Technology Assessment and the Sociopolitics of Health Technologies

Pascale Lehoux
University of Montreal

Stuart Blume
University of Amsterdam

Abstract In a growing number of countries, health technology assessment (HTA) has come to be seen as a vital component in policy making. Even though the assessment of the social, political, and ethical aspects of health technology is listed as one of its main objectives, in practice, the integration of such dimensions into HTA remains limited. Recent social scientific research on the inherently political nature of technology strongly supports such a comprehensive approach. The growing claims by and on behalf of consumer groups also suggest that HTA should be informed by a broader set of perspectives. Using the example of the cochlear implant in children, this essay compares the professed objectives of HTA with typical practice and explores possible explanations for the discrepancies observed. A second example, home telemonitoring for elderly persons, demonstrates how the types of evidence considered by HTA and the process through which assessments are produced may be reconsidered. We argue for the formal integration of the sociopolitical dimensions of health care technologies into assessments. The ability of HTA to more fully address important issues from a public policy point of view will increase by making explicit the sociopolitical nature of health care technologies.

Producing Knowledge on Health Technologies for Public Policy

Health Technology Assessment (HTA) is a field of applied research that seeks to gather and synthesize the "best available evidence" on the costs, efficacy, and safety of health technology. The field has grown steadily dur-

The authors would like to thank the two anonymous reviewers who provided helpful criticism. The authors are grateful to the journal editor, Mark Peterson, for his detailed review of two earlier drafts of the manuscript and for providing an extremely valuable analysis of the reviewers'

Journal of Health Politics, Policy and Law, Vol. 25, No. 6, December 2000.

ing the past three decades in several industrialized countries (INAHTA 1997). Through influential advocates, it has attracted the attention of governments, third-party payers, policy makers, and more recently, patients' advocacy groups (Bastian 1998). During this period of development, the methods of HTA have been debated (Coyle, Davies, and Drummond 1998), its potential misuse in rationing stressed (Garber 1994; Morgall 1993), its impact called into question (Lehoux 1997; Lomas 1991), and emphasis has been placed on the way competing technologies are "assembled" before being assessed (Giacomini 1999). In this essay we are primarily concerned with the content of HTA, that is, the range of "evidence" considered in assessments, which we argue centers too narrowly on efficacy, safety, and costs. Neglect of the social, ethical, and political dimensions in HTA is untenable, given what is known about the nature of technology. On the one hand, social scientific research (Blume 1992; Faulkner 1997; Stone 1997) has shown that health technologies have a variety of sociopolitical implications for individuals and society, and therefore cannot be considered axiologically equal—some seen simply as more effective or affordable. On the other hand, the growing claims made by and on behalf of consumer groups should persuade evaluators to recognize that public policy needs to be informed by the multiple "rationalities" and values that prevail in a given society.

Our purpose in this article is threefold. First, a brief overview of the emergence and development of the field of HTA is given, and the significance of sociopolitical dimensions is discussed in the light of the latest social scientific research. Second, using an initial example (the cochlear implant in children), we compare the professed objectives of HTA with typical practices and explore possible explanations for the discrepancy observed, drawing here on studies of other policy analytical tools. Third, by drawing on a second example (remote home monitoring of elderly persons), we illustrate how a more socially and politically informed HTA might look.

The Origins of HTA

The CT (Computed Tomography) scanner, developed initially by EMI between 1968 and 1972, radically and rapidly affected the practice of radiology and of diagnostic medicine in general. Beyond that, the very enthusi-

comments. This article was initiated during Pascale Lehoux's postdoctoral studies at the University of Amsterdam, for which she was awarded a fellowship by the Social Sciences and Humanities Research Council of Canada (#756-96-0241). She is a National Scholar from the National Health Research and Development Program of Canada (#6605-5359-48).

asm with which it was adopted led a number of health policy analysts to wonder at the evidentiary basis for investing in such substantial resources. In the United States, Morton C. Creditor and Julie Beetle Garrett (1977), among others, publicly questioned the decision-making processes of hospitals purchasing an instrument that, when it first reached the market in 1973, cost in excess of $300,000. How could it be that such decisions were being taken on the basis of so little information regarding the device's benefits to patient management? In February 1975, the U.S. Senate Committee on Labor and Public Welfare (on behalf of its Subcommittee on Health) invited the recently established Office of Technology Assessment (OTA) to conduct a study of the kinds of justifications that should be necessary before costly new medical technologies and procedures are implemented. The CT scanner played an important role in crystallizing concern about fast-developing technologies elsewhere in the world as well. H. David Banta and Seymour Perry (1997: 433) suggest that "the prototype of a high technology device, [the CT scanner] was visible, exciting, and expensive. . . . It was a public policy issue during the mid-1970s in (at least) Australia, Canada, the Netherlands, France, Denmark, Belgium, and Germany. It surely stimulated the beginnings of interest in health care TA in many countries."

The reports that were subsequently produced by OTA can be seen as defining the objectives, scope, and methods of a new policy analytical tool for the health policy area. In the succeeding two decades, HTA has pursued a "race against health technology diffusion" (INAHTA 1997) and has come to be seen as an essential factor in developing health policy around the world. As the scale of work expanded, and as the results of studies began to be exchanged and compared, the foundation was laid for a new field of professional work and research.[1]

Neglect of the Social and Political Aspects of Technologies

Throughout the 1990s, a call for evidence-based medicine and rational priority setting in health care contributed to defining the aims and means of HTA (Giacomini 1999). According to what leading practitioners tell us of the field's objectives, the term *technology assessment* in health care

1. The International Society of Technology Assessment in Health Care (ISTAHC) held its first annual meeting in 1985 (where sixteen countries were represented). Today members are drawn from nearly fifty countries. The *International Journal of Technology Assessment in Health Care* was also first published in 1985. The International Network of Agencies for Health Technology Assessment (INAHTA) was established in 1993 (and includes thirty-one organizations as of November 1999) to promote HTA and the development of joint assessments on selected topics (INAHTA 1997).

"enlarges the evaluation process to encompass not only the clinical consequences, but also the economic, ethical, and other social implications of the diffusion and use of a specific procedure or technique on medical practice. Technology assessment thus takes a broad perspective and its aim is to provide facts as a basis for not only clinical decision making, but also for policy making in health care as a societal endeavor" (Banta and Perry 1997: 431).

Practice, however, is different. For example, while current discussions of xenotransplantation show that ethical and social issues today may be a major societal preoccupation when considering a new medical technology (Fox 1996), rarely have such concerns been reasonably integrated into HTA (Morgall 1993). Analysis of the potential social implications of ethically problematic technologies tends to be pursued in ad hoc advisory groups outside formal HTA, as happened in the United Kingdom (Faulkner 1997).

