

**What future physicians want: a comparative analysis of the perception of medical students and pharmaceutical industry executives regarding the future of pharmaceutical sales**

by

**Rehan A. Khan**

M.B.A. Marketing  
Drexel University, 1998

B.S Economics with Mathematical Emphasis  
University of Wisconsin-Madison, 1993

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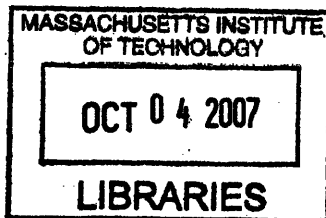
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Signature of Author: \_\_\_\_\_  
Harvard-M.I.T. Division of Health Science and Technology

Certified by: \_\_\_\_\_  
Teo Forcht Dagi, MD, MPH, MBA, Senior Lecturer  
Harvard – MIT Division of Health Science and Technology  
Thesis co-Advisor

Certified by: \_\_\_\_\_  
Pedro Huertas, MD, PHD, MBA, HST Affiliate Faculty  
Harvard – MIT Division of Health Science and Technology  
Thesis Co-Advisor

Accepted by: \_\_\_\_\_  
Martha Gray, Ph.D.  
Edward Hood Taplin Professor of Medical and Electrical Engineering  
Director, Harvard-MIT Division of Health Science & Technology



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## **Abstract**

The leading publicly traded pharmaceutical companies ("Big Pharma") in the US are facing a commercial crisis - their sales structure collectively consisting of more than 100,000 pharmaceutical sales representatives, originally setup to launch blockbusters, is suffering as a result of shrinking pipelines and low NME approvals. Although sales and marketing constitutes by far the largest corporate expense at 33% of revenues, sales productivity continues to decline.

The goal of this study is to explore how pharmaceutical sales will change over the next 5 – 7 years and more specifically explore the role technology (including the internet) will play in the sales process. The study focuses on testing the perceptions of two key stakeholders – pharmaceutical executives and current medical students (future physicians) regarding the future of pharmaceutical sales process. Accordingly, 33 individuals were interviewed of which 18 were pharmaceutical executives and 15 were future physicians.

The study tests three hypotheses:

1. Pharma executives believe that sales representative based detailing will continue to be the predominant method to engage and sell to physician customers while future physicians believe that technology will play a dominant role in the pharmaceutical detailing process.
2. Pharmaceutical executives agree that the most effective and ethical method to convey the benefits and challenges of an ethical pharmaceutical product are via a trained sales representative while future physicians believe that the sales representative does not effectively and ethically convey the merits of the relevant pharmaceutical therapy.
3. Person to person contact is not essential in conveying the merits of a particular ethical therapy – pharmaceutical executives disagree with this premise while future physicians agree.

The data sets were compared using the following statistical tests: Yates' chi-square test, Armitage's chi-squared test and Two sample test of binomial proportions. In conclusion, the data showed that the perceptions of pharma executives and future physicians were in concurrence with each other.

Thesis co-advisor: Dr. Teo Forcht Dagi, MD, MPH, MBA

Title: Senior Lecturer, Harvard – MIT Division of Health Science and Technology  
General Partner, HLM Ventures

Thesis co-advisor: Dr. Pedro Huertas, MD, PHD, MBA

Title: Affiliate Faculty, Harvard – MIT Division of Health Science and Technology  
Medical Director, Benson-Henry Mind Body Institute of Massachusetts General Hospital

*In memory of,  
Abbu  
and  
Agha Mamoon*

•

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# Chapter I: Introduction

## Thesis Objective

According to a report in the McKinsey Quarterly “the Pharmaceutical sales model is costly, inefficient and rife with dissatisfaction”<sup>11</sup>. All of the key stakeholders in the pharmaceutical sales process – physicians, sales representatives, sales managers and pharmaceutical firms feel that the “model is seriously flawed and needs to change in the longer term [5 – 7 years]”<sup>12</sup>.

In Arthur Miller’s classic play *Death of a Salesman*, the protagonist – Willie Loman, a salesman states that “ I never have to wait in line to see a buyer”<sup>18</sup>. I have been always fascinated by salespeople and in this thesis I am interested in combining an abiding interest in the Willy Lomans of the pharmaceutical industry with my previous 11 years experience in Healthcare in exploring how the “flawed” pharmaceutical sales model will evolve over the next 5 – 7 years.

Functionally, I am interested in understanding how two of the key stakeholders in the Pharmaceutical sales process – the pharmaceutical senior executives and future physicians perceive that pharmaceutical detailing will change over the longer term (5 – 7 years). More specifically I am also interested in exploring how innovative technologies, including the internet, will impact the pharmaceutical sales process.

Why does this area need to be explored? There are several compelling reasons for evaluating the Pharmaceutical sales process. The evolution of the pharmaceutical sales process over the next decade has profound strategic, commercial and human implications for the entire pharmaceutical sector.



Big Pharma spends over \$20 billion dollars per year in the US market in sales costs and there are over 100,000 pharmaceutical sales representatives in the US market selling several thousand ethical drugs to over 800,000 physicians. In my opinion a major change, for e.g. a reduction, in the sales force will have a significant multifactoral impact on the industry. For example, a 30% reduction in the sales force to 70,000 sales representatives will save the industry \$6billion dollars<sup>9</sup> but will have a significant and decidedly adverse impact on the morale of the commercial (sales and marketing) divisions of Big Pharma. Strategically, the method of selling using a live sales representative is an expensive method in an industry with shrinking margins and competitive pressure from generics.

The current Big Pharma sales model appears to be crumbling with declining productivity (discussed in detail in the sales and marketing section of the study). Thus, there appears to be tremendous value in doing a sense check of Pharma executive and future customer/physician perceptions of Pharma sales to explore what each constituent considers to be the “ideal way” for the sales process to be conducted in the future.

In my literature survey as well as in my previous professional experience in the Healthcare and pharmaceuticals sectors I have not seen any studies focusing on the perception of the future of the sales process from future customers' (current medical students) point of view; I have also not yet seen Big Pharma engage future physicians in a thoughtful and comprehensive manner.

With the wide spread usage of interactive multi channels like mobile/wireless, the internet and interactive TV and with the current medical student and future pharmaceutical industry customer (the future physician) using these technologies as part of their daily lives and often as part of their medical training, I also want to explore how pharmaceutical detailing will evolve to

accommodate these new customer touch points and how these new channels will impact the role of the pharmaceutical sales representative.

The geographical focus of the study is the US market and the functional focus is limited to the primary care sales (sales forces that focus on general practitioners and/or primary care physicians). I have interviewed 18 Director and Vice President level executives from large pharmaceutical companies ("Big Pharma") with worldwide revenues of more than USD 10 billion per year<sup>30</sup>.

The mean age of the pharmaceutical executives is 40.1 and all are mid career professionals with both country (sales and marketing affiliate e.g. the UK market) as well firm headquarters experience. Over 70% of the executives interviewed have work experience with more than one Big Pharma company and more than 50% have worked with 2 or more pharmaceutical, Biotech and/or Diagnostics firms. (This section is more fully discussed under Chapter 2: Methodology)

I also interviewed 15 future physicians from accredited US medical schools who intend to practice medicine in the next 5 – 7 years. All of these students are below the age of 25 and their mean age was 22. All of these future physicians have undergraduate degrees from accredited US institutions. (This section is more fully discussed under Chapter 2: Methodology)

This is intended to be a pilot study with a small sample size (n=33) and based on the initial data this could be scaled up to a larger project.

The assumptions regarding this study are:

- ❖ The internet “revolution” kicked off in 1996 – 2000 with the widespread usage of the Netscape browser and I am assuming that most individuals below the age of thirty have steadily and increasingly used the internet and other related technologies (wireless, iTV) in their personal and professional lives.
  
- ❖ I am also assuming that individuals who were already in the workforce by 1996 – 2000 (the 30+ year olds of today), may have begun to use the internet both professionally and personally (especially email) but the usage of the new multiple channels are not as pervasive in this demographic as it is in the under 30 years olds.

The key hypothesis I am looking to test are:

1. Pharma executives believe that sales representative based detailing will continue to be the predominant method to engage and sell to physician customers over the next 5 – 7 years while future physicians believe that technology (mobile, internet and interactive TV applications) will play a dominant role in the pharmaceutical detailing process.
  
2. Pharmaceutical executives agree that the most effective and ethical method to convey the benefits and challenges of an ethical pharmaceutical product is via a trained sales representative while future physicians believe that the sales representative does not effectively and ethically convey the merits of the relevant pharmaceutical therapy. Additionally, the pharmaceutical executives believe that the role of the sales representative will not be diminished due to the advent of the new technology developments in the future. The future physicians believe that the

role of the sales representative will be diminished as a result of new technological developments.

3. Person to person contact is not essential in conveying the merits of a particular ethical therapy – pharmaceutical executives disagree with this premise while Future physicians agree

Before embarking on an analysis of the perceptions of future physician customers and Pharma executives it is important to briefly review the history of the industry as well as some critical challenges facing this sector. The importance of highlighting these challenges can not be understressed – all of the challenges facing the industry have played a central role in the current bloated and broken state of the pharmaceutical sales model.

It is also important that a comprehensive analysis of the current sales and marketing model in the industry is undertaken to fully understand the context and changes that are going to affect the industry over the next 5-7 years.

### **Origin of the Pharma Industry**

In *The Global Pharma Industry – a case study*, Dr. Bernardo Batiz-Lazo states that “the origins of the modern pharmaceutical industry can be traced to the late 19th century, when chemical dyes were found to have antiseptic properties”<sup>3</sup>. For example, the Swiss Pharma companies - Roche, Ciba-Geigy and Sandoz (now Novartis AG) started out as family owned dye manufacturers based in Basel, Switzerland.

All three began synthetic pharmaceutical manufacturing in early 1900s and eventually became global corporations<sup>ibid</sup>. Penicillin was a major discovery for the emerging Pharma-chemical industry and 1940s onwards research and development (R&D) became firmly established within

the pharmaceutical sector. The industry expanded rapidly and extensively in the 1960s onwards, benefiting from new discoveries with introduction of legal safeguards like permanent patent protection. Regulatory controls on clinical development and marketing were relatively limited and healthcare spending boomed across US, Europe and Japan after World War II <sup>ibid</sup>.

Over the past 30 years the pharmaceutical Industry has emerged as one of the largest and more complex sectors in the world. Worldwide sales of prescription pharmaceutical drugs were estimated at \$602 billion in 2005<sup>1</sup> and are expected to continue growing at 7% - 10% over the next 5 years<sup>2</sup>. The industry has enjoyed compounded annual revenue growth in excess of 10% since 1981, when global pharmaceutical revenues were \$71 billion <sup>ibid</sup>. The US market has continued to be the largest healthcare and pharmaceutical market in the world - the Centers for Medicare and Medicaid Services reports that the US spent \$1.99 trillion on healthcare in 2005, and that \$200.7 billion was spent on prescription drugs<sup>4</sup>.

The US accounts for approximately 35% of worldwide sales and is the leader of the "triad" of geographies (US, Japan, Europe top five nations – Germany, France, UK, Spain and Italy) that account for 85% of total world wide Pharma sales. The US market has been the leading market for pharmaceuticals for a host of factors including a favorable pricing environment, high value biotech products and direct to consumer (DTC) advertising.

### **Pharmaceutical Industry Challenges**

Although the pharmaceutical industry operates in an especially complex R&D, regulatory and commercial arena, the growth of the sector is fueled by emerging demographic, epidemiological and economic trends.

According to Pharma 2020, a report published by the consultancy PriceWaterhouseCoopers, “The world population is growing and aging; new areas of medical need are emerging; and the diseases from which people in developing countries suffer are increasingly like those that trouble people living in the developed world. These changes will generate [significant] opportunities for the Pharma [industry]”<sup>4</sup>.

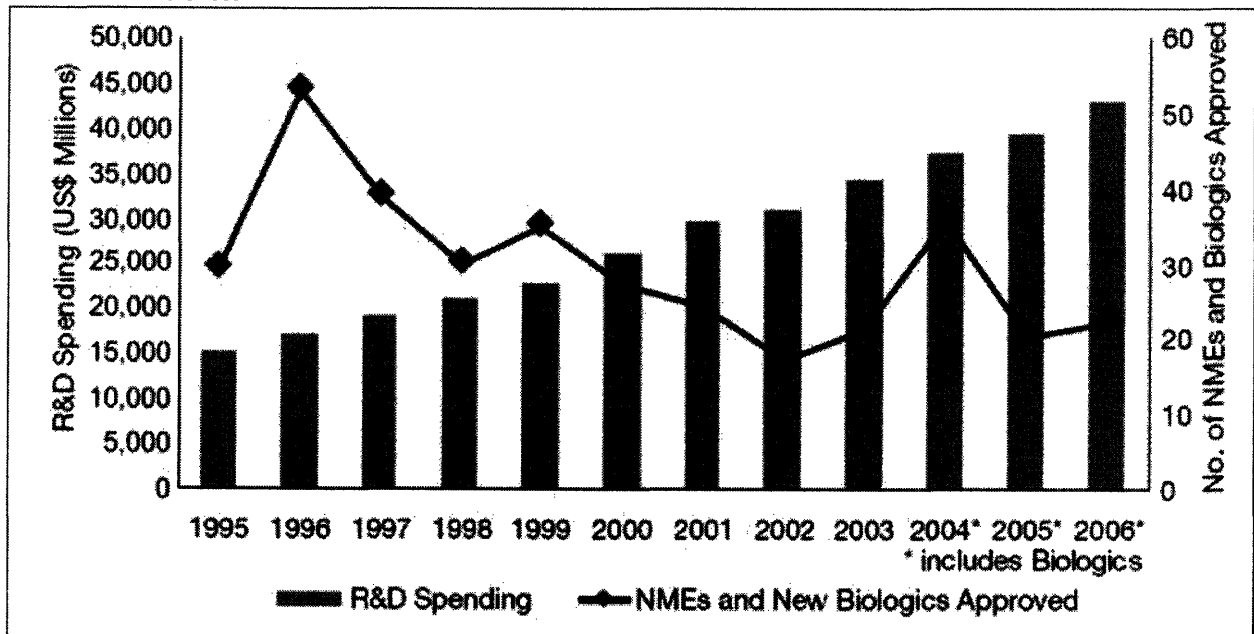
The global population is projected to rise from 6.5 billion in 2005 to 7.6 billion in 2020. The population is also rapidly aging; by 2020, about 719.4m people – 9.4% of the world’s inhabitants – will be aged 65 or more. Older people generally consume more medicines than younger people so these “third agers” will dramatically boost the need for medicines across the globe<sup>5</sup>. In the US, over the next 50 years, it is expected that the number of Americans over the age of 65 or older will be doubled<sup>2</sup>.

Despite the positive news on the demographic front, there are a number of serious issues befalling the industry beginning with the R&D challenge. Over the previous 70 years the industry has invested increasing amounts of resources in R&D in order to isolate compounds to better treat chronic diseases. The cost of discovering and developing a new chemical entity (NCE) continues to rise and according to Industry experts, the total cost of discovering, developing and bringing a successful compound to market is in the range of \$800 million pre-tax. This sum includes the \$150 - \$200M for the “failed compounds” that dropped off on the freeway to commercialization.

