The emergence of HIV in the U.S. blood supply: Organizations, obligations, and the management of uncertainty

KIERAN HEALY
Princeton University

In the early 1980s, blood suppliers in most Western nations went through at least a crisis, and often a scandal. Thousands of people were infected with HIV after receiving a blood transfusion or some other blood product. Blood-borne AIDS, like the AIDS epidemic as a whole, was a human tragedy. It was also an organizational disaster. If we want to understand what happened, the experience of the United States provides a particularly important starting point. It has the largest blood industry in the world. Unusually, a non-profit whole blood sector that relies on voluntary donations coexists with a large, for-profit plasma industry that buys its raw material from suppliers. Almost the same volume of raw plasma is purchased as whole blood is donated each year. In retrospect, the blood industry in the U.S. between 1981 and 1983 provides a kind of natural experiment that allows us to test and develop our ideas about the social embeddedness of economic transactions, and the reactions of complex organizations to uncertainty.

This article seeks to explain why blood banks and plasma companies reacted differently to the same information about the spread of a new disease through the blood supply in the United States. I draw on recent work in economic sociology and the sociology of risk in order to give an account of these events. Using the concept of a "negotiated information order" to frame the analysis, I explain why blood banks and plasma companies acted as they did.[1] The appearance of blood-borne AIDS was an instance of an awkward kind of uncertainty. Actors in the blood industry were not sure what was going on, and the available information was ambiguous. They constructed a set of standards, an information order, to evaluate information about the problem. Drawing

Theory and Society **28**: 529–558, 1999.

on statements made to a commission of inquiry, as well as internal memos, minutes, and transcripts, I show that these standards were influenced by three factors: the external dependencies of these organizations, the exchange relations that bound them in different ways to their suppliers and recipients, and the organizational ties that linked them to other stakeholders in the blood industry.

This study contributes to theory and research in two ways. First, it extends ideas about the management of uncertainty by applying them to an under-explored area. Despite its importance to the medical system as a whole, remarkably little has been written about the social organization of the blood supply. Sociological theories of risk most often focus either on the day-to-day management of uncertainty, where organizations know something might go wrong, or on reactions to serious accidents, where something already has. For theoretical purposes, a distinctive feature of the AIDS disaster was that it unfolded in slow-motion, as the participants gradually became convinced of the extent of the problem. Second, my analysis shows that particular exchange relations – that is, how blood and plasma were transferred among suppliers, processors and recipients – had an important effect on the observed outcomes. Economic sociologists stress that strictly economic interests are socially embedded. This study shows how economic interests were embedded in exchange relations that had a strong moral component, and that these relations significantly affected how organizations acted.

Interestingly, one of the earliest empirical studies to stress the social aspects of economic behavior was also partly responsible for the organization of the blood supply. Richard Titmuss's *The Gift Relationship* made a strong moral and empirical case against the commercial market for blood that existed in the United States prior to 1974. The book led directly to the reorganization of the system along voluntary lines. Changes in law and government policy encouraged people to donate their blood rather than offer it for sale. Accepting the arguments of *The Gift Relationship*, the government tried to ensure a clean and safe supply by removing the profit motive from the blood business. However, the system's reaction to the appearance of AIDS in the U.S. between 1981 and 1983 shows that Titmuss was at best only partly correct. The relationship between blood organizations and the quality of supply is subtler than he realized.

Titmuss's argument was the main article of faith that the U.S. blood supply rested on from 1974 to 1981. Understanding where Titmuss erred provides a useful starting point for an empirical account of the AIDS disaster of the 1980s, as well as an entrée to the theoretical issues at stake.

The legacy of *The Gift Relationship*

Titmuss compared the social organization of the blood supply in England and the United States. He argued that the then largely commercial, market-driven system of the United States was demonstrably inferior to England's voluntary system. In the United States, hepatitis was a chronic problem in the blood supply, whereas in England it was almost entirely absent. Titmuss claimed that if blood is a commodity, individuals will have an incentive to lie about their health. Unsuitable suppliers come forward and are paid for a bad product. The people most likely to sell their blood are also those most likely to transmit disease. (Titmuss referred to them as "skid row" suppliers.) In addition to contaminating the supply, these commercial blood suppliers tend to drive volunteer donors away. By contrast, in an altruistic system there are no such incentives to lie; thus no one from "skid row" will donate blood and the supply will stay clean. In addition – and ultimately most important – altruism is morally better for society than the market. Markets are both inefficient and morally bankrupt. If blood remains a gift, then the system will stay efficient and the bonds of community will remain strong.

The book was very influential. The response to its argument was generally favorable, and has remained so.[2] It also had a remarkable influence on blood policy. A few economists objected, but for once they were ignored.[3] In 1973, the Assistant Secretary for Health announced the National Blood Policy, which recognized that reliance on "commercial sources of blood and blood components for transfusion therapy has contributed to a significantly disporportionate incidence of hepatitis, since such blood is often collected from sectors of society in which transmissible hepatitis is more prevalent."[4] The National Blood Policy aimed to eliminate pernicious commercialism in the blood supply by instituting an all-volunteer system for the collection of whole blood.

There are many problems with Titmuss's argument. The book is a strong mix of empirical facts and moral charges. From the perspective

of economic sociology, it is an exemplary case of what Zelizer calls the "boundless model" of markets.[5] The market is seen as a voracious entity liable to eat up whatever it can get its hands on. In a market society, everything becomes commodified and can be put up for sale. Important social relationships are destroyed. The only defense against the market is the "legal preservation of selected items or activities outside of the cash nexus."[6] Some things – blood, for instance – should be kept sacred. Zelizer notes that, although motivated by a deep disgust with the evils of the market, these critics nevertheless accept that markets really are laws unto themselves, unbeholden to any social or cultural dampers. They do not accept the possibility that, once set loose, the logic of the market might still be inhibited or deflected by other institutions. By contrast, more recent writing has tended to stress that markets are related in complicated ways to other features of economic, cultural, and social structure. Markets are "embedded" in networks, subject to organizational and state interference, and affected by culture.[7]

Titmuss's argument about blood and the market assumes two important things. First, there must be a clear way to link an organization's form to the quality of the blood it procures. We can isolate some mechanism that ensures that the one will affect the other. Second, this link is unmediated by any other factors. Market logic or altruistic virtue will always have their respective effects. Thus, the market has a direct, unequivocally negative effect upon the quality of the blood supply.

Both of these assumptions are false. The link between organizational form and clean supply exists, but it is contingent. Both market and altruistic arrangements are embedded within social structure and culture. I now have to justify these assertions in turn. The first point can be argued for briefly. Defending the second will mean giving a positive account of the empirical relationships involved, drawing on concepts and theory from economic sociology and the sociology of risk.

Do good gifts mean clean blood?

Titmuss was right to argue that, in the United States, payment for blood attracted people who contaminated the supply. But he was wrong to suggest that contamination occurred because they were paid. Titmuss was able to conflate these claims because he was mainly concerned with the hepatitis B virus (HBV). This was indeed prevalent

amongst the supply population in the United States at the time. But, as has been pointed out by several commentators, this does not mean that we can assume that the price mechanism will always attract dirty blood.[8] Whether it does or not will be contingent upon the overlap of blood-selling and disease-bearing populations. These commentators note that some countries (such as Sweden) or hospitals (like the Mayo Clinic) pay their suppliers and still manage to have a clean supply, but the underlying argument that makes these examples relevant has not been clearly made.