Two early reports from the OTA suggested that at that time there were two potential approaches. The first response to the U.S. Senate's request of 1975 was a report dealing with "the need to assess the social impact of each new medical technology during the research and development process" (OTA 1976: vii). It dealt with the set of implications that assessments of medical technology would have to address. Whereas the first OTA report outlined the scope of a comprehensive approach to assessing the social implications of a medical technology, a later report had a much narrower focus (OTA 1978).[2] The first report argued that explicit attention be paid to possible implications that went well beyond the health care system. For example, in relation to "implications for the legal and political systems," OTA drew attention to potential problems of justice, fairness, and access. Might manufacturers be liable for damages resulting from the failure of a technology? Would use of the technology require changes in definitions of death or suicide? Could political pressure for increasing availability or political action opposed to the technology or procedure be anticipated? The second report was limited to implications for health care, dealing with a much more focused set of technical and clinical questions. According to this report, it was possible in principle to deal adequately with the assessment of safety and efficacy

2. Each OTA document uses a number of brief case studies to establish certain features of medical technologies and to explain how relevant information was, and might be, collected. In the first report, these case studies included the CT scanner, polio and rubella vaccines, the cardiac pacemaker, and cortical implants. Included among the seventeen case studies in the second report were pap smears, amniocentesis, the chicken pox vaccine, and electronic fetal monitoring.

through established procedures, using epidemiological data, and randomized controlled trials.

If one considers the substantial volume of work now being produced in the field of HTA, compared with the contrasting programs of research set out by the OTA more than two decades ago, one approach has come to dominate.[3] For example, we conducted a search on the 1999 International Society of Technology Assessment in Health Care (ISTAHC) CD-ROM database, which contains abstracts presented at its annual meetings (1994–1998) and all abstracts of papers published in the *International Journal of Technology Assessment in Health Care* (1985–1999). From a total of 2,906 records, 30 records contained the word *social* in their title[4] (1 percent), 5 contained *political* (0.2 percent), and 19 *ethical* (0.7 percent). A search of the abstracts was slightly more encouraging: 181 *social* (6 percent); 49 *political* (1.7 percent); and 80 *ethical* (2.8 percent). Since health insurers only want to pay for effective and safe interventions, and cost containment remains an important concern for most governments, attention to the measurement of the efficacy, safety, and costs associated with medical innovations is hardly surprising. But what of the other questions raised by OTA in its very first response to the Senate Subcommittee on Health? Are safety, efficacy, and cost the only characteristics of health technologies by which rational policy making should be informed?

HTA as a Regulatory Science

Decades ago, the intrusion of political values into scientific work was seen as aberrant, like something that was explored only in the work of Nazi or Stalinist scientists. But since the early 1970s this view has been challenged by sociologists of science and of medicine. In recent work,

3. Interestingly, HTA has been formalized in different countries according to a more or less similar model. An HTA unit can take the form of a government agency, a nonprofit organization or a university-based research group (in the United States, there are a growing number of HTA freelance consultants). In most instances, an HTA unit remains an arm's-length organization. The "products" of these organizations are also strikingly similar, as they often choose (or are requested to assess) the same "emerging" policy topic and examine it through the methodological "gold standard" meta-analysis. Nevertheless, important variations in the regulatory mechanisms used to implement the conclusions of HTA are found across countries (i.e., clinical guidelines, reimbursement rules, professional licensing, hospital accreditation systems, refundable drug lists, etc.).

4. The search is case sensitive. We therefore added the results of two requests: one with a capital letter (i.e., *Social*), and one lowercase (i.e., *social*). Of course, some of the records found may not be relevant (e.g., a title including "social security" or "social support" does not necessarily address social issues). However, the very small percentages obtained still reflect that social, political, and ethical issues are rarely, if ever, addressed.

scientific (and medical) knowledge has been portrayed as the result of social activity, imbued with social values, and actively constructed within and in relation to the interplay of social, economic, and political interests (Blume 1992; Cozzens and Woodhouse 1995). Where the distinction between scientific work and the political process was once essential, the suggestion more recently has been that it is largely rhetorical. Inspired by the work of social scientist Thomas Gieryn, David Guston (1999) observed that the NIH Office of Technology Transfer functioned as a "boundary organization," stabilizing an acceptable boundary between scientists and politicians.

Clarifying some of the linkages between politics and scientific expertise, Susan Cozzens and Edward Woodhouse (1995:534) classify three types of relations. First, there is the *political shaping* of knowledge. Insofar as scientific knowledge is seen to be imbued with social and political values, its authority in resolving (or "closing") controversy is diminished. For example, various studies of regulatory processes and decision making have focused on the relations between available scientific knowledge and the decisions reached by decisions makers (Abraham 1993). The knowledge is disseminated in ways that depend on how regulatory processes are organized and therefore differs from country to country. Second, there is the *social distribution of authority* between experts and lay participants. Whether participating in publicly funded research programs or in advisory processes, scientists typically represent, and may seek to further, the specific disciplinary perspective with which they are associated. In the past few years, the scope of professional expertise has been challenged by citizens' groups whose claim to a voice depends on their very distinct experience-based knowledge. While the best-known examples of this process come from social scientific research on AIDS (Epstein 1996), it is a phenomenon of growing importance. Third, there is the *business steering* of knowledge production. The importance of industry in the field of medicine is not new, given that its participation is essential for discoveries to evolve into new drugs or devices. It was shown that over a period of decades the development of new medical imaging devices reflected the interplay of interests, perspectives, and priorities of both radiologists and industry (Blume 1992). The past decade has seen a growing "privatization" of knowledge, reflected in the increasing importance of patents in various fields of medical innovation, including the development of new vaccines (Blume and Geesink 2000). Some see this trend as potentially impeding the process of biomedical innovation (Heller and Eisenberg

1998). Thus one should remember that existing knowledge and technologies do not embody the "natural" outcomes of neutral efforts invested in research and development endeavors. In addition to the web formed by these three relations between a "regulatory science" (Jasanoff 1990) and politics, the role of HTA can be examined not only with consideration for the type of knowledge it produces and the institutional context in which it operates, but also with respect to the object of its inquiry: technology.

In What Sense Is Health Technology Political?

