In recent years, many physicians have become alarmed by the ease and clarity with which the pharmaceutical industry is able to study their prescribing habits (2–4). With a few keystrokes on a handheld personal digital assistant, a sales representative can cross-reference real-time data sets to analyze week-by-week changes in prescribing for a particular drug; compare the data against those of her local and national colleagues; analyze use by diagnosis, specialty, and types of medical practice; and then use those data to fine-tune a sales pitch or allocate marketing resources. Prompted by a growing sense of outrage among physicians, several state legislators, state medical associations, and the American Medical Association (AMA) have put forward a series of proposals to limit the distribution and use of prescriber data (5). In May 2006, the AMA initiated an opt-out program—the Prescribing Data Restriction Program (PDRP)—through which physicians can deny pharmaceutical representatives access to their individual prescribing data (6). The following month, New Hampshire became the first state to prohibit the sale of prescriber information for use in pharmaceutical sales and marketing. A joint suit by health care information organizations (HIOs) to have the law overturned is currently being heard by a federal court (7).

Contrary to common perception, the business of selling prescriber data—the bread and butter of the HIO industry—did not emerge suddenly over the past decade. Private companies that monitor physicians’ prescribing practices were founded in the aftermath of World War II, as the growth of the prescription drug market led to increased marketing interest in understanding and influencing prescribing patterns. The development of this surveillance system was not simply imposed on the medical profession by the pharmaceutical industry but was developed through the interactions of pharmaceutical salesmen, pharmaceutical marketers, academic researchers, individual physicians, and physician organizations. Examination of the role of physicians and physician organizations in the development of prescriber profiling is directly relevant to the contemporary policy debate surrounding this issue.

See also:

Print
Key Summary Points .................................. 743
Editorial comment .................................... 751
Web-Only
Appendix
Conversion of figures into slides
advertisement placed in the 4 leading medical journals would cost less than $3000 (roughly $20 000 in 2007 dollars) and would reach every physician in the United States (11). In addition to medical journals, physicians could be directly accessed through a growing legion of sales representatives. As the drug firms’ most direct form of contact with the physician, sales representatives began to serve not merely as mouthpieces for their firms but as sense-organs as well (12).

Pharmaceutical salesmen of the 1940s began using physician caricatures during sales training, such as “Dr. Snob,” “Dr. Resistant,” and “The Backslapper,” to illustrate how different physicians would respond to various sales tactics (13). As the postwar pharmaceutical industry worked to rationalize the activities of its sales force, this grassroots assessment of physician receptivity also began to take on analytic importance for sales management. “To call on every doctor on the block entails a great deal of waste motion at the company’s expense,” one sales manager noted in 1949, suggesting instead that there were “various methods of selecting the names of physicians who are most likely to prescribe a new product to a large group of patients” (1). One technique advised salesmen to keep logs of their visits in which they rated physicians on 2 axes: the first—coded A, B, C, or D—recorded the size of their practice, and the second—coded X, Y, or Z—recorded their receptivity to salesmen and to novel medications (14). These data, reported back to supervisors, generated a crude map of practice density and marketing receptivity that enabled more strategic deployment of salesmen.

Enterprising salesmen began to use the pharmacy as a site of data collection, asking local pharmacists for monthly lists of prescriptions filled and noting which local physicians were large-volume prescribers. In 1950, pharmacist Raymond Gosselin—inspired by the survey practices recently popularized by Gallup and the increasing ease of tabulating data through IBM punch cards—submitted a master’s thesis that represented one of the first systematic, reproducible prescription drug audits (15). Aided by the tabulation team of the Boston University Statistical Laboratory, Gosselin conducted a population-stratified random sample of Massachusetts pharmacies, rummaging through prescription books and coding random samples of scripts. Gosselin subsequently formed a company and began to market the National Prescription Audit (NPA), a subscription database that could segment the prescription drug market by region and give quarterly information on the performance of specific products and therapeutic categories. By 1953, the original panel of 6000 prescriptions had grown to 225 000, and by the end of the decade, industry executives admitted that the NPA sales figures were more reliable than their own (11). The NPA was the leading product of R.A. Gosselin & Co. until the company was sold to IMS Health in 1970. It remains a key plank of pharmaceutical market research today.

