# Profitable Gifts: A History of the Merck Mectizan Donation Program and Its Implications for International Health

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# PROFITABLE GIFTS

## *a history of the Merck Mectizan® donation program and its implications for international health*

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**ABSTRACT** A unique public/private partnership situated around a pharmaceutical, Merck's Mectizan® donation program stands out as an example of corporate philanthropy in the history of the pharmaceutical industry and provides insight into future public/private partnerships in public health. This paper considers the issues Merck faced in the decision to donate Mectizan (ivermectin) and in the subsequent development of the Mectizan donation program, delineating the moral and financial debates that arose within the company. Coming after almost 15 years of donation, this assessment of the program's strengths and shortcomings suggests how the pharmaceutical industry can better serve as a viable partner in improving international health.

IN 1978, PARASITOLOGIST WILLIAM CAMPBELL approached Roy Vagelos, head of the Merck Research Laboratories, with exciting information: ivermectin, the drug he was developing to treat parasitic infections in livestock, might also be effective in treating onchocerciasis, a human parasitic infection causing blind-

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ness in millions of people in sub-Sahara Africa, Latin America, and Yemen. If the veterinary drug could be found effective for human use, it could dramatically improve the lives of people in tropical countries at risk for onchocerciasis, a disease with no available cure.

Campbell and Vagelos knew that the millions of people who needed the drug were much too poor to pay for it, and that no conceivable market existed for the human use of the drug. Faced with this apparent conflict between humanitarian and corporate responsibilities, Merck nonetheless decided to test the drug for human use. On October 21, 1987, upon demonstration of ivermectin's dramatic efficacy against onchocerciasis, Merck announced that the company would give the drug, brand name Mectizan®, away for free to anyone who needed it for as long as it was needed. Merck's decision gave birth to a drug-donation program that has become one of the foremost examples of a public/private partnership in international health, treating more than 25 million people annually and donating more than 525 million ivermectin tablets in little over a decade.

While other public/private collaborations existed in the pharmaceutical industry before the Mectizan donation program, these collaborations were initiated by public sector institutions and involved corporate sponsorships. In contrast, the Mectizan donation program developed out of Merck's decision to develop a drug without a market, donate the drug, and assemble public organizations to aid in the distribution of the drug. However, the development of the Mectizan donation program was not without its obstacles, and the experiences of the program provide insight into future public/private partnerships in public health. This paper will consider the issues Merck faced in the decision to donate ivermectin and in the subsequent development of the Mectizan donation program.

## ONCHOCERCIASIS BEFORE IVERMECTIN

A debilitating filarial worm, *Onchocerca volvulus* infects humans living in fertile river valleys in the tropical and Sahel regions of Africa, Yemen, southern Mexico, Guatemala, Ecuador, Colombia, Venezuela, and the Brazilian Amazon. The blackfly, the river blindness vector, breeds in fast-moving rivers, and through its bite transmits larval *Onchocerca volvulus*, which grow into worms that live in nodules under the skin. The adult worms grow up to two feet long, and adult females live 12 to 15 years in the human host. Male and female worms produce larval microfilariae, which migrate under the skin, causing severe itching, and in the later stages of the disease, invade the eyes, causing visual impairment and even blindness—hence the common name, river blindness. The disease has forced the relocation of entire villages away from rivers to less fertile land, with devastating socioeconomic impacts on agricultural communities. Diethylcarbamazine and suramin, the only drugs available to treat onchocerciasis prior to ivermectin, were toxic and had limited effectiveness. Those afflicted with river blindness were among the world's poorest, and their inability to pay for medication—even

if one were to become available—provided little incentive for pharmaceutical companies to develop treatments.

In 1974, the World Health Organization and the World Bank, along with the Food and Agriculture Organization and the United Nations Development Program, launched the Onchocerciasis Control Program, which initially focused on vector control and involved spraying blackfly breeding grounds with toxic chemicals. Eventually, however, immigrant flies began to reinvade treated rivers, and some flies developed resistance to the insecticides used by the program.