Consider: If there is a virus floating around in the blood supply that no one knows about, then how important is it whether people sell or freely give their blood to you? The answer is that, in the absence of epidemiological information, it is not important. More precisely: it may be true that market forms of organization attract infected populations. But the same might be said of voluntary forms. When the epidemiological profile of a disease is unknown, the extent to which each system appears to perform successfully is entirely dependent on whether the virus-bearing population is co-extensive with the population of suppliers. To the extent that it is, the system will appear to be failing.

Titmuss wrote at a time when hepatitis was the main risk to the quality of the blood supply. Though recognized, this risk was not properly understood. "Serum hepatitis" (as it was then called) seemed resistant to attempts to weed it out of the system. There was no test that would reliably distinguish carriers from the general population. Tests existed, but they missed many carriers. It later turned out that this was because another virus, hepatitis C, was also being transmitted by transfusion.[9] Titmuss was lucky on both these counts. With one significant risk and no reliable test for it, he was able to assess the effectiveness of markets *versus* altruism as mechanisms for reducing that risk. The test of organizational efficiency was obvious: all one had to do was examine the prevalence of hepatitis amongst transfusion recipients. But this was an effective performance index only because of the unusual circumstances. Some of Titmuss's critics saw through this problem. They pointed out that the issue was not simply whether you paid for blood, but rather whether the person you paid had hepatitis.[10] If we had a different way to get information about supply quality – through epidemiology, or accurate tests – then it wouldn't matter whether suppliers were paid or not, since we would not be relying on that mechanism to reduce the risk borne by the system.

Once we recognize that the relation between the social organization and the cleanliness of the supply is contingent, it is easy to see why neither voluntary nor price mechanisms can generally ensure anything about the quality of supply in cases where we do not know about a bloodborne pathogen. Titmuss's argument is then greatly weakened. It amounts to saying that when we know that a disease is chronic in the population we buy blood from, then our blood supply will be dirtier than if we relied on voluntary donors who do not have the disease. This is not saying very much. Sweden and the Mayo Clinic make the same point. If Sweden has a naturally low rate of hepatitis across its population, or if the Mayo Clinic carefully screens all its donors, then it doesn't matter if the suppliers are gift-givers or money-grubbers.

In spite of these flaws, Titmuss had the kind of effect on government policy that most social researchers only dream about. Both the United States and the European Union are presently committed to an altruistic supply system, and Titmuss is usually cited as the inspiration in both cases.[11] It is therefore surprising that so little has been written about the effects of this change. For the great irony of *The Gift Relationship* is that its success helped create the conditions that allowed its argument to be turned upside down. In the case of AIDS, a population of responsible, voluntary donors happened to be co-extensive with a large chunk of the disease-bearing population. The blood banks knew homosexual men to be reliable givers and good volunteers. As it turned out, they were also important vectors for HIV. The voluntary system ended up attracting people who contaminated the supply. But, as with commercial donors and hepatitis, they contaminated the supply not because they were donors, but because they had HIV. Titmuss's system ended up selecting the wrong people in much the same way as the previous market arrangement had selected the wrong people: by accident.

To say there is only a contingent connection between organizational form and supply quality is not to say that it is never observed. Diseases are socially distributed, usually in ways predictably related to income, class, or race. Indeed, to be fair to *The Gift Relationship*, these distributions would probably lead us to expect "Titmuss effects" more often than not. In general, the better-off are both less prone to certain diseases and more likely to be blood donors. Therefore supply arrangements that select for the former will also happen to select for the latter. But, like most useful rules of thumb, this assumes that important underlying conditions will not change over time. It is dangerous to

ignore the potential for uncertainty. The U.S. blood supply managed to do so for about seven years. Then something new showed up and the system failed to deal with it.

Titmuss's work remains a touchstone for those, like the blood bankers, who argue that the blood supply ought to rely exclusively on voluntary donation. It is therefore important to see clearly the ways in which it is limited or wrong. But if we want to understand what happened to the supply in the early 1980s, we need a better theory than Titmuss can provide. Zelizer urges that a course be charted to "capture the complex interplay between economic, cultural and social factors" in the study of economic institutions.[12] The events of 1981–1983 give us an opportunity to examine this interplay in the case of the blood banks and plasma companies.

I argue that organizational responses to the emergence of AIDS are best understood as a process of risk-managmenet operating under social-structural constraints. When a new uncertainty arises, these constraints provide the grid within which the uncertainty will be understood. In 1981, the relative importance of suppliers and recipients, and the kind of exchange relationships they had with one another, gave managers a set of reference points that guided them as they evaluated new information and made decisions to develop this argument, I begin with some necessary background on the structure of the blood supply, and then discuss theories of organizational response to risk and uncertainty.

How the U.S. blood supply works

Getting blood or plasma out of one person and safely into another is a complicated business, and at present the people of the United States have two different kinds or organizations to do this job for them. First, there are the blood banks (including the Red Cross). They obtain almost all of their supply from voluntary donors.[13] They process and then distribute freely donated blood. They charge hospitals for their services, but they are non-profit organizations. Every year in the United States about 14 million units of blood are donated to these organizations. The American Red Cross collects about 45 percent of the total, blood banks about 42 percent, hospitals 11 percent and the small remainder is imported.[14] These donations are processed into different blood products: whole blood, plasma, clotting factors, and

others. About 3.6 million people receive transfusions of these products every year. Blood banks generally enjoy local (geographical) monopolies. They do not compete with one another.

Plasma companies are the second kind of organization. They pay people to undergo plasmapheresis. A supplier is paid about $15 to $20 for an uncomfortable couple of hours having about 700 mls of the liquid portion of their blood extracted and the red cells returned to their body. It is estimated that about 13 million units of plasma are purchased in the U.S. each year.[15] There are four U.S. based companies. These organizations process plasma and sell it to those people – mainly hemophiliacs – who need it. There is a competitive market for plasma products.

In 1981 neither the blood banks nor the plasma companies were in any danger of being sued for infecting their recipients. So-called "blood shield" laws passed in the 1950s and 1960s exempted blood and blood products from strict liability or implied warranty claims, on the basis that they provided a service rather than a sale. The collective benefits of having a blood supply overrode individual rights to damages. A test case in 1977 confirmed that the plasma companies were covered by these laws in the same way as the blood banks.[16]

It would be highly impractical for an individual to negotiate a blood transfusion for herself. Individuals do not have the time, money or expertise to obtain blood and monitor its quality. Instead, they rely on these organizations to do it for them. By doing so, they hope that the organization involved will minimize the risks involved in the transaction on their behalf. When there is good information about risks, this process is reasonably straightforward. Most blood is processed and delivered safely.

Difficulties arise when unexpected events occur. In the 1970s, blood collection and transfusion had a number of risks associated with it, in particular the prevalence of hepatitis in the supply. But these problems were *risks* precisely because their probabilities were reasonably well known. In late 1982, when evidence began to show that a new disease might be spreading through blood products, things became more complicated. There appeared to be a threat, but its seriousness was difficult to measure. In such conditions, risk cannot easily be assessed. Instead, the blood industry was faced with real uncertainties about what was going on.[17] Despite this, the blood organizations were nevertheless

obliged to make decisions, and act on the basis of the information they had. I offer an explanation for why, when they were faced with the same uncertainties and armed with the same information, the blood banks and the plasma companies reacted in different ways.