The NPA helped marketers visualize prescriptions at the point of purchase—the pharmacy—but its scope did not include the clinic or hospital—a key site of prescription decision making. As one marketing executive noted, prescription audits “do not tell us how the drugs are being used...we want to go beyond the prescription and learn about the patient for whom it is written” (11). In 1956, Lea Associates—a spinoff group of marketing executives from Smith, Kline, and French—came to market with the National Disease and Therapeutic Index (NDTI), a statistically representative panel of physicians who agreed to use case record diaries to record “basic diagnostic and therapeutic information about all patient contacts made by them during assigned 2-day periods of their practices” (16). The NDTI did for drug prescribing what the Nielsen family did for television watching: It turned a set of real-time consumer decisions into a quantified set of data for market research (17). While the prescription audit showed marketers which prescriptions were being filled in pharmacies, the therapeutic index allowed marketers to tie prescription sales data to specific diagnoses and temporal...
changes in therapeutic practice. As this marketing executive explained (11):

From the data we can learn how a given drug or class of drugs is being used. We can learn the relative frequency with which our sample of physicians sees or treats a given illness. We can learn how the illness is being treated. We can learn the sex and age distribution of patients. And in most cases we can learn the extent to which the condition is treated by specialists rather than by physicians in general practice. In fact, the possible types of tabulations and crosstabulations are almost limitless.

Similar audits and index panels were established to map hospital purchases and responses to journal advertisements, direct mailings, and sales representatives (18). In addition to database products, early HIOs also ran customized analyses and sold raw data in the form of punch cards for subscribing firms to run on their own IBM machines (19). Electronic data products diversified as the industry consolidated. By 2000, the industry leader, IMS Health (which had absorbed R.A. Gosselin & Co. and Lea Associates, as well as several other HIO firms), reported annual revenue of more than $1 billion from its portfolio of market research databases, providing insight on individual, institutional, national, and global scales with products for mainframe, Web access, and handheld personal digital assistant distribution (Figure 1). As the quality and accessibility of prescriber data increased over the decades, pharmaceutical marketers used them to forecast markets and allocate resources, while sales representatives incorporated physician-specific data into their efforts to manipulate the prescribing practices of target physicians.

The Role of Physician Organizations

The AMA provides a unique case for examining the active role of the medical profession in its own market surveillance. In the late 1940s, the AMA created a computerized registry using IBM punch cards of all physicians living in the United States. Along with other clients (such as state licensing boards), this database was actively advertised to the pharmaceutical and medical device industries as a useful tool for market research (Figure 2) (20). Marketers could use demographic and practice-related data to weed out retired or nonpracticing physicians and focus marketing efforts on the 125,000 actively prescribing physicians or to further subdivide the profession into relevant segments to promote specific products. Although sales were initially modest, this product evolved over subsequent decades into the product now known as the AMA Physician Masterfile. This database is an important link connecting pharmacy prescription data to individual prescribing physicians via a series of individual identifiers, including state licensing information, medical education information, national provider identifier codes, and U.S. Drug Enforcement Agency numbers for all U.S. physicians. Sales of AMA physician database products in 2005 yielded $44.5 million in revenue, roughly 16% of the organization’s total revenue (5).

In the early 1950s, the AMA hired Ben Gaffin and Associates, a Chicago-based opinion research firm, to conduct a series of surveys of AMA members to compare the effectiveness of various means of pharmaceutical marketing on physicians’ prescribing habits (21). These studies were then distributed to pharmaceutical and device manufacturers along with promotional pamphlets for advertising in the Journal of the American Medical Association (Figure 3) (22). They would also play a role in the AMA’s decision to end the Seal of Acceptance Program, which had previously limited journal advertising in the Journal of the American Medical Association to those products that had passed the AMA’s own tests of efficacy. Ben Gaffin and Associates claimed that their market research was directly responsible for the increased advertising revenue that resulted, as noted in a subsequent AMA report stating that “the utilization of
these study findings netted the AMA a return of 3600% in increased pharmaceutical advertising for each dollar spent on research” (23).

As the relationship between Ben Gaffin and Associates and the AMA broadened between 1953 and 1955, the AMA distributed 20 reports to the Pharmaceutical Manufacturers Association and all major pharmaceutical firms discussing the influence of pharmaceutical marketing on the practicing physician. In 1955, Ben Gaffin and Associates was commissioned to generate a total understanding of all influences on prescription habits within a limited geographic test region around Fond du Lac, Wisconsin. A significant budget was allocated to study all actions of pharmacists, physicians, hospitals, and clinics in relation to 5 newly released drugs and all forms of professional, periodical, and promotional information sources regarding their practice. When published, the Fond du Lac Study was distributed directly to the pharmaceutical industry, with the hope “that the industry will be very mindful of AMA publications when setting up advertising media allocations” (23).

In the environment of the late 1950s, the AMA and the Pharmaceutical Manufacturers Association viewed the Fond du Lac Study as an example of free-market industrial–professional cooperation; neither party anticipated that it would carry public relations costs as a symbol of collaboration or collusion. But as the pro-business climate of the Eisenhower era gave way to the more consumer-protectionist policies of the Kennedy years, Senator Estes Kefauver initiated a well-publicized inquiry into the marketing and pricing of prescription drugs. On 5 and 6 July 1961, Hugh Hussey, the chairman of the AMA, was brought before Senator Kefauver’s subcommittee and was publicly confronted with the market research reports by Ben Gaffin and Associates as evidence of marketing collusion between the AMA and the pharmaceutical industry. “We are not ashamed of what was found out by these surveys,” Hussey maintained under questioning (24). Nonetheless, from the Kefauver hearings onward, a new genre of medical muckraking has attempted to document conflicts of interest between the business offices of the AMA and the pharmaceutical and medical device industries (25).