## THE DISCOVERY OF IVERMECTIN

Merck spends over $2 billion annually on research and development in order to create products that will generate profits. Although their business is humanitarian insofar as the products the company develops are life-saving and life-enhancing drugs, the company must also uphold its financial responsibility to stockholders, as evidenced in the annual reports Merck submits to stockholders. The Merck, Sharpe, and Dohme Research Laboratories (the research-and-development division of Merck) operate independently from the business side of the company, yet remain beholden to the stockholders. As the drugs that Merck researchers develop become commodities, they move away from the locality of the laboratory and the researchers that "produced" them and into a large-scale, more decentralized, manufacturing-based production for Merck & Company. John H. Horan, the former Chairman of the Board of Merck, drew this connection between the research and business divisions of Merck in the 1977 annual report: "we look [to the research laboratories] for the new products that are the driving force of our growth and are capable of rewarding stockholders for their confidence." The company's concern with profits is the result of the pragmatics of operating a business in a globalized, capitalistic marketplace.

The potential profits that a drug can gain as a marketable product provide the stimulus for research in the laboratory; however, pharmaceutical companies take large financial risks in investing in one drug. According to the Pharmaceutical Research and Manufacturers of America, each new drug is the result of 15 to 20 years of research and costs of $500 million. Only 5 in 5,000 compounds tested in a preclinical setting make it to human testing, and only 1of the 5 tested in humans is approved. Pharmaceutical companies like Merck invest a significant amount of capital in research and development with the expectation that they will gain huge profits in return for the development of a successful drug.

The story of ivermectin is at base one of an unpredicted outcome. The scientists who discovered ivermectin certainly did not set out to develop a pharmaceutical that would prevent river blindness. Rather, they were engaged in the development of a profitable veterinary anti-parasitic drug. The anti-helminthic program at the Merck Research Laboratories was established in 1955 as part of the animal health research division. In 1973, Merck initiated a collaboration with

the Kitasato Institute in Japan: the Institute would search for microorganisms that might be the source of active chemicals and would send the samples to Merck to be tested for anti-helminthic activity. In soil sample No. OS3153, collected from a Japanese golf course, Merck scientists discovered compounds with strong anti-helminthic properties, which were later found to represent a new class of chemicals they named the avermectins. The researchers modified these compounds to develop ivermectin.

The company sought regulatory approval for ivermectin. Upon receiving approval from France, Merck gave ivermectin the brand name *Ivomec*, and in 1981, it introduced the new drug into several markets outside the United States as an injection formulation for cattle. As brand name Ivomec, ivermectin became a commercial, profit-making drug. In the next few years, ivermectin acquired a whole complex of names, each name describing a product with unique uses and applications. By 1987, Merck was marketing not just Ivomec for cattle, but also Ivomec injection for pigs, Ivomec liquid for sheep, Equalan for horses, Heartgard-30 for dogs, Ivomec-F—a combined ivermectin and clorsulon product—and Ivomec Pour-on, a topical formulation for cattle. Indeed, in the 1980s, Ivomec became the world's most profitable veterinary drug. The 1987 Merck Annual Report declared ivermectin for animals "the Company's second largest selling product, a first for an animal health product."

The researchers responsible for the initial research on ivermectin were concerned with ivermectin's development as a veterinary drug. However, the company made a self-conscious commitment to collaboration between animal and human health research, and according to William Campbell, Merck took a "very liberal approach" in providing its researchers with the freedom to take their research in the direction they chose. Campbell, while primarily a veterinary researcher, had a demonstrated interest in human parasitic diseases, and in the 1960s, soon after he joined Merck, he had helped discover the human applications of the veterinary drug thiabendazole. According to Campbell, thiabendazole, which was put on the market in 1962 as Thibenzole, a treatment for gastrointestinal parasites in livestock, was the first of the anti-parasitic drugs to have a spin-off into human medicine: it was released in 1964 as Mintezol for the treatment of trichinosis in humans. Campbell believes that the communication and collaboration between the animal and human health division of Merck insured the company could be "primed for [the] discovery" of ivermectin's use as a human drug.

On May 9, 1977, Campbell sent a memo to his supervisor suggesting that ivermectin might have human applications. His supervisor passed the letter on to Vagelos, who sent a personal reply to Campbell, encouraging him to continue his search for human therapeutic uses.