In 2006, North American spending on biopharmaceutical R&D reached a record \$55.2 billion (and the US accounts for about three-quarters of global expenditure in this area). The member companies of the Pharmaceutical Research and Manufacturers of America (PhRMA) spent an estimated \$43 billion, while non-member companies spent another \$12.2 billion<sup>7</sup>. But the US

Food and Drug Administration (FDA) approved only 22 new molecular entities (NMEs) and biologics, a far cry from the 53 it approved in 1996 when R&D expenditure was less than half the sum it is now. The industry is investing double the amount in R&D as it did 10 years ago and producing only 40% of the new medicines it then produced<sup>4</sup> (see figure 1 below):

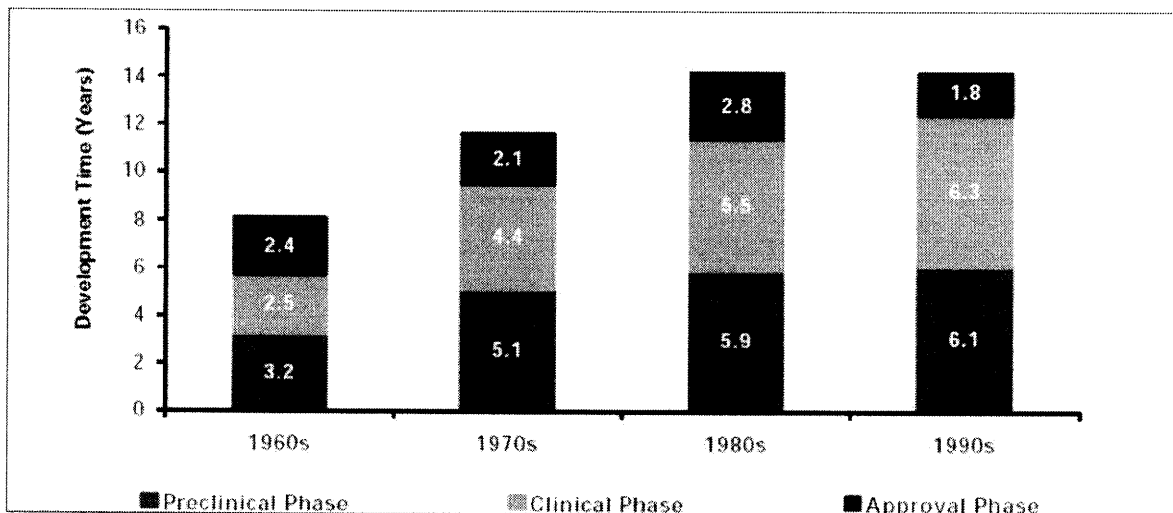
**Figure 1: R&D spending has soared but the number of NMEs and Biologics approved by the FDA is down<sup>4</sup>**



Although the industry has invested heavily in technology to establish technology platforms in order to industrialize the research process, the time to get product to market has been steadily rising over the past few decades.

As illustrated in figure 2 below, the time to get products to market has increased from an average of 8 years in the 1960s to nearly 15 years in late 1990s<sup>2</sup>. Today (2002 figures) nearly 70 clinical trials are undertaken for each new drug application (NDA) as compared to the much smaller sum of 30 in the beginning of the 1980s<sup>1bid</sup>. Additionally FDA has significantly increased the burden of proof required to prove efficacy and safety for a new filing and today (2002 figures) over 4,200 patients are required per NDA versus only 1300 in the 1980s.

**Figure 2: Time to get a new molecule to the market 1960s – 1980s<sup>2</sup>**



In 2006 only nine of the new treatments launched in the US market were organic developments i.e. came from the labs of “Big Pharma”. According to analysis conducted by the consulting company PriceWaterhouseCoopers, this pattern has not changed over the previous 3 years<sup>4</sup>. Finally, as the pharmaceutical industry has expanded, more money has been invested in R&D in search of new therapies. According to PhRMA estimates – the investment in R&D in the US market has increased tenfold (10x) over the past twenty years<sup>2</sup>.

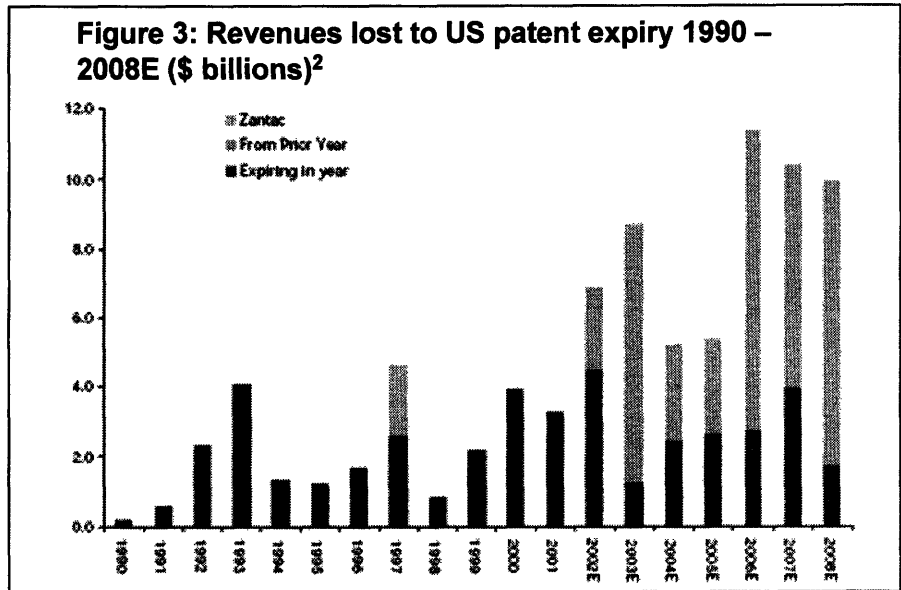
The Pharma industry is thus facing a “lack of products in the pipeline crunch” and this issue is exacerbated by a number of related and equally important challenges including intellectual property (IP) issues, market exclusivity shortening challenges, government/pricing issues and a variety of other commercial challenges (further discussed under the marketing and sales section of the thesis).

Big Pharma has enjoyed record margins and robust financial success in the 90s and early 2000s based on discovering and patenting a large number of drugs across a variety of therapy



areas. Most of these drugs were therapies for chronic diseases. According to IMS Health<sup>8</sup> there were 94 global blockbusters (drugs with worldwide sales of greater than \$1 Billion) in 2005, up from 34 in 2000. Since the early 2000s, there has been significant pressure on Big

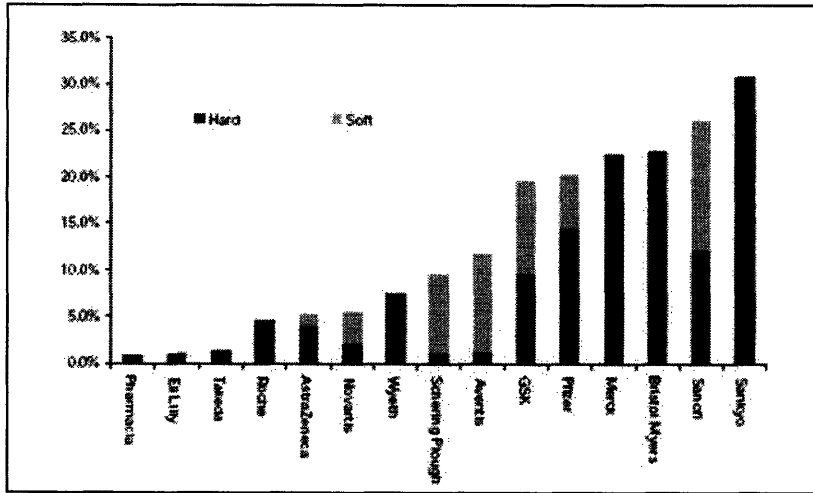
Pharma to “plug the gap” in their pipeline from expiring patents (see Figure 3). Throughout 2002 and 2003 several of the majors including BMS, Eily Lilly, GSK, Merck and Schering Plough were forced to communicate to Wall



Street a reduction in earning expectations based on patent expirations of their blockbuster products<sup>2</sup>.

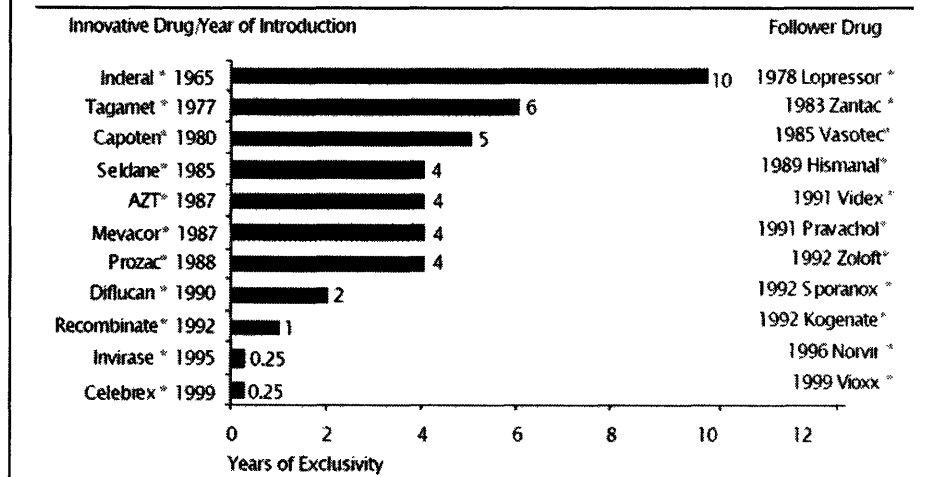
According to Lehman Brothers, in 1998 – 2002, Big Pharma firms launched an average of 59 drugs per year but this rate is on the decline: in 2002 – 2006 only 50 drugs were expected to be launched<sup>9</sup>. Additionally, all of the top 10 Big Pharma companies’ revenue growth over the next decade is bound to come under severe pressure and as evident by figure 4 (below) all of the leading Big Pharma firms have been facing a revenue crunch over the past 5 years due to patent expiry.

**Figure 4: US exposure by company (% 2002E sales) <sup>2</sup>**



Another related and urgent issue that is affecting the industry is market exclusivity by drug class. The competition amongst the drugs by therapy class has increased dramatically over the past 20 years with most of the Big Pharma majors indulging in launching

**Figure 5: Years separating first in class from first imitator<sup>2</sup>**



drugs that are essentially a copy of their competitors' product – colloquially these drugs are called “me too” products and they have affected every aspect of the industry – from R&D to sales and marketing.

The “me too” drugs that address the same medical condition as their competitors are usually marketed heavily to prescribing physicians and since 1997 have also had the added benefit of

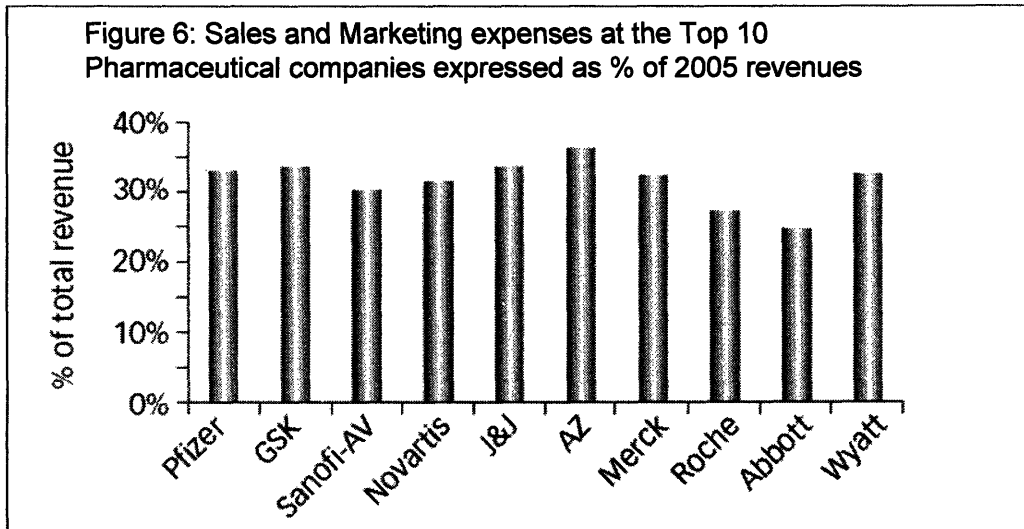
encouraging patient customers via direct to consumer marketing (DTC) to request their physicians for a particular drug brand.

These me too drugs have been entering the market at an increasing rate. For example<sup>2</sup> almost 6 years separated the launch of the ulcer drug Tagamet™ and its follow up product Zantac™ but only 6 months separated the launch of the first COX2 inhibitor Celebrex™ and the second product to market which was Vioxx™ (see figure 5 on the previous page).

All of the above mentioned challenges have affected the sales method the industry uses to sell the products to physicians and the launch of “me too” products have had an especially damaging affect on the long term credibility and direction of the industry. With the launch of multiple me too products, each pharmaceutical company needs to convince prescription writers (physicians) and prescription consumers (patients), that their me too product is better than a comparable therapy marketed by a rival firm.

Thus began a sales force arms race in mid 1990s led by Pfizer with the largest US sales force of 12,000 reps (50% of the company's world wide sales force)<sup>10</sup>. There are now (2007 figures) nearly 100,000 sale representatives in the pharmaceutical industry<sup>11</sup> and this is the leading cause for the dramatic rise in sales and marketing expenditure for Pharma companies. Sales and Marketing is far the biggest corporate expense for a Big Pharma company at 33.1% of sales (R&D by comparison is only 17.1%)<sup>4</sup> – see figure 6 below.

Figure 6: Sales and Marketing expenses at the Top 10 Pharmaceutical companies expressed as % of 2005 revenues

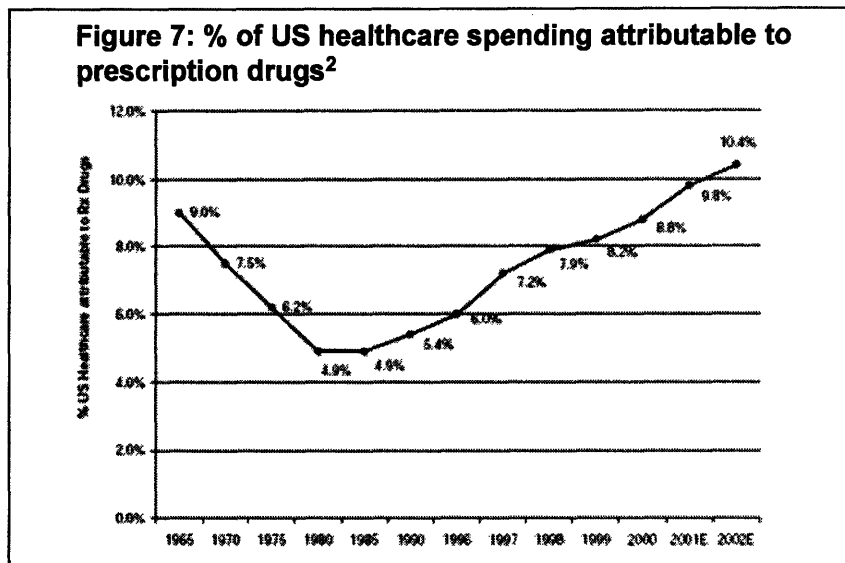


This issue is discussed in the next section but it is important to note that the launch of me too products has diverted R&D, marketing, sales and management attention and resources away from discovering new therapies to focusing on maximizing the sale of similar therapies.