At first blush, it seems that the blood banks reacted very badly: they played down the extent of the risk, they claimed that the evidence did not show conclusively that HIV was a blood-borne disease, and they refused to screen out potentially infected donors. By contrast, the plasma companies accepted that there was a good chance that HIV was being transmitted by their products, they moved very quickly to switch the source of their supply, and introduced new methods to inactivate viruses in plasma derivatives. But these positive moves were mitigated by decisions to keep older product batches on the market, and commercial plasma ended up infecting more people than did donated blood. Both the banks and the companies fell, but at different hurdles.

Organizations, risks, and disasters

There is a huge literature on the AIDS epidemic, but almost none of it deals with the blood industry. Relevant commentaries tend to fall into one of two categories: either they ignore the distinction between the commercial and non-commercial parts of the system or, with the benefit of hindsight, they tell the story in a whiggish way, with those who were in the right cast as heroes from the beginning.[18] Sapolksy and Boswell's brief characterization of the structural differences between the banks and the companies stands out as a rare attempt to explain their different reactions.[19] They argue that the plasma companies reacted better because they were market-driven organizations with a competitive interest in selling a demonstrably safer product, whereas the blood banks wished merely to protect their quiet monopolies. This goes some of the way toward a satisfactory explanation. But Sapolsky and Boswell tend to argue for the general superiority of markets, much as Titmuss supported the opposite view.

A richer theoretical perspective is available. In recent years, social scientists have paid increasing attention to the ways individuals and organizations manage risk, and respond to disasters. This work has yielded a body of case-studies and concepts that I draw on here. In doing so, I also argue that the particular characteristics of the blood

industry can help us sharpen our general theories of organizational responses to uncertainty.

The literature in this field can roughly be divided into three varieties.[20] The first kind focuses on individual risk assessment and the social construction of risk objects. Experimental work by Kahneman and Tversky (and others) shows that individuals are not good judges of risk. If given choices between outcomes, with probabilities attached, people do not calculate expected values as decision theory says they should. Instead of doing a straightforward calculation, they draw on rules of thumb ("heuristics") that systematically bias their choices.[21] This experimental work shows how individuals can be made to misperceive risks in different ways. Sociologists taking up this perspective became interested in what happened outside of laboratory settings. In particular, they were interested in why some risks were perceived as such and others were not.[22] The question here is why particular "risk objects" – seat belts on school buses, drunk drivers, tamper-proof medicine bottles – emerge from an ocean of potential candidates to be socially constructed as real dangers. In general, the risks studied are small. Often, the research question is precisely why people bother to worry about them at all.

At the other end of the scale are studies of organizational responses to large disasters. Here the catastrophe has already occurred and what's interesting is how quickly the organization in charge reacts, whether it acts in a competent manner, and whether it learns from the experience. In the face of an obvious disaster – the Bhopal accident, for instance, or the Exxon Valdez oil spill – we find that organizations tend to be slower to react and less flexible than they should be.[23]

The AIDS disaster reflects aspects of both these problems, but falls somewhere in between them. The blood industry had to decide whether the data they had meant a real "risk object" existed, and they had to react to a disaster as it happened. But the data were not good, and the catastrophe occurred silently and in slow-motion. The blood industry was not so much constructing a risk object or reacting to an accident, as deciding whether a disaster was happening around them.

This brings us to the third variety of research in this area, the study of how organizations continuously manage risk and uncertainty. When an organization knows the probability that some future event will occur, it deals in risk. Risks can be insured against or otherwise

planned for. When outcomes are known to be possible but there is little or no information about the probabilities involved, an organization is simply uncertain about the the future. Research and theory suggest that organizations (and institutions more generally) are important to questions of risk and uncertainty for three reasons. First, the public does not construct the risk objects they worry about, organizations do. Organized interests "devote *sustained attention* to constructing facts and machines, laws and regulations, organizations and management systems, risk objects and networks for controlling them."[24] Second, as well as dealing with risk, organizations are complex systems that produce their own risks and uncertainties in the course of their day-to-day operations.[25] Third, the most common reason offered for organizational failure or inadequate response – human error – is hopelessly inadequate when it comes to explaining the way an organization behaved before and after a disaster.[26]

The sociology of risk and uncertainty, then, focuses on discovering "how organizational interests influence information classification and interpretation, how information is used by responsible organizational elites and by contending elites within organizations, the degree to which technical elites and managerial elites are autonomous or interdependent and the symbolic roles of technical information."[27]

The blood industry's information order

It is easy to say that interests are important, or that the relationships between organizational elites matter. We need to be more specific, both theoretially and empirically. In explaining the decisions of the blood banks and plasma companies, I draw on Carol Heimer's concept of a "negotiated information order" to show how structural interests, exchange relationships, and organizational ties shaped the decisions that the blood industry made about AIDS.[28]

Heimer studied how oil rigs in the Norwegian refining industry get insured. Drilling for oil in the North Sea is dangerous. As a relatively new enterprise, "experience-based information, usually the basis for decision making in marine insurance, was unavailable … there were no data about what the losses were likely to be."[29] To turn these uncertainties into insurable risks, the insurers and drillers developed a set of standards and routines for evaluating the information they had. Following Feldman and March, Heimer points out that the standards

for knowing something to be true vary by institutional setting: "[W]hen several actors are required to carry out [a] decision, then the problem is not so much to get evidence to answer the question, but to get information that everyone concerned will agree is evidence. That is, the information needs to be socially sufficient as well as technically sufficient."[30] The "negotiated information order" is the set of criteria for the social sufficiency of information. It is partly determined by the interests and bargaining power of the participating organizations.

Heimer's refiners and insurers had a well-worked-out set of rules, a stable information order. This was partly because they were oriented toward solving the problem of insurance from the beginning. In the case of the blood supply, the blood banks and plasma companies had to negotiate an information order on the fly, as they gradually became aware of the uncertainties they faced. The result was open conflict over the social sufficiency of the data they had. As we shall see, some players could look at the available information about transfusion AIDS and say "How many more cases did they need?" whereas others just saw "iffy" cases and "soft and squiggly data."[31] The decision process – and the resulting information order – was shaped by the interests of those involved. It is not obvious what those interests were. What led the blood banks and plasma companies to act as they did? I argue that three factors were decisive: the external dependencies of the major players, the exchange relations that these dependencies were embedded in, and the organizational ties that linked the industry to other interested groups.

External dependencies

As I have said, we can think of the blood banks and the plasma companies as organizations that mediate between suppliers and recipients of blood and blood products, calculating risks and dealing with uncertainty as they go. When a problem like AIDS comes along, the organization needs criteria to evaluate it. One option is to understand it in terms of its possible effects on suppliers and recipients. If there is a conflict of interest between these groups, an organization will move to protect the constituency it is externally dependent upon. Social structural relations of relative power and dependency condition the interests of the organization, and valuable or important relations will be better attended to.[32]

The blood banks and plasma companies had different dependencies. For the banks, suppliers were relatively more valuable than recipients. Given a choice, blood bankers would much rather have a new supplier than a new transfusion recipient. Suppliers are relatively rare. Recipients are all too common. Given the same choice, plasma companies would much rather have a new recipient than a new supplier. In cases where the organization is caught in a conflict of interest between suppliers and recipients, it will tend to side with the constituency most valuable to it. The blood banks had a hard time finding and keeping donors, but they had plenty of recipients for these gifts at the other end. The plasma companies had a more or less stable population of recipients – determined in part by largely uncontrollable factors like the prevalence of hemophilia – that was much smaller than the population of potential suppliers. Their interests pointed to different constituencies.

