

**ORGANIZATIONAL REPUTATION AND THE TIMING OF AGENCY
EXPANSION: AN ANALYSIS OF FDA'S RESPONSE TO THE EMERGENCE
OF INNOVATIVE MEDICAL TECHNOLOGIES**

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Abstract

When do regulatory agencies expand, following the emergence of novel technologies? To address this question, I draw on recent developments in institutional political science that view regulators as generally rational agents, and also as politically conscious organizations interested in protecting their reputations. I present a model which suggests that a regulator is most likely to issue a jurisdiction claim over a novel technology when its political legitimacy is at stake. This, in turn, is most likely to occur when (i) new information becomes available that may undermine the agency's unique reputation, and (ii) a rival regulator attempts to formalize its regulatory authority, or fails to do so although officially required to. An historical-institutional analysis of the temporal process leading to jurisdiction claims by the FDA over gene therapy, laboratory-developed complex diagnostic tests, human tissue transplants and human cloning, support the model's prediction.

Introduction

When do regulatory agencies expand, following the emergence of novel technologies?

This question evolves from the recognition developed in recent years that many of the most significant decisions made by bureaucratic organizations involve choices of timing. The critical problem is not what to choose but when to choose (Carpenter 2002, 2003). The assumption underlying Carpenter's arguments is that the regulator protects its reputation (Quirk 1980; Heimann 1997; Carpenter 2001; Krause and Douglas 2005; Maor 2006). "Reputation" refers to a set of symbolic beliefs regarding "virtually any attribute along which organizations may vary that can serve as a source of status comparisons" (Ruef and Scott 1998, 879).

Previous attempts by political scientists to explain jurisdictional expansion have treated agencies as either passive participants in shaping their purview or as somewhat less passive actors that bring to the policy environment their strategic incentives. Miwa and Ramseyer's (2005) analysis of the Japanese antitrust agency is a classic example of the former approach. It shows that, in equilibrium, politicians will grant agencies a jurisdictional monopoly over electorally important issues only when they have access to other sources of information by which they can monitor their bureaucrats. Along the same vein, Moe (1989) argues that task's bureaucratic home reflects the preferences of the interest groups and legislators concerned with its performance. The second approach is vividly captured by Wilson's (1989) observation that even expansionist agencies frequently shun new responsibilities if they might cause agencies to lose their "sense of mission", impose additional costs, and introduce additional opportunities for failure. A more recent example is Ting's (2002) game theoretic study that views the problem of when an agency is assigned multiple tasks as equilibrium phenomenon "because task sets affect agencies' performance incentives,

and designers anticipate these incentives” (p. 364). Ting argues that tasks will be consolidated under a single roof when that agency prefers lower levels of policy than the legislature. In other cases, separating tasks prevents resources from being allocated in a manner undesired for the legislature.

This article adopts a different perspective. Instead of asking when a task is assigned to multiple agencies or when an agency will be assigned multiple tasks, it considers when an agency will expand its purview, following the emergence of novel technologies, without acknowledging that it might need help from Congress in the form of new statutory jurisdiction or new administrative tools. Regulatory agencies are thus considered here as more active participants in jurisdictional politics by insisting that existing laws both confer jurisdiction and provide the necessary means of control.

I draw on recent developments in institutional political science that view regulators as generally rational agents, and also as politically conscious organizations interested in protecting their reputations. I present a predictive model which suggests that a regulator will issue a jurisdiction claim over a novel technology when its political legitimacy is at stake; that is, when its unique reputation and its “uniquely diverse complex of ties to organized interests and the media” (Carpenter 2001, 4) are under threat. I show that this may occur when (i) new information becomes available that may undermine an agency's unique reputation, and (ii) a rival regulator attempts to formalize its regulatory authority, or fails to do so although officially required to. Empirical evidence, in the form of an historical-institutional analysis of the temporal process leading to jurisdiction claims by the FDA over gene therapy, laboratory-developed complex diagnostic tests, human tissue transplants and human cloning, support the model's prediction.

This research carries important implications as it undermines the assumption that, when jurisdictional politics is concerned, all regulatory agencies are more or less passive actors (Moe 1989; Wilson 1989; Ting 2002). It also departs from the argument — advanced in the context of committee politics — that the foundation stones of organizational autonomy lie in the fixity of its jurisdictions (Cox and McCubbins 1993, 12-13).¹ Or, in other words, an agency's decision to specialize, its choice of regulatory policies, and the likelihood that it can unilaterally expand its purview, do not depend on the action of any other agency. This research has corrected the record and deepens our understanding of agency expansionism.

This article also has important implications for our understanding of the reasons the FDA has such broad gate-keeping power (i.e., the power to impose restrictions that must be satisfied before the product can be distributed at all) over the pharmaceutical marketplace despite numerous regulatory reforms.² Because of the powerful FDA's public reputation as the patient and consumer protector in the American health care system, its response to novel technologies displays the superiority of bureaucratic mechanisms (i.e., the timing of bureaucratic decisions) over mechanisms of political influence, such as media and interest group influence. In addition, because powerful reputation for competence implies credibility (Moscarini 2007), agencies enjoying powerful reputation can credibly offer flexibility for legislators, the pharmaceutical industry, the research community, and large segments of society. The FDA, for example, administers a regulatory regime that can be made operational immediately, provides interim control over a provocative technology, minimizes the probability of a legislative ban on human research, and neutralizes the

¹ On committee politics and jurisdictional disputes, see: Baughman (2006).

² For an analysis of FDA's gate-keeping powers, see Merrill (1996).

fears of competing groups in society (e.g., favoring outright ban or no ban at all). The fact that at a later stage FDA review occurs largely outside public view in order to protect the confidentiality of sponsors' proprietary material emphasizes the democratic deficit inherent in processes of FDA expansion following the evolution of novel technologies. Bringing the political mechanisms of influence to center stage during agency expansion is therefore urgently required. It implies installing legal and non-legal mechanisms that challenge FDA's qualifications to regulate emerging policy areas, its institutional capacity to mediate the societal conversation concerning the ethics of emerging technologies, and the manner by which the FDA formalize its regulatory authority over novel technologies and communicates it to the general public.

The layout of the article is as follows: the first section considers the debate among bureaucratic organization scholars over issues pertaining to the locus of power in the interaction between legislature, agency structure and design, and interest groups; the second section outlines the model and the derived hypothesis; the third section elaborates the methodology employed; the fourth section presents the empirical analysis; and the fifth section presents the article's conclusions.