His first experiments proved promising, and soon Campbell passed responsibility for the development of the drug as a human therapeutic on to Merck physician Mohammed Aziz. By that time, the company was already committed

to developing ivermectin for human use. With the support of the WHO, Aziz began clinical trials at the University of Dakar in Senegal in February 1981. The initial trials demonstrated the efficacy of the drug (Aziz et al. 1982), and subsequent studies suggested that ivermectin was safer and more effective than diethylcarbamazine. Ivermectin was also well-suited for the treatment of patients in the field, as treatment involved one pill once a year and the drug had minimal side effects. Following the success of the clinical trials, Merck's marketing department began to consider strategies for the distribution of ivermectin.

## THE DECISION TO DONATE

The development of ivermectin posed an unusual problem for the marketing department, which was normally expected to bring in returns on each product exceeding the product's research-and-development costs. To understand the importance of the marketing division's role within the company, it is worth noting that Merck actually invests much more money in marketing than it does in the research and development of drugs. According to the Merck Annual Report, in 1984 Merck spent $1.68 billion on marketing, while spending $566 million on research and development. As one contemporary Merck marketing executive observed, "Merck is in business to make some money," and good marketing strategies are essential to achieving this goal.

When marketing laid out the figures, they realized there was no way the company could make any money on the drug. Charles Fettig entered the international marketing department at Merck in the 1980s, just as ivermectin was being assigned to the marketing group, and he worked closely with researchers inside and outside of Merck on the donation program. He recollected, "Honestly, we couldn't find a way to price it," noting that early on the marketing group realized "there's no way they [river blindness patients] can afford it." According to Fettig, the normal price of an anti-parasitic drug was about $3 a dose, and those afflicted with river blindness could afford less than $1.

Initially, the company was reluctant to consider donation. Vagelos attempted to find means of funding ivermectin's distribution. He turned to national and international organizations—such as the WHO, the U. S. Agency for International Development, the U.S. Department of State, European and African governments, and private foundations—but to no avail. Senators Bill Bradley, Edward Kennedy, Frank Lautenberg, and Richard Lugar sought Congressional action to support the worldwide distribution of ivermectin, but their efforts also were unsuccessful. By late 1986, the prospects of covering the cost of distribution of ivermectin, let alone recouping the costs of development, appeared unlikely.

A few within the company, including Aziz, began to raise the possibility of donation, arguing that the company's primary goal should be making sure those who needed ivermectin received it; making a return on investment should be secondary. Even though pharmaceutical company employees were often vilified

as the industry came under fire for its astronomical profit margins and the rising costs of pharmaceuticals, these employees, like many of us, saw themselves as moral agents working within an ethical framework.

Within Merck, this ethical framework is embodied in the "Merck philosophy," which employees began to use in support of their argument for donation. Merck has a reputation as a socially conscious pharmaceutical company, in part because of this philosophy. In 1950, George W. Merck, the founder's son, told an audience at the Medical College of Virginia that "medicine is for the people. It is not for the profits. The profits follow, and if we have remembered that, they have never failed to appear." William Campbell has commented that it is important to make sure that George Merck's statement is read as Merck intended it—as the philosophy of a *money-making* company. According to Campbell, the statement should not cause employees to overlook the central tension within the industry between saving lives and making profits. As long as it is not used to hide the fact that the company is, indeed, concerned with a bottom line, such a philosophy can work to the pharmaceutical company's benefit.

Even before ivermectin, Merck had a history of donating some of their essential medicines. After World War II, the company donated a large supply of streptomycin to the Japanese, who were suffering from high rates of tuberculosis; in the 1990s, Merck became the largest American pharmaceutical company in Japan (Useem 1998). Such experiences suggested that donation could actually be considered a sound business strategy. In 1958, the company established the Merck Medical Outreach Program, through which it donated medicines, including antibiotics, anti-parasitics, and vaccines, to ongoing humanitarian programs in developing countries and disaster situations. These programs provided a precedent within Merck that helped to support the donation of Mectizan. The appeal to "philosophy" served to justify the decision.

Merck employees looked to the company's bottom line in order to gain further support for their call for the donation of ivermectin. The various ivermectin-based veterinary drugs were bringing in more than $300 million annually, with a 15% growth in sales per year. Even if the company donated Mectizan, it would incur no net loss on ivermectin, because sales on Ivomec alone would be likely to exceed the production and distribution costs of Mectizan. The financial success of ivermectin added to the moral pressure to donate. However, even those more skeptical of pharmaceutical donations have argued that the donation of Mectizan was a minimal price to pay—compared to the profits brought in by Ivomec—for the benefits of good publicity, improved employee morale, and a tax write-off (Wehrwein, 1999).