Exchange relations

Interests are generally understood as forces that striaghtforwardly inform decisions. The concept of external dependence is a useful way to grasp the structural basis of organizational interests. But I argue that, in this case, the exchange relationships that linked organizations to their suppliers and recipients influenced their actions independently of their interests. The external dependencies were embedded in a set of norms and expectations of exchange that either dampened or exacerbated them. In our case, the organization structurally dependent upon suppliers obtained units of blood as voluntary gifts. By contrast, the organization structurally dependent upon recipients contracted with its suppliers and sold its products in a competitive market. The social obligation of the blood banks to their suppliers reinforced their dependency. If nothing else, Titmuss showed that making blood a gift tends to sacralize it, placing the receiver in a debt of gratitude to the supplier. The Red Cross had drawn on this powerful cultural notion of gift-giving for years, in an effort to create a moral community of dedicated givers. The blood banks joined them after 1974. Having a gift relationship with their suppliers made it very difficult for the blood banks to treat them in certain ways, including rejecting their gift or directly questioning its provenance. No such bonds existed between the plasma companies and their suppliers or recipients. In the case of plasmapheresis, contract and payment define and discharge the obligations of the transaction, leaving all parties free of any further responsibilities.

I argue that the consequences of each organization's structural dependencies were channeled through the exchange relations it had with those it dealt with. This is an important part of what it means to say economic interests and actions are socially embedded.[33] Suppliers can merely be suppliers, or they can be donors. Recipients can be patients or customers, and so on. When it comes to understanding why particular decisions were made, the structural dependencies and the exchange relations are analytically separable from one another, and have independent effects.

If we did not make this distinction, we might think at that the blood banks' supply pool was small simply because they did not pay for blood, whereas the reverse was true for plasma companies. This is incorrect, for two reasons. First, we are concerned here with the relative importance of the supply and demand populations in each case, not their absolute size. In absolute terms, more people donate blood than are paid for plasma. Second, imagine that only a tiny percentage of the population were physically able to donate plasma, whereas a large number of people actually needed it. (This might be true locally in times of war, or after a natural disaster, for example.) In this case plasma delivery organizations would be externally dependent upon suppliers regardless of whether they paid those who showed up at the hospitals. Conversely, if donating blood was very easy, and not many people needed it very often, then even a non-profit organization would be more dependent upon recipients than suppliers for its survival.[34]

The blood banks and plasma companies were externally dependent on their respective suppliers and recipients. This dependency mainly defined their interests, but was itself embedded in a social relationship, in this case either gift-giving or market pricing. The structural and the social relationship were closely related, and variation in the one would most likely affect the other. But they remain separable, and need not push in the same direction. Embeddedness is the further shaping of structurally-driven interests and goals by social relations and expectations.

Organizational ties

Finally, the blood banks and plasma companies were themselves situated in important relationships with other organizations. These

include government agencies, health authorities, the medical profession and groups representing suppliers and recipients. In each case, the kind of relationship that exists will affect how the organization interprets new information. I focus on two organizations that significantly affected responses in each case. The blood banks' decisions were influenced by their relationship with gay rights groups and the Centers for Disease Control (CDC).[35] Links to the medical profession and the National Hemophilia Foundation (NHF) were both important in the case of the plasma companies. In the former case, the blood banks' attitude toward gay rights groups and the CDC tended to encourage the conservative and defensive stance they were already inclined to take. In the latter, the initially positive response of the plasma companies tended to be significantly watered down by the mediating influence of physicians and the NHF.

Data sources

The data for this article come mainly from an archive held at the library of the National Research Council (NRC) in Washington, D.C. In the wake of the HIV disaster, activists and critics of the blood and plasma industry campaigned for a full Senate investigation of the HIV diaster. This demand was denied. Instead, in 1994 the Government directed the Institute of Medicine to investigate the matter. They held some public hearings and invited interested parties to submit arguments and information to them. However, they conducted all their interviews with blood industry executives in private. In addition to interviews, they obtained access to internal memos, the minutes or transcripts of meetings, and other previously confidential documents. The committee published its report in 1995.

The archive at the NRC contains copies of all of the documents received by the committee, as well as the notes made during face-to-face or telephone interviews with the principal players. These notes are not transcripts, though they often contain verbatim statements from interviewees along with summaries, paraphrases, and observations by the interviewer. Apart from the committee's own report, these data have not been analyzed before now. It is the best available window into the events of the period.[36]

The bulk of the information in the NRC archives concerns the internal workings of the Red Cross, the blood banks, plasma companies, and

the National Hemophilia foundation. In addition to these data, I also draw on the official transcript of the public hearings held by the committee in September of 1994. This meeting heard evidence from the victims of the disaster, mainly hemophiliacs and their families.[37]

The blood banks: Defending suppliers

This was how things stood in 1981. In the case of non-profit blood banks with voluntary donors, the recipient bore the risk of receiving dirty blood. The recipient trusted the bank to minimize that risk, but the bank bore no liability for passing contaminated products to the recipient. The law said blood was a service, not a product, and the banks could not be sued for supplying bad blood. Strictly speaking, the supplier bore no risk either. Blood is a gift that is safe to donate, and donors are not culpable for any poisoned gifts they may hand over. Of course, the blood banks had no interest in actually killing their recipients, so they tried to ensure a safe supply. There was a problem with transfusion hepatitis that was controllable but could not be eliminated. The banks were both externally dependent upon their donors and obliged to them for their gift. Only about eight percent of eligible donors give blood in any one year, and the number of regular donors is a much smaller number again.[38] The gay community was known to supply good donors, having been drawn into the system in the 1970s during the effort to develop a vaccine for hepatitis B.[39] This meant that, in the case of the blood banks, the risk-bearers (recipients of transfusions) were different from the people the blood banks were obliged to and reliant upon (blood donors). This imbalance had serious consequences for recipients.

If they are to deal with uncertainty at all, organizations need information about what is happening. There are two important facts about the flow of information in this case. First, we know what information was available at various times during the disaster. Second, we also know that all the organizations involved got this information at the same time – and often at the same meeting. This means we can be sure that it was not simply that some organizations were better at gathering news than others. Rather, they processed the same information in different ways – why there were differences is what needs to be explained.[40]

Evidence of blood-borne AIDS transmission began to appear in December 1981.[41] A small number of hemophiliacs were found to have the

same sort of immune-suppressive disorder that had been seen in homosexuals and recent Haitian immigrants. By August or September of 1982, epidemiologists at the Centers for Disease Control were sufficiently convinced that people were being infected by transfusions to suggest the blood banks not accept high-risk donors. In December 1982, the first fully documented case of AIDS by transfusion was reported. Bruce Evatt, an epidemiologist with the CDC, began to present the data he had collected to various interested parties, including the Blood Products Advisory Committee (BPAC) of the Food and Drug Administration (FDA). On January 4th 1983, the CDC held a public meeting at their headquarters in Atlanta. Representatives attended from the FDA, NHF, the National Institutes of Health, the National Gay Task Force, plasma fractionators, and blood suppliers.