Government and pricing has also played a significant role in putting pharmaceutical industry

under pressure. All ethical products marketed by the industry have to be approved by a regulatory authority and in most markets with the exception of the US market; prices are controlled by

Figure 7: % of US healthcare spending attributable to prescription drugs<sup>2</sup>



government controlled bodies. As discussed earlier in the thesis, an ageing population demands more pharmaceutical drugs and thus the government will want to control the prices of drugs more tightly. In the US, the high (and increasing) cost of drugs (see figure 7) and the

increasing cost of medical health insurance is exerting social, political and legislative pressure on the pharmaceutical industry.

Finally, the notion of “trust and reputation” as a reflection of corporate health can not be underscored specially in the pharmaceutical industry, whose life mission is viewed by the general public as “in the business of saving lives”. The reputation of the pharmaceutical industry has continued to decline over the past two decades.

According to the Kaiser Family foundation which conducted a national poll regarding the publics’ views on prescription drugs and the pharmaceutical industry: “Although the public is generally positive about the value of prescription drugs to society, they have much more mixed views of pharmaceutical companies themselves. One-half of all adults have an unfavorable opinion of pharmaceutical companies with drug companies ranking [just] ahead of oil and tobacco companies in favorability, but behind many other groups such as hospitals, airlines and banks.”<sup>14</sup>

This negative reputation and lack of trust has a direct effect on the physician customers and consumer (patients) of the pharmaceutical industry’s products and this puts further pressure on the industry both from reputation as well as commercial perspectives.

### **Traditional Sales and Marketing models in the Pharmaceutical Industry**

Pharmaceutical marketing has evolved slowly from the early 1950s from being a primarily a scientific based sale targeted at physicians and focused only on the clinical benefits of a product to a full blown marketing and sales machinery that still uses principles of scientific data as its base but employs many marketing and sales principles from consumer goods and automobile industry. Additionally the target of the marketing and sales pitch has expanded beyond the physician customer to include hospital and/or doctor’s office staff, registered nurses, medical

students/future physicians, residents, fellows, academic researchers, patients, caregivers and pharmaceutical benefit managers (PBMs) and payors.

As discussed earlier, with the advent of me too drugs and generics the importance of sales and marketing for a new and/or existing drug can't be undervalued. Since branded, patented drugs have limited peak sales potential, Big Pharma has recognized that it is urgent that a full suite of marketing and sale firepower be unleashed so that the drug can achieve its full revenue potential in the shortest period of time in its lifecycle. The lifecycle of an ethical drug can be roughly broken into five distinct phases: pre-launch, launch/growth, extension/maintenance, maturity and patent expiry / generics.

*The pre-launch phase* of a drug can take as little as 2 years and as much as 8 years. This is the period when the drug compound is in the clinical trial and registration process and a number of internal and external events need to happen before the drug can be converted into a launchable product. Internally, clinical trials are structured and clinical endpoints determined based on patient and market needs.

The resulting data dossier is successful if all the clinical endpoints are met, with minimum safety issues and with the highest efficacy. Once this process is completed the global marketing teams work with marketing agencies to create a marketing platform that can be used to launch the product. Externally, the marketing and medical teams works with senior physicians (called "opinion leaders") to publicize the attributes of the product through symposia and clinical trials results in peer reviewed publications.

*The launch phase* of the drug is when the majority of financial, people, opinion leader and marketing resources are invested to inform the prescriber community about the positive

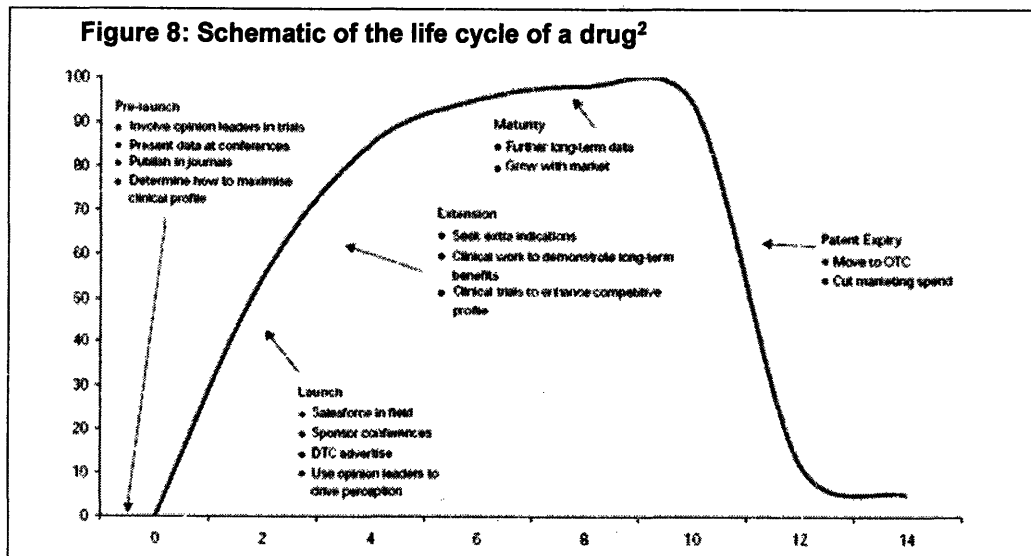
attributes of the product. This education is also seeded to payors, pharmacists as well as to consumers and caregivers via DTC advertising.

*The extension / maintenance phase* of a drug involves extending the patent life of the product by gaining new clinical indications for a new demographic (e.g. pediatric) or a related medical condition. Additionally further clinical trials can be conducted to prove further or longer term efficacy, safety or tolerability especially as it relates to the competition.

*The maturity phase* of a product usually involves slowly tapering off the marketing and sales spend and moving the product to a “milk” stage – since the investment is limited at this stage, most of the revenue can be captured as profit.

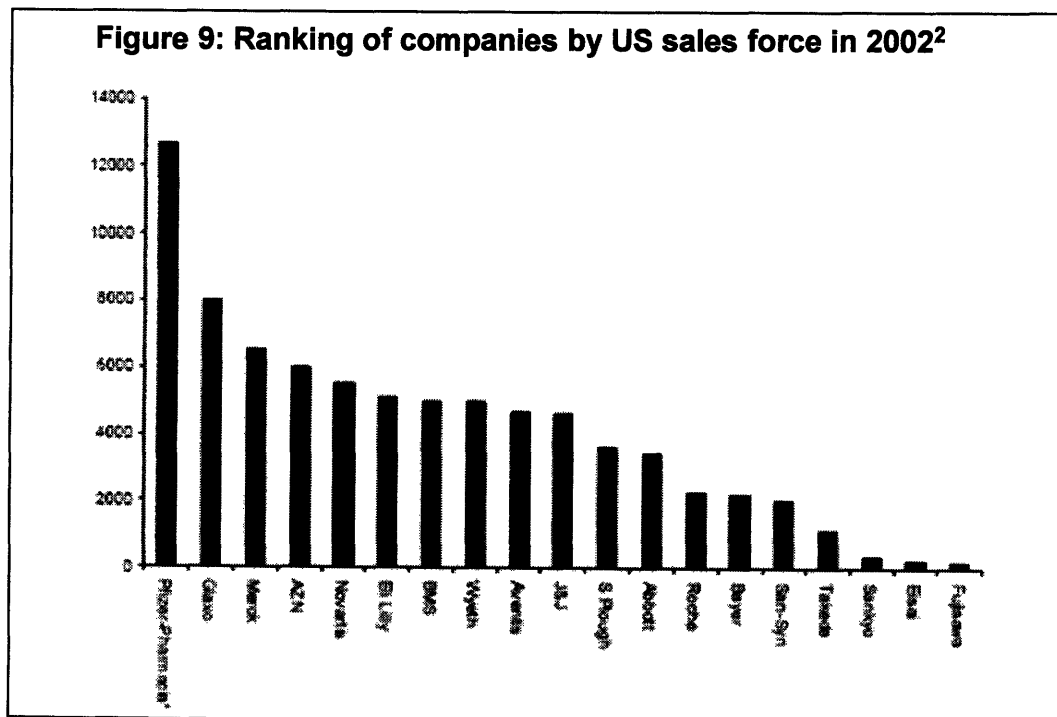
At the final *patent expiry phase* upto 90% of the revenues may be lopped off due to the entry of generics and any activity – whether lifecycle extension or legal remedies that adds months or years to the patent life can be substantially commercially beneficial.

Figure 8 (below) outlines the broad marketing and sales processes at each phase of a product's lifecycle:



This often limited time frame for exclusivity (average 10 – 12 years) has led to the advent of DTC advertising in 1997 and an increase in the size of the sales force from 35,000 in 1997 to over 100,000 today (also see figure 9 on the next page)<sup>15</sup>. This has also led to a tripling of promotion spending. A study conducted by the New England Journal of Medicine showed that in the US market from 1996 to 2005 pharmaceutical promotional spending grew from \$11.4 billion to \$29.9 billion<sup>16</sup>. The study also showed that direct to consumer advertisements increased 330% to \$4.2 billion over the same period.

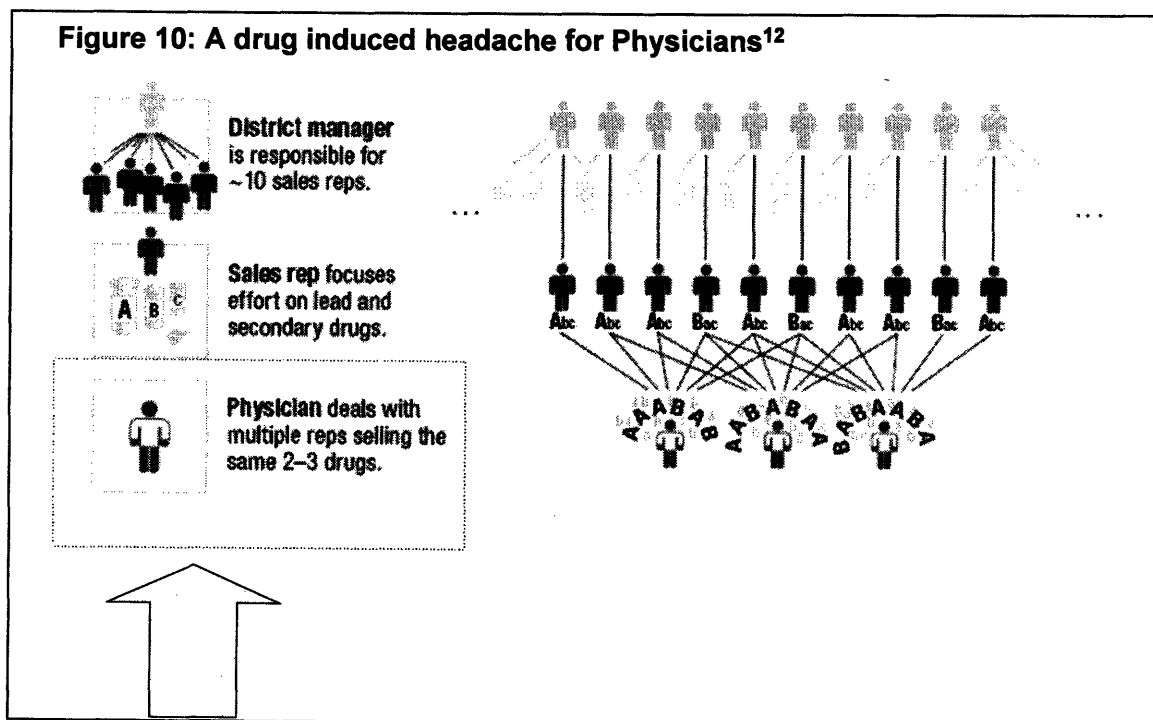
The key lever for the successful launch and maintenance of a drug in the marketing and sales arsenal has been the size of the sales force. As mentioned earlier Pfizer with its sales force of 12,000 was able to become the largest pharmaceutical company in the US market as well as globally.





US Pharma spends \$20 billion per year on their sales force and the average cost to the company of one sales representative is \$200,000 per annum<sup>9</sup>. As previously mentioned, the US sales force has tripled over the past two decades and this is by far the most expensive line item on the P&L of a Pharma company. Unfortunately, this highly compensated and collectively hugely expensive resource is also extremely inefficient.

According to a study conducted by McKinsey & Company<sup>12</sup> “US pharmaceutical firms for decades have relied on the pin ball wizard sales model”. In this model, sales representatives bounce around from one doctor’s office to another in the hope of engaging the physician for 30 seconds and influencing them to write a prescription. This model is also known in the industry as “mirroring” with a high prescribing physician being targeted by 12 - 15 sales representatives from the same company *every month*<sup>15</sup> and each representative repeats similar lines from the same script (called visual aid) every time they are in front of a physician (see figure 10).



Each sales representative usually has “3 drugs in the bag” to sell (called P1, P2 and P3 in the industry). The drug in the P1 slot (the lead drug) gets the most amount of attention in selling to the physician and a representative’s incentive compensation is leveraged to reflect the sales success of the P1 (lead) and P2 (secondary) products. The P3 product is usually a sample drop off.

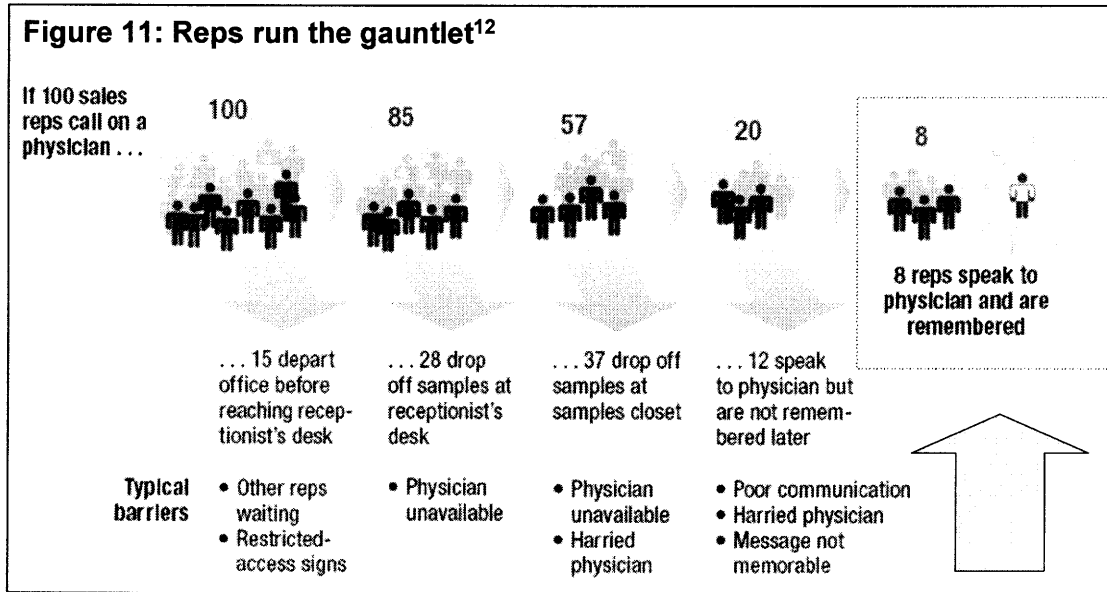
To make matters more complicated, one sales representative’s P1 (lead drug) is another representative’s P2 and so on and so forth. Thus, when different sales representatives call on the same physician they compete with their colleagues to sell the same products. The theory behind this “pin ball wizard model” is that eventually one representative will be able to convince the physician to write the prescription as well as reduce the impact of the competitor’s sales representatives.

