plants they grow and cook food at school. The school has designated a kitchen chef and garden manager to ensure the sustainability and growth of the program.

California Universities have also provided research and support to the school garden network in the state. The University of California, Davis has a Children's Garden program that hosts teacher training on garden-specific topics.[52] Likewise, the Princeton Cooperative has already started reaching out to nearby Universities. For example, it has collaborated with the Community-Based Learning Initiative (CBLI) at Princeton University to research the effects of school gardens on children's health.

The California Department of Education supports and reaffirms the importance of school gardens. California funds numerous research studies that investigate the effectiveness of school gardens as well as the barriers they face. One study found that the greatest barriers for using gardens in academic instruction were found to be "a lack of curricular materials linked to academic standards and a lack of teachers' interest, knowledge, experience, and training in relation to gardening."[7] California has tried to address these two barriers by publishing Nutrition to Grow On (an activity guide that links nutrition to garden-based learning), Kids Cook Farm-Fresh Foods (recipes suitable for the classroom), and A Child's Garden of Standards (instructional material that links specific activities to state standards in science, history, mathematics, and language arts). In addition, the government supports three School Garden Regional Training Centers that offer workshops related to gardening and garden-based nutrition.[8] The Princeton School Gardens Cooperative can learn from this example, and should explore the possibility of distributing instructional materials and conducting leadership workshops.

Schools in California are also able to apply for funding that supports school gardens. The California Instructional School Garden Program at the California Department of Education "has $15 million dollars in non-competitive, non-matching grant funds for school districts, county offices of education and charter schools who are interested in starting or sustaining a school garden program. Grant funds can be used for garden equipment, garden supplies and teacher/school garden coordinator professional development."[8] The Princeton Cooperative has benefited from the fact that Princeton is a fairly affluent community that has people with the financial resources to support school gardens. However, additional support from local businesses, the local government, and the state government can further expand its mission and programs. The Princeton Cooperative has garnered support from principals and community members in Princeton, and can continue to reach out to policymakers at the state-level in order to make a bigger impact on the children of New Jersey.

Conclusion

In conclusion, the growing body of evidence that indicates the unhealthy nature of child dietary behavior, and the detrimental health consequences that develop as a result, presents a convincing argument for developing programs that improve child nutrition. The Princeton School Gardens Cooperative has garnered substantial community support in its initiative to encourage Princeton children to consume greater amounts of fruits and vegetables, and should continue to incorporate individuals at the local and state level in order to expand the depth and breadth of its mission. Through these and similar efforts across the nation, communities can take an active stand to safeguard the health and wellbeing of our children – the bright future of our great country.

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Original Article

INFANT FEEDING CHOICE: BIOLOGICAL IMPLICATIONS, SOCIAL PRESSURES, GLOBAL CAPITALISM AND THE MODERN-DAY BREASTFEEDING MOVEMENT

*Amanda Harris**

Despite scientific research that demonstrates that "breast is best" in infant feeding, both for mother and baby, many mothers still struggle with the choice of whether to breast or bottle-feed. This struggle has been created by a varied history of infant feeding that produced a capitalistic baby formula market and a culture of social pressures that have challenged the biological implications of infant feeding. These include the rise of medicine's control over maternal care, the convenience of the bottle, and the sexualization of the breast, which have been able to popularize bottle-feeding despite its shortcomings. Such social pressures and aggressive marketing strategies by infant formula companies have had devastating consequences for maternal and child health, particularly in the developing world. U.S. government policies such as formula vouchers through low-income aid programs and laws around indecent exposure have worked both for and against the breastfeeding movement. Today, those involved in the pro-breastfeeding counter-movement, or "lactivists," are working toward institutional changes that would create a breastfeeding-friendly climate and allow mothers to make an educated decision about how to best feed their infant.

Alternatives to mothers' breastmilk have been available for infant feeding in America since colonial times, when mothers who had difficulty breastfeeding would ask friends or hired women to nurse their children for them. Called "wet nursing", the gradual popularization of this practice created a market for human milk and allowed it to become a frequently advertised commodity in the eighteenth century.[1] A niche for infant formula's developed and they began to be accepted by the medical community. Even thought it is recognized that breastmilk is the most balanced source of nutrition for infants, bottle feeding remains common. In 2007, the Center for Disease Control (CDC) reported that for infants born in 2004 there was a 73.8% breastfeeding initiation rate with 41.5% of infants breastfeeding at 6 months of age and 20.9% at 12 months of age, although only 30.5% were exclusively breastfeed through 3 months of age and 11.3% were exclusively breastfed through 6 months of age.[2] This paper seeks to examine how the history of infant feeding has created a capitalistic baby formula market and a culture of social pressures that challenge the biological implications of infant feeding, requiring mothers to decide between breast- or bottle-feeding. The formation of an activist pro-breastfeeding counter-movement and its recent developments will be discussed.