Related Literature

Although bureaucratic organization scholars generally agree on the importance of the interaction between legislature, agency structure and design, and interest groups, they have been divided on the locus of power in this triangle. In the literature that depends on principal-agent models of bureaucratic politics, the locus of power rests with the legislature, which is in charge of the agency structure and design process. For example, in the seminal work on administrative structure of McCubbins, Noll and Weingast (1987), the legislature wishes to push agency ideal points in the direction of

the interest groups' ideal points. Others, however, have resolved the legislature's "optimal delegation" problem by stating that the discretion granted to an agency is an increasing function of the agency's ideological affinity with the legislature. Stated simply, the legislature prefers the most ideologically compatible agent (Krehbiel 1991; Epstein and O'Halloran 1994, 1999; Huber and Shipan 2002; Bendor and Meirowitz 2004). A recent advance in this literature pays particular attention to the legislature's need to design agencies that elicit the voluntary provision of policy information by on-governmental actors (Boehmke, Gailmard and Wiggs Patty 2005). Their model raises the point that "legislative delegation can be desirable, not only because the agency to whom authority is delegated may be more expert than the legislature itself, but also because voluntary sorting by lobbyists can increase the incentive for the legislature to acquire information and make better-informed policy choices when it is lobbied" (Boehmke, Gailmard and Wiggs Patty 2005, 162). Put simply, legislature may strategically choose a group with which it disagrees ideologically through the choice of an agency whose views are more compatible to the group's point of view than the legislature would be on its own. Delegation to an ideologically distinct agency can make legislative lobbying more informative because lobbyists will primarily press the legislature for a policy change. This, in turn, increases the voluntary provision of policy information and thereby the ability of the legislature to make better-informed policy choices.

A much smaller comparative literature puts bureaucratic agencies and interest groups, under conditions specified by Carpenter (2001), squarely in charge of their capacity and autonomy. Agencies, rather than waiting passively for policy authority to be granted, establish political legitimacy — a reputation for expertise or efficiency and a uniquely diverse complex of ties to organized interests and the media — and

compel a legislature to grant policy authority even when it prefers otherwise (Carpenter 2001). This insight provides a convenient starting point for a discussion on the failing of principal-agent models of bureaucratic politics to capture the response of agencies to radical technological innovation.

One failing of the ideological compatibility model, and the policy activation by non-governmental actors' model, is the underestimation of the clout of some agencies, and especially their ability and willingness to articulate their statutory authority by adopting the view that the statutes are sufficiently broad in scope to encompass novel challenges of which they have little knowledge or relevant expertise. In fact, claiming jurisdiction puts the regulator in a position similar to the legislature. It means that once jurisdiction is claimed, no legislation (and thus no debate) is needed. Specifically, although a jurisdiction claim is not a law, its “practical message to the research community is as emphatic as if Congress has enacted new legislation” (Merrill and Rose 2001, 126). Still, the legislature may challenge the notion that every technological innovation necessarily must go through the traditional regulatory process. Furthermore, jurisdictional claim does not involve, at least not in the short term, issuing new regulation. Without new regulation to be implemented, it may be very difficult, if not impossible, to challenge the regulator's decision. Any judicial challenge at such an early stage may be premature.

Another failing of these two strains of scholarship is that radical scientific novelty is a potentially public crisis as it often involves serious health and safety issues. Significant segments of society may condemn the technological innovation as immoral or unethical for application to the human race. In other cases, an overwhelming majority may concur in condemnation. Why would the regulator want to throw itself into such a seemingly highly emotional debate with wide-ranging

moral, scientific and medical implications when losing seems inevitable? Both the ideological compatibility model and the policy activation by non-governmental actors' model fail to account for the agency seeing the divisive issue as an opportunity. They also fail to account for the agency responding to demands by politicians to stop "mad scientists", and for career concerns by persons leading the regulatory agency (Price 1998, 629). These pressures leave the agency enough room for maneuver to claim jurisdiction swiftly and unilaterally, ensuring that technological experiments do not proceed until basic questions about safety are answered. The question which arises is related to the factors that determine the timing of agency decision to expand its charter to include a number of technological innovations not previously thought of as subject to regulatory authority. Attention turns to the model which will aid the construction of our empirical tests.

A Temporal Model of Agency Expansion Following the Emergence of Novel Technologies

Jurisdictional claim is a statement of agency policy, predicting the position of the regulator in future interaction with the research community and private interests by stretching existing statutes. It stresses that existing laws confer sufficient authority to regulate all the commercial applications of the new technology within its jurisdiction, or that the innovation is not a fundamentally different modality which requires special scrutiny or new oversight mechanisms. The start-up costs for jurisdiction claim are relatively low because products derived from the new technology can be dispersed to existing agency's offices and added scientific expertise can be placed where necessary. Starting up the jurisdiction claim process is easy: it takes only one sentence — "the scientific novelty will be subject to the same requirements as other relevant products" — to place the new product derived from the scientific novelty into the

statutory framework that best fits the product's intended use and mode of action. If upheld, it enhances the agency's ability to choose among available statutory authorities and to assign administrative responsibility as it judges appropriate. Claiming jurisdiction is therefore a classic manifestation of agency autonomy which “occurs when bureaucrats take actions consistent with their own wishes, actions to which politicians and organized interests defer even though they would prefer that other actions (or no action at all) be taken” (Carpenter 2001, 4). Still, jurisdiction claim may represent a response, maybe even a reluctant one, to the President's pressure to act in order to forestall restrictive legislation, deflect public debate, and so on.

According to Carpenter (2001, 4), “Autonomy prevails when agencies can establish political legitimacy — a reputation for expertise, efficiency, or moral protection and a uniquely diverse complex of ties to organized interests and the media — and induce politicians to defer to the wishes of the agency even when they prefer otherwise”. To gauge the factors that determine the timing reputation-sensitive agencies will venture into new regulatory arenas, I draw on recent developments in institutional political science (Heimann 1997; Carpenter 2001; Krause and Douglas 2005; Maor 2006) that view regulators as generally rational agents, and also as politically conscious organizations interested in protecting their reputations.