More specifically, two aspects of technology require further development: (1) its political nature and (2) its sociological dimensions. Political philosophy is concerned with the relationship between society and the state, and "how they ought to be ordered" (Reese 1980: 447). Political analysis aims to identify the entities (e.g., a procedure, an institution, or a system) that facilitate or impede the ordering of society according to a particular political philosophy (i.e., Platonian, Machiavellian, Rousseauist, etc.). More commonly, political issues are examined with respect to the principles governing a democratic society (such as equity, justice, freedom, autonomy) (Dahl 1989). Accordingly, there is a sense in which the political nature of health technologies has come to be familiar. The perception that technological advance was a major factor in rising health care costs came to play an important role in health policy and politics of the 1970s, which led successive governments to establish mechanisms for better regulating the diffusion of expensive technologies—whether through general budgetary mechanisms or through reserving the right to restrict the diffusion of specific technologies (as in the Netherlands).[5]

In the academic field of science and technology studies (STS), technologies are viewed as "political" in a different and more fundamental sense. Years ago, Langdon Winner's (1980: 121) "classic" exploration suggested that there are "two ways in which artifacts can contain

5. The dilemmas for which these initiatives were seen as potential resolutions can themselves be seen as outcomes of more fundamental political processes and tensions. For example, the historian David Rothman draws a connection between the politics of health care and what he sees as the "technological imperative" of American medicine. In his view (Rothman 1997: 4), America's "passion for (medical) technology" is related to "an ongoing refusal to socialize medical care and make it available to everyone." Rothman sets out to show that the crux of this relationship is the unwillingness of the middle class to tolerate any restriction on its access to the fruits of medical science.

political properties." First, there are "instances in which the invention, design, or arrangement of a specific technical device or system becomes a way of settling an issue in a particular community" (ibid.). Here the political intent is explicit. The use of prenatal screening genetic tests for specific conditions might be an example of this instance. Second, and more complex, are cases of "what can be called inherently political technologies, man-made systems that appear to require, or to be strongly compatible with, particular kinds of political relationships" (ibid.). The adequate and efficient diffusion of technology into which substantial investments have been made "necessitates" particular social, economic, or political arrangements. Such complex arrangements are illustrated by vaccines developed for the universal immunization of children. It is in the second sense of Winner's argument that we consider the nature of technology as political. This line of inquiry has been extended and strengthened by Madeleine Akrich (1995), who argues that the development of any technology entails the construction of a "user-representation" with his or her unique putative characteristics, values, and skills. In practice, these assumptions may prove counter to what actual users deem acceptable or desirable. For instance, several conflicts emerged during the development and trials of immunological contraceptives: Was the emerging entity an abortifacient? Was the male body an appropriate target for reproductive technology (van Kammen 1999)? The diffusion of a medical technology would thus entail more than negotiation over the use of limited health care resources. The whole process of development and diffusion involves a series of informal "assessments" in which the potential value of a given technology and its compatibility with the interests and priorities of different groups is debated and redefined.

A sociological examination of technology augments a political analysis by emphasizing how the decisions and actions of certain actors influence the lives of others. Evan Willis (1997: 603–604) suggested there are five features to be explored by a sociological approach: (1) the social context in which technology is used; (2) the mutual relationship between society and technology; (3) the career of a given technology; (4) the stakeholders involved (patients, professionals, the state, and industry); and (5) the values embedded in scientific and medical knowledge. Health technologies are usually used in an asymmetrical social context, where the different providers are the experts and the patients are the (passive) subjects of interventions and care. Since each technology is

unique and carries its own set of issues[6], the concept of *career* is helpful in examining a technology's particular evolution over time and the way in which it affects different social groups. Medical innovations, because of their values and through their social utilization, may reinforce hierarchical relations (i.e., computerized information systems), contribute to the exclusion of certain groups (i.e., designated services and programs for AIDS patients), impede the social development of individuals (i.e., genetic screening for "noninsurable" conditions), or extend questionable social practices (i.e., ultrasonography leading to selective abortion of female fetuses). Actors should be seen as reflexive agents (Béjean and Gadreau 1992) who study and react to the possible implications of emerging technologies. Organized groups may struggle to protect their assets and attempt to exercise power over the projects of others. A group might be "successful" because its claims and privileges are either perceived as acceptable by outsiders or are not strongly challenged by competing candidates (Dahl 1989; Vincent 1992).

Social and political dimensions are closely interrelated, perhaps more acutely so when controversy emerges. Tensions are revealed when competing definitions of a technology's value and relevance are publicly articulated. Tensions also emerge when groups of actors feel threatened or perceive themselves at risk of losing power and authority, particularly when such groups possess the resources or "cultural capital" (Bourdieu 1984) to express their discontent (mobilizing the media, voicing their concerns publicly). Articulate social groups (such as ethicists, medical

6. We would like to thank a reviewer for asking us to clarify how it could be possible to classify political issues for different technologies. Health technologies encompass an extremely large spectrum of issues, as they can be used for several purposes, can operate on an individual (e.g., diagnostic imaging devices) or societal level (e.g., safer work environments), can reinforce particular values (e.g., genetic screening as a preemployment condition), and their costs can be collectivized or not—notwithstanding the fact that their benefits can be individualized.

An initial attempt to stress the different levels of analysis and viewpoints from which health technology could be examined was suggested previously (Lehoux 1997). A typology describing the (1) clinical status (experimental, innovative, accepted, obsolete); (2) resources mobilization (human resources-intensive versus capital-intensive); (3) clinical purpose (prevention, diagnostic, etc.); (4) means of delivery (pharmaceutical, surgical procedure, laboratory tests, etc.); (5) context of use (ambulatory care, home care, self-treatment); and (6) market position (degree of competitiveness and profitability) helps analyze the often confounded issues raised by a given health technology. With this typology, one could stress that a genetic test is capital-intensive, that its development is principally financed through public funds, that it does not solve any health problem, and that its social use creates unacceptable practices, such as "avoiding" the hiring of workers identified as "hyper-susceptible" to a toxic substance (Nelkin and Tancredi 1989). Nevertheless, such a typology does not support an ethical analysis at both the individual and collective level.

sociologists, feminists, medical specialists, patient associations, and policy analysts) may trigger controversy by asserting competing explanations or alternative definitions of a "problem" (e.g., aging, infertility, physical stature, or deafness) and of a technology devised to address it. While technologies may or may not become controversial, the basis for controversy is actually established in the development process (Blume 1998). For example, the assumption behind the development of telemonitoring (discussed later) is that certain experts (engineers, medical specialists, nurses, health insurance companies) have the knowledge to fulfill the health and safety needs of elderly persons. Both the legitimacy of this claim and the implications of the technology design could, in principle, be challenged. HTA could scrutinize the rationale behind medical technologies, not only their efficacy.

Identifying Sociopolitical Dimensions of Health Technologies

The concept of the sociopolitics of health technology that we wish to enlarge upon here does not assume that sociopolitics happens *around* technology, but rather, that it is an integral *part of* a given technology. Both technology's existence and use require the support and involvement of social groups, who in turn may mobilize resources, knowledge, and power relations. For HTA to include a sociopolitical perspective, it is therefore not sufficient to be *aware* of the sociopolitical tensions that surround a particular technology; the different ways in which this technology can be "known" must be considered as well. With this end in view, the social scientific insights summarized above can be recast in the form of a framework—a heuristic device, which might be applied before beginning the assessment of a technology. Such a framework is intended to help identify the actors who will potentially be affected by a new technology and to draw attention to the implications it might have for their control over material and cognitive (or more generally symbolic) resources, and for their autonomy.