This high muscle, high pressure model has been successful for the industry as each firm rolled one blockbuster after another over the previous 20 years. In recent years, due to the launch of a horde of me too products, the decline in the pipeline of new blockbuster products and a dramatic rise in the number of sales representatives the “pin ball wizard” model has come under severe pressure.

Estimates of the amount of face time US sales representatives get with physicians varies from 20 seconds to less than two minutes <sup>18, 12</sup>. According to the McKinsey study mentioned earlier<sup>12</sup> - a rep only gets to speak to a physician in one out of only five office visits and out of a 100 sales representatives departing out of the company in the morning 12 manage to speak to the physician and only 8 are remembered (see figure 11 below). Bain and Co estimates that a

pharmaceutical sales representative now (2004) makes about 750 sales calls on physicians as compared to approximately twice that amount (1450) in the mid 1990s<sup>32</sup>.

Furthermore, according to AC Nielsen<sup>32</sup>, the return on investment on each dollar invested in traditional drug detailing has fallen from \$3.34 in the mid 1990s to about \$1.25 today (2005).



According to another article on pharmaceutical productivity by Bain and Company “the commercial side [of Big Pharma] has seen a similar decline in productivity. Physician details have become almost twice as expensive, evidenced by the drop in sales representatives’ productivity of nearly 50% over the past seven to eight years [2003]<sup>33</sup>.

Research and opinions on how much the Physician remembers of the “visual aid” and the product being sold are equally dismal<sup>18</sup> – physicians only remember the products pitched by 2 – 5 representatives. This number is fast approaching the customer conversion figures (2.5%) in the direct marketing business (telemarketing, catalogue based), which are a fraction of the cost and do not involve all the related management and goodwill issues.

The strain in the process is reflected in the key stakeholders in the sales continuum (Representatives, Sales Management, physicians, pharmaceutical company management) feeling frustrated and overwhelmed<sup>12</sup>. Sales representatives feel badly compensated and under trained; sales managers will overwhelmed with the amount of administrative work managing the increasing number of representatives; physicians feel under attack and pharmaceutical management view the escalating cost (and declining productivity) with alarm.

With the increasing pressure to convert a pitch to a prescription, it is not surprising that sales reps feel under immense amounts of strain. Additionally, sales reps feel that they are under trained and given a script to pitch to physicians. According to the McKisney study <sup>12</sup> that interviewed several hundred reps, found them to be poorly informed and less experienced than representatives from even 5 – 7 years ago. Some 80% of the sales executives agreed that the training of sales force has been significantly impacted as the size of the sales force has ballooned.

Sales managers (district managers, regional managers) feel equally burdened. They must hire, train, supervise and evaluate reps, serve as the eyes and ears for the corporate marketing department and manage relationships with the high prescribers. There is additional pressure on their time in managing the expanded field force while still working on administrative activities that don't generate revenue. This leaves limited time to train, coach and provide feedback to sales representatives. Furthermore, the compensation of the managers is linked to the performance of the sales representatives making the motivation and performance of the sales managers a long term issue as well.

Physicians feel “besieged” <sup>12</sup> - top prescribing physicians feel that they do not receive the information required to prescribe a particular product – the sales representative parrots the

standard script to the physician but is usually incapable of having an informed, scientific and facts based “pros and cons” discussion with the physician. Doctors are also interested in finding out if the particular drug is reimbursed by the HMO and patients’ views on the drugs but the sales representatives are not trained to engage the physician at this level and can only recite the script handed to them by the marketing teams at the corporate office.

So, the obvious question that arises is: what are the ideal number of sales representative visits to the doctor? With \$20 billion being spent on sales forces in the US<sup>9</sup> and with the average sales representative logging in 7-10 visits per day, this is a central question. According to research conducted by MedSite Inc.<sup>30</sup> the ideal number of visits is somewhere between 1 and 7 with 2 visits ensuring as many incremental scripts as 5 visits (see figure 12 below). Although this study is not all encompassing it does go to show that the 15 – 17 visits are a hugely inefficient and a significant waste of resources and goodwill.

**Figure 12: Rep returns**

Number of Visits or Details	Number of Prescriptions
19.02	117.11
11.34	107.34
7.37	104.43
4.53	103.17
2.44	103.73
1.12	103.98
.30	104.10
0	89.00
0	86.38
0	89.97

There is also a less savory aspect of the sales representative and the physician relationship that needs to be outlined. The physicians often tend to view the sales representatives as nothing

more than glorified sample closet fillers and as the door opener to other financial benefits like meals, golf outings, symposia dinner and congress/convention sponsors<sup>18</sup>.

The pharmaceutical sales machine on the other hand has a more complex relationship with the Physician for obvious, commercial reasons. In “Following the script: how drug reps make friends and influence Doctors”<sup>20</sup>, former sales representative Shahram Ahari describes (see Figure 13 on next page) some of the ways by which physicians are manipulated by the representative.

## Table 13: Tactics for Manipulating Physicians

Category	Technique	How It Sells Drugs	Comments
Outgoing and friendly	I frame everything as a gesture of friendship. I give them free samples not because it's my job, but because I like them so much. I provide office lunches because visiting them is such a pleasant relief from all the other docs. My drugs rarely get mentioned by me during our dinners.	Just being friends with most of my docs seemed to have some natural basic effect on their prescribing habits. When the time is ripe, I lean on my "friendship" to leverage more patients to my drugs...say, because it'll help me meet quota or it will impress my manager, or it's crucial for my career.	Outgoing, friendly physicians are every rep's favorite because cultivating friendship is a mutual aim. While this may be genuine behavior on the doctor's side, it is usually calculated on the part of the rep.
Humility and skeptical	I visit the office with journal articles that specifically counter the doctor's perceptions of the shortcoming of my drug. Armed with the articles and having hopefully scheduled a 20 minute appointment (so the doc can't escape), I play dumb and have the doc explain to me the significance of my article.	The only thing that remains is for me to be just aggressive enough to ask the doc to try my drug in situations that wouldn't have been considered before, based on the physician's own explanation.	Humility is a common approach to physicians who pride themselves on practicing evidence-based medicine. These docs are tough to persuade but not impossible. Typically, attempts at geniality are only marginally effective.
Mercenary	The best mercenary docs are typically found further down the prescribing power scale. There are plenty of 6's, 7's, and 8's [lower prescribing doctors] who are eagerly mercenary but simply don't have the attention they desire fawned on them. I pick a handful out and make them feel special enough with an eye towards the projected demand on my limited resources in mind. Basically, the common motif to docs whom you want to "buy out" is to closely associate your resource expenditure with an expectation—e.g., "So, doc, you'll choose Drug X for the next 5 patients who are depressed and with low energy? Oh, and don't forget dinner at Nobu next month. I'd love to meet your wife."	This is the closest drug-repping comes to a commercial exchange. Delivering such closely associated messages crudely would be deemed insulting for most docs so a rep really has to feel comfortable about their mercenary nature and have a natural tone when making such suggestions.	Drug reps usually feel more camaraderie with competing reps than they do with their clients. Thus, when a doctor fails to fulfill their end of the prescriptions-for-dinners bargain, news gets around and other reps are less likely to invest resources in them.

Category	Technique	How It Sells Drugs	Comments
Prescribers	I rely on making a strong personal connection to those docs, something to make me stand out from the crowd.	Friendship sells. The highest prescribers (9's and 10's) are every rep's sugar mommies and daddies. It's the equivalent of spitting in the ocean to try to buy these docs out because, chances are, every other rep is falling head over heels to do so.	The highest prescribers receive better presents. Some reps said their 10's might receive unrestricted "educational" grants so loosely restricted that they were the equivalent of a cash gift, although I did not personally provide any grants.
Competing	The first thing I want to understand is why they're using another drug as opposed to mine. If it's a question of attention, then I commit myself to lavishing them with it until they're bought. If they are convinced that the competitor drug works better in some patient populations, I frame my drug to either capture another market niche or, if I feel my drug would fare well in a comparison, I hammer its superiority over the competing drug.	If, during the course of conversations, the doctors say something that may contradict their limited usage of our products, then the reps will badger them to justify that contradiction. This quickly transforms the rep from a welcomed reprieve to a nuisance, which can be useful in limited circumstances. We force the doctors to constantly explain their prescribing rationale, which is tiresome. Our intent is to engage in discourse but also to wear down the doc until he or she simply agrees to try the product for specific instances (we almost always argue for a specific patient profile for our drugs).	For reps this is a core function of our job. We're trained to do this in as benign a way as possible. No doc likes to be told their judgment is wrong so the latter method typically requires some discretion.
Doctors	Most docs think that if they simply agree with what the rep says, they'll outsmart the rep by avoiding any conflict or commitment, getting the samples and gifts they want, and finishing the encounter quickly. Nothing could be further from the truth. The old adage is true, especially in pharmaceutical sales: there is no such thing as a free lunch.	From the outset of my training, I've been taught to frame every conversation to ultimately derive commitments from my clients. With every acquiescent nod to statements of my drug's superiority I build the case for them to increase their usage of my product. They may offer me false promises but I'll know when they're lying: the prescribing data is sufficiently detailed in my computer to confirm their behavior. Doctors who fail to honor their commitments, no matter how casually made, convert the rep into a badgering nuisance. The docs are often corralled into a conversational corner where they have to justify their previous acquiescence.	Gifts are used to enhance guilt and social pressure. Reps know that gifts create a subconscious obligation to reciprocate. New reps who doubt this phenomenon need only see their doctors' prescribing data trending upwards to be convinced. Of course, most of these doctors think themselves immune to such influence. This is an illusion reps try to maintain.



These “finely titrated”<sup>20</sup> dosage of friendships between the sales representatives and the physician have resulted in a severe lack of trust and lack of credibility for the sales representatives and as well as cheapened the reputation of the pharmaceutical industry.

Pharmaceutical firms know well that the key to a successful sale is developing a long term relationship with physicians and the above mentioned complexities have made evident that the traditional sales model of the pharmaceutical industry is broken and need to be fixed.

### **Innovative sales models in the Pharmaceutical Industry**

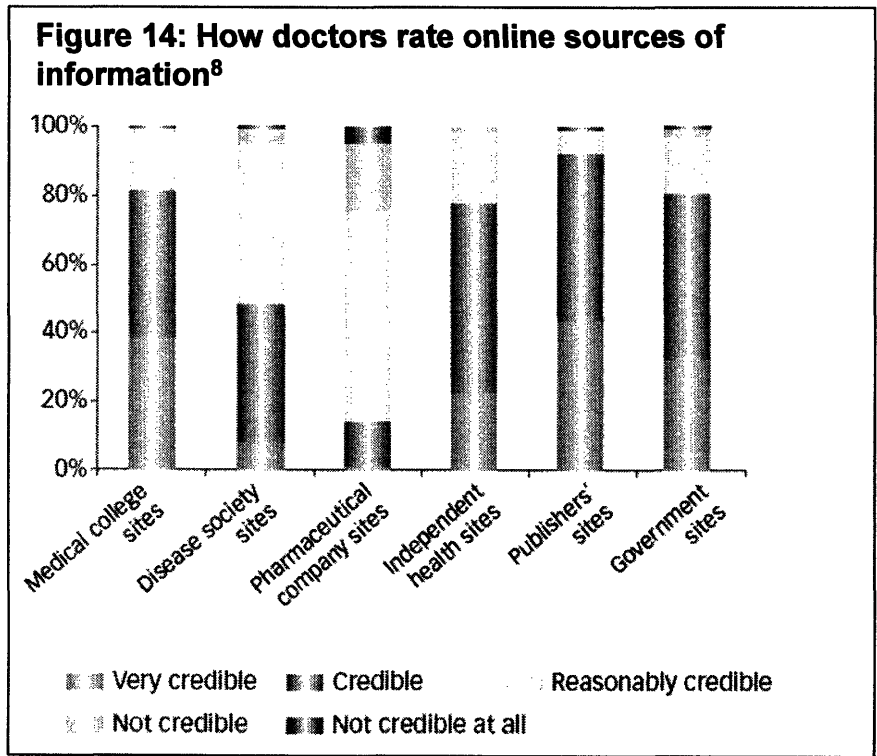
With the advent of the internet, online sales to physicians emerged in the late 1990s. These new online sales ventures grouped under the term “eDetailing” are defined by Datamonitor as “the use of the Internet as the medium of communication for the pharmaceutical sales detailing of physicians”<sup>21</sup>. There are a number of eDetailing models including the following:

- Push: multiple sales representatives sitting in a call centre type location and speaking to the physicians with a pre-arranged appointment
- Pull: Physician goes online and accesses the detail himself. There is usually a reward at the end of the detail including medical books/atlas etc
- Mix of push and pull: Physician is contacted with a short pre-arranged appointment, detail discussed and then he can, at his/her leisure explore an interactive website or a Continuing Medical Education (CME) site.

Since the late 1990s more than 15 eDetailing companies emerged but very few large players remain today<sup>21</sup> – this limited success is due to a number of both customer (Big Pharma) and well as market timing reasons.

Despite multiple successes of eDetailing models with return on investment business cases of upto 500% (\$5 generated for every \$1 invested)<sup>21</sup>, Big Pharma has been reluctant to embrace eDetailing in any significant manner. There are multiple reasons, both historical and cultural for this lack of traction.

Firstly, Big Pharma had spent tens of millions of dollars<sup>22</sup> on exploring the “eBusiness” sector in the late 90s through 2003 and also spent considerable amounts of money developing their own product websites. Once these websites were developed, it became evident that prescribing physicians viewed these sites as an extension of detailing. In an OnMedica study conducted in 200<sup>8</sup>5 only 15% of physicians surveyed believed that these sites were credible, whereas more than 75% believed that content on medical school sites, publishers’ sites and government sites could be trusted (see figure 14 below).



Another key reason for the reluctance of Big Pharma executives to commit to eDetailing is the disintermediation of the “ownership of relationship” that they claim exists between the sales representative and the doctor. In reality, with 12-15 sales representatives visiting the doctors per day these relationships are getting increasingly rare. Also, In my experience, no one company “owns” the relationship with a key prescriber – this ownership of a relationship (even if this does happen) is harmful for all involved – the physicians lose credibility with their peers and may even do so with her patients. The patients do not get the best quality of care for their disease and the pharmaceutical firm is accused of “soft bribery”.

Thus the best a pharmaceutical firm can do is to encourage the Physician to prescribe their products based on solid scientific and clinical data and although are positive aspects of developing a relationship with the Physician, the sales representative can be supported by online tools.

Additionally, many Pharma firms claim that not many physicians are interested in eDetails but in fact this is not entirely true – more than 65% of all physicians in the US access the internet at least once per day for work related purposes<sup>9</sup> and in multiple surveys physicians have expressed their desire to be communicated to at their leisure and via an online channel (see figure 15 on next page).

The economics of the eDetail is also solid as compared to the offline channel. Research conducted by OnMedica<sup>23</sup> shows that message recall from controlled eDetailing are very high. According to the OnMedica study “In follow up studies of 607 doctors who received eDetails on five different products, between 50% and 80% of the respondents spontaneously recalled the product key message”.