Because jurisdictional claims are made on scientific ground they are making more room for reputation considerations. Consequently, the need arises for the agency to trace forceful threats on, and opportunities to, its reputation, as well as to its uniquely diverse complex of ties to organized interests and the media during the jurisdiction claim process, and react to them. There are at least two direct threats to agency reputation and its uniquely diverse complex of ties to organized interests and

the media: (i) new information becomes available that may undermine an agency's unique reputation, and (ii) a rival regulator that attempts to formalize its regulatory authority.

Regarding the former, for an agency which enjoys a powerful reputation as patient and consumer protector in a given policy sector, new information that touches the core of its unique reputation is related to a central fact of bureaucratic politics — that resources that may be scarce or unavailable at one point in regulatory history may be widely available at others (Pierson 2004). The stock of available resources held by politicians, firms, disease-specific organizations, the media and the regulators, may change dramatically from one point in time to another. These changes may take place quickly, for example, as a result of the emergence of a provocative technology which brings into the public agenda public safety issues, or provocative subjects which lead to an intensive public debate over moral issues. In an analysis of such developments, the timing of a particular piece of information making headlines becomes critical. This is because agency inaction may turn public attention to weaknesses in the existing regulatory structure, and change the repertoire of possible responses by legislators as well as other actors. For example, inaction by a drug safety regulator that enjoys powerful reputation as the guardian of public health may lead to claims that the agency has been negligent in protection the nation's consumers by ensuring that new technology is safe. This holds also when a competitor regulator fails to guard public health and the regulator that enjoys powerful reputation makes no steps. Put simply, negligence claims may be raised whether or not the agency has formal jurisdiction over the issue at hand. And this, in turn, may be subsequently translated into declining resources.

Regarding the rivalry amongst competing regulators to “fill-up” the “regulatory vacuum,” the focus here is on the relational nature of this competition. Take, for example, a regulator that enjoys early competitive advantage in terms of regulatees and interest groups that are already committed to their patterns of regulation. A temporal analysis of the moves and countermoves of each regulator enables one to gauge whether the timing of the jurisdiction claim by a reputation-sensitive agency is a blunt attempt to block self-reinforcing feedback enjoyed by early entrants. Because a new regulatory space is conducive to path dependence, and the consequences of “lateness” may be severe, the demonstration that early entrants were blocked by regulators that arrived later, precisely when the former were attempting to consolidate early advantages, may expose a causal chain. Put differently, if a jurisdictional claim by a reputation-sensitive regulator is made precisely before, or shortly after, the early entrant regulator crosses the minimum threshold that may allow it to prosper in the new regulatory niche, and this sequence of events repeat itself across novel technologies, then a causal chain is at work.

What explanation is provided by the model for the willingness of politicians to remain silent when regulatory agencies claim jurisdiction without acknowledging that the agency might need help from Congress? Claiming jurisdiction may benefit politicians no less than it benefits the agency itself. A jurisdictional claim on the hills of the public debate may neutralize the debate by creating immediate moratorium on domestic research; placing researchers and their sponsors at legal risks if they fail to gain regulator's approval, and discouraging further experiments by individual researchers, at least until the subject could be fully debated elsewhere. In this respect, claiming jurisdiction may take the pressure of the legislature to find a middle ground between ideological extremes [e.g., the right-to-life group (total ban) and the scientific

community (no ban at all)]. The importance of this role should not be underemphasized because it is a virtually impossible task to reach a consensus on legislative details and to devise statutory language acceptable to both the scientific community and the advocacy group which is ideologically opposed to the application of the technological innovation. Claiming jurisdiction may also take the pressure off the scientific community because of the alternative (i.e., a legislative ban on all research or disruption of research which holds great promise for the development of new technologies) and because of the ready-made regulatory regime (i.e., agency regulations and guidelines) offered by the regulator whose basic outlines are familiar to that community and whose requirements are already operational. Claiming jurisdiction may also help the agency to bypass the need to integrate the profound ethical and moral issues raised by the scientific novelty with the inevitable effort to address basic questions about the procedure's safety. Because the nature of the regulator's task is primarily scientific, and the regulator's officials have the experience to make such judgments, the jurisdiction claim insulates science and its accompanying research activities from the political issues encountered in legislative debates and attempts to approve bills.

However, even an expansionist agency that enjoys a powerful reputation may be dissuaded from claiming jurisdiction over a new area. To protect its reputation, the agency may not seek to play a significant oversight role when its oversight can be easily evaded. The agency will also try to avoid undermining the relationship with the professional community whose members serve as the main carriers of agency reputation. This is why it will shun new responsibilities if a jurisdiction claim implies encroaching upon the prerogatives of the professional community. The agency will also try to avoid damaging its relationships with the business community by

regulating traditional goals and areas of oversight, rather than innovative forms to deliver essentially commercial products. In addition, when the technical aspect behind the product at hand indicates that use of these technologies may involve considerable uncertainty, the agency may decline to claim jurisdiction and, by doing so, may reduce the prospect of questioning its reputation. The agency may also shun new responsibilities when the product at hand is commercially available before the validity and reliability of its predictive value have been established even minimally. At a more general level, the agency may be dissuaded to claim jurisdiction when the broader social implications create a negative political climate and when the regulation of the issue at hand may seem a thankless task.

Using the intuition elaborated upon above, I seek to examine the following hypothesis: When a novel technology emerges, a regulator will issue a jurisdiction claim when its political legitimacy is at stake. This may occur when (i) new information becomes available that may undermine an agency's unique reputation, and (ii) a rival regulator attempts to formalize its regulatory authority, or fails to do so although officially required to. Below I discuss data and measurements for the variables under consideration.

Methodology

The article employs a comparative analysis within a single case setting. This research design was selected because the model advanced here is only applicable to agencies characterized by powerful public reputation, such as FDA's reputation as patient and consumer protector in the American health care system. The research strategy utilized here is an historical-institutional analysis of the temporal process leading to jurisdiction claims by the FDA over four novel technologies. The idea is to gauge when waiting to assert jurisdiction becomes politically costly (Carpenter 2002, 492),

and to estimate the conditions under which a jurisdiction claim over a novel technology is more likely. Needless to say, the analysis ignores issues pertaining to whether the regulator has “gone beyond its brief”; whether it has the resources and capacities to regulate the novel technology, and whether the jurisdiction claim was successful.

Following the inherent logic set by the theoretical framework, the study systematically link threats to agency reputation to jurisdiction claims by the FDA. Reputation threats are operationalized as (i) attempts by a rival regulator to formalize its regulatory authority or its failure to do so although officially required to, and (ii) serious public health risks derived from the novel technologies under examination. Jurisdiction claim is operationalized as an assertion — published in the Federal Register or announced by the agency or its senior officials in any public forum — that the agency already possessed authority to regulate the subject matter.