We suggest that such an assessment framework should address four sets of issues: (1) The potential *actors* involved—What is the technology's significance for each? Is it dependent on the social context in which it is to be used? Which actors play a leading role in its development?(2) The implications of the technology for the flow of material and human *resources*—Who is going to benefit from its development, dissemination, and use? Who is going to pay? (3) The production and circulation of

knowledge—What knowledge circulates about this technology? Whose knowledge is it? What kind of knowledge is lacking? (4) The *power* relations involved—How does the technology influence actors' autonomy and freedom? Who is in a position of authority? Are there individuals whose choices are constrained? We apply this framework to the example of the cochlear implant, whose use with deaf children has been a source of overt conflict in many countries. This technology was chosen because it carried normative assumptions and values that have been publicly contested, emphasizing several of the limitations of HTA as currently practiced.

HTA in Practice: The Pediatric Cochlear Implant

The cochlear implant—an electrode implanted surgically into the inner ear and designed to take over the task of a nonfunctioning cochlea—emerged in the 1970s (Blume 1995). Early work in various centers in the United States, Europe, and Australia suggested that the device could provide deafened adults with a form of hearing. Although substantial rehabilitation was required (users had to learn to interpret stimuli relative to their memories of spoken language), new generations of the device seemed to provide many users with access not only to environmental sounds, but to speech itself. Gradually the group for whom the device was deemed potentially appropriate was expanded from late-deafened adults to children, and then to prelingually deafened children, who, by definition, had never acquired spoken language in the natural manner. Despite concern expressed in a number of countries at the use of children as (according to critics) guinea pigs, the work continued (Blume 1997). Increasingly, deaf communities around the world began to protest the growing practice of pediatric implantation. At a time when the deaf community was seeking acceptance as a linguistic and cultural minority (based on its use of sign language),[7] the cochlear implant became a symbol of deafness viewed as pathology, from which emancipation had to be achieved. Protests incorporated a number of arguments, including the position of sign language in the psychosocial development of deaf children, the limited nature of the assessments that had been carried out, and the competence of hearing parents to make decisions about their deaf child's future.

7. Sign language received official recognition as the language of a distinctive cultural group in Sweden in 1981. Other countries are gradually following suit.

Formal assessments of (pediatric) implants have typically been limited to safety and reliability, or, in audiological terms, efficacy (e.g., perception and production of speech in controlled settings). In 1990 the U.S. FDA approved the marketing of the Nucleus 22 channel cochlear prosthesis for surgical implantation in children aged two to seventeen years. (It had been approved for implantation in adults five years earlier.) This recommendation was based on a review of data on two hundred implanted children, submitted by the manufacturer. The FDA (1990) examined the safety of the device, its reliability in use, and its influence on sound perception and speech comprehension/production. In a subsequent position paper, the National Association of the Deaf argued that the FDA had made a number of mistakes: procedural, ethical, and scientific. They concluded with a recommendation that the FDA "withdraw marketing approval and revise the procedures employed" (NAD 1991). Though subsequent assessments have differed in detail, many of them have come to similar conclusions. In France, the Agence Nationale pour le Développement de l'Evaluation Médicale (ANDEM) (now ANAES), basing its views on a literature review and discussions with French experts, reported on the use of the prosthesis with children having a hearing loss greater than 94 dB, again in positive terms. Their report explicitly stated that little was known regarding factors such as language acquisition, psychological adjustment, and social integration, and that the assessment had therefore ignored these areas (ANDEM 1994). A comprehensive analysis of an experiment with more than four hundred children in seventeen centers in the United Kingdom was also largely limited to the results of (a wide variety of) audiometric tests (Summerfield and Marshall 1995). A recent economic evaluation, carried out in Australia and funded in part by the principal manufacturer of the device, concluded that enhanced quality of life justifies the costs of the procedure (Carter and Hailey 1999). However, the authors note that costs incurred exclusively by patients (travel time, forgone income, home expenditures) are not included in the analysis. Similarly, benefits derived by the deaf community from the use of sign language and the preservation of a distinct culture are not considered.

These evaluative research assumptions, along with the presumption that a deaf child, once implanted, will move from special to regular (mainstream) education as a matter of course, are precisely what the deaf community contests. As a final example the report produced by the Quebec Health Technology Assessment Council (Conseil d'Evaluation des Technologies de la Santé du Québec or CETS) did not challenge the

authority of hearing parents as many spokespeople for the deaf have done. Nevertheless, its content and conclusions were more nuanced and less optimistic than many. According to the report, "Among other things, it is important for parents to be informed of the risks of the operation, the investment required by the rehabilitation, the hierarchy of potential benefits, the impossibility of predicting the likelihood of success, and the fact that the child will still exhibit hearing disabilities and very likely still use sign language to communicate" (CETS 1997: 63).

Few formal assessment bodies have taken the concerns or arguments of deaf people seriously, with the result that the dispute—one can hardly speak of a debate—persists, rarely rising above mutual misunderstanding and recrimination. What insights might a sociopolitical examination provide?

Actors. Which groups appear to have an interest in cochlear implantation, and why are they interested? The manufacturers, of which one company (the Australian Cochlear Corporation) has a dominant position in the world market, have a palpable interest in extending the market for their product. Considerable effort is put into further research and development (aimed at still better devices), into gathering the data required to demonstrate the value of the device, and providing clinicians with technical support and instruction. This company enjoys an extremely high reputation with its customers, and the company's willingness to provide help and support is notably valued. There is a constant search for new markets. The position of clinicians (otologists) is highly compatible with that of the manufacturer. For the specialty as a whole, implantation provides a means of helping a group for whom they could previously do nothing—a means of enhancing the standing of the specialty. Otological surgeons in many countries believe in the (proven) value of the device and do their best to provide and secure reimbursement for this service. Various other professions are also involved (including audiologists, speech therapists, teachers of the deaf, psychologists) in ways that differ from country to country. As a result, it is more difficult to visualize a "collective project," for more divisions and nuances are to be found among these groups. Much depends on the tradition that dominates in any given country: the extent to which deaf children are brought up orally or manually (i.e., using sign language).

Deaf communities are also deeply concerned about cochlear implantation. Although there are considerable national differences in the eloquence of deaf organizations and in the extent to which they voice their

concerns, deaf communities are agreed on one thing: the large-scale implantation of deaf children (and some clinicians argue for implantation of *all* deaf children) is seen as a terrifying threat to the future of their community and to the well-being of deaf children. And what, finally, of the parents of deaf children, whose organizations frequently have higher standing and greater resources than deaf organizations, and whose decisions are ultimately decisive? Parents are also divided about it and rarely speak with a single voice. Much depends on the influences, which come to bear on them as they try to determine what is best for their deaf child. Perhaps the more enlightened parents seek the best of both worlds: sign language and speech, integration in the deaf community and in the hearing society, some speak out in favor of implants, others against. In the face of such ambiguity, parents' organizations are rarely able to take a clear and powerful public stand.