At the meeting, Bruce Evatt and James Curran presented their data and conclusions about the new disease and made a number of recommendations. Evatt had data on seven cases of transfusion AIDS, cases where it seemed that the victims (for example, small children) could only have contracted the disease through blood transfusions they had received. On the basis of these cases, the CDC recommended that blood banks and plasma fractionators screen out homosexual donors and implement a surrogate test for the virus they believed must be the cause of AIDS.[42]

The organizations involved now had to decide what to do with this information. When asked about it during the 1994 investigations, those who attended turned out to have widely differing recollections of the conduct of the meeting, the effectiveness of Evatt's presentation, and the strength of his data. Evatt himself remembers being "stunned and depressed" by the response he received.[43]

Blood bank representatives reacted by denying that the evidence was conclusive. Dr Aaron Kellner, President of the New York Blood Center, said "There are at most three cases of AIDS from blood donation and the evidence on two of these cases is very soft."[44] A program of donor screening would cost money, and false positives would mean that a lot of good blood would be thrown away. Dr Joseph Bove, director of the blood bank at Yale University Hospitals and chair of the FDA committee on blood safety, said, "We are contemplating all these wide-ranging measures because one baby got AIDS after a transfusion from someone who later came down with AIDS and there may be a few other cases."[45] Later, blood bankers admitted that there

was a risk, but claimed that it was less than one-in-a-million transfusions.

Note that claims of this sort, about the likelihood of contracting AIDS through transfusion, were not based on statistical risk assessment in any formal sense. There weren't enough data to do this kind of analysis. In an interview in 1994, Jay Epstein of the FDA noted in retrospect that those who thought the objective risk was low had "no scientific basis for that belief…. Instead of operating under the assumption of an unknown risk, they operated under a low risk assumption." Dr. June Osborn attended the January 4th meeting. She noted in her interview that she did not believe a formal model of cost *versus* risk was formulated until after 1985, when the ELISA test for HIV came into use.[46] Although the vocabulary was the same, the language of risk was socially rather than technically grounded. Mary Douglas has made this argument in her work on risk and culture. As she suggests, phrases like "benefits and risks" were used by the blood industry "in an antique mode … to legitimate policy or discredit it." Douglas argues that "[t]he neutral vocabulary of risk is all we have for making a bridge between the known facts of the world and the construction of a moral community."[47]

In January of 1983, the blood banks issued a statement saying they did not want to ask people about high-risk sexual practices. They had ethical objections to limiting voluntary donation from high-risk groups, saying that "direct or indirect questions about a donor's sexual preference are inappropriate."[48] They did encourage autologous donations, especially in elective surgery.[49]

The overriding reaction, as we would expect, was to deny that there was a problem with the supply. The January statement stressed that "the possibility of blood born transmission [was] still unproven."[50] In private, the banks were more forthright in their opposition. The banks later added questions about AIDS symptoms to their standard list of questions before donation. However, they were against directly questioning donors about their sexual behavior, and neither did they recommend surrogate testing. An internal American Red Cross memo circulated in February of 1983 shows how the officials in the voluntary sector were thinking at this time:

> Relevant facts are: (1) the focal group of concern is the gays, we are not likely to incur much resistance with respect to elimination of any other group; … (3) homosexuals and bisexuals constitute up to 25% of the donor population … [male homosexuals] probably equal 15% or less of the donor population; … the scientific basis for elimination of gays [from the donor pool] does not exist at present.[51]

Their refusal to test for co-indicators of AIDS indicates that the banks were reluctant to take the time and money to question the quality of the gift that was being given them. External dependence on their suppliers meant that they were particularly aware of the implications of screening out homosexuals. The well-organized gay rights lobby saw the question as one of personal autonomy. They argued that the evidence did not warrant what would amount to outright discrimination against homosexuals. The blood banks tended to agree. The author of the same memo says "[e]thically, I don't think sexual preference is the proper business of anyone (or any institution)."[52] This kind of concern from the blood banks was confined to homosexuals, however. Groups with no representative organizations were more easily removed from the donor pool, although even this took some time. Prisoners and Haitians were excluded on the grounds that they had a high rate of hepatitis, which was the most reliable surrogate marker for AIDS at the time. Male homosexuals had a higher rate of HBV than both these groups, but were not excluded.

> The blood banks began with the view that a volunteer blood donor is an altruistic person who, despite the inconvenience, takes the time to donate blood. The idea of confronting such a donor with a prying and personal question about his sexual behavior seemed reprehensible and potentially very damaging to donor movivation…. In addition, the blood banks perceived that the gay community might not co-operate if gay donors were rejected on the basis of sexual orientation and, furthermore, that they might donate on purpose out of spite.[53]

Beyond their relationship with donors, the way the banks evaluated the available evidence was further influenced by their relationship to other organizations in their environment. These groups had their own interests, which might be to the detriment of the banks and their donors. The ARC's own analysis (in an internal memo from January 1983) of the motives of the CDC is particularly striking:

> Even if the evolving evidence of an epidemic wanes CDC is likely to continue to play up AIDS – it has long been noted that CDC increasingly needs a major epidemic to justify its existence. This is especially true in the light of

> Federal funding cuts…. In short, we can *not* depend on CDC to provide scientific, objective, unbias [*sic*] leadership on the topic. However, because CDC will continue to push for more action from the blood banking community, the public will believe there is a scientific basis and means for elimininating gays.[54]

Similarly, at a meeting of the Blood Products Advisory Committee (BPAC) in February 1983, the participants heard a summary of the cases of transfusion AIDS that the CDC had identified. This evidence was given by Dennis Donohue, the Director of the FDA's Division of Blood and Blood Products. Donohue described the case reports as "very soft and squiggly data."[55] When asked whether the cases were accepted as valid evidence by the CDC, Joseph Bove (the Chairperson) responded, "Yes. Oh, my goodness, they are hanging everybody on the basis of it … [these cases] are all, you know, very iffy."[56] The banks' assessment of risk was strongly conditioned by existing, institutionalized relationships with suppliers and other organizations. Their attitude was that if you looked a gift horse in the mouth, not only were you being churlish, you risked having your nose bitten as well. The blood banks chose to play down the problem and defend their suppliers' interests as their own. Unwilling to violate or question the gift relationship that gave them their blood, they acted as if reaffirming their trust in donors was the same thing as reducing the risk borne by recipients.

The plasma companies: Defending recipients

As was the case with blood, plasma recipients bore the risk of exchange and trusted the company to minimize it. The same liability laws applied. But in this case, the risk bearers were the more valuable group from the organization's point of view. The market for plasma was competitive, and consumers might easily have bought a competitor's alternative. The plasma companies also had an interest in keeping their suppliers, of course, but this was largely solved by paying them for their time and effort.

The plasma companies had the same information available to them as the blood banks, were in the same legal position, and were faced with much the same range of choices. They reacted differently. From December 1982, Alpha Theraputics began questioning donors directly. They excluded Haitians, homosexual males, and IV drug users from their supply population. A memo circulated to their affiliates identified the relevant risk groups and ordered them excluded from the company's

supply population. The memo said, "While we recognize the potential for the rejection of long term donors, we strongly believe that the loss of these donors is more than offset by the protection of our patients."[57] This move was strongly opposed by the blood banks and the gay community. Nevertheless, the plasma companies ignored this opposition.[58] They had no moral commitment to their suppliers.