"Breast is Best": Biological Reasons for Breastfeeding

Proponents of breastfeeding often cite the motto "Breast is Best," which is becoming accepted by more professional organizations and practitioners. The American Academy of Pediatrics, the American College of Obstetricians and Gynecologists, the American Public Health Association, the Food and Drug Administration, the Center for Disease Control (CDC), and World Health Organization (WHO) all have official platforms that specifically sanction breastfeeding.[3] In November 2000, the CDC and the Health Resources and Services Administration released a set of goals for the health of the U.S. population called Healthy People 2010. These goals include several stipulations on breastfeeding, including increasing the proportion of mothers who breastfeed their babies in the early postpartum period from the current 64% to 75%; at 6 months of age from 29% to 50%; and at one year from 16% to 25%.[4] However, tracking these goals is challenging because the duration and exclusivity of breastfeeding vary between mothers. Some feed their babies exclusively with breastmilk until they are more than a year old, others breastfeed only while in the hospital after delivery, and others use a combination of formula and breastmilk.

Many studies have compared the differential outcomes from infant feeding for both mothers and infants, and it has been found that exclusive breastfeeding is sufficient for infant development and is in fact the best source of nutrition for babies.[5] Nursing not only provides an opportunity for bonding between mother and child and satisfies the baby's oral and touching needs, but yields lower rates of asthma, allergies, anemia, diarrhea, ear infections, lymphoma, sudden infant death syndrome, and other illnesses. Children who are breastfed also score higher on tests of mental ability and receive less extensive dental care than babies who are bottle fed.[5-7] Formula companies try

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to imitate the beneficial qualities of mothers' milk in their products and advertise the formula as better than or equivalent to breastfeeding.[6]

Although most formulas have roughly the same ratios of protein, sugars, vitamins and minerals that breastmilk does, they cannot replace the antibodies and other organic substances a mother passes to her infant through breastfeeding. The well documented immunological properties of mothers' milk help strengthen the immune system of a newborn, preventing the child from being ill as often as babies who are formula fed.[8] Overall rates of hospitalization are much higher in infants who bottle-feed, and between 1 and 2 million infants mostly in the third world die annually from bottle-feeding as a result of problems of diarrhea, dehydration, and malnutrition, or "baby bottle disease."[8,6]

Bottle-feeding Chic: Social Pressures to Use Formula

Formula feeding first became popular in the 1930s, as the baby milk industry began to develop and rigid ideas about infant care were perpetuated throughout the early twentieth century. Rates of breastfeeding stayed low through 1970, until they spiked in the early 1980s as a result of feminist actions against medical control, only to slowly fall again.[9] Bottle feeding was increasingly popularized due to various social pressures. These include the rise of medicine's control over maternal and child health, the desire to regulate maternal practices, the sexualization of the breast and concerns of public modesty, the convenience of the bottle, and attempts to schedule feedings especially if returning to work after childbirth, leading to "insufficient milk."[10,8] Marketing strategies of the formula companies have successfully used the media as well as the medical community to normalize bottle feeding and promote it as an alternative to breastfeeding. Studies have shown that the frequency of formula feeding advertisements in popular parenting magazines is negatively correlated with breastfeeding rates.[5] Hospital practices of separating mothers and babies, offering breastmilk substitutes, and giving out formula coupons and samples make breastfeeding more difficult.[11]

Government policies have also played a key role in the breast-bottle debate both for individual mothers and societal perception. WIC, the Special Supplemental Food Program for Women, Infants and Children, provides food vouchers for families who meet certain income, age, maternal status and nutritional/health risk factor criteria. These vouchers allow parents to purchase specific healthy foods such as cheese and peanut butter to supplement their children's diets. Vouchers are also provided for formula, but as of 1994, extra money is allotted to mothers who choose to breastfeed.[12,13] Since formula is the largest food item cost of the WIC program, some states began to engage in competitive bidding with formula companies to lower the price of formula for those on WIC and help more families in need. Ironically, this process has created a cycle that undermines the program's attempts to encourage breastfeeding: the more infants on WIC who are formula fed, the larger the rebate WIC gets from formula companies, which allows the program to reach more eligible families and increases formula sales, benefiting the companies. This cycle has also driven the price of formula higher, causing problems for consumers not on WIC and parents using WIC to feed their children who need more than the voucher allows, but cannot afford the costs.[12]