Flow of Resources. How does cochlear implantation affect the flow of resources? Who is affected and in what ways by changes in the flow of material resources associated with cochlear implantation? The procedure is expensive. Cost estimates for preliminary testing, the device, surgery, and the first year's rehabilitation vary (as of course do costs between centers) between roughly $25,000 and $40,000. A substantial program of implantation, involving perhaps forty children per year, has major resource implications. In the current climate of cost containment, those committed to the technology (principally the manufacturers and clinicians) must make a powerful case if their claim on resources is to be accepted. Health policy makers and insurers have frequently shown themselves unwilling to provide resources on the scale demanded. Economic arguments are playing an increasing role in the debate as the attempt is made to demonstrate (to policy makers) the cost-effectiveness of the procedure (e.g., Hutton, Politi, and Seeger 1995). The success of such an analysis depends on showing, in the case of adults, that they can enter (or advance in) employment, and in the case of children, that they can move from special education into less-expensive mainstream education. For their part, deaf communities have tended to argue that these investments will be at the cost of the services and provisions that they most need: training and provision of sign language interpreters, captioning on TV, text telephones, and so on. Speculation and analysis regarding the implications for resource flow will play a major role in the future of cochlear implantation.

Knowledge. There is a general assumption in Western society that parents have the right and responsibility to make decisions in the interest of their (deaf) children. Parents need to make a responsible and informed choice regarding, in this case, cochlear implantation. While this essay is not the place to review the assumptions underlying these precepts, certain questions are naturally forthcoming: What do parents need to know to exercise their responsibility in a sufficiently informed and appropriate manner? Whose knowledge counts? Many recent analyses and policy statements have stressed that parents considering implantation need to be provided with full information, including the difficulty of predicting an individual child's progress. Some centers in certain countries feel it proper to present sign language as an alternative or complementary option. Current discussion on this point fails to consider the actual process of parental decision making, in which media reporting (which largely exaggerates the promise of the implant), and the views of advisors, helpers, friends, and family may play a more important role than printed information. How, if at all, do parents of deaf children learn what growing up as a deaf person—and specifically a signing deaf person—is like? What access do they have to the very different knowledge of deafness that personal experience brings? Is a proper understanding of deaf people's knowledge of deafness a necessary component of being "informed"? The reality is that parents' exposure to the views of the deaf community varies enormously from country to country, as it is a function of the degree to which that community has achieved recognition. These issues, which have both social and ethical implications, have found no place in assessments to date.

Power. What are the implications of cochlear implantation relative to power, status, and autonomy? The fact that it has become a symbol of the debate regarding the nature of deafness (Lane 1992) suggests that they are considerable. To oversimplify, cochlear implantation has become a battle ground between two groups. On one side are those (professions) whose expertise, status, and incomes are inextricably connected to a view of deafness as a "defect" (Harlan Lane [ibid.] speaks of the "audist establishment"). On the other side are deaf communities and their scholarly allies committed to the "emancipation" of deaf people and communities (Blume 1997). Acceptance of sign language as a natural and full language, of its users as a linguistic minority, and of the need for deaf children to be educated in and through sign language are fundamental

demands. Many actors would admit that the way the implant is used (including the requirements for acceptance in a program), and the scale of its use, have major implications for both the culturally dominant perception of deafness and for the future of the deaf community. An assessment based on the measurement of audiologic benefit in twenty or thirty children could hardly be authoritative, or conclusive.

In this application of our framework we have tried to show how neglect of the stakes in the controversy has led to a situation in which traditional HTA has proven insufficient. It is significant that in 1997 the Dutch Minister of Health decided, very unusually, against the assessment-based advice of the Health Insurance Council that would have provided reimbursement of pediatric implantation on a normal basis. The Dutch Minister's decision, which presumably took note of the resource implications, was taken after consultation with the deaf community and with the organization of parents of deaf children. In part concerned by growing waiting lists, clinicians then sought ways to circumvent this decision and lobbied actively. In late 1999, the Minister decided in favor of regular reimbursement. In the Netherlands, as elsewhere, formal assessment did not predicate an informed public policy. The Health Council, a leading HTA institution in the Netherlands, has been unable to meet this political timetable (as was intended).

Exploring the Gap between Rhetoric and Practice

Why have evaluators ignored the concerns of the deaf community in relation to cochlear implantation? Why, in general, should there be this gap between stated objectives and actual practice?[8] Is it ignorance on

8. Interestingly, in the Netherlands, where HTA has developed very rapidly over the past decade, a recent analysis shows many similarities with our own. A 1994 debate in the Dutch Parliament conveyed the sentiment that this contribution had been less than expected, given the volume and quality of work carried out. Not only was the work too fragmented and uncoordinated, but many important questions were ignored. The Rathenau Institute (a technology assessment office reporting to the Dutch Parliament) subsequently commissioned a study of the development, organization, and achievements of HTA in the Netherlands. Published in 1995, this study was directed by David Banta (Banta, Oortwijn, and Beckum 1995), previously of the U.S. Office of Technology Assessment and one of the "founding fathers" of HTA. In a subsequent document presented to the Parliament of the Netherlands, the institute itself reflected on that study and the perceived limitations of HTA as practiced at the time (van der Bruggen and Tils 1996). The Rathenau Institute points out that assessments have tended to be limited to the safety, effectiveness, and financial aspects of technologies and have largely ignored the social, ethical, legal, and cultural components. Assessments are too exclusively oriented to decision making around reimbursement of new procedures, while giving too little attention to earlier phases in the "life cycle" of a new technology. The importance of involving interested parties—both within the health care system but also, on occasion, outside it—is stressed.

the part of evaluators? Not really. Many of the problems we raise have been recognized by members of the HTA community. Clifford Goodman (1992: 351) argued that HTA practitioners have difficulty "debating and taking positions" on important issues and suggested, among other things, "adopting a higher advocacy profile." Leading practitioners also stressed that if HTA "is to be effective as a form of policy, it must have a relationship to [political] processes"(Banta and Andreasen 1990: 116). In addition, the international HTA community is aware of the growing "consumerism" that characterizes the modern society within which health care services are delivered. The winter 1998 issue of the *International Journal of Technology Assessment in Health Care*, devoted to consumer advocacy and the patient's perspective, reflects such interest. According to Hilda Bastian (1998), this phenomenon will grow in importance and could influence the future of HTA. Gianfranco Domenighetti, Roberto Grilli, and Alessandro Liberati (1998: 99) argued that "healthy skepticism" among consumers about the effectiveness of medical technologies would, in fact, facilitate the development of evidence-based medicine. Interestingly, this view assumes that the involvement of consumers will make them "more scientific," but it remains unclear as to whether HTA would introduce the patient's experiences and knowledge as another type of relevant evidence.