After the January 1983 meeting in Atlanta, the American Blood Resources Organization (the representative body of the plasma companies) issued recommendations about donor screening and deferral to reduce the risk of AIDS. In addition, news of AIDS in the blood supply caused research into viral inactivation methods to be accelerated. All of the U.S. plasma fractionators applied to the FDA to license treatment methods between June 1982 and December 1983. All were producing heat- or detergent-treated antihemophilic factor (AHF) concentrate by February 1984.

Although the businesslike exchange relationships with suppliers and recipients initially pushed the plasma companies to protect their markets, more than half of the sixteen thousand or so hemophiliacs in the United States contracted AIDS from contaminated plasma products. There are a number of reasons for this. Research into ways to kill hepatitis viruses in AFH concentrate began in the 1970s, but subsequently stalled. Plasma fractionators had the potential to develop viral inactivation methods prior to 1980, but failed to do so because most of the people they were selling their product to – hemophiliacs – were already HBV antibody positive. The benefits of AHF concentrate were great, and their target population was already infected with a chronic, but manageable, disease. The plasma companies assumed that no further protection would be necessary:

> Hepatitis was viewed as an acceptable risk for individuals with hemophilia because it was considered a medically manageable complication of a very effective treatment for hemophilia.[59]

In this case, the plasma fractionators fail on the same grounds as the blood banks. They had a set of known costs and benefits that they used to guide the marketing and further development of their products. But they assumed that HBV was the only virus in the plasma supply and that, seeing as most of their customers had it, there was no need to develop a process to eliminate it from AHF concentrate supplies. They contrasted the large benefits brought by their products to the manage-

able cost of hepatitis, with the emphasis strongly on the benefits. When evidence about AIDS began to mount, the feeling in the industry was that, whatever it was, the costs brought by this new problem could not outweigh the benefits of Factor VIII and related products.

At a BPAC meeting in December of 1982, a representative of Cutter Biologics argued that "we need to keep the life-sustaining significance of this product to the patient, and the lack of clear-cut risk based on currently available information, foremost in our collective minds."[60] The anticipated arrival of a HBV vaccine added to this reluctance (the first one became available in 1982), because uninfected people would be protected against it in that way, rather than by some new manufacturing process. There were no market incentives to pursue the research. No one seemed to countenance the possibility that other serious pathogens or latent agents (like Creutzfeld–Jakob disease or HIV) might also be present in untreated AHF concentrate. Once AIDS appeared, the plasma companies were able to move quickly and in the right direction to defend their market, but by then most of the hemophiliacs were infected anyway.

The market mechanism failed to deliver a safe product to recipients once it became available. By market logic, the new product should have had a distinct competitive advantage over the old. But aspects of the organizational environment deflected the effects of the market. Despite having the newer, safer product available on the market, physicians were reluctant to prescribe it to their patients. The Institute of Medicine reports that hemophiliacs who came to their doctors worried about catching AIDS from AHF concentrate were reassured in spite of the evidence.[61] The plasma companies had reacted to the information by developing a new product, but doctors tended to play down the dangers. They were happy with the therapeutic effects of AHF, which outweighed any other worries:

> [P]hysicians tended to avoid, downplay, or deny the possible risk associated with the use of blood and blood products, one of the case studies revealed that physicians often responded to the initial questions of the patients with reassurances that the risk was not serious, that the patient was overreacting, that there are always risks, and that patients and doctors should wait and see what happens … physicians emphasized the known benefits of AHF concentrate and underweighed the risks of AIDS, which were still uncertain.[62]

The role of the plasma companies was further complicated by their relationship with the National Hemophilia Foundation (NHF). The

NHF "served a crucial function as and intermediary between the sources of scientific and medical information i.e., CDC, FDA, plasma fractionation industry), and the consumers of that information."[63] The NHF was funded in part by the plasma companies. The Institute of Medicine reports that "the NHF's credibility … was eventually seriously compromised by its financial connections to the plasma fractionation industry."[64] In a series of newsletters, the NHF reassured both doctors and patients that they could safely continue treatment with older batches of AHF concentrate, and other plasma derivatives that later turned out to have been infected. In July of 1982 "Hemophilia Newsnotes" stressed that "it is important to note that at this time the *risk* of contracting this immuno-suppressive agent [AIDS] is *minimal*."[65]

As with the blood banks, technically sufficient data to make this sort of statement about risk were not available. The NHF took a conservative line throughout 1982 and 1983. Its Medical and Scientific Advisory Council (MASAC) did eventually recommend, at a meeting in October of 1983, that blood products not be collected from homosexuals and other at-risk groups. But (like the plasma companies) they continued to use the good risk-benefit data they had about Hepatitis as though it took care of uncertainty about AIDS. The NHF took the same stance as the plasma companies: the benefits that plasma concentrates brought to hemophiliacs were just too large to be outweighed by information about a new disease. At worst, AIDS would probably be like Hepatitis – endemic, but manageable. At their October 1983 meeting, the MASAC noted with approval that data from a CDC/NHF study showed the average life expectancy of hemophiliacs to have risen from 11 years in 1968 to 20 years in 1983. "These findings," they commented, "put into good perspective the importance of the use of [plasma] concentrates vs the small risk of AIDS."[66] The newsletter was still urging a conservative approach as late as January of 1984. As a result of this reassurance, a variety of plasma products were kept on the market for longer than they should have been, and many more hemophiliacs contracted HIV than might otherwise have been the case.

The relationship of the plasma companies to their recipients was mediated by both the medical profession and the National Hemophilia Foundation. Both of these organizations underestimated the effects of AIDS. Doctor–patient and buyer–seller relationships were interdependent, and the representative bodies of the plasma companies and

their recipeints were also closely interwoven, in this case with negative effects.

Conclusion

With hindsight, there is no doubt that there was a right way and a wrong way to react to the information about AIDS that began to appear from June 1981. Decisions about donor screening, risk assessment and patient treatment all seem obvious. But the reactions of the blood banks and plasma companies cannot be rightly understood from this point of view. What hindsight grants us is *accurate risk assessment*, precisely what those involved did not have. What we can now see as risks were then simply uncertainties. To take a risk means to place a bet, and in order to place a bet you must know the odds. From the point of view of the organizations involved at the time, bets had to be placed, but the odds were not obvious. Had AIDS turned out to be a non-disaster like Swine Flu, the blood banks would have appeared prudent and the companies foolish.[67]

Given this state of affairs, the forces pushing on the decision-making process are sociologically interesting. In this article I have offered an explanation for why one set of organizations rather than another tended to do (what in retrospect turned out to be) the right thing, and why neither was ultimately successful. I have argued that in 1982 the blood banks and plasma companies found themselves living in an unusually uncertain world. The result was a conflict over the quality of data, the credibility of sources, and the standards for evaluation, as the organizations involved tried to construct a viable information order. Unusually, in this case the standards of evidence had to be sufficient not to judge the riskiness of future projects, but to establish the existence of an ongoing disaster.

Decisions were shaped by structurally-based interests, morally-weighted exchange relationships, and inter-organizational ties. The conjunction of these contingent relationships led the blood banks to side with their suppliers and the plasma companies with their recipients. External dependencies and moral obligations combined to influence reactions to the new information. This set of relationshiops was itself situated in an extended organizational environment that further affected how the banks and plasma companies behaved. A number of forces pushed against one another. Things might easily have been different. Had their

external dependencies been different, the plasma companies might have moved to defend the wrong group. Had their ties to other organizations been different, the blood banks might have found it easier to get important information from their donors. Had their donors been paid suppliers, the banks might have found it easier to eliminate some of them from the supply pool.