The AMA has subsequently argued that selling physician-specific data through the AMA Physician Masterfile represents a responsible and necessary relationship between the organized medical profession and the legitimate pharmaceutical industry. Were the AMA to abandon its role in the licensing of physician information, other less responsible parties would market this information instead (American Medical Association. Personal communication). In this context, the launch of the PDRP opt-out program (Appendix, available at www.annals.org) can be understood as an attempt by the AMA to temper a long-standing internal conflict between its institutional and pragmatic goals—necessarily dependent on journal advertising and sales of databases for revenue—and an increasing portion of its membership who request that their professional organization insulate them from pharmaceutical marketing.

**The Role of Practicing Physicians**

It is difficult to know the extent to which the average physician practicing in the 1950s and 1960s was conscious of the expanding network of prescriber surveillance. Like their counterparts today, most would have been surprised to learn that the industry had developed such interest and data sources pertaining to their clinical practices. Nonetheless, individual physicians were essential to the development of these surveillance tools. Certainly, physicians participating in panels like the NDTI were consciously aware of and were undisturbed by this practice. By 1960, the NDTI maintained a panel of 1200 quarterly rotating physicians reporting on all private patient contacts occurring in specified 48-hour periods. No physician served for more than a total of 12 months, and every private practitioner in the country had an approximately equal chance of being asked to participate (26). Lea Associates maintained a similarly sized panel for its National Detailing Audit, and rival data companies enrolled physi-
cian panels for their own data products. Because the medical profession had fewer than 150,000 practitioners at the time, most physicians probably would have been approached at least once to participate in a marketing data panel over the course of the 1950s and 1960s. The subsequent growth of the HIO industry and concurrent advances in medical informatics and electronic data interfaces have increased physician participation in profiling panels; physicians often participate unwittingly through the simple act of using handheld personal digital assistant software to look up the indications or dosage for a drug (27).

Two out of 3 physicians approached in the 1950s agreed to take part in profiling panels, and this trend seems to continue today. Physician participation is directly encouraged through financial award systems, in which collected prescription data is turned in for credits toward “awards,” such as washing machines and home theater systems (a sample can be found at www.ims.awardscatalog.com). Physician participation has also been motivated by the appeal of the potential public health and professional benefits of data collection. The head of the National Detailing Audit noted in 1968 that “the principal appeal that leads to cooperation in the panel is the fact that participation helps make possible an annual grant of $25,000 to the American Medical Student Association tuition loan program” (18). Solicitation letters to physicians from the NDTI promised that “[i]n return for the invaluable cooperation of individual reporting doctors, data on morbidity, patient and physician characteristics, and general areas of therapy are made available to the profession” (16). In 1962, Lea Associates began distributing these brief quarterly reports to state, county, and specialty medical associations; medical journals; and medical schools. The reports provided summaries of leading diagnoses covered by physicians and information on the changing reasons for office visits. These reports were distributed free to the medical profession but functioned more as statistical summaries than as research tools (27). To access the data directly, physicians and public health organizations typically have to pay the same prices as pharmaceutical clients.

**Conclusions**

If it withstands the current appeal by the HIO industry, the recent action of the New Hampshire legislature will mark the end of one of the most comprehensive market research experiments in U.S. business history. As a well-bounded population of proxy consumers with total representation via the AMA Physician Masterfile, the medical profession has become one of the most easily defined and efficiently studied sectors of consumers in the U.S. economy. While the New Hampshire law would disrupt this complete market surveillance, the AMA’s PDRP will continue to allow the sale of prescriber data for marketing purposes. It is possible that prescription data sets would no longer be useful to pharmaceutical sales representatives if a substantial proportion of physicians were to choose to opt out. According to the AMA, however, only 7000 of roughly 650,000 actively prescribing physicians have enrolled in the PDRP to date; only 25% of surveyed physicians are even aware that the program exists (American Medical Association. Personal communication).
In the past year, some physician groups have questioned the ethics of prescriber data collection as an invasion of the physician’s privacy. However, these arguments seem tenuous. Physician–patient confidentiality has historically been invoked to protect the privacy of the patient, not the physician, and HIO companies were already maintaining strict anonymity of patient information in all of their data products long before the Health Information Portability and Accountability Act. Unlike the patient, the physician is expected to act as a public figure, whose prescriptions and chart notes are legal documents and whose actions are generally being made more transparent, not less so, by the work of the American health polity, as evidenced by the growing practice of outcomes reporting (28). It is perhaps more fitting to question the ethics of prescribers who participate in market research panels and translate their physician–patient relationships into a market research instrument for an industry with an interest in manipulating prescribing practices.