To avoid the possibility of “[...] accidental intersection of unrelated chains of causation” (Scharpf 1997, 49), the following section presents a systematic exploration of jurisdiction claims' unfolding over time and across four novel technologies, namely, human gene therapy, lab-developed complex diagnostic tests (specifically, In Vitro Diagnostic Multivariate Index Assays [IVDMIA]), human tissue transplants and its distributors (specifically, Corneal Lenticules, Dura Mater, Heart Valve Allograft and Human Tissue Banks), and human cloning experiments. These technologies vary over the degree of regulatory urgency, how provocative the technology, the number of regulators that claimed a dominant interest in the subject, the degree of FDA's confidence that it possesses the needed resources or legal authority, the degree of overlapping jurisdictional interests and the degree of overlapping regulatory responsibilities. This comparative strategy lends itself to examination of the long-term

dynamics of regulatory politics when confronted with challenges posed by novel technologies.

Empirical Analysis

Jurisdiction Claims in the Face of Regulatory Competition

Table 1 presents two cases of similar jurisdictional topography: a rival agency that expresses a dominant interest in a new regulatory space and is about to formalize its position as the sole oversight mechanism nation-wide. Our interest here departs from the debate around striking the balance between protection of human subjects and promotion of promising research. Instead, we focus on the direct threat posed by the new regulatory entrant to FDA reputation and its uniquely diverse ties to organized interests and the media in the regulatory space of biological products.³

Table 1 about Here

The former case revolves around gene therapy, a procedure in which healthy genes are spliced into the cells of sick patients. In 1974, an announcement by scientists that they have developed a method to recombine DNA from different species to form new biological entities (Lyon and Gorner 1996, 61) was followed by calls from the scientific community for a moratorium on such experiments as well as National Academy of Science's recommendations regarding the need to devise guidelines to be followed by recombinant DNA researchers (Berg et al. 1974;

³ This regulatory space includes “any virus, therapeutic serum, toxin, antitoxin, vaccine, blood, blood component or derivative, allergenic product, or analogous product.” U.S. Statutes at Large 58, 702 (1944), as amended, codified at U.S. Code, vol. 42, sec. 262 (a).

Fredrickson 2001; Merrill and Javitt 2000, 322). Subsequently, the National Institute of Health (NIH), which was then part of the Department of Health, Education, and Welfare (now Health and Human Services, HHS), established the Recombinant DNA Advisory Committee (RAC). The RAC was an interdisciplinary body set up to review and at least tacitly approve federally funded research using the techniques of recombinant DNA technology (Merrill and Javitt 2000, 322).⁴ In 1976, a government professor and an ethicist joined the 15-member RAC, which, in 1978, expanded to 25 members, one-third of whom were nonscientists (Rainsbury 2000, 577).

The evolution of regulations regarding the conduct of recombinant DNA experiments followed roughly three steps. The first stage was the publication in July 1976 of RAC guidelines, which were binding only on institutions receiving NIH funding.⁵ These guidelines have been widely observed by other institutions conducting recombinant DNA research (President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research 1982: 12). The second stage was the formation on April 11, 1983, of the Working Group On Human Gene Therapy, to study and respond to the 1982's President's Commission report that called for the erection of both an oversight body to review gene therapy experiments and a permanent federal bioethics commission. The third stage involved the recommendation of the Working Group that the RAC expand its purview to include experiments involving "Deliberate transfer of recombinant DNA or DNA derived from recombinant DNA into human subjects",⁶ as well as the drafting of guidelines, entitled "Points to Consider in the Design and Submission of Human

⁴ National Institute of Health. Federal Register 39, 39306 (October 7, 1974).

⁵ 41 Federal Register at 27,902, 29,903 (July 7, 1976).

⁶ National Institute of Health. Federal Register 49, 2940 (1985).

Somatic-Cell Gene Therapy Protocols”, for researchers seeking RAC approval for gene therapy experiments. The Working Group submitted drafts to the RAC in late 1984 and to the public on January 22, 1985.

The establishment of the RAC Working Group with no legislation that directs its formation or authorizes the NIH oversight of gene therapy protocols is a clear indication of RAC's enjoying an independent power base in the general public and Congress. As Culliton (1985, 493) nicely observed “In the absence of any other duly constituted body, the Working Group on Human Gene Therapy has become the locus of power for broad social discussion of [gene therapy] issues”. Most notable in his support in Congress has been the then-Senator Albert Gore Jr., chairman of the Subcommittee on Investigations and Oversight of the House Committee on Science and Technology, who began congressional hearings concerning this novel technology (Merrill and Javitt 2000, 323; Sheingate 2006, 247).

Not only did the RAC take a lead regulatory role, it also aimed to change the agendas and preferences of politicians and the organized public by contemplating a unique regulatory approach for reviewing gene therapy. Specifically, the RAC's submission guidelines comprised of scientific aspects of experiments as well as social concerns pertaining to gene therapy. This implies that submissions by recombinant DNA researchers would be judged according to their scientific validity and social acceptability (Merrill and Javitt 2000, 322). Assuming that the first proposals would include no trade secrets, the RAC was also committed to public review of all research proposals. These two regulatory innovations were not implemented immediately because, upon completion of the “Point to Consider”, there were no gene therapy proposals ready for review (Rainsbury 2000, 581). Still, they stood in stark contrast to the FDA approach which focused solely on the scientific merit of a proposal, and was

committed to secrecy in its evaluation process. Waiting for the technology to catch up, the RAC was therefore the only player in town – a player that very skillfully had carved a unique and differentiated political niche in the regulatory space of biological products and enjoyed an organizational capacity for approving gene therapy proposals as well as political legitimacy in the public and Congress. In these regulatory arrangements the FDA was involved only through the individual contributions of Dr. Henry Milner as FDA liaison to the RAC.