Could this gap between stated objectives and actual practice be due to a lack of skills and know-how? Like many health scientists, HTA practitioners seem to share a negative view of politics, which they see as subjective or irrational (Banta and Andreasen 1990; Goodman 1992). They are unfamiliar with the concepts needed to explain such issues and are not trained to integrate such concepts into their assessments (Morgall 1993). The early years of HTA were indeed marked by a strongly perceived need to establish the scientific legitimacy of the field (Battista et al. 1994). Because the randomized controlled trial (RCT) was (and still is) typically viewed as the most conclusive and scientific means of assessing the efficacy of drugs (and by extension, all types of health technologies), the RCT acquired a particular significance for HTA (Koch 1995; McKinlay 1981). Meta-analysis of published results of RCTs became the most popular method for HTA agencies to draw recommendations for policy makers. Economic analyses were then integrated, more or less satisfactorily, into RCTs (Coyle, Davies, and Drummond 1998). The scope of assessments, and their subsequent interpretation, is typically limited to the available clinical or epidemiological evidence and to the costs and benefits associated with a particular health technology once it has reached the stage of clinical application (Morgall 1993). Ellen B. Koch

(1995: 252) emphasized that the dominant perspective in HTA "presupposes that good quantitative clinical data indicating clinical efficacy and safety of a technology *must* precede any HTA of the social aspects of a technology." But in fact, these two perspectives (clinical versus social) are often seen as being in opposition. Reflecting on her experience with the Canadian Royal Commission on New Reproductive Technologies, Janet Hatcher Roberts (1999: 20) mentioned that "concepts such as 'weight of evidence,' relative effectiveness, and meta-analysis were considered suspect because some commissioners felt they were driven by medical models of evaluation." She explains that a polarization between the social and feminist perspective and the medical and economic analysis remained and became more pronounced as the commission completed its report. Thus, while evaluators are willing to debate the political tensions surrounding health technology on an informal basis, in formal discourse a significant distinction is sustained between the sociopolitical and the scientific, and quantifiable evidence is generally favored.

Social scientific research on the role of science in public policy may clarify why such a situation prevails. The information for decision making produced and made available by HTA incorporates and generally reflects the understanding of third-party payers, hospital administrators, and health care professionals. Unless public controversy emerges, this information will largely consist of epidemiological, clinical, and economic dimensions of new or existing medical technologies. That is to say, analyses disseminate data generated by the practices of clinical care and of health services finance and management. In cases where the public does not perceive any great risk (perhaps through lack of information) and where experts themselves perceive no significant risk to the public, the involvement of health care consumers in shaping the parameters of an assessment is rarely sought. Where consumer behavior departs from what experts believe has been proven, this is typically dismissed as irrationality or the result of media scaremongering. A good example of this is the response of experts to the reaction of many British, Japanese, and Swedish parents in the 1970s about worrying reports regarding the safety of the pertussis vaccine. The reports suggested that the whole-cell pertussis vaccine could cause neurological damage in a small percentage of children, and many parents responded by refusing to have their children vaccinated. The salient point here is that parental reaction was not treated as the possibly rational outcome of a different assessment of risks and benefits, but as the product of irrational behavior.

In fact, scientists acting as advisors within the policy process claim influence by virtue of their privileged access to scientific truths about the world (Jasanoff 1990). Their status depends on the status of the body of knowledge, and the method, which they claim to represent (Cozzens and Woodhouse 1995: 541). However, for this claim to be sustainable in the policy process, advisors—and the advisory process—must be seen to be "beyond politics." Similarly, the value of HTA professionals as advisors depends on the extent to which their work is accepted as objective, uncompromised, and "untainted" by political commitment. To the extent that they recognize this, and to the extent that their ultimate influence on the political process is regarded as a mark of professional achievement, we can expect experts to stress the apolitical or value-free nature of their work and to seek refuge behind "hard" evidence.[9] Could it be that the typical form of assessments, and the unwillingness to address potentially controversial, nonquantifiable issues, reflects an acute sense of the configuration of power within which HTA practitioners themselves must function?

The Comparison with Health Economics

Although HTA was conceived as a more ambitious undertaking, comparing it with the practice of health economics is instructive. Cost-benefit, cost-effectiveness, and other policy analytical techniques had been developed in other areas of public policy (notably water management and defense), and in the 1970s they began to be applied to health care provision. Economists argued that once cost-benefit techniques were widely understood and accepted, using these techniques could lead to important cost savings. They stressed that, because neither patient nor clinician had to foot the bill, the market forces were presumed to lead to rational adoption and use of technology in other sectors that were missing in the health care area. Though by the mid-1970s there had been few full-scale analyses, many authors had devoted themselves to explaining the techniques to health care practitioners. It was clear that there were technical problems in deciding which costs and benefits to include, in attaching money values

9. As suggested by Porter's (1995) recent work, objectification and quantification in public life may be viewed as the response of professions to loss of trust. Porter distinguishes his position from those who see quantification and objective measurement as the "natural" mode of operation of science-based professions. On the contrary, he argues, the introduction of manifestly objective standards or rules reflects a loss of political—or societal—confidence in the subjective judgment of professionals. The manifest deployment of impersonal and objective rules and procedures then enables a professional group to restore or "reground' confidence. From this perspective, the medical profession would have a vital interest in any analytic tool designed to provide "objective" evidence of the value of its practices.

to enhanced health care outcomes, and in establishing time horizons and discount rates (Klarman 1974). Nonetheless, technically adequate solutions could be found for technical problems, and as better data became available, more adequate alternatives would emerge.

A second category of problems, although recognized, proved more problematic. It had been pointed out long before that a participant's interest in an economic assessment—the costs and benefits of relevance to that participant—depended on their particular responsibilities (Wildavsky 1966). But the implications of this undeniable point were uncomfortable. Any one participant—whether physician, hospital, or third-party payer—may be interested in a study focusing on its specific out-of-pocket costs. But should the concern of the economic analyst not be with maximizing the societal utility of any health care technology or practice? Where, for example, should a cost that no health care provider bears (for example, lost earnings or productivity due to illhealth) be included? The uncomfortable implications of this perspectival paradox become clear as economists explain their methods.[10] Cost-effectiveness analysis often takes the societal point of view and is therefore

> directed at decision-makers who act as agents for society as a whole. Nevertheless, the basic analytic framework should be useful to a variety of decision-makers, who may include in the definition of cost and benefit whatever elements they perceive to be within their domain. . . . Moreover, as we as a nation move toward the creation of institutions that take on more of the societal perspective (e.g., national health insurance, health-systems agencies and health-maintenance organizations), the importance and value of cost-effectiveness analysis will increase even more. (Weinstein and Stason 1977)

In practice, the perspective of a specific decision maker is often adopted. For instance, the economic evaluation of the cochlear implant adopts the perspective of service providers. Its measures of costs are restricted to those born by the health and education services. Its measures of outcomes (quality of life) are less clear, except that they reflect the judgment of medical professionals. Costs accruing solely to families are ignored, and there is no place for possible dissension regarding the value of, for example, being able to use the telephone.