Some Merck officials questioned whether donation was a sound strategy for reasons beyond financial concerns. They wondered if Merck gave ivermectin away for free whether other companies would be discouraged from further research on tropical diseases, concerned that they might be pressured into following Merck's example. Others were worried that patients and health workers

would question the value of a drug given away for free. As no large-scale donation program initiated by a pharmaceutical company had ever been attempted before, there were no answers to these questions.

The moral arguments won out over other concerns, and Vagelos decided in favor of donating ivermectin. Fettig commented that drug donation "has come into vogue in the last decade, but I don't think anyone ever expected it or even suggested it" prior to Merck's decision.

## DISTRIBUTING MECTIZAN

Merck then faced the challenge of distributing a drug to millions of people in need, many of whom lived in remote regions of Africa and Latin America lacking the basic infrastructure—paved roads, telephones, faxes, mail systems, and running water—essential to drug distribution.

In addition to the challenge of the physical distribution of the drug, Merck had to deal with the difficulties of transferring a culturally loaded product—a medicine developed and produced with particular value in American and Western European culture—between two vastly different cultures. The exchange of commodities within a society occurs within a cultural structure that has created unique definitions and uses for certain things and that has delineated the rules that govern the exchange of those things (Appadurai 1986). With the donation of ivermectin, however, an object was being exchanged between two different societies in which the givers and receivers, operating within different cultural value systems, disagreed on its value and use. Before Merck officials asked whether ivermectin recipients would question the value of a drug offered for free, they should have asked whether these cultures would assign a value to a Western medicine at all. In the communities where ivermectin was to be distributed, a plurality of explanations and remedies for river blindness already existed. These explanations differed from the Merck researchers' biomedical explanations for the illness and the mechanisms by which the medicine could treat it. Further increasing the gap in understanding between the different medical systems, people in some communities where ivermectin was to be distributed had been treated with the drugs previously used to treat river blindness—diethylcarbamazine and suramin—during the 1970s and 1980s. Having experienced the terrible side effects of these medicines brought in by Western physicians, they distrusted Western medicines.

Merck sought to overcome the obstacles of a lack of infrastructure and cultural barriers by establishing public/private partnerships with organizations already working in Africa and Latin America. The company approached William Foege at the Task Force for Child Survival and Development—a nonprofit public health organization—to ask if the Task Force would be willing to help run a donation program. Although others discouraged him from getting involved, warning him that pharmaceutical companies could not be trusted, Foege agreed to help.

In 1988, at Merck's request, the Task Force organized the Mectizan Expert Committee, an entity separate from Merck and comprising specialists in tropical diseases, which would receive and process applications from organizations and governments wanting to distribute ivermectin. The applicants included national ministries of health, as well as organizations that had been working on blindness prevention and cure projects in Africa and Latin America since the 1950s and '60s, including Helen Keller International, Sight Savers, and the International Eye Foundation. The decision to donate provided an impetus to build up these existing yet very basic health infrastructures in Africa and Latin America, as well as put infrastructure in place where it did not previously exist.

As a result of the partnerships with these organizations, the exchange of ivermectin—which on the largest scale occurs between Merck as a corporate entity and the onchocerciasis victims as generalized masses—is carried out through intermediary exchanges. These exchanges occur within what Peter Galison (1999) has called "trading zones." In these sites, "Two groups can agree on rules of exchange even if they ascribe utterly different significance to the objects being exchanged . . . partners can hammer out a local coordination despite vast *global* differences." Merck is responsible for the production of ivermectin, which it then distributes to nongovernmental organizations that act as intermediary bodies in the exchange between Merck and the recipients. Thus, ivermectin passes through a series of local interactions and is exchanged within several trading zones before it reaches the victims of onchocerciasis. Because these international nongovernmental organizations employ people from both the United States and the countries in which ivermectin is to be distributed, they understand the systems in which both cultures operate. The employees of these organizations help to create sites of local coordination in which the exchange of ivermectin can take place, thereby bridging cultural and geographic gaps between Merck and ivermectin recipients.