Prescription audits, such as the NPA and chain store pharmacy databases, can circumvent the physician and record prescriptions because they function downstream from the physician’s office. However, the more sensitive tools of prescriber profiling—such as the NDTI and the AMA Physician Masterfile—require participation from both professional associations and practicing physicians. It is important to ask why the medical profession, a group long devoted to maintaining professional autonomy, should willingly reveal these data to an industry with an interest in manipulating prescriber decision making. To a certain extent, financial and pragmatic factors are relevant to the institutional actions of the AMA and may have influenced those practicing physicians who participated in prescription panels. However, many physicians who have participated in pharmaceutical marketing research seem to have done so in the name of broader professional and public health goals with no immediate financial benefit to themselves.

Similar claims of professional and public health benefits have been recently invoked in defense of the practice of prescriber data collection (6). Advocates of prescriber profiling claim that data sets enable development of outcomes studies, clinical guidelines, disease management programs, and evidence-based drug safety studies, as well as evaluation of physician performance and bioterrorism surveillance. While these are insufficient financial motivations to create a database of prescriber data, they are still viable uses for—and thereby a utilitarian justification of—a database created for marketing purposes (29). On historical review, however, these claims of professional and public health benefits to prescriber data collection represent more of a potential space than a true wellspring of benefit. Although it is true that data, once created, are conceptually available for all forms of research, such companies as IMS Health do not have provisions for making their data easily available to public health, pharmacoepidemiology, or policy research personnel without significant expense—indeed, the cost of purchasing data from HIOs is prohibitive for the independent researcher. Moreover, several non-HIO sources of prescription information, such as Medicare and Medicaid claims databases and a growing number of e-prescription databases from health systems with electronic medical records, have been used for pharmacoepidemiology, public health, and practice management research at a fraction of the cost of HIO databases.

The historical perspective presented here is limited by the problems of access common to social studies of the pharmaceutical industry. Although the author reviewed hundreds of articles in the medical, trade, and popular literature and conducted oral histories with retired and active pharmaceutical marketers, limited access to corporate archives and the piecemeal nature of archives preserved in medical and business school libraries provide the historian with only a small part of the complete picture of pharmaceutical marketing research as practiced over the past 50 years.

Nonetheless, 2 firm conclusions can be drawn from this work. First, although controversy over prescriber profiling is fairly recent, the practice itself is not: As early as the late 1950s, a robust network of surveillance technologies allowed pharmaceutical marketers and sales representatives to track prescribing practices and use these data to influence physician prescribing habits. Second, the HIO industry has required the active cooperation of physicians and physician organizations to develop its most robust tools for providing descriptive analysis of prescriber decision making. Any policy to remedy these issues must acknowledge that not only the pharmaceutical industry but also physicians and physician organizations make these practices possible and collectively bear responsibility to ensure their proper utilization.

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APPENDIX: PRESCRIBING DATA RESTRICTION PROGRAM

In July 2006, the AMA launched the opt-out program PDRP, enabling American physicians to deny access of their prescribing data to pharmaceutical sales representatives and sales managers. Physicians can enroll in the PDRP via a Web portal (www.ama-assn.org/go/prescribingdata) that serves as a reporting center for any misuse of prescriber data.

The AMA does not directly collect prescribing data on individual physicians, but it does license demographic, educational, professional, and current practice information to HIOs and pharmaceutical clients via the AMA Physician Masterfile. Under the PDRP, HIOs and pharmaceutical companies can only purchase physician data from the AMA if they agree to restrict prescriber profiling by sales representatives to physicians who have not opted out.

Sales-level “restricted data” are defined as “any product-level data regarding the prescription practices of an identifiable physician who has made the PDRP election. This includes measures of prescription volume in absolute and percentage terms, the associated dollar value of a physician’s prescribing, any indicators of change in these measures, as well as any means of ranking, benchmarking, or grouping physicians that may reveal prescribing habits for a particular product” (6). Information on physicians who opt out remain available to clients for broader purposes of marketing and research. End user compliance will be assessed by physician complaints to the AMA, and clients with patterns of abuse may lose access to both the AMA Physician Masterfile and HIO data in general.

The restriction must be renewed every 3 years and can be withdrawn. End users are expected to comply with a physician’s status change within 90 days. In addition to the PDRP, the AMA offers 2 other privacy options regarding the AMA Physician Masterfile data: do not release status (which prohibits the AMA from releasing any physician information to any AMA database licensee, including state licensing boards and hospitals) and no contact status (which prohibits the use of physician information for marketing by mail, telephone, or fax but permits the use of such information by sales representatives).