Furthermore “63% said that they expected to increase the number of prescriptions they wrote for the product concerned – the physicians estimated that that they had written an average of 7.6 prescriptions (excluding repeats) in the 3 months preceding the eDetail but anticipated writing 10.3 prescriptions in the 3 months following the eDetail – an increase of 35.5%<sup>23</sup> .

**Figure 15: Doctors preferred channels for receiving product information<sup>23</sup>**

Promotion Type	1 (most preferred)	2	3	4	5	6 (least preferred)
Representative visit	11%	16%	20%	19%	14%	21%
Postgraduate meeting	50%	17%	9%	8%	7%	8%
E-detail	21%	28%	20%	16%	9%	6%
Promotional meeting	4%	17%	23%	22%	22%	11%
Advertising	7%	13%	16%	15%	23%	25%
Mailing	6%	8%	13%	20%	25%	29%

Additionally, in a controlled analysis of a product launch in 2006, an IMS Health / OnMedica study showed that eDetailing for a product that was launched recently (2006) cost 70% less than person sales representative based detailing for the same product would have cost. Also, the sales increased generated as a result of the eDetail was 29% vs. 11% for the sales representative detail. Finally, the end of year analysis showed that the return on investment (ROI) on the eDetail campaign was 23% while it was -87% for the live sales representative based campaign.

It needs to be mentioned that the above case study is not all inclusive – ROI and investment will vary by therapy area, geographical location in the country, time of product launch and competitive landscape but it does go to prove that the online channel is well accepted by the Physician customers and the key issue lies in Big Pharma being reluctant to make major changes in the way that the sales process is rolled out. Finally, a few Pharma companies have already begun to move away from full time sales representative to the online channel with

Wyeth being a case in point – it moved away from 100% full time sales representative based model to a mix of full time, part time and eDetailing based one<sup>29</sup>.

## Chapter 2: Methodology

### Questionnaire design

An interview questionnaire was created with several key goals:

- ❖ I wanted the questionnaire to fully explore the *perceptions* of pharmaceutical executives and future physicians. It is important to distinguish perception from a *fact based* approach. Since all the Pharma executives had some exposure to sales and marketing I wanted to ask them questions that would challenge conventional heuristics or “facts” as they are known in the industry (e.g. sales forces are the best way to market pharmaceuticals), without alienating the interviewee.
  
- ❖ I also wanted to ask questions that would stay away from hard data i.e. sales/prescription/market share data and explore the “personal opinion” of the Pharma executive interviewee. It is important to note that I requested each of the Pharma executives to not focus on their current company and role but answer questions more holistically keeping their entire experience (including non pharmaceutical / healthcare industry related) in mind when answering the questions. Similarly, I requested the future physicians to “stretch their imagination” and answer questions looking ahead 5-7 years when they will be practicing physicians.
  
- ❖ I wanted to keep the questionnaire design at a simple and basic level since the same questionnaire was to be used both for the future physicians as well as for Pharma

executives. This proved to be challenging especially in light of the fact that more than 70% of senior executives rated the questionnaire to be far too simple (e.g. sales strategies for a product differ by life cycle stage the product is in). On the other hand, most future physicians found the questionnaire to be simple and straightforward. As a result there were a number of questions that I had to omit asking but I wanted to ensure that all interviewees answered all the questions as thoroughly as possible and thus it was essential that some more technical, sales related topics not be included in the survey.

- ❖ The questions were grouped into four separate sections, namely – pharmaceutical sales exposure, Internet/technology exposure, pharmaceutical sales exposure and pharmaceutical sales and new technologies. Each of the sections were meant to tease out the perceptions and experiences of the interviewees and to collect data to test each of the three hypothesis (see page 12 for details).

### **Interviewee Selection**

The total sample size for the interview was thirty three individuals (n = 33).

I interviewed 18 Director and Vice President level executives, above the age of twenty eight (28) from large pharmaceutical companies (“Big Pharma”) with worldwide revenues of more than USD 10 billion per year<sup>30</sup>.

The mean age of the pharmaceutical executives was 40.1 their ages ranged from 28 to 59 with a median of 40. More than 90% were mid career professionals with both country (sales and marketing affiliate e.g. the UK market) as well firm headquarters experience. Additionally, the executives were from more than 10 different nationalities including Swiss, US American, British,

Indian, Egyptian, Italian and Canadian and more than 90% had worked outside their country of origin.

The selection of executives with both HQ and local experience was a critical selection factor – I did not want executives with only headquarters based experience as exposure and experience with local (affiliate) based sales process is essential to authoritatively discuss the topic of future sales models. All executives had some experience and exposure to the US market.

Over 70% of the executives interviewed had work experience with more than one Big Pharma company<sup>34</sup> and more than 50% had worked with 2 or more pharmaceutical, Biotech and/or Diagnostics firms. Again, this was an important criterion in selecting the interviewees as a broad based exposure (in my opinion and assumption) would have provided more refined and qualified answers.

I also interviewed 15 future physicians from accredited US medical schools who intend to practice medicine in the next 5 – 7 years. All of these students were below the age of 25 and their mean age was 22. All the future physicians have undergraduate degrees from accredited US institutions. 90% of the future physicians that answered the questions were in their first or second year of the four year program.

Over 90% of the future physicians were enrolled at Harvard Medical School. More than 90% of the future physicians had no one-on-one experience with pharmaceutical representatives. All of them had been exposed to the pharmaceutical sales rep either in a personal situation (e.g. parent is a Physician), as a result of an internship in a hospital or knew a friend who had gone on to become a sales representative. Of course most future physicians had read in popular media about pharmaceutical reps and thus this was part and parcel of their perception.

## **Interview Process**

The interview process was divided into two phases. After creating the initial questionnaire I circulated it for review and upon feedback sent emails to 43 individuals soliciting an interview. This group was not evenly divided between pharmaceutical executives and future physicians: 25 requests were sent to pharmaceutical executives while only 18 were sent to Future physicians. There was no strategy behind the unevenness of this sample size, except that my personal network amongst pharmaceutical industry professionals is much stronger as compared to my network in the medical student community.

This was further validated by the quick turnaround from my former colleagues in the pharmaceutical industry – within a few days of emailing the questionnaire, I had scheduled 18 interviews. The response time from future physicians was relatively slower – it took me multiple emails, phone calls, further solicitations from their fellow future physicians in order to get the interview questionnaire filled out.

Another noticeable difference was the desire of the Pharma executives to insist on having a phone or face to face conversation, while most future physicians were happy to fill out the questionnaire and send it back via email, although I was able to convince over 90% of the medical student interviewees that a face to face chat would be more conducive to this survey.

There could be a number of speculations regarding the divergent behavior of executives and future physicians. My strong sense was that the brand power of MIT/Harvard brand had a net positive effect on the executives and they were eager for their comments to be included in this survey. Additionally I had a strong personal and professional connection with most of the



executives and had worked for upto 5 years with some of them. This certainly played a positive role in the quick turnaround and detailed, in depth discussions with them.

Contrastingly I felt that the future physicians are used to surveys and thesis processes and there was a sense of “déjà vu” when I sent the email regarding the survey. Several future physicians responded that they did not feel qualified enough to discuss pharmaceutical sales but were happy to share their perceptions.

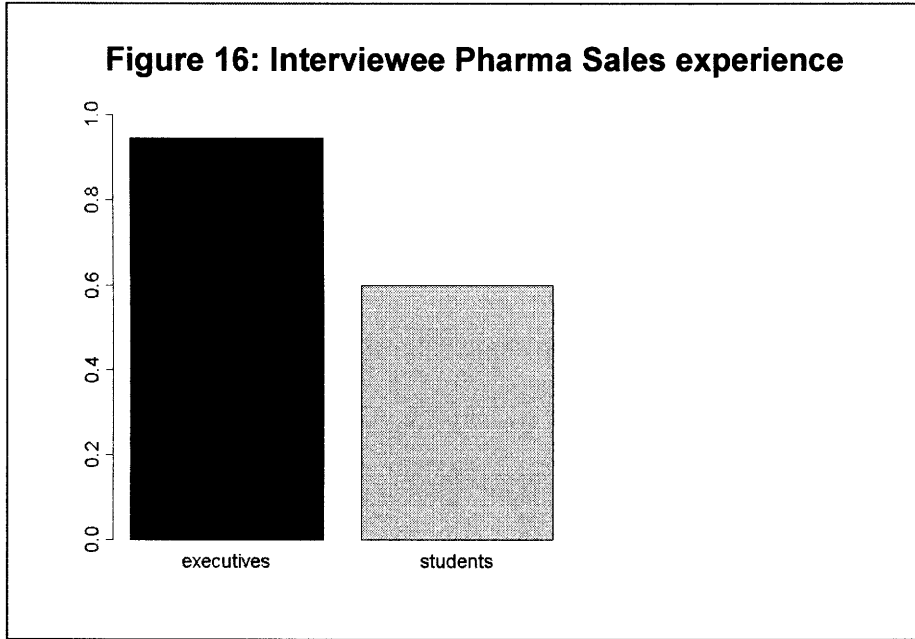
The interview process with the pharmaceutical executives was conducted entirely via phone as most of them were located outside of the US. The future physician interviews (with the exception of 2 interviewees) were all conducted face to face in Cambridge, MA.

### **Chapter 3: Results**

The following results are discussed in order of the questions presented to the interviewees (see Appendix, Section A for a copy of the questionnaire).

#### **1. Do you have direct/indirect experience with Pharma sales?**

	Yes	No
Executives	17	1
Future physicians	9	6



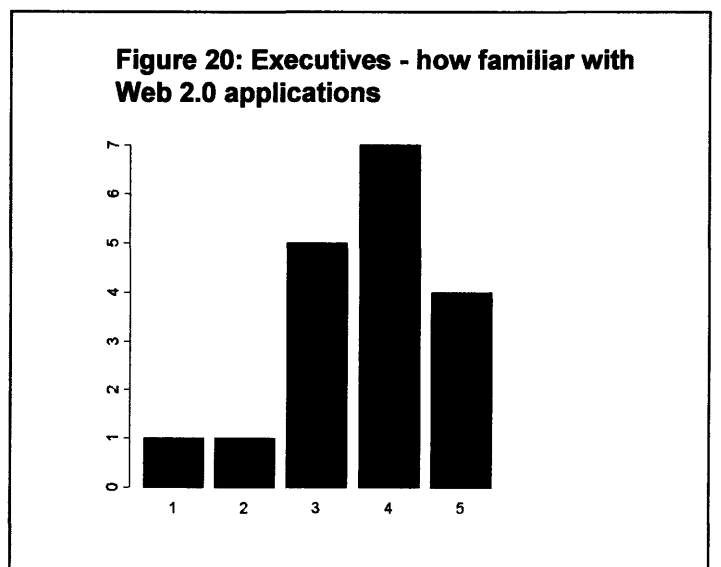
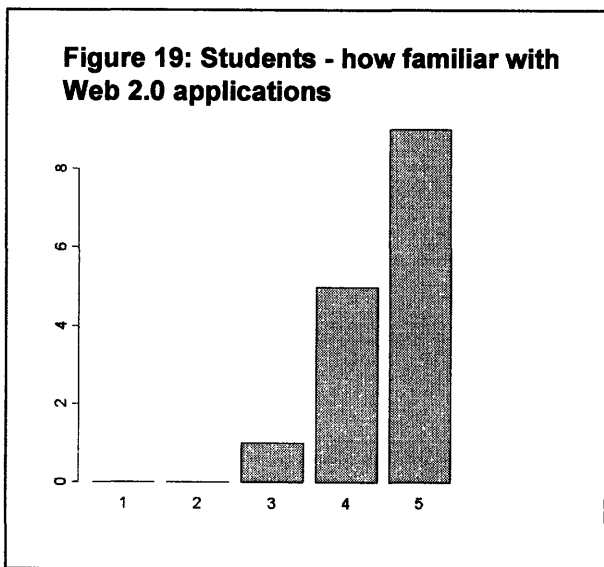
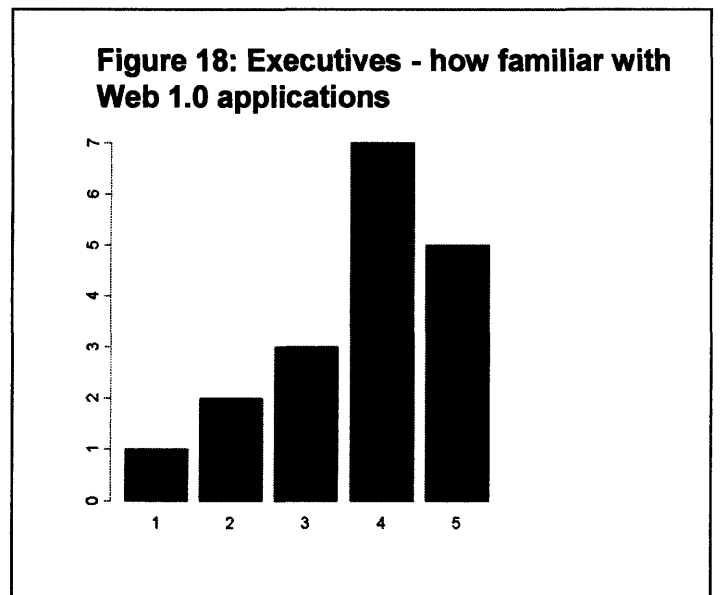
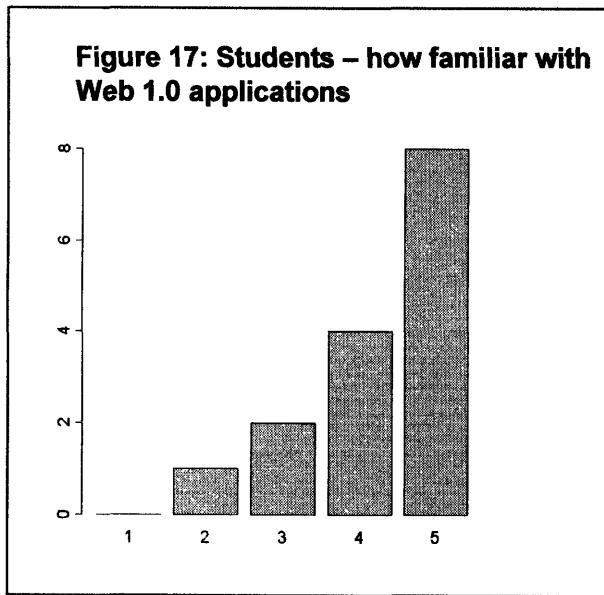
Statistically, there is not much to test here. I had reason to believe that future physicians and executives were probably interpreting the question differently, although my intention (and explanation) was to enquire about perception so any exposure to a sales environment would be acceptable proof positive of exposure to sales.