## MODELS OF DISTRIBUTION OF MECTIZAN

When mass distribution of ivermectin began in 1988, mobile teams of health workers from the Onchocerciasis Control Program, national governments, and nongovernmental organizations visited the communities to educate community members on river blindness and then distribute ivermectin. The distributors provided a Western scientific explanation for how the disease was transmitted and presented ivermectin as the cure. Some community members, skeptical of these explanations, refused to take the drug. Although the distributors were often local employees of the nongovernmental organizations involved in the program, and were therefore of the same nationality as the recipients, the skepticism with which many of the recipients approached the drug suggests that the workers and the recipients still held very different perceptions of ivermectin's value. These differing views were most likely the result of differences in class, education, and/or eth-

nicity between the distributors and recipients. Considering the problems that gaps in understanding between recipients and donors created in the process of exchange, it is not surprising that the program became more successful as it shifted from the mobile-team model to a community-directed treatment model, in which organization members worked with local ministries to train health volunteers who then distributed ivermectin in their communities (Nyiama 1988). Under the community-directed model, the distribution of ivermectin has become integrated into the traditional patterns of community life and has given the communities ownership over the program, helping to de-emphasize the paternal relationship between Merck and the onchocerciasis-endemic community.

Through these community-directed programs, the Mectizan program has improved local health systems by creating capacity among local health workers. Recently, the argument that a lack of health infrastructure in developing countries impedes drug delivery has been raised against the donation of HIV/AIDS drugs and has been used by pharmaceutical companies reluctant to donate HIV/AIDS drugs. However, much of the infrastructure for the distribution of ivermectin developed following Merck's decision to donate the drug. Once Merck made the commitment to produce ivermectin, governments and nongovernmental organizations stepped in to assist with its distribution.

Merck's partnerships with nongovernmental organizations facilitated the adjustment to more adequate systems of distribution that worked within local contexts and allowed the program to function in areas with limited health infrastructures. The experience of the Mectizan donation program in the recipient countries suggests how other programs, such as AIDS drug donation programs, might be organized most efficiently using the community-directed treatment program as a model: the community needs to be involved from the beginning in the decision-making and planning processes in order to ensure better community ownership of the program and participation.

## BENEFITING THE COMPANY

Pharmaceutical companies often argue that, because there is no market for drugs in developing countries, programs like the Mectizan donation program are simply corporate acts of good will. However, the case of ivermectin highlights the public relations value of drug donation programs; the benefits Merck has received from the Mectizan donation program may well translate into financial gains. In large part because of this program, Merck has received extensive recognition as a publicly responsible company. The January 11, 1988 issue of *Business Week* described Merck as one of "the best in public service" and called the Mectizan donation program "an unusual humanitarian gesture." In January 1988, Merck received recognition from *Fortune* as America's most admired company. This recognition can influence the actions of stockholders, who, like all people, think of themselves as moral agents with certain moral values. They might be

more likely to invest in a socially conscious company that they believe is operating according to certain ethical standards.

The attitude of stockholders toward Merck's donation program suggests the importance of such programs to stockholders. Nearly 10 years after Merck made the decision to donate,Vagelos announced that the company had not received any complaints from shareholders about his decision to donate ivermectin (Useem 1998). Brenda Colatrella, who has been working with the Mectizan program for nine years, reported in 2001 that mail from stockholders had been 98% positive and supportive. In addition, the company has also received mail from employees who have explicitly chosen to work for Merck because they heard of the Mectizan donation program and considered the company morally responsible.

## LOOKING AHEAD

The Mectizan donation program blurs the line between medicines as commodities and medicines as gifts. Breaking down this barrier provides space for public/private collaboration in public health and collaboration between the developed and developing worlds. The challenge then becomes moving beyond the colonial relationship that can be recreated through the movement of Western medicines and medical practices into the lives of countless "others," which in the case of Mectizan was solved in part through the community-directed treatment model. The Mectizan donation program demonstrates that industry can be a viable partner in improving international health. However, the Mectizan experience also begs the question: for future drugs that do not share the double identity of human therapeutic and profitable veterinary drug, where will the incentive to donate come from?

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