By the end of 1984, RAC latitude of operation seemed unlimited in the sense that it could take a leading regulatory role without depending on legislative, presidential or judicial recognition of its capacity and political power. In addition, it seemed that the FDA was not making any concerted effort to have its own regulatory vision placed on the regulatory agenda. To block RAC proposals and avoid venue shopping by researchers and powerful interests in the case of jurisdiction-sharing arrangements, FDA had to enter the fray before the initial draft of the “Point to Consider” document was unveiled, thereby solidifying the RAC's regulatory authority. And indeed, it did so. On December 31, 1984, three weeks before the RAC draft “Point to Consider” was published for public comment in the Federal Register, the FDA issued a jurisdiction claim, stating that existing laws conferred sufficient authority to regulate all the commercial applications of biotechnology, while acknowledging that it might share regulatory duties with the NIH.⁷ The jurisdictional rivalry that was subsequently brewing between the FDA and the NIH is elaborated in detail elsewhere (Merrill and Javitt 2000). In 1997, NIH published revised guidelines which acknowledged FDA's exclusive statutory authority to approve gene therapy experiments, and, by implication, to regulate the development and marketing of gene

⁷ Food and Drug Administration. 1984. Federal Register 49, 50878.

therapy-derived products, whether privately supported or federally-funded.⁸ Because RAC's expertise was needed to evaluate the non-medical issues raised by some gene therapy protocols, NIH, with FDA concurrence, preserved the RAC as the forum for their discussion (Merrill and Javitt 2000; Merrill and Rose 2001, 119-120)

A similar jurisdictional topography was evident in the case of laboratory-developed complex genetic tests following innovations in molecular diagnostics that tailor treatment, drug therapies, and monitoring to patients with cancer, heart disease, diabetes, and other chronic conditions. The jurisdictional center of gravity in the legislation lay squarely with the Centers for Medicare & Medicaid Services (CMS). CMS had the responsibility for overseeing compliance with the Clinical Laboratory Improvement Act, 1967 (CLIA), which was amended in 1988. The amendment establishes CMS' responsibility for ensuring the quality of genetic testing laboratories, namely its analytical and clinical validity. However, the CLIA did not address complex test systems, i.e., tests that include complex, statistically-driven, data-driven algorithms that are not standard primary ingredients of in-house tests. This lacuna has meant a lack of specific standards that address complex test systems as well as an absence of both proficiency test schemes and expertise for evaluating validation studies.

Before lab-developed complex diagnostic systems were commercialized, no jurisdictional entropy emerges. This was because the FDA traditionally has regulated “test kits” and not in-house developed diagnostic tests (so-called “home brews”). This, in turn, has created a two-path system whereby “a company that invests the time and effort necessary to develop a test kit for cystic fibrosis, for example, will encounter competition in the market place from laboratories offering laboratory-

⁸ National Institute of Health. 1997. Federal Register 62, 59032.

developed cystic fibrosis tests that have not undergone FDA review” (Javitt 2007, 2). Not surprisingly, “there exists an uneven playing field that creates a disincentive to perform research to establish clinical validity and deters innovation of new tests with demonstrated validity” (Javitt 2007, 2). In addition, although in the past FDA was not actively involved in regulation of in-house tests or in the regulation of the building blocs sold and used to create these tests, it published in the Federal Register on 1997 a final rule,⁹ classifying the building blocs of in-house tests as analyte specific reagents (ASRs) and subjecting both the manufacturers of these building blocs as well as the laboratories using them to incremental regulation. “The purpose of this rule was to clarify FDA oversight for in-house tests in relation to the oversight provided by the CMS under the CLIA” (FDA 2003). Specifically, it limited the FDA role to regulating ASRs used in lab-developed genetic testing.

The weaknesses in the regulation of lab-developed genetic testing products led to a process whereby fraudulent marketing of some of these products to consumers continues to grow, creating an environment that is ripe for consumer fraud and abuse. Subsequently, the HHS published on May 4, 2000 a Notice of Intent in the Federal Register announcing its intent to issue a proposed rule to create a genetic testing specialty under CLIA. FDA did not act at this stage although, due to jurisdictional proximity, it could potentially face an allegation that it had been negligent in protecting American consumers by ensuring that the tests are safe, useful and accurate. In 2006, these pressures had reached a climax following six years of CMS inaction combined with the dramatic growth of the genetic testing industry as demonstrated by availability of genetic tests that cover more than 900 diseases.

⁹ Food and Drug Administration, 6 Federal Register 62260 (November 21, 1997)

On March 2006, the Genetic Alliance called for genetic testing specialty under CLIA. On April 2006, the HHS placed the issuance of a proposed rule on its Semiannual Regulatory Agenda, with a target release date for a notice of proposed rule-making regarding genetic testing specialty in November 2006. On June 2006, Government Accountability Office's (GAO) examination of the quality of lab testing revealed that “oversight of clinical lab quality is not adequate to ensure that labs are meeting CLIA requirements” (GAO 2006a, 1). One month later, another GAO investigation revealed that “The results from all the tests GAO purchased misled consumers by making predictions that are medically unproven and so ambiguous that they do not provide meaningful information to consumers” (GAO 2006b, 1). Those results kicked off a hearing on July 27, 2006 into direct to consumer genetic testing at the U.S. Senate Special Committee on Aging,¹⁰ as well as two bills: the Laboratory Test Improvement Act (S. 736), sponsored by Edward Kennedy (D-MA), chairman of the Health, Education, Labor & Pensions (HELP) Committee with ranking Republican Gordon Smith (OR) as co-sponsor, and the Genomics & Personalized Medicines Act 9S. (76), sponsored by Barack Obama (D-IL), with co-sponsor Richard Burr (R-NC), both members of the HELP Committee. The former bill, for example, would target lab-developed genetic testing as medical devices requiring pre-market review by the FDA. Both bills would establish a CLIA specialty for genetic testing.

The pressure on CMS culminated in September 2006, when a petition was submitted by the Genetics and Public Policy Center, Public Citizen's Health Research Group and Genetic Alliance (pursuant to section 553(e) of the Administrative

¹⁰ See hearing of “At home DNA Tests: Marketing Scam or Medical Breakthrough” at <http://aging.senate.gov/public/index.cfm?fuseaction=hearing.home> (accessed on 21.5.07).