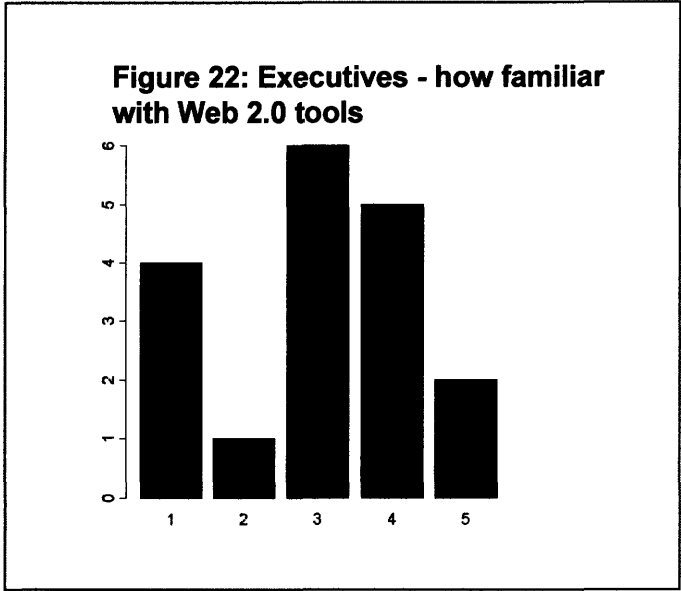
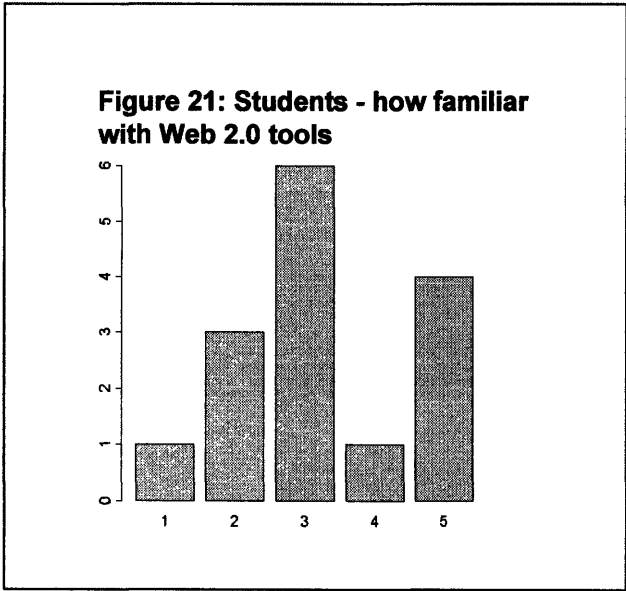
The executives, being in all sales and marketing driven organizations most likely took a much more stringent approach and thus the one (1) individual in the executive group who did not have exposure to sales.

On the other hand, several future physicians most certainly did not have formal exposure to sales but believed that they had based on my open ended question and perhaps their (as of yet) lack of exposure to the commercial world.

**3. How conversant are you with Basic internet, Web 1.0 apps, Web 2.0 apps & tools?**

Note: only 3 individuals reported less than a "5" for familiarity with basic internet, so there is nothing to test in this question.





	Student mean	Student median	Executive mean	Executive median
Web 1.0 applications	4.27	5	3.72	4
Web 2.0 applications	4.53	5	3.67	4
Web 2.0 tools	3.27	3	3.0	3

For each of the above three technologies, I compared the mean response among future physicians with the mean response among executives using a two-sample t-test. When the sample sizes are small this test relies strongly on the assumption that the data are roughly normally distributed within each population, which does not seem to be the case. Hence, I acknowledge that the p-values obtained for this test will not be exactly correct. The null and alternative hypotheses are:

$H_0$ : average familiarity among executives is the same among that of future physicians  
 vs.

$H_1$ : average familiarity among future physicians differs from that of executives

And obtain the following p-values:

<b>Two-sample t-tests</b>	
	<b>p-value</b>
Web 1.0 applications	0.15
Web 2.0 applications	0.008
Web 2.0 tools	0.56

The only significant result occurs for Web 2.0 applications. Since the 2-sample t-test is not entirely reliable in such a small, non-normal sample, I performed a second test to check the robustness of this result. The data is dichotomized according to whether each respondent reported "5" or less than "5" and test the following hypotheses; then I performed the 2-sample test of binomial proportions.

This test compares the proportions in two different populations using two samples. Since it is only comparing binary variables ("yes" vs. "no"), it does not rely on the distribution of response values on the 1-5 scale in each population and is thus valid even if these values are not normally distributed. The hypotheses are:

$H_0$ : proportion of executives with familiarity "5" (high) is the same as that of future physicians  
vs.

$H_1$ : proportion of executives with familiarity "5" (high) is different from that of future physicians

I calculated a 2-sided p-value via Monte Carlo sampling due to the small sample size. This method of calculating a p-value relies on simulation instead of on asymptotic theory, and is thus more valid than p-values computed in the standard way when the sample size is small. This

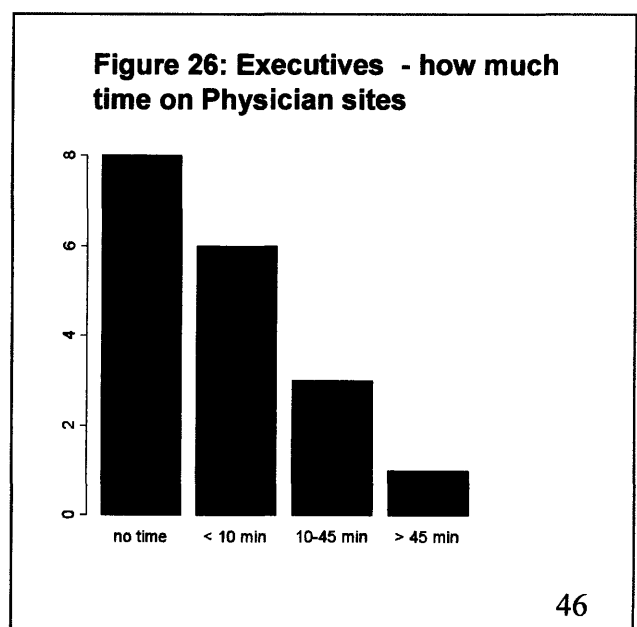
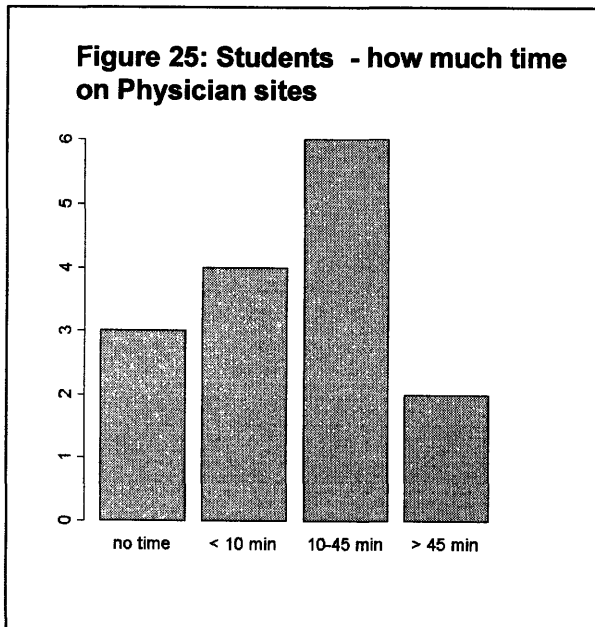
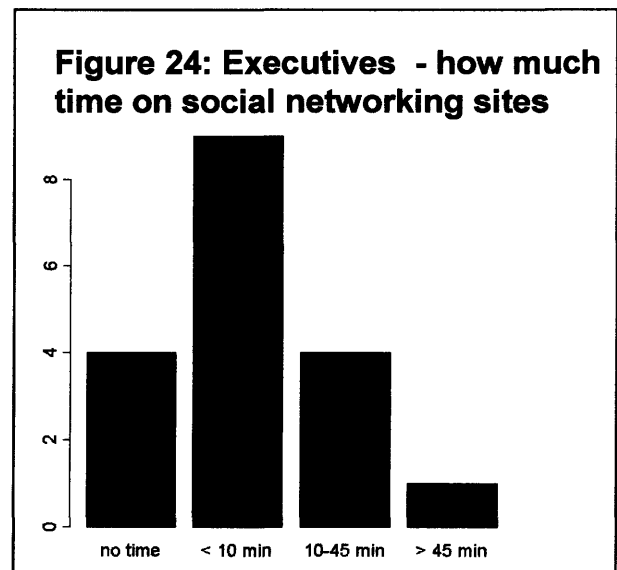
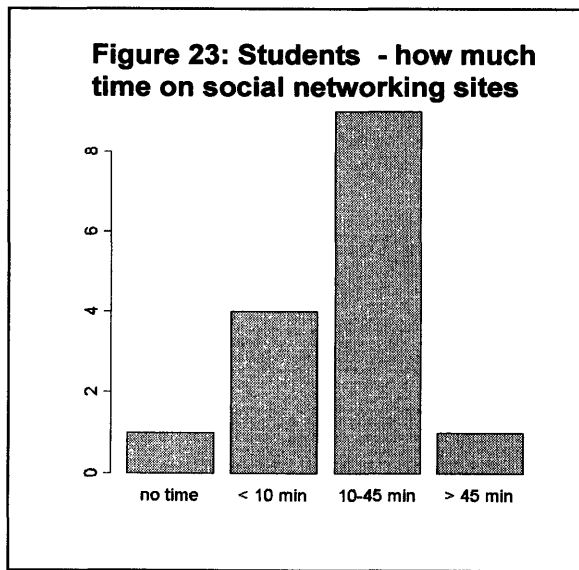
test provided a two-sided p-value of 0.041, attesting to the robustness of the result on this question

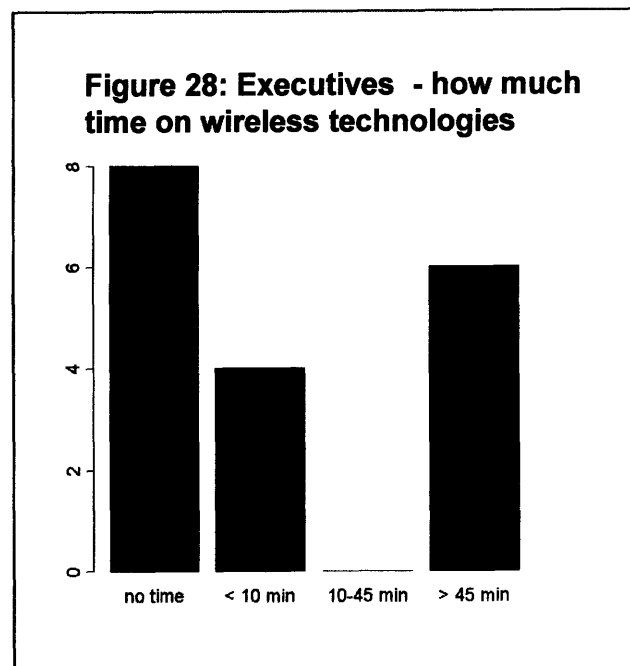
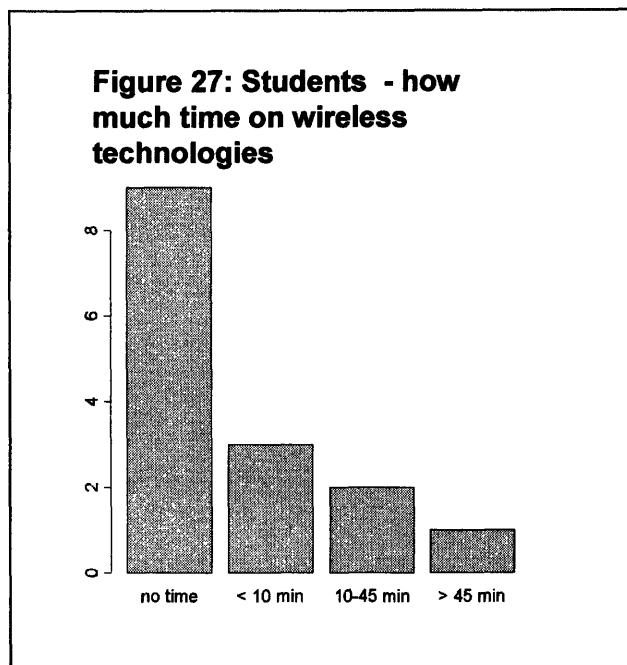
**Yates'  $\chi^2$  test**

	<b>p-value</b>
Web 2.0 applications	0.041

In summary, I have not found statistical evidence that future physicians and executives differ in terms of familiarity with Web 1.0 applications and Web 2.0 tools. However, I can conclude that there is a statistically significant difference in terms of Web 2.0 applications, with future physicians reporting a higher degree of familiarity.

**5. How much time do you spend per day on each type of site?**





For each type of site, I tested for differences between the amount of time executives spend and the amount of time future physicians spend on such sites.

It is not straightforward to use a t-test in this situation because there is only a time-category for each individual, not an actual time. Therefore, I calculated Yates' chi-square statistic for contingency tables. Due to the small sample size, the asymptotic approximation ordinarily used for this test is not appropriate. P-values were obtained via Monte Carlo simulation.

$H_0$ : no association between occupation and time spend on each type of site

vs.

$H_1$ : association between occupation and time spent on each type of site

### Yates' $\chi^2$ test

	<b>p-value</b>
Social Network sites	0.17
Physician sites	0.32
Wireless technologies	0.16

No significant p-values are obtained from this test; however, it is an extremely conservative test to use in this case because it does not account for the ordering of the categories.

In this case, because we know the categories to be ordered, it is preferable to use a test that is more powerful to specifically detect a linear trend in proportions across categories. This test, although more complicated to state clearly, thus respects the ordering of the possible responses. This is the test for trend in proportions, also known as Armitage's trend test. It compares the following hypotheses:

$H_0$ : as one proceeds from the lowest response-category ("no time") to the highest ("> 45 minutes"), there is no linear trend in the proportion of respondents in each category who are future physicians

vs.

$H_1$ : there exists such a linear trend

The p-values for this test are as follows:



### Armitage's $\chi^2$ test for trend

	p-value
Social Network sites	0.050
Physician sites	0.064
Wireless technologies	0.18

This confirms my visual intuition that there is indeed a difference between future physicians and executives, at least regarding social networking sites. Thus, although there is not a striking difference between future physicians' and executives' time spent in these activities – since Yates' chi-square test failed to detect one – there is still a statistically significant difference in the time spent on Social networking sites, which is more subtle but detected using the trend test.

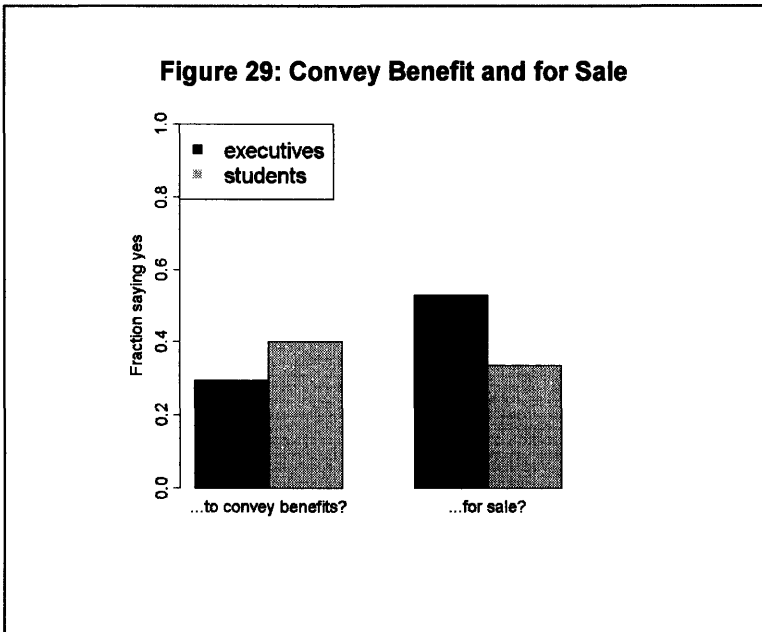
### 6. Is person-person contact necessary for conveying benefits of product, and for generating sale of product?