Other policies have had an impact on breastfeeding as well. One recent law protects a woman's right to nurse in public without being arrested for obscenity.[8] Alternately, the WHO's International Code for the Marketing of Breast-Milk Substitutes applies to the marketing of products as suitable to totally or partially replace breast milk, a policy the United States has not chosen to enforce. The Code contains stipulations that prevent companies from advertising their products to the general public, health practitioners from promoting breastmilk substitutes, and the distribution of free samples to pregnant women, new mothers or their families. Additionally, the U.S. has refused to support the Baby-Friendly Hospital Initiative, a movement that supports the Code and promotes "10 Steps to Successful Breastfeeding."[8] Of 118 countries who voted unanimously to endorse the Code, the U.S. was the only country who opposed it, afraid of profit and free trade loss.[6]

Global Capitalism and the Infant Formula Market

A tolerant environment has allowed the formula market to expand in America and beyond. Companies such as Nestle have pushed their products into the global economy, particularly in third world countries, creating problems for families convinced that bottle-feeding their children is the more modern approach to infant feeding. Such perceptions of bottle feeding as being equated with progress and wealth ironically end up costing families significantly: more than 30% of a family's income can go toward buying formula and 100% of it may go toward buying bottles and other equipment. The high cost of formula also often forces parents to stretch out the amount of formula available, which results in malnutrition and dehydration.[6] Health problems such as these are exacerbated by the difficulties

of safely preparing infant formula in areas where there is limited access to clean water and an inability to properly follow instructions for preparation due to illiteracy.[14]

Global capitalism of the formula industry has had a marked effect on the development of third world countries and perhaps less obviously on the U.S. As formula company executives work to bring in more revenue, families put all of their income toward bottle-feeding their infant. Often by while using free formula samples the mother's may no longer be able to produce milk, and the family becomes dependant upon formula purchases. The tactics of the formula market and capitalistic enterprises as a whole are undeniably closely tied to inequities in race, class, and gender.[6]

Current Infant Feeding "Choice" in the U.S. and Breastfeeding Activism

Clearly, the connection between the formula market and consumers is not a simple one. Proponents of the formula market argue that the decision of how to feed an infant should be the mother's choice. Breastfeeding advocates, on the other hand, argue that this decision is not really a "choice" when views have been distorted by the marketing campaigns of formula companies and the pervasive social issues they promote. This is especially problematic when Western standards of beauty, wealth and modernity are encouraged.[3,6] A lack of family and partner support can further reduce women's agency in their infant feeding decisions. In extreme cases, breastfeeding can become a matter of safety for mothers in controlling relationships when partners become jealous of a child feeding at the breast.[3] Ambivalent medical messages and hospital practices are often also unhelpful in guiding women towards making the appropriate, educated decision for themselves.[11] Practices of post-delivery intervention, supplemental feeding, separate rooms, and taking handouts from formula companies do not create a supportive environment for breastfeeding.

Consequently breastfeeding advocates and activists, or "lactivists," have been working for "material, legal and institutional changes that would support and encourage breastfeeding such as lactation support in hospitals, laws protecting public breastfeeding, restrictions on formula advertising, workplace support for pumping, etc."[3] With the Healthy People 2010 goals in place and more health care organizations committed to the "10 Steps to Successful Breastfeeding" promoted by the Baby-Friendly Hospital Initiative, the situation is improving. Rates of breastfeeding increased from 2000 to 2004 in all categories, although rates of exclusive breastfeeding remain low and clear differences exist between various racial, socioeconomic, marital status, age and urban/rural populations. Specifically, rates of exclusive breastfeeding through age 3 months were lowest among black infants, infants of teenage mothers, unmarried mothers, poor mothers, mothers with a high school education or less, and mothers who live in rural areas.[2]

Several interesting critiques of breastfeeding activism have come from feminist scholars. These critics point out that breastfeeding advocacy can be elitist and essentialist. "Lactivism" is seen as a white, middle-class ideal that ignores the realistic lack of options for many women who face specific racial and socioeconomic pressures, such as the need to return to work after delivery. The emphasis on breastfeeding as the only acceptable option in infant feeding can re-place an importance on gendered positions by symbolically shifting the full burden of children's needs back onto the maternal framework. By advocating that breastfeeding is necessary in order to be a good mother, "lactivism" may actually take away women's agency. As Bernice L. Hausman concisely articulates, "The implication is that women can or should resist such social prescription, which is part of a historical pattern of controlling women through ideological regulation of their reproductive activities."[8] A specifically third world critique has been that the emphasis on the problems caused by bottle feeding ignores the underlying issues of poverty and inequality. Although these comments certainly present important issues, there is still a strong case for a form of breastfeeding activism that encourages not only individual mothers to breastfeed, but more importantly, one that encourages the government and institutional practices to make changes that provide all women with infant feeding choice to breast- or bottle-feed as a reality.[8]