Procedure Act. The petitioners requested that the CMS implement the CLIA by creating a genetic testing specialty and establish standards for proficiency testing. The fact that CMS did not respond to the petition meant further delay in assuring the safety and accuracy of a genetic testing. Precisely at this point, FDA claimed jurisdiction over IVDMIAs – a growing category of complex diagnostic tests that use clinical data to empirically identify an algorithm and employ the algorithm to integrate different data points in order to calculate a patient-specific result. The draft guidance issued by the FDA extends the scope of FDA regulation on the premise that these tests “cannot be interpreted by the well-trained health care practitioner using prior knowledge of medicine without information from the test developer regarding its clinical performance and effectiveness”.¹¹ FDA had therefore defined a narrow niche of devices, whether commercially distributed and laboratory developed, that is subject to FDA regulation rather than enforcement discretion. One month later, on October 2006, CMS officials stated their intent to abandon efforts to develop tailored standards for genetic testing laboratories. The rationale of its sudden reversal of longstanding plans to create a genetic testing specialty was that no such specialty is needed.¹²

Jurisdiction Claims Following Threats to Public Health

¹¹ FDA, Draft Guidance for Industry, Clinical Laboratories, and FDA Staff: In Vitro Diagnostic Multivariate Index Assays, at 3 (September 7, 2006), available at <http://fda.gov/cdrh/oivd/guidance/1610.pdf>.

¹² Genetic & Public Policy Center. 2006. “Editorial.” E-news. Available at: http://www.dnapolicy.org/news.eneews.article.nocategory.php?action=detail&newsletter_id=18&article_id=61 (accessed on 21.5.07).

Table 2 clearly demonstrates that whether and when to claim jurisdiction is a question of politics as much as, if not more than, a question of science. The table shows that when the emergence of novel technology creates an immediate public health need for FDA to assert jurisdiction, FDA is likely to do so. In the case of human tissue transplants, for example, the question of whether FDA could regulate human tissue transplants was discussed in 1976 by representatives of the three FDA bureaus (now Centers) responsible for regulating medical products (Merrill 2002, 10). According to Stuart Nightingale, FDA's Associate Commissioner for Health Affairs, “[N]o one system seemed applicable to all of the potential products that fall under the rubric of transplantable tissues. It was [therefore] decided that FDA jurisdiction over tissues would be asserted only in response to an immediate need” (Nightingale 1991, 5). In 1979, two incidents occurred of disease transmission through transplantation – one of which led to the death of a young woman one month after transplantation (Nightingale 1991, 5). These incidents prompted the agency to review its position but, once more, the decision was to opt for voluntary self-regulation and leave the FDA the power to intervene on a case-by-case basis, rather than to assert jurisdiction. This was because the reported incidence of disease transmission through transplantation was “extremely low” (Merrill 2002, 11, quoting Richard Cooper, the then FDA's Chief Counsel), and the risk was not viewed as serious (Nightingale 1991, 5).

Table 2 about Here

Yet within a decade the FDA was forced to claim jurisdiction over dura mater (the outer meningeal tissue covering the brain; extracted from cadavers and used to patch the brain sacs of live human beings), corneal lenticules (a human tissue product

derived from the human cornea and applied to the cornea to correct vision problems), and heart valve allograft (a device intended to perform the function of any of the heart's natural valves). According to Nightingale, “Issues such as whether or not allogeneic tissue was processed, or to what degree it was processed, or to what extent it was commercialized, became less and less important a reason to regulate as the threat of communicable disease loomed larger [...] Much of what was being learned about the potential infectivity of blood and plasma was applicable to other bodily fluids, as well as organs and tissues [...]” (Nightingale 1999, 6).

The first step in the FDA's serious evaluation of the need to regulate human tissue for transplantation was its request that all processors of dura mater offered for transplant submit information on donor criteria, collection procedures, processing procedures, packing information, labeling, including lot numbering system and traceability, in-process and final testing and quality control procedures, and information on sales in the US (Kahan 1995, 1). This request came immediately after a report in the February 6th issue of the CDC Morbidity and Mortality Weekly Report, concerning the death of a 28-year-old woman from Creutzfeldt-Jacob disease 21 months after she received a dura mater graft during surgery (Kahan 1995, 1). Perhaps because it was the first type of human tissue intended for transplantation, it took the FDA several years to decide how to evaluate dura mater (Kahan 1995, 1). Only on November 1990 did the FDA issue a jurisdiction claim over dura mater (Nightingale 1991, 7; Kahan 1995, 1; Merrill 2002, 18).¹³ In the second type of human tissue intended for transplantation, FDA response has been swift. From November 1989

¹³ A letter from Leighton W. Hansel, Division of Produce Surveillance, Center for Devices and Radiological Health, Food and Drug Administration (November 14, 1990).

through January 1990, five cases of AIDS infection, two of which involved corneal, were reported to the Center for Disease Control and Prevention.¹⁴ FDA jurisdiction claim over corneal lenticules was announced on November 1989. FDA's jurisdiction claim over corneal lenticules and over dura mater were undertaken without publication in the Federal Register.

However, low visibility of FDA's further jurisdiction claims over human tissue transplantation was not an option given the mounting public and professional concern over AIDS. According to Merrill, former FDA chief counsel,

FDA officials confronted the grim reports of a growing epidemic primarily in two contexts. First, the Agency's costly requirements for approval of new drugs came under sharp attack from AIDS patients and caregivers. The other arena in which AIDS posed a special challenge was the country's system for collecting, processing, and distributing whole blood and blood products, for which FDA had assumed regulatory responsibility in 1972 [...] Concern about disease transmission thus became the primary justification for FDA's creation of a system for tissue regulation in December 1993 (Merrill 2002, 16-17).

As the main guardian of public health in the American health system, the FDA was forced to act swiftly. On June 1991, the FDA promptly asserted its authority to regulate human heart valve.¹⁵ This jurisdiction claim came after the Public Health

¹⁴ CDC. 1990. "Epidemiologic Notes and Reports Microsporidians Keratoconjunctivitis in Patients with AIDS." *MMWR Weekly*, March 23/39(11): 188-189, Available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/00001578.htm> (accessed o 18.7.07).

¹⁵ Cardiovascular Devices; Effective Date of Requirement for Premarket Approval; Replacement Heart Valve Allograft, 56 *Federal Register* 29, 177-78 (June 26, 1991).

Service Work Group, which was nominated by the Assistant Secretary of Health, recommended Federal development and publication of standards or guidance on donor screening, testing, recordkeeping and tracking procedures to reduce the risk of transmission of infectious disease. The Work Group recommended also that Federal agencies, including the FDA, proceed with pending regulations as “expeditiously as possible”.¹⁶ Although the Work Group's report was officially published on July 1991, it is reasonable to assume that, being part of the same government department that appointed the Work Group, FDA officials were informed in advance of the recommendations.