Although I have not argued for it here, it seems likely that blood suppliers in other countries, particularly in Europe, faced similar uncertainties and obligations as they dealt with AIDS. Future research might examine how reactions to uncertainty in these countries were shaped by similar factors to those identified here. Blood is an unusual good, deeply human and culturally resonant, yet also a raw material in a sophisticated production and distribution system. The blood supply provides a Mertonian "strategic research site" for the study of socially embedded economic relations. I have argued that, in the United States, the contrast between donors and sellers was key. But other cultural features might well play a role. The moral community bound by "common blood" is not just a vague idea. In France, for example, it was one of the key considerations that prevented the government from using the (American) ELISA test for AIDS, a decision that led to widespread infection in the French supply pool and the imprisonment of blood industry executives. Three government officials were tried for manslaughter: former prime minister Laurent Fabius, social affairs minister Georgina Dufoix, and health minister Edmond Hervé. The case was heard March 1999. Fabius and Dufoix were aquitted; Hervé was convicted but given no sentence.

Titmuss was right to say that exchange relationships have important consequences for the blood supply. But, except contingently, they are not the mechanism by which good or bad blood is brought into the system. In fact, there is no such mechanism driving things by itself. Rather, a variety of theoretically distinct factors combine to produce the effects we observe. Although we can identify the relevant components in theory, it is an open question how things play out empirically. The notion of "embeddedness" sensitizes us to the important effects that exchange relations can have on the process of risk assessment. The evidence shows that the reactions of the different actors to a series of external events were strongly influenced by these relations, in addition to their "interests" more narrowly conceived. The external dependencies faced by the blood banks and plasma companies were embedded in altruistic and profit-seeking exchange relationships that

were an important part of their identity. These in turn were set in the context of both wider organizational environments and cultural ideas about gift giving and social obligations. These factors strongly influenced how organizational actors negotiated standards of proof, despite a generally shared commitment to objectivity and scientific integrity. The continuous danger of new uncertainties and the persistence of these institutional arrangements makes it very unlikely that any single aspect of organizational form or culture can reliably ensure something like the safe and efficient supply of blood.

Acknowledgments

I thank Paul DiMaggio, Paul Starr, Viviana Zelizer, Miguel Centeno, and Laurie Paul for their comments and suggestions on earlier versions of theis article. Thanks also to anonymous *Theory and Society* reviewers for a number of decisive suggestions.

Notes

1. Carol Heimer, "Allocating Information Costs in a Negotiated Information Order: Interorganizational Constraints on Decision Making in Norwegian Oil Insurance," *Administrative Science Quarterly* 30 (1985): 395–417.
2. It has recently been re-issued in an updated edition that contains several new papers (by others) reaffirming the importance and validity of the original argument. Its place in the canon of economic sociology is assured, and its claims about the social aspects of market exchanges are regularly and favorably cited. It also had a remarkable influence on blood policy. See Richard Titmuss, *The Gift Relationship: From Human Blood to Social Policy,* expanded and updated edition (New York: New Press, 1997).
3. Harvey Sapolsky and Stan N. Finkelstein, "Blood Policy Revisited – A New Look at *The Gift Relationship*," *The Public Interest* 46 (Winter 1977): 15–27.
4. Institute of Medicine Report: Committee to study HIV Transmission through Blood and Blood Products, *HIV and the Blood Supply: An Analysis of Crisis Decisionmaking*, L. Leveton, H. Sox, and M. Stoto, editors (Washington: National Academy Press, 1995): 41 (hereafter IOMR).
5. Viviana Zelizer, "Beyond the Polemics of the Market: Establishing a Theoretical and Empirical Agenda," *Sociological Forum* 3 (1988): 614–634.
6. Zelizer, "Beyond the Polemics," 622.
7. Mark Granovetter, "Economic Action and Social Structure: The Problem of Embeddedness," *American Journal of Sociology* 91 (1985): 481–510.
8. Sapolsky and Finkelstein, "Blood Policy Revisited"; A. J. Culyer, "Blood and Altruism: An Economic Review," in David B. Johnson, editor, *Blood Policy: Issues and Alternatives* (Washington: American Enterprise Institute for Public Policy

Research, 1976), 29–58; Rueben Kessel, "Transfused Blood, Serum Hepatitis and the Coase Theorem," in Johnson, *Blood Policy*, 183–207.

9. The Hepatitis family has grown steadily since the 1960s. Hepatitis A (HAV) is the mildest form. It is spread orally. Although blood-borne transmission is possible, it is very rare. What Titmuss called serum hepatitis is caused by the hepatitis B virus (HBV). The virus is spread through the blood supply and is very infectious. It was discovered in 1965, and by 1968 a direct test (the hepatitis B surface antigen test) was available. A vaccine for HBV did not become available until 1982. In 1977, the hepatitis Delta virus (HDV) was discovered. This is an incomplete RNA virus that can be transmitted only in the company of HBV. By the late 1970s, it became clear that there was still another form of hepatitis being transmitted through the blood supply. The virus causing this form was identified in 1989 and named hepatitis C (HCV).
10. Jennings, quoted in Kessel, "Transfused Blood," 190.
11. Jane Allyn Piliavin and Peter L. Callero, *Giving Blood: The Development of an Altruistic Identity* (Baltimore: Johns Hopkins University Press, 1991), 2; Piet Hagen, *Blood Transfusion in Europe: A White Paper* (Strassbourgh: Council of Europe), 87.
12. Zelizer, "Beyond the Polemics," 629.
13. Properly speaking, there are three kinds of organization and two representative bodies in this voluntary sector. The American Red Cross (ARC) is the largest. Community blood banks operate on a smaller, locale scale. Hospital blood banks collect blood for use only by their controlling hospital. The American Association of Blood Banks (AABB) and the Council of Community Blood Centers (CCBC) are the two representative groups. In the past, the ARC and the Blood Banks had differing views about how blood should be collected. The ARC has always promoted a voluntary, community-based approach. The blood banks used to advocate a (sometimes for-profit) philosophy of individual responsibility, but are now much more like the ARC. In this paper, references to "the banks" or "the blood banks" refer also to the ARC.
14. IOMR, 29.
15. IOMR, 31.
16. Pamela Westfall, "Hepatitis, AIDS and the Blood Products Exemption from Strict Products Liability in California: A Reassessment," in *Hastings Law Journal* 37 (1986): 1101. Note that if liability falls anywhere, it falls on the blood banks and plasma companies. This is true even though blood banks sell blood to and patients receive blood in hospitals. Hospitals may be liable for a whole variety of other risky interactions with patients, but the implicit contract for blood transfusions remains between the patient and the blood bank. This article does not discuss the relationship between hospitals and the blood banks, chiefly for want of information. I expect that, given that they are a captive market, the hospitals did not play a very important role in the banks' calculations.
17. Jens Beckert, "What is sociological about economic sociology? Uncertainty and the embeddedness of economic action," *Theory and Society* 25/6 (1996): 803–840.
18. For the former difficulty, see Charles Perrow and Mauro F. Guillén, *The AIDS disaster* (New Haven: Yale University Press, 1990), and Sandra Panem, *The AIDS Bureaucracy* (Cambridge, Mass: Harvard University Press, 1988); for the latter, see Randy Shilts, *And the Band Played On: Politics, people and the AIDS epidemic* (New York: St Martin's Press, 1987), especially 115–116, 160–163, 168–171, and 220–226. Perrow and Guillén's valuable work is the only study of the blood supply

from the perspective of the sociology of organizations. Shilts's book is the standard history of the period, but his focus is not on the blood suppliers as such.