With these considerations, alternative options for a more feminist activism have been set forth toward overall social change alongside individual education and group visibility. Feminist breastfeeding activism pushes for breastfeeding to be accepted as a right, not just as a privilege. This acknowledges the importance of an individual, educated choice in the matter but also recognizes that without structural change in government policies, working environments, medical influences, family systems of support, individual choice is not really a choice at all.[8] In particular, this activism includes asking candidates for government positions how they will promote breastfeeding, calling out on poor media representations of breastfeeding, and seeking support for the Breastfeeding Promotion Act of 2007 that protects breastfeeding women from discrimination in the workplace and establishes standards for breast pumps.[15] One campaign in particular, the Ban-the-Bag campaign,

seeks to stop hospitals from giving mothers baby bags with formula sample packs when they leave postpartum.[16]

This activism takes into account the biological implications, social pressures, and global capitalism that have so strongly influenced the debate around infant feeding. Creating an awareness of the reality of women's decisions around infant feeding and educating about the benefits of breastfeeding will open the door for women to truly make an educated choice in the matter. Progress has been made in the pro-breastfeeding movement with greater recognition of the benefits of breastfeeding. That being said, the history of breastfeeding in America must be remembered, and an understanding of the benefits of breastfeeding for both infants and mothers must continue to be promoted.

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Editors Note: For a alternative perspective on breast feeding, the reader may look to "The Case Against Breastfeeding" in the April 2009 Atlantic. Available online at: http://www.theatlantic.com/doc/200904/case-against-breastfeeding.

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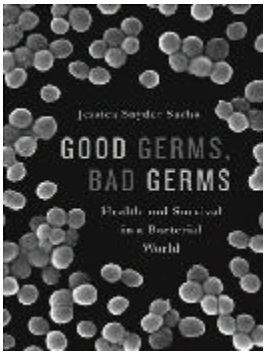
Book Review

GOOD GERMS, BAD GERMS: HEALTH AND SURVIVAL IN THE BACTERIAL WORLD

*Reviewed by David Kudlowitz**



Farrar, Straus and Giroux
October 2007
$25.00, Hardcover
$14.00, Paperback

From terrorism to the next flu epidemic, there are plenty of reasons to be scared to leave your house. In "Good Germs, Bad Germs," we learn of a college football player killed by am infection of methicillin-resistant Staphylococcus aureus (MRSA). This new superstrain comes largely from overuse of antibiotics in animal feed and abuse of antibiotics in general practice.

In this highly understandable and fascinating book, Sachs investigates our evolutionary and ecological relationship with bacteria. She describes why the overuse of antibiotics is not only leading to stronger, more resistant strains of deadly diseases, but also how antibiotics are killing the very bacteria we need in to survive in our daily lives. The human body must be thought of as an ecosystem with a variety of bacterial species that are essential to our existence. From every microscopic piece of a person's skin to the inner digestive tract, bacteria reside in abundance. When antibiotics deplete these bacterial colonies, this unique ecosystem can no longer properly function.

The first section of this book focuses upon this issue in its discussion of the Hygiene Hypothesis. This scientific argument seeks to attribute the influx of allergies and sicknesses today to too much cleanliness. By allowing our immune systems to remove foreign invaders and form a memory against them, we become primed to face disease. For immune systems that do not face "dirtiness" (or perhaps adequate exposure to bacteria and viruses) early on in life, the consequences could be an excess of sickness. Too much cleanliness can range from using large quantities of bleach as a cleaning product to the modern Caesarian section, which prevents the newborn from coming in contact with the bacteria in the uterine canal.

Afterwards the reader is introduced to the world of immunological research from efforts to introduce pig whipworm eggs as treatments for Crohn's and other intestinal disorders to viruses as targeted treatments for bacterial infection. At the same time Sachs notes that molecular biologist and Noble laureate Joshua Lederberg himself has indicated the need for humans to consider themselves as a "superorganism" of human and non-human cells that must coexist. Can we afford to wage constant war against our bacterial residents?

In sum, Sachs, a professional science writer and professor, has put forth a strong argument and an interesting read. Although at times the gloom of our disinterest in antibiotics and bacterial research is evident, the author demonstrates avenues of ongoing research to prevent a major catastrophe from resulting via strains of resistant bacteria (including research into the disruption of bacterial processes without killing the bacteria). A fascinating section on the immune system and its possible role in depression further develops the theme of the work. "Good Germs, Bad Germs," reveals a complex and engrossing world of bacterial science and evolution and helps us to understand and acknowledge the complicated effects of our own technological advancements.

**Reviewed by David Kudlowitz, a Managing Editor of TuftScope.*

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