The FDA's unique role in the prevention of the transmission of AIDS and hepatitis through human tissue used in transplantation, led it to claim jurisdiction over human tissue banks on December 1993 (Indech 2000, 348).¹⁷ This jurisdiction claim followed an FDA investigation of imported tissue material. At a Senate hearing in October 1993, Dr. Kathryn Zoon, the Director of the FDA's Center for Biologics Evaluation and Research, elaborated the investigation's findings:

[S]everal tissue bank directors have been solicited by individuals offering to sell tissue that originates from other countries. Generally, these contacts have been unwilling to declare the actual source of the tissue, to provide the documentation as to the cause of death, the medical records of the donor, the

¹⁶ Federal Register 62 (July 29, 1997), 40429-30.

¹⁷ Human Tissue Intended for Transplantation, 58 Federal Register at 65,514 (December 14, 1993)

results of donor screening and testing, or to furnish samples of donor serum for testing.¹⁸

These findings — elaborated specifically in the preamble to FDA regulation of human tissue banks¹⁹ — led to an abrupt decision to assert control, effective immediately, over as many as 200 institutions (Merrill 2002, 34). The urgency of FDA's jurisdiction claim was manifested by its refusal to provide notice and opportunity for comments, thereby blocking any opportunity to question the contents of the restrictions imposed on human tissue banks. The FDA did, however, invite comments on its interim regulation (Merrill 2002, 36).

The FDA's decision to assert jurisdiction over human cloning experiments has followed a similar sequence of events. On February 27, 1997, the Observer reported that a team of researchers at the Roslin Institute in Scotland had successfully “cloned” a sheep, which they named Dolly, through the use of a technique called somatic cell nuclear transfer. Cloning is the production of a precise genetic copy of a cell, plant, animal or human being. On March 7, 1997 then President Clinton imposed an administrative ban on federal funding of attempts to clone human beings and simultaneously charged the National Bioethics Advisory Commission (NBAC) with the task of analyzing the legal, moral and ethical issues surrounding cloning technology and reporting its recommendations within ninety days (Merrill and Rose 2001; Rokosz 2000; NBAC 1997). President Clinton also proposed enactment of the

¹⁸ Regulation of Human Tissue Banks: Hearing Before the Subcommittee on Regulation, Business Opportunities, and Technology, 103d Cong, 1st Sess. 56 (1993).

¹⁹ Human Tissue Intended for Transplantation, 58 Federal Register 65,514, 65,516 (December 14, 1993)

Cloning Prohibition Act of 1997 in an attempt to ban the creation of human beings using somatic cell nuclear transfer.

Alongside legislative proposals to ban human cloning at both state and federal levels, a few lawmakers proposed bills allowing experiments that may result in cloning of human beings (Greene 2002, 349-50). In June 1997, the NBAC presented the President with its conclusions on cloning (NBAC 1997). While determining that cloning of DNA, cells, tissues and non-human animals using the novel technology was not unethical, it found human cloning to be morally problematic. The report agreed that federal funds should not be allocated to science oriented toward human reproductive cloning, and it urged private researchers to adhere to the voluntary moratorium established by President Clinton (Campbell 2005). The climax of public and professional concern was reached when a Chicago physicist announced at a September 1997 scientific conference that he was ready, willing and able to clone humans as soon as he raised the necessary funding (Silberner 1998, 5). The news that the physicist had assembled a team of scientists and was simply looking for financial supporters, created a media sensation and widespread condemnation of human cloning (Weingarten 1998; Horning Priest 2001, 64). “Without waiting for congressional action [...], the FDA abruptly declared that it already possessed, and was prepared to exercise, authority to regulate cloning experiments” (Merrill and Rose 2001, 87). This jurisdiction claim was made by Acting FDA Commissioner Michael Friedman during a radio talk show on January 12, 1998. Justifying the claim on the scientific ground that human cloning presented “serious health and safety issues” for both the fetus and mother, the FDA asserted that human cloning is another form of gene therapy, over which the agency already exercised regulatory control (Merrill and Rose 2001, 100; Rokosz 2000, 468). FDA's jurisdiction claim was later

on stated publicly in writing, in a “Dear Colleague” letter signed by the then-Associate Commissioner Stuart Nightingale (Javitt and Hudson 2003, 1205-6; Merrill and Rose 2001, 87; Rokosz 2000, 468).

The aforementioned empirical analysis raises an inevitable question: Are the causal relationships observed so far not already obvious from the start? In my opinion, the answer is negative. One goal of an empirical analysis, and especially a qualitative one, is the estimation of parameters in a model. The empirical analysis brought to the forefront the impact of both regulatory competition and threats to public health on the timing of FDA's decision to assert jurisdiction. It did so by revealing precisely when waiting becomes politically costly for a regulator facing a novel technology. In the case of regulatory competition, for example, the presence of a competitor regulator per se is not likely to lead to regulatory action on behalf of the reputation-sensitive “old” regulator. Only when the competitor reaches a stage in which it is about to formalize general requirements, supporting guidelines and/or tailored standards — a critical threshold between the jurisdiction claim and actual enforcement — or when it fails to do so when officially required to, then it is highly likely that the “old” regulator will assert jurisdiction.

Similarly, in the case of threats to public health, a few incidents of serious side-effects and even death following tissue transplants twice led to the FDA reviewing its position with no subsequent seizure of jurisdiction because the reported incidence of disease transmission through transplantation was extremely low. Only when the risk to the public was high — following the discovery of communicable diseases through transplantation (Creutzfeldt-Jakob disease and especially the AIDS virus) and the potential human cloning experiment by a “mad” scientist — did the FDA assert jurisdiction. A more recent example — a forceful foray of the FDA in

July 2001 into regulating fertility treatment when it effectively outlawed a procedure known as ooplasm transfer following two cases in which fetuses resulted from this novel technology were aborted due to a serious genetic disorder — provides another illustration of the argument advanced here (Javitt and Hudson 2003, 1226). The timing of jurisdiction claims is therefore a strategic choice variable.

Another inevitable methodological question is whether there is more than one theory for the observed phenomena. Because, if that is so, the methodology employed is not much help. The methodology applied here brings to the reader, in the least complicated way, the story of expanding FDA's gate-keeping power by focusing on the political dynamics that enables it to claim jurisdiction over a scientific novelty when it decides to do so. The methodology sharply discriminates between the two factors that pose a threat on agency reputation, and allow for a careful reading of agency inaction as well as agency response. This leads to the verification of several predictions that are quite different than one would expect from a model based on legal theory rationale.