19. Harvey M. Sapolsky and Stephen L. Boswell, "The History of Transfusion AIDS: Practice and Policy Alternatives," in Elizabeth Fee and Daniel M. Fox, editors, *AIDS: The Making of a Chronic Disease* (Berkeley: University of California Press, 1992).
20. For reviews see Carol Heimer, "Social Structure, Psychology and the Estimation of Risk," *Annual Review of Sociology* 14 (1988): 491–519, and Lee Clarke and James F. Short, Jr, "Social Organization and Risk: Some Current controversies," *Annual Review of Sociology* 19 (1993): 375–399.
21. D. Kahneman and A. Tversky, "Subjective Probability: A Judgement of Representativeness," *Cognitive Psychology* 3 (1982): 430–454. D. Kahneman, P. Slovic, and A. Tversky, editors, *Judgement under Uncertainty: Heuristics and biases* (Cambridge: Cambridge University Press, 1982).
22. Joseph Gusfield, *The Culture of Public Problems* (Chicago: University of Chicago Press, 1981); R. Kasperson et al., "The Social Amplification of Risk: A Conceptual Framework," *Risk Analysis* 8 (1988): 177–187.
23. P. Shrivastava, *Bhopal: Anatomy of a Crisis* (Cambridge, Mass: Ballinger, 1987); Lee Clarke, "The Disqualification Heuristic: When do Organizations Misperceive?" *Research in Social Problems and Public Policy* 5 (1993): 289–312.
24. Stephen Hilgartner, "The Social Construction of Risk Objects, or, how to Pry Open Networks of Risk," in James F. Short, Jr, and Lee Clarke, editors, *Organizations, Uncertainties and Risks* (Boulder: Westview Press, 1992), 51. Emphasis in original.
25. Charles Perrow, *Normal Accidents: Living with High-Risk Technologies* (New York: Basic Books, 1984).
26. Diane Vaughan, "Autonomy, Interdependence and Social Control: NASA and the Space Shuttle Challenger," *Administrative Science Quarterly* 35: 225–257.
27. Clarke and Short, "Social Organization and Risk," 395.
28. Heimer, "Allocating Information Costs."
29. Heimer, "Allocating Information Costs," 398.
30. Heimer, "Allocating Information Costs," 397; Martha S. Feldman and James G. March, "Information in Organizations as Signal and Symbol," *Administrative Science Quarterly* 26 (1981): 171–186.
31. "Bruce Evatt Interview Notes," NRC archive Box 2 Folder 25, Interview and conversation notes; transcript of BPAC Meeting, February 7–8 1983, NRC archive Box 3, Tab 86, 46–81.
32. Jeffrey Pfeffer and Gerald Salancik, *The External Dependence of Organizations: A Resource Dependence Perspective* (New York: Harper & Row, 1978).
33. Granovetter, "Economic Action and Social Structure."
34. If a voluntary organization can rely on a steady supply of contributions from the public, it will be structurally dependent on the recipients of its charity. The organization owes its existence to them. If the recipients no longer need help, then the charity is threatened with death regardless of the number of people willing to donate money to it. More often than not in such a situation, the organization finds a new group to assist. This is the well known phenomenon of goal succession.
35. The CDC is the organization responsible for monitoring mortality and morbidity in the United States.
36. If a relevant quotation appears in the Institute of Medicine Report, I cite it from there rather than the original documents, for convenience. Otherwise, I provide a direct reference to the archives.

37. Committee to study HIV transmission through blood products. *Proceedings of a public meeting held on September 12, 1994 in Washington D.C.*, U.S. Department of Commerce, National Technical Information Service Record Locator, No. PB95–142345.
38. Piliavin and Callero, *Giving Blood*, 1.
39. IOMR, 101–102, 104.
40. This is also true of outcomes: the information-base *was* the same and (in retrospect) the decisions made by the blood banks and the plasma companies *ought* to have been about the same. Thus, our attention is focused on the reasons why the decision processes within each organization produced different outcomes.
41. Randy Shilts, *And the Band Played On: Politics People and the AIDS Epidemic* (New York: St Martin's Press, 1987), 105.
42. At this time, HIV had yet to be discovered. The only way to test blood for the virus (assuming there was one) was to test it for surrogate markers, i.e., known items reliably found in the blood of AIDS patients. A hepatitis B core antigen test was the earliest such test. In early 1983, the CDC believed that implementing this test would detect 90 percent of donors with AIDS. See IOMR, p. 106.
43. "Bruce Evatt Interview Notes," NRC archive Box 2 Folder 25, Interview and conversation notes.
44. IOMR, 221.
45. IOMR, 221.
46. June Osborn interview notes p. 2, NRC archive Box 2 Folder 25, "Interview and Conversation Notes."
47. Mary Douglas, "Risk and Justice," in Mary Douglas, *Risk and Blame* (New York: Routledge, 1982), 22–37.
48. IOMR, 106.
49. In autologous donation, patients "donate to themselves" by building up a store of their own blood prior to surgery. Autologous donations account for about 2 percent of the supply, as of 1995.
50. IOMR, 277.
51. IOMR, 285–289.
52. IOMR, 285.
53. IOMR, 111.
54. IOMR, 287. Emphasis in original.
55. Transcript of BPAC meeting, February 7–8, 1983, NRC archive Box 3, Tab 86. Quotation from page 46.
56. Transcript of BPAC meeting, February 7–8, 1983, 46–48. In his interview with the Institute of Medicine committee in 1994, Bove said he "wanted to see the relationship between the transfusion patient and AIDS proven to be closer cause and effect [*sic*] – that the recipient had no other risk factors and that the donor came down with the disease; and that the donor gave twice and both the recipients came down with AIDS. Now I know I was asking for too much. But the epidemologic data were not good in 1983." "Joseph Bove Interview Notes," NRC archive Box 2 Folder 25, Interview and Conversation Notes.
57. IOMR, 270.
58. My argument does not extend to the workings of the pharmaceutical companies involved in searching out a cure for AIDS. The relationship of this set of organizations to voluntary organizations, persons with AIDS, and Federal agencies is discussed in Steven Epstein, 1996, *Impure Science: AIDS, activism and the politics of knowledge* (Berkeley: University of California Press).

59. IOMR, 93.
60. NRC Archive, Transcript of BPAC Meeting, December 4th, 1982, 104.
61. IOMR, 169–207.
62. IOMR, 195–196.
63. IOMR, 172.
64. IOMR, 212.
65. IOMR, 265, emphasis in original.
66. "National Hemophilia Foundation Meeting Minutes, October 22nd, 1983," NRC archive Box 3.
67. In 1976, on the basis of three cases of swine flu, millions of Americans were vaccinated. More people died from the vaccine than the disease. The episode was a huge embarrassment for the government and the CDC. For a full account, see Diana Dutton, 1988, *Worse than the Disease* (New York: Cambridge University Press).