→ Necessary for conveying benefit?

	Yes	No
Executives	5	12
Future physicians	6	9

→ Necessary for generating sale?

	Yes	No
Executives	9	8
Future physicians	5	10



I used a two-sample test of binomial proportions for to test for a difference in the proportion of future physicians vs. executives answering “yes” to each question. The p-values are shown below. The hypotheses are provided below, along with the p-values.

$H_0$ : equal proportions in both professions agree with necessity of person-person contact  
vs.

$H_1$ : more executives than future physicians agree with necessity of person-person contact

**Two-sample test of binomial proportions**

	<b>1-sided p-value</b>
For conveying benefits	0.60
For sale	0.46

In neither case did I find a significant difference. Perhaps most strikingly, in the case of benefit conveyance, the observed difference is not even in the same direction that I had anticipated. A greater proportion of future physicians in the sample believed in the necessity of sales reps for this purpose than of executives.

Although the result is not statistically significant, it is still noteworthy in that the observed difference is actually in the opposite direction than anticipated in the original hypothesis.

## **7. Perceived Contribution to Pharmaceutical Sales**

Altogether, 16 (of 18) pharmaceutical executives estimated the percent contribution to Pharma sales by reps and by electronic marketing. The executives' ages ranged from 28 to 59 with a mean of 40.1 and a median of 40.

Overall, the mean estimate for contribution of sales reps was 60.6% and the median was 65%. The IQR ranged from 45% to 70%, with 75% of executives believing that reps contributed at least 50% of all sales.

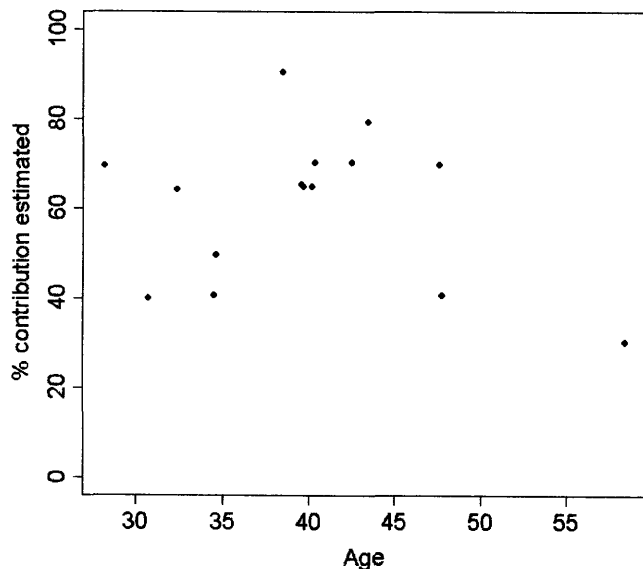
Ordinarily a confidence interval is provided as an estimate of the plausible range of values for a quantity being estimated. However, the theoretical justification for confidence intervals rests on some asymptotic approximations that are not valid in small samples where the data distribution is highly non-normal. In cases such as this, the Inter-quartile range (IQR) is often used instead.

The IQR is defined as the range from the first quartile of the distribution (that is, the 25th percentile) to the third quartile (the 75th percentile). Thus, the IQR represents the range that captures the *middle 50%* of the data. In this case, since there are 16 data points, the IQR for

each answer represents the range that excludes the highest four values and the lowest four values.

There actually appears to be a strong correlation between age and perceived contribution of reps, with older executives providing higher estimates. However, this relationship is somewhat obscured by two data points in the lower-right hand part of the graph below, which do not fit with the overall trend. It would be useful to study this question in a larger panel to determine whether this is actually a real trend and these points outliers, or whether this seeming pattern is a random occurrence.

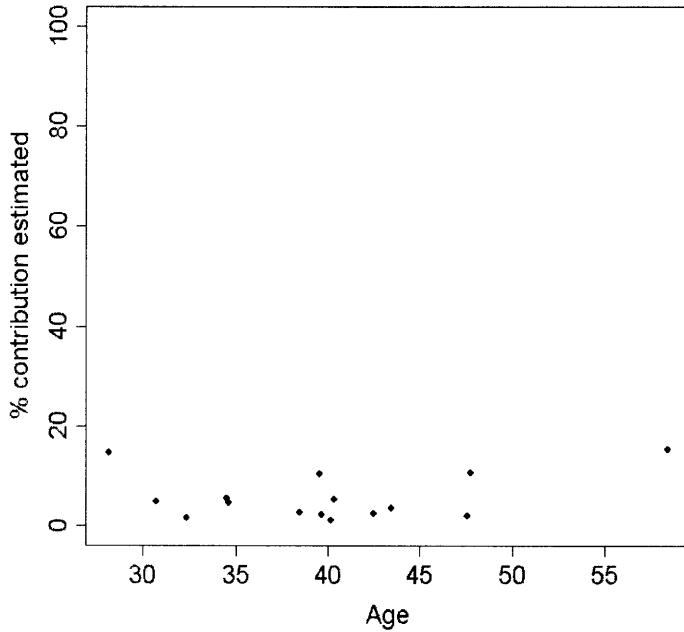
**Figure 30: Pharma Marketing Mix – Sales Rep expenditure (%) perception of Pharma Execs**



Overall, the mean estimate for contribution of electronic marketing was 5.9% and the median was 5%. The IQR ranged from 2% to 10%, with 69% of executives believing that electronic marketing contributed 5% of sales or less.

As the graph below (see Figure 31) illustrates, there is no evident relationship between age and perception of the contribution of electronic marketing.

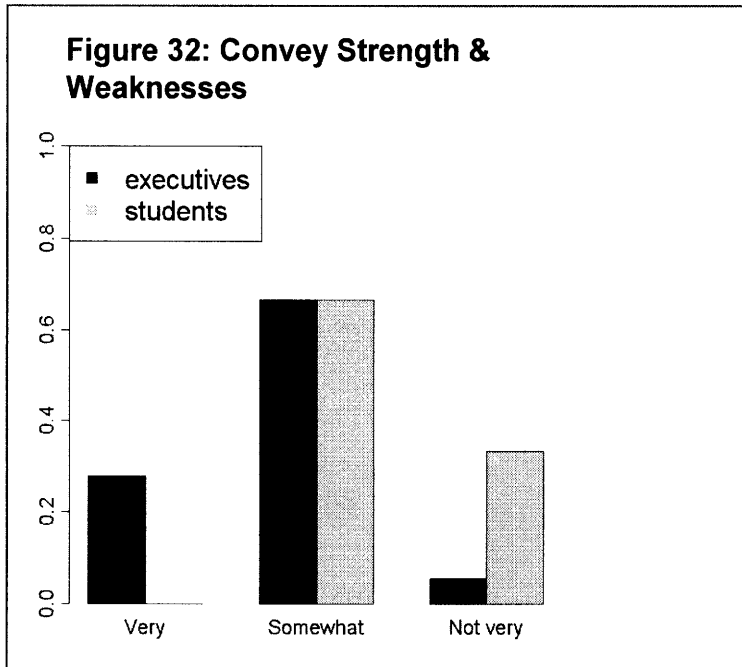
**Figure 31: Age and perception of the contribution of electronic marketing**



**8. How effectively and ethically do reps convey strengths/weaknesses of drug?**

	<b>Very</b>	<b>Somewhat</b>	<b>Not very</b>
Executives	5	12	1
Future physicians	0	10	5

Please figure 31 on next page



To test for a difference in beliefs on this question I used Yates' chi-square test, since the data came in the form of a 2x3 contingency table (above). The hypotheses tested are:

$H_0$ : no association between belief in reps' effectiveness/ ethics and occupation

vs.

$H_1$ : there is an association

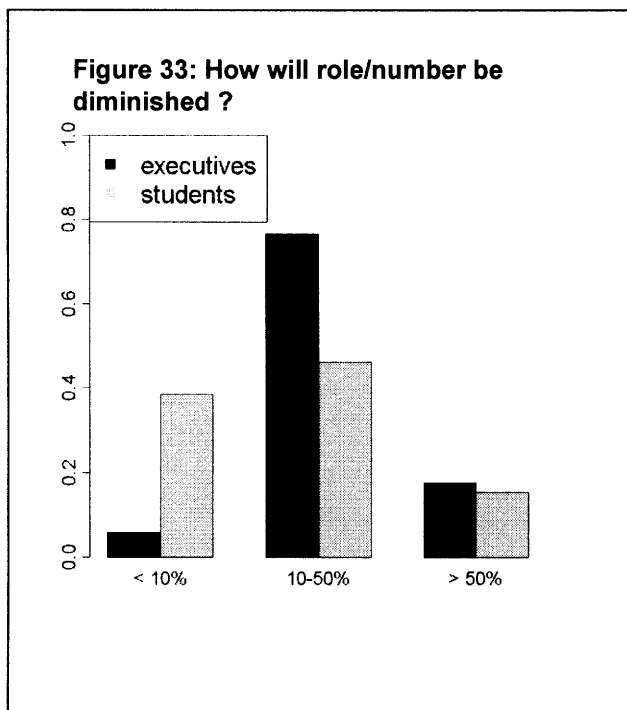
Because some of the cell counts are small, the standard p-value calculation which relies on asymptotic results is not appropriate. Hence we again calculate the p-value using Monte Carlo simulation.

**Yates'  $\chi^2$  test**

	<b>p-value</b>
<b>Effectiveness/ethics</b>	<b>0.02</b>

This confirms what visual intuition from the chart; namely, that the difference in perception of reps' effectiveness and ethics between executives and future physicians is statistically significant.

**9. How will role/number of reps diminish?**



	< 10%	10-50%	> 50%
Executives	1	13	3
Future physicians	5	6	2

I initially used Yates' chi-square test for the 2x3 contingency table, with p-values simulated by Monte Carlo sampling because of the small counts in some cells. The hypotheses and p-value are:

H<sub>0</sub>: no association between belief in role diminishing and occupation

vs.

H<sub>1</sub>: association between belief in role diminishing and occupation

**Yates'  $\chi^2$  test**

	<b>p-value</b>
Role diminishing	0.09

This is not a statistically significant difference, but again this test is conservative because it does not account for the ordering among categories. Using the chi-square test for trend we obtain a p-value of 0.12, but this p-value is likely biased due to this test's reliance on an asymptotic approximation.

In the chart of responses there is a visually observable trend, although the sample is too small to provide conclusive evidence. If only a slightly larger sample could have been interviewed to show this trend, the result would be highly statistically significant.

**10. Can the following channels play a role in Pharma sales?**

→ Social networking sites?

	<b>Yes</b>	<b>No</b>
Executives	10	8
Future physicians	10	5

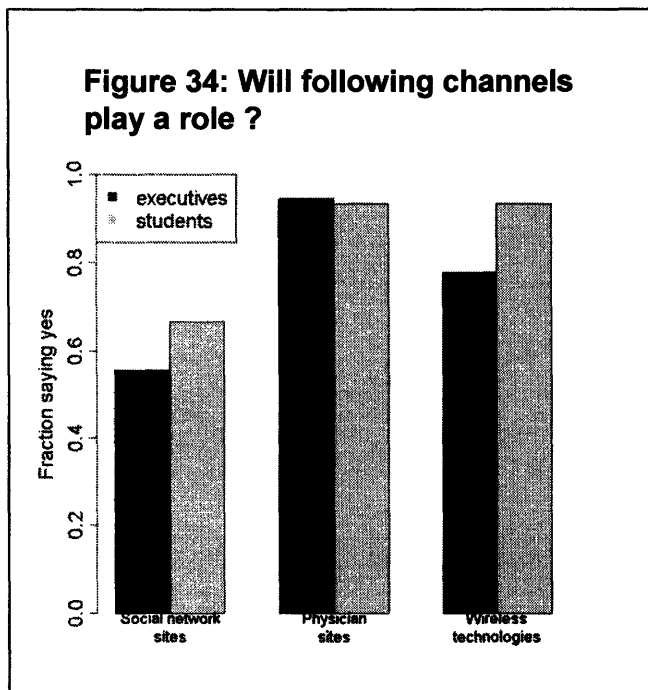


→ Physician sites?

	Yes	No
Executives	17	1
Future physicians	14	1

→ Wireless technologies?

	Yes	No
Executives	14	4
Future physicians	14	1



For each of these questions the data consists of a 2x2 contingency table. To test for a difference in proportions between executives and future physicians I could use either the two-

sample test of binomial proportions or Yates' chi-square test. These tests are equivalent for 2x2 tables. The null and alternative hypotheses for Yates' chi-square test are:

H<sub>0</sub>: no association between belief in technology's role and occupation

vs.

H<sub>1</sub>: association between belief in technology's role and occupation

I again computed p-values via Monte Carlo sampling due to the small counts observed in some of the above cells. The p-values for the three tests are:

**Yates'  $\chi^2$  test**

	<b>p-value</b>
Social network sites	0.72
Physician sites	1
Wireless technologies	0.34

Hence there's no evidence of a difference in proportions among physicians and executives in response to questions about any of these three channels. In particular, for physician sites and wireless technologies there is nearly unanimous agreement across the entire sample that these technologies will play a role in sales

**Can the above channels support/diminish/replace role of sales rep?**

→ Support?

	<b>Yes</b>	<b>No</b>
<b>Executives</b>	16	2
<b>Future physicians</b>	14	1

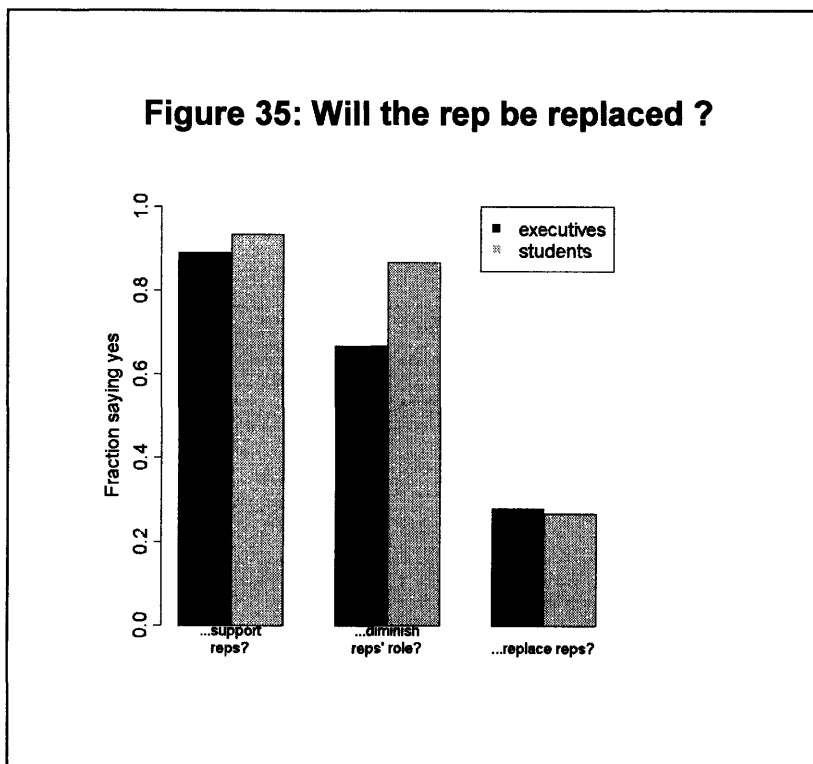
→ Diminish?