10. Another health economist was even more explicit regarding the tension between analysis and political reality: "While the economic tool of cost-benefit analysis implies a delineation of goals and an articulation of values, imperatives of the political process may call for a blurring of differences and potential conflicts, in order to facilitate the building of coalitions aimed at the accomplishment of particular ends" (Klarman 1974: 347).

In its early years, health economics had a far from easy passage in gaining acceptance (Ashmore, Mulkay, and Pinch 1989).[11] For the medical profession, economic analysis had to be presented as "no more than a technical aid that will help participants improve their economic performance without encroaching upon the medical or evaluative prerogatives" (ibid.: 25). Similarly, HTA could well have been viewed as a potential constraint on clinical autonomy.[12] Insofar as we perceive medical practitioners as principally oriented to doing their very best for their individual patients, it is not difficult to see the possibilities for conflict. Starting from a fundamental commitment to the effective use of limited health care resources, analytical tools (such as cost-effectiveness analysis or HTA) seem to challenge the fundamental ethos of commitment to the good of the individual patient.[13] In other words, the medical profession would seem to have a fundamental interest in the nature of the assessment process, and the constitution of what counts as "HTA knowledge." Two lines of argument may help us understand the potential outcomes. First, Ted Porter (1995) argued that quantitative techniques may be developed as a means of restoring trust in a profession. Second, according to Deborah Stone's (1997) analysis of the nature of policy making, it is interest politics that shape the framing of policy alternatives. Seen in this way, a rationalizing discourse like HTA is best conceived as a new (alternative or additional) language in terms of which interests are played out. Distinctive and potentially conflicting interests in the introduction of new technologies in health care would then be obliged to find ways of expressing their interests in the terms of the new language. The gap between the rhetoric and the practice of HTA is thereby understood as a response by HTA professionals to the complex political environment in which they work. Could it be otherwise?

11. For a detailed sociological account of the rise of health economics in British health care policy and politics, see Ashmore, Mulkay, and Pinch (1989: 8).

12. The field always faced a stronger resistance from the medical equipment industry and from physicians' associations. The National Center for Health Care Technology (NCHCT) was created in 1978 by the U.S. Congress and "disappeared in 1981, the victim of opposition of the medical device industry and organized medicine, combined with the Reagan Administration's budget cuts" (Banta and Perry 1997: 434). The OTA was itself closed down in 1995 under similar pressures.

13. Harvard pediatrician David Nathan, in his account of his thirty-year involvement with a thalassemia patient, is unusually explicit on this score: "My patients' hopes, and not the 'sensible' use of the medical commons, have to be my fundamental goals. If my opinion runs counter to the views of advocates of cost control and resource utilization, I cannot help it. As long as I have a scientifically supportable reason to offer encouragement to a child, I must put that child's needs ahead of any broader consideration" (Nathan 1995: 248).

Taking the Sociopolitics of Health Technologies into Account

We have argued that HTA should be held to its programmatic claims: that the political nature of health technologies and the range of their implications should be examined. The feasibility of our argument clearly depends on two significant questions: Is such an analysis methodologically feasible? Is the position of the analyst then a tenable one? In the last section of our essay, the analytical framework introduced earlier is used to show how such an analysis might be structured in the case of telemonitoring of the elderly. This example was chosen for two reasons. First, we believe that a sociopolitical analysis—even in a preliminary form—could positively influence the career of an emerging technology (and perhaps of its alternatives). Second, telemonitoring promoters, like the proponents of information technology more generally, tend to underestimate the significance of the social dimensions of their "solution" and overestimate its desirability.

Thinking Differently about HTA: Telemonitoring and the Elderly

A shift from an emphasis on hospital care to ambulatory care is currently taking place in many industrialized countries (CETS 1996; Rettig 1994). Several technologies will attract the attention[14] of evaluators and policy makers as their use at home (i.e., in a less controllable environment) increases (Norman et al. 1995). One example is the use of communications technologies to support the provision of health care at a distance—*telehealth* (Celler et al. 1995; Lindberg 1997; Puskin 1995; Watzke 1997). A variety of telehealth applications are blooming, actively promoted by academics from the prestigious fields of military and space medicine and by private firms in the telecommunications sector. Home telemonitoring has been the subject of a large number of papers and several HTA reports that together yield largely positive conclusions (CETS 1998).

14. The ambulatory interventions which have been implemented in North America are substitutes for acute care delivered in in-patient settings, services fostering reduced lengths-of-stay in hospital, and procedures required for home care of chronic patients (CETS 1996). Technologies used in ambulatory care include antibiotic IV therapy, endoscopic surgeries, oxygen therapy, cancer therapy, monitoring systems (blood pressure, EKG), and renal dialysis.

The use of these technologies is not easy to regulate and could become a greater concern for evaluators. The Safe Medical Devices Act (SMDA), passed by the U.S. Congress in 1996, mandates that serious illness, injury, or death related to the use of medical devices be reported to the FDA. This regulatory mechanism will require that manufacturers remove defective devices from the market. However, the SMDA is not linked to other issues that matter to patients, such as quality, user-friendliness, and maintenance of the equipment.

After a six-month experiment involving thirty-eight patients in Kansas, Christopher Lindberg (1997: 17) concluded that "many successful patient 'profiles' have shown marked improvements in specific situations," even though, as he remarked in his discussion, "the telemedicine nursing staff has experienced some alienation and isolation due to the nature of the telemedicine job." In their study of patients' perceptions of home telenursing, based on telephone interviews with small numbers of participants, Pamela Whitten, Frances Mair, and Bart Collins (1997: 69) concluded that "contrary to expectations, the 'technology' was not an important issue for these elderly patients. They did not express particular worry or excitement about this aspect of the program. Nor did they describe difficulties in adapting to its use. Use of telemedicine did not appear to have negative effects on communication. Patients did not perceive a difference between talking to the nurse in person as opposed to talking to her over a videolink.

We contend that the use of these types of results in policy making is problematic. Information technologies are not as simple as they appear; they rely on complex (and invisible) data management procedures (capture, transmission, duplication, archiving, etc.), they create opportunities for surveillance practices, and they often impose a tacit standardization of communications (Lehoux, Sicotte, and Denis 1999). Applying the previously proposed scheme leads to the following preliminary analysis.