Conclusion

At least two important implications follow from the jurisdictional dynamics illustrated by the cases discussed above for the theory and practice of organizational reputation. The first has to do with reputation-conditioned autonomy (Carpenter 2001). My understanding of the increase in a regulator's gate-keeping powers as determined by agency's reputation-conditioned autonomy departs from accounts of “textbook” regulators. It departs first and foremost from the arguments that assume regulatory agencies to be more or less passive actors in decisions involving their purview (Moe 1989; Wilson 1989; Ting 2002). It also departs from the argument — advanced in the context of committee politics — that the foundation stones of organizational

autonomy lie in the fixity of its jurisdictions (Cox and McCubbins 1993, 12-13).²⁰ Or, in other words, that an agency's decision to specialize, its choice of regulatory policies, and the likelihood that it can unilaterally expand its purview, do not depend on the action of any other agency. This research has corrected the record and deepens our understanding of agency expansionism. As I have tried to show, a regulator will issue a jurisdiction claim over a novel technology when its political legitimacy is at stake. This, in turn, may occur when (i) new information becomes available that may undermine an agency's unique reputation, and (ii) a rival regulator attempts to formalize its regulatory authority, or fails to do so although officially required to. Needless to say, expansion of agency's purview may impact agenda dynamics (e.g., issue definition), policy outcomes and the complex ties of the regulator with interest groups and the media. Thus, in the end we are left with a very different picture of agencies that enjoy powerful public reputation.

The second implication has to do with our understanding of the reasons the FDA has such broad gate-keeping power over the pharmaceutical marketplace despite numerous regulatory reforms.²¹ Because of the FDA's powerful reputation as patient and consumer protector in the American health care system, its response to novel technologies displays the superiority of bureaucratic mechanisms (i.e., the timing of bureaucratic decision) over mechanisms of political influence, such as media and interest group influence. The fact that at a later stage FDA review occurs largely outside public view in order to protect the confidentiality of sponsors' proprietary material emphasizes the democratic deficit inherent in processes of FDA expansion

²⁰ On Committee politics and jurisdictional disputes, see: Baughman (2006).

²¹ For the numerous cases FDA reform has appeared high on the agenda of political figures and associations representing manufacturers, see Merrill (1996, 1755-6).

following the evolution of novel technologies. Bringing the political mechanisms of influence to center stage during agency expansion is therefore urgently required. It implies installing legal and non-legal mechanisms that challenge the FDA's qualifications to regulate the emerging policy area, its institutional capacity to mediate the societal conversation concerning the ethics of the area in question, and the manner by which the FDA formalizes its regulatory authority over the novel technology and communicates it to the general public.

The model developed here also directs attention to further relationships that are theoretically interesting and ripe for empirical testing. Specifically, the relationship between agency reputation and an agency's strategy of formalizing its regulatory authority; public visibility of jurisdiction claims; the nature of agency's statutory interpretation; agency's role in settling the meaning of law, and the power agencies have to change their mind.

It is worth noting two important caveats of our study. The first caveat is that only contexts within which novel technology emerges were examined. But, if the timing of jurisdiction claim is a strategic choice variable, why should this conclusion be limited to novel challenges? Take, for example, the case of FDA's assertion of jurisdiction over tobacco which fits perfectly with the prediction of the model advanced here. The FDA claimed jurisdiction only after an investigation of the tobacco industry had revealed that tobacco manufacturers intended to produce nicotine's drug-like addictive effects (Kessler 2001). The investigation also brought to light information about the mechanisms manufacturers use to control the level of nicotine in their products. For the FDA, this new piece of information meant that tobacco was a drug, and that tobacco therefore fell within its jurisdiction (Kessler 2001). This jurisdiction claim, however, did not avoid judicial nullification.

The second caveat is that only the FDA was examined in this study. Our empirical evidence comes from a comparative case-study analysis of jurisdiction claims, and thus a high degree of caution is appropriate in generalizing the conclusions. Nonetheless, the logic that we advance in this study may apply to regulators entrusted with broad gate-keeping powers and which enjoy powerful reputations. My hope is that future research will build on the foundation advanced here to further understand the ways regulatory agencies unilaterally expand their purview.

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Table 1. FDA's Jurisdiction Claims Following Regulatory Competition

<i>Novel Technology</i>	<i>Regulatory Competitor</i>	<i>An Event Preceding Agency's Claim</i>	<i>Jurisdiction Claim</i>
Gene therapy	Recombinant DNA Advisory Committee (RAC), established on 1974, by the NIH	On January 22, 1985, RAC issued an initial draft of "Point to Consider" in the Federal Register for public comment.	December 31, 1984
Laboratory-developed Complex Diagnostic Tests	Center for Medicare & Medicaid Services (CMS), is responsible, since 1988, for overseeing compliance with requirements imposed by the Clinical Laboratory Improvement Amendments of 1988 (CLIA)	<ul style="list-style-type: none"> - On April 2006, HHS placed the issuance of a proposed rule on its Semiannual Regulatory Agenda, with a target release date for a notice of proposed rulemaking in November 2006 - On October 2006, CMS officials stated their intent to abandon efforts to develop a genetic testing specialty under CLIA 	On September 7, 2006, the FDA claimed jurisdiction over a growing category of complex diagnostic tests (IVDMIA's)

Table 2. FDA's Jurisdiction Claims Following Threats to the Public Health

<i>Novel Technologies/Distributors</i>	<i>An Event preceding agency's claim</i>	<i>Date of Event</i>	<i>Jurisdiction Claim</i>
Human tissue transplants			
Dura Mater	A report concerning the death of a 28-year-old woman from Creutzfeldt-Jacob disease 21 months after she received a human dura mater graft during surgery	February 6, 1987	November 1990
Corneal Lenticules	From November 1989 through January 1990, five cases of AIDS infection, two of which involved corneal, were reported to the Center for Disease Control and Prevention	November 1989	November 1989
Heart Valve Allograft	Public Health Service Work Group recommended measures to reduce transmission's risks	July 18, 1991	June 1991
Human Tissue Banks	FDA investigators had discovered that several tissue bank directors have been solicited by individuals to sell tissue that originates from other countries	October 1993	December 1993
Human Cloning Experiments	An American physicist announced his plan to clone a human being	September 1997	January 1998