	<b>Yes</b>	<b>No</b>
<b>Executives</b>	12	6
<b>Future physicians</b>	13	2

→ Replace?

	Yes	No
Executives	5	13
Future physicians	4	11

I performed Yates' chi-square test as before, with p-values computed via simulation. The p-values for the three tests are:



### Yates' $\chi^2$ test

	p-value
Social network sites	1
Physician sites	0.25
Wireless technologies	1

Interestingly, future physicians and executives are in almost complete agreement that these channels will support reps but not replace them. There is a difference on the question of whether they will diminish the role of reps, but it is not statistically significant. Since the difference does at least extend in the direction expected, with future physicians more likely to respond that reps' role will be diminished, it would be worthwhile to study this question in a larger sample and see if the difference persists.

## **Chapter 4: Discussion**

### **Interpretation of Questionnaire Results**

It is relevant to reiterate the three hypotheses that I set out to prove at the beginning of the study. They are:

- ❖ Pharma executives believe that sales representative based detailing will continue to be the predominant method to engage and sell to physician customers over the next 5 – 7 years while future physicians believe that technology (mobile, internet and interactive TV applications) will play a dominant role in the pharmaceutical detailing process.
  
- ❖ Pharmaceutical executives agree that the most effective and ethical method to convey the benefits and challenges of an ethical pharmaceutical product is via a trained sales representative while future physicians believe that the sales representative does not effectively and ethically convey the merits of the relevant pharmaceutical therapy. Additionally, the pharmaceutical executives believe that the role of the sales representative will not be diminished due to the advent of the new technology developments in the future. The future physicians believe that the

role of the sales representative will be diminished as a result of new technological developments.

- ❖ Person to person contact is not essential in conveying the merits of a particular ethical therapy – pharmaceutical executives disagree with this premise while Future physicians agree

After evaluating the results and comparing them to the statistical analysis and results, several general themes emerge:

- ❖ Contrary to my expectations and hypothesis, Pharma executives and future physicians are not very divergent in their views of technology and its' usage in the sales detailing process. I was interested in exploring the usage of technology across three key fronts and technologies – social networking sites, physician focused sites and wireless technologies. I asked questions regarding whether these technologies can support the sales representative, diminish the role of the sales representative and replace the role of the sales representative (questions 10 – 13).

According to the statistical analysis, particularly as relating to physician sites and wireless technologies, there is nearly unanimous agreement across the entire sample that these technologies will play a key role in supporting the sales rep. The future physicians and executives are in almost complete agreement that these channels will support reps but will not replace them. There is a difference on the questions whether the technologies will diminish the role of the representatives but it is not statistically significant. Since the difference does at least extend in the direction expected, with

future physicians more likely to respond that reps' role will be diminished, it would be worthwhile to study this question in a larger sample (n = 75) and see if the difference persists.

The key question is why are two conceivably different groups of people, with different work experience levels, ages and education levels in agreement? My sense is that there is a wide range of ages in the pharmaceutical executives but there were more "younger turks (less than age 40)" dominating the survey. If the sample size was larger (n = 75), I may have been able to co-relate the attitudinal differences with diverging views on the use of technology.

Additionally, over the past year there has been a significant amount of news regarding layoffs in Big Pharma, with Pfizer laying off 20% of its US sales force in November 2006<sup>10</sup> and the issues with a bloated sales force are centre stage for the industry. Also center stage have been multiple discussions regarding the use of eDetailing to support and/or replace sales forces.

Most future physicians are very experienced with the use of technology – this was evident by the fact that they did have a statistically significant difference in familiarity (from executives) in terms of Web 2.0 applications (e.g. Facebook, MySpace). They however may have had a challenging time correlating it with usage in the context of sales. In my opinion, the lack of sales exposure and real world clinical experience may have driven the future physicians to be a lot more conservative in their answers. There is obviously a bias here in terms of selection of the "right" future physician population and it will be discussed in the follow on section on "Limitations of the study".

It is relevant at this point to briefly discuss the technologies involved. The first group of technologies, roughly grouped under the term social networking are growing at a furious pace. For instance Facebook, a social networking group predominantly for University and High School students has 34 million members<sup>35</sup>, \$140M in revenues, a \$6 billion market valuation and it was formed only in 2004<sup>36</sup>. There are dozens of other social networking sites including the physician/scientists focused SciLink.com and LinkedIn.com which is focused on the general business community.

Having seen the impact and usage of facebook first hand as a student at Harvard Medical School in the 2006/07 academic year (by my estimate more than 90% of all of my classmates ranging in ages from 19 – 24 were on facebook) I hypothesized that this technology has a significant potential as sales and marketing vehicle to future physicians.

This premise is further validated by the fact that some of the technologies have in essence become significant platforms for user retention, communication and transaction. Facebook for instance has become an open platform for more than 3000 other software firms to use as a marketing launch pad for their products<sup>36</sup>. This is both a revenue and foot traffic driver for facebook. This open platform belief can easily stretch to a scenario where facebook can began segmenting verticals including healthcare and pharmaceuticals and begin offering marketing opportunities to pharmaceutical and consumer healthcare firms.

The second and third groups of technologies – physician websites and wireless technologies definitely have a role to play as validated positively by the interviewees. Physician websites are used regularly by future physicians (especially eMedicine.com by WebMD for research) and the usage of wireless technologies is more pronounced by executives (e.g. extensive use of

blackberries). Thus it makes sense that the perceptions of executive and future physicians are aligned.

- ❖ Also as relating to my hypothesis no. 3 that “person to person contact is not essential to convey the merits of a particular ethical therapy – pharmaceutical executives disagree with this premise while future physicians agree”, there were some surprising revelations. Perhaps most strikingly, in the case of merit conveyance, the observed difference is not even in the same direction that I had anticipated. A greater proportion of future physicians in the sample believed in the necessity of sales reps for this purpose than of executives.

Although the result is not statistically significant, it is still noteworthy in that the observed difference is actually in the opposite direction than anticipated in the original hypothesis. Why is this so? in my opinion, the future physicians are just at the cusp of understanding medical therapy and its usage and have not had the benefit of clinical training thus they feel strongly that there should be a live person to help with any any product/therapy related issues. This statement of course can not be qualified without the benefit of a larger survey with a sample size of at least  $n = 50$ .

From a real world perspective this data makes sense to some extent. Executives today are using technology at increasing rates and hope that it will be of benefit in the sales process that is losing efficiency at an alarming rate. Future physicians use technology regularly in their training but do not have yet been professionally detailed to, thus do not have the “jaded” attitude that sometimes older physicians may have when discussing the Pharma sales process.



It goes without saying that technology will play a significant role in supporting the sales representative of the future. In a white paper entitled *Physicians and Web 2.0*, the author states that over 300,000 practicing physicians are actively engaging in blogs, with 25,000 using blogs for professional reasons<sup>36</sup>. Additionally over 80,000 physicians participate in online physician communities (e.g. Sermo)<sup>ibid</sup>. This also goes to prove that technology in all its consumer and physician focused format is going to become an increasingly important part of the pharmaceutical marketing and sales process.

### **Limitations of the study**

There were a number of limitations as related to this study. To begin with this being a pilot study, I only used a small sample (n=33) of individuals to test the hypothesis. This was an adequate size from my point of view for a pilot study but a larger sample size (greater than n = 50) will most certainly have given more robustness and confidence to the results.

The two groups of interviewees, namely – pharmaceutical executives and future physicians were selected from my own pool of acquaintances and friends network. Thus there was an obvious bias in both pools.

The executive interviewees were mostly colleagues (or friends of colleagues) who had worked with me at my previous place of employment (a global Big Pharma firm with annual revenues of more than \$10 billion). As mentioned earlier all of these executives had broad based, multinational (including US) experience and had worked with a number of other Big Pharma and Bioetch firms.

Although none stated this explicitly, all must have felt some compulsion to help me with the survey, say “what (they thought) I wanted to hear” and most knew that I began my career in

the eBusiness group of this Pharma Company. Additionally, all knew that I personally had limited experience working in the sales function of a Big Pharma company. All of these background issues have certainly played a “biasing” role in this study. In retrospect I should have selected a larger pool who did not know me personally and more who were US based. This would have given me a more realistic and current feedback on the market’s sales and technology related challenges.

The medical student pool also had its obvious biases. Over 90% of the future physicians were drawn from Harvard Medical School, which has one of the most stringent admission criteria and one of the lowest admission rates in the country. Thus, this was the most obvious bias.

Secondly there was a disproportionate number of future physicians (>90%) drawn from the first and second years of the MD and MD/PhD programs. Since most first and second years have limited or no clinical exposure and most had no personal experience with sales, this provided a certain bias. Again, I was leveraging my contact network within Harvard Medical School and did not know many third and fourth year students thus ended up selecting the current pool. In retrospect I should have only used 4<sup>th</sup> year medical students and first and second year residents. This pool would have had some *personal* exposure to the pharmaceutical sales process and again, the feedback would perhaps have been more robust.

## Chapter 5: Appendix

### A. Interviewee Questionnaire



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**Rehan A. Khan**  
**BEP 2007 SM Candidate**

**Thesis co-supervisors: Dr. Teo F. Dagi, MD. Faculty - Harvard/MIT and General Partner, HLM Venture Partners**

**Dr. Pedro Huertas, MD, PhD, MBA.**  
**Faculty – MIT/Harvard and Medical Director – Benson Henry Mind Body Institute, MGH / Harvard Medical School**

**July 2007**  
**Thesis questionnaire**

---

Interviewee name

Type (age in parenthesis)

Pharma Executive ( )

Medical Student ( )

Date:

Interviewer: Rehan Khan

**Informed Consent and Confidentiality Statement**

- Your participation in this interview is voluntary
- You may decline to answer any question
- All answers are confidential in **that no identifying information (your name, company name, organization names, group name) will be presented in any written or oral report.**

**Purpose and Procedure Statement**

- Conducting semi-structured interviews with large pharmaceutical companies ("Big Pharma") executives who have held global marketing and sales responsibility (inc. US market) for products/product portfolios and with future physicians at accredited US medical schools who intend to practice medicine in the next 5 – 7 years.

❖ The interview should not take longer than one hour.

- ❖ The purpose of this research is to explore the difference in perception between those of pharmaceutical executives and future physicians / future physicians (FP hereafter) as relating to pharmaceutical sales/ detailing
  - ❖ Specifically, I am interested in understanding how you perceive that pharmaceutical detailing will change over the longer term (5 – 7years). With the wide spread usage of new customer touch points (used interchangeably with the term multiple channels) like mobile, internet and interactive TV/iTV.
  - ❖ Additionally with the future pharmaceutical industry customer (the FP) using these technologies on a regular basis, often as part of their medical training, I want to explore how pharmaceutical detailing will evolve to accommodate these new multiple channels.
  - ❖ The geographical focus of the study is the US market and the pharmaceutical detailing focus is limited to the primary care (sales focus on GPs/PCPs) sector.
- Your candid responses are important.
  - All of this information is strictly confidential and any data presented in journals or in any other public forum will be sans your company name, individual name, product names, or any other labels that could identify you or your organization.

**General Definitions Given**

- Ethical Pharmaceutical Product
- Pharmaceutical Detailing
- Primary care and specialty pharmaceutical sales

**Pharmaceutical detailing experience/exposure**

1. Do you have any direct or indirect experience with pharmaceutical sales in the US market (Y/N)?
2. What is your impression of pharmaceutical sales and/or sales people in the US market – describe briefly?

**Internet and technology experience/exposure**

3. How conversant are you with the following (on a scale from 1 [low] to 5 [high])?
  - a. Basic internet applications (e.g. email, internet explorer, chat )
  - b. Web 1.0 applications (e.g. Leading health websites, internet commerce)

- c. Web 2.0 Applications (e.g. social networking sites, online video, Wiki sites)
  - d. Web 2.0 tools including wireless enabled (e.g. iPhone, tablet PC, blackberry)
4. Are you familiar with the following new technologies / developments (Y/N)?
- a. Social networking sites (e.g. Facebook, Myspace, LinkedIn) and online video sites (e.g. Youtube, Liveleak)
  - b. Physician and patient focused sites (e.g. Sermo, Physicians Online, WebMD)
  - c. Emerging wireless technologies and iTV (e.g. iPhone, Tivo, Skype)
5. Do you have membership to any of the sites below (Y/N) and if yes how much time do you spend per day on each category (less than 10 mins, 10 – 45 mins, 1+ hours)
- a. Social networking sites and online video sites
  - b. Physician and patient focused sites
  - c. Emerging wireless technologies and iTV

### **Pharmaceutical sales process experience/exposure**

6. Do you believe a person to person contact is essential in conveying the benefits of an ethical pharmaceutical product (Y/N) and is it essential in generating the sale of that particular ethical pharmaceutical product (Y/N)?
7. In your experience how are ethical pharmaceutical products sold to physicians today (%)?
- a. Via sales Representative
  - b. Via direct marketing mailers and/or advertising
  - c. Via electronic means including online/wireless/iTV marketing & promotions?
  - d. Via product sample drop
  - e. Non office based physician customer contact (e.g. symposia, dinner event)
8. How effectively and ethically do you feel pharmaceutical sales representatives convey the strengths and weaknesses of the ethical drug therapy that they are selling?
- a. Very effectively and ethically
  - b. Somewhat effectively and ethically
  - c. Not very effectively and ethically
9. In the longer term (7 – 10 years), can you envision the role and numbers of pharmaceutical sales reps diminishing?
- a. By less than 10%
  - b. Between 10 – 50%
  - c. Greater than 50%

### **Pharmaceutical detailing and new technologies**

10. In the longer term (7 – 10 years), can you envision the following multiple channels playing a role in the pharmaceutical sales process (Y/N)?
- a. Social networking sites and Online video sites
  - b. Physician and patient focused sites
  - c. Emerging wireless technologies and iTV
11. Can the above mentioned multiple channels (Social networking sites, online video sites, Physician and patient focused sites, wireless/iTV technologies) support the

pharmaceutical sales representative in ethically and effectively conveying the strengths and weaknesses of an ethical drug therapy (Y/N)?

12. Can the above mentioned multiple channels (Social networking sites, online video sites, Physician and patient focused sites, wireless/iTV technologies) potentially diminish the role of the pharmaceutical sales representative? (Y/N)?
13. Can the above mentioned multiple channels (Social networking sites, online video sites, Physician and patient focused sites, wireless/iTV technologies) ever replace the role of the pharmaceutical sales representative? (Y/N)?

**If you have any further comments or questions, please feel to email me at [rehan\\_khan@harvard.hst.edu](mailto:rehan_khan@harvard.hst.edu) or ring at +1 617 945 2907.**

Many thanks for your time.

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within this definition, although its sales are less than \$10 billion, because it has the same business characteristics as the other top pharmaceutical companies

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