Actors. Videoconferencing can be used in patients' homes (through standard TV and phone lines), whether for providing support and advice or for monitoring their health status (physical status, medication intake, ECG, blood pressure). The value and relevance attached to the technology differs for patients, natural caregivers, providers, health administrators, manufacturers, and third-party payers. For the moment, physicians are not enthusiastic adopters. It is thus possible to imagine that administrative, professional, or commercial interests could be pursued, depending on who will foster remote home care programs in the near future. For health administrators, telemonitoring at home could contribute to streamlining the nursing staff and to a tighter control over the time nurses spend with patients. For nurses, other health care providers, and medical specialists, it could be a means to provide more services by concentrating their clinical activities in one place and thereby reducing the time "lost" traveling from place to place. Manufacturer promotion of a shift to home care is potentially important. Biomedical equipment manufacturers tend to reinforce an individual approach to health and foster devices that create market opportunities—in this case, in an aging pop-

ulation. Thus, in the case of home telemonitoring, this new technology could be used not so much to address critical community health needs but to provide more (and not necessarily essential) services to selected patients (CETS 1998).

Flow of Resources. Telehealth has been promoted and developed through a mix of private and public funds from health, industrial, and telecommunication sectors. In Canada, many initiatives have been supported by both the federal and provincial governments. Telehealth is seen as a positive example of private-public partnerships that improve health care and engender concrete commercial successes as well. Most remote monitoring programs are actually implemented on an experimental basis. The lack of a formal mechanism of reimbursement for physicians (in most countries, except for teleradiology in some American states) has been identified as a major impediment to a wider dissemination of telehealth programs. It remains difficult, however, to anticipate in which ways home telemonitoring could alter the actual flow of resources in the health care system. In a public health system such as in Canada, health planners will wonder whether a telemonitoring program should be aimed only at targeted groups (frail elderly persons with loss of autonomy) or offered to the whole population aged over sixty-five. In other systems, questions will be raised about the regulation (content, liabilities, prices, etc.) of private telemonitoring programs to be offered to insured members. Finally, a cost-shifting effect—from public to private costs—is often associated with an increased use of home care instead of hospital care. Over the long run, this might be also the case for remote monitoring since patients could have to pay for the durables and other equipment used at home as well as the costs of communication.

Knowledge. How and by whom are the conditions for desirable telemonitoring use being established? For whom? On the basis of what information? Developers and engineers of telehealth applications have been keen to offer specialized systems to the public (CETS 1998). Their definitions of what should be monitored at a distance and how it should be done will have a direct impact on the quality of life of elderly persons and on the clinical relevance of collected data. For instance, different sorts of sensors installed in the home to detect the switching on/off of lights, the use of electrical appliances, or the presence and mobility of individuals across different rooms have been proposed for improving the "detection and management of the health problems associated with aging" (Celler et al. 1995). Does telemonitoring, as a technological device, embody an idealized, focused concept of what it means to grow old, and to experience the loss of physical capacities?

To develop a specific niche in this new market, some manufacturers might be willing to develop user-friendly communications systems. However, the responsibilities of manufacturers regarding the safety and maintenance of equipment for remote home monitoring (alarm system, reliability of data transmission, confidentiality) will have to be clarified. The manipulation of medical equipment can cause stress to patients and disturb family routines (Brown and Mulley 1997). The videoconferencing system can be an invasive technology if its main purpose is to verify patients' compliance with treatment, especially when the insurance coverage stipulates such compliance. Does remote home care offer an adequate solution from the elderly person's view? While positive health outcomes certainly can (and will) be measured, we fear that a variety of other potential outcomes—such as enhanced feelings of anxiety, loneliness, or dependence—will not be. Do nurses feel alienated standing in front of a TV screen all day (Lindberg 1997)? Is trying to "be close at distance" really a solution for elderly persons? Videoconferencing might not prove such an easy substitute for the need for personal contact.

Power. Telemonitoring has yet to be stabilized. Its properties as an information technology to *monitor* a person's health suggest that it might not only alter the usual patterns of communication (face-to-face encounters, phone calls, group or peer support), but that it might take the form of a *program* including both clinical and behavioral components. How telemonitoring will affect power relations will depend on how precisely it is used. It seems clear that the user will have to deal with a new intermediary, the "provider at distance," and also accept himself or herself as a subject of monitoring. The technology might give the impression that somebody is there to care (and control), although without necessarily offering the possibility of two-way communication. The elderly person becomes aware that his or her behavior and responses are being scrutinized without having much influence over this surveillance process. Nor is it likely that the patient will be able to decide when he or she wants to talk with a physician or nurse over the video system: an appointment is fixed. Power relations might also change through the "packaging" of services into comprehensive programs. Patients might not be allowed to select from these electronic packages (electronic nursing visit, verification of drug compliance, monitoring of nonhealth-related behavior). Who will make the deci-

sion to provide or receive remote home care instead of the nursing visit? As is often the case with health technologies, the ultimate responsibility is said to lie with the patients themselves (or their parents), without admitting the forces that in fact constrain their freedom of choice.

In what ways might remote home care benefit (empower) patients? The patients and their family members might get a better sense of control on the management of a chronic condition, and on the use of the videoconferencing and medical equipment (Charles and DeMaio 1993). A few studies reported that elderly patients participating in experimental telemonitoring programs were very satisfied with the technology, dressing up and grooming themselves before the electronic appointment, and looking forward to this "event of the day" (Lindberg 1997; Whitten, Mair, and Collins 1997). However, one may suspect that the initial enthusiasm will be succeeded by a "normalized" use of the technology in which the binding, narrow exchange it offers will appear more stringent. A videotaped teleconsultation contains private information about the patient and, because of its material properties, is reproducible. How will confidentiality be maintained? Thus promoting the use of telemonitoring at home hinges on reliable mechanisms of negotiation and accountability.

Broadening the Types of Evidence, Revising the Assessment Process

This telemonitoring example suggests that one could rethink the types of evidence and conceptual frameworks that structure typical assessments and the connections established with consumer groups, manufacturing industry, and other social organizations. Our proposition is that HTA should be informed by perspectives that discern what is at stake when a technology is developed and promoted by engineers and manufacturers, used by health care providers, introduced into patients' lives, paid for by third-party payers, and preferred over other forms of interventions. This entails (1) an effective broadening of the disciplinary perspectives upon which HTA is relying, (2) the renewal of the research methods that are used, (3) the redesigning of the organizational structures in which HTA is produced, and not least of all, (4) a fundamental reconsidering of the nature of technology, which remains HTA's main object of inquiry (see Table 1). These changes can be characterized as follows.

First, several scholars with disciplinary backgrounds in sociology, political science, or anthropology have amassed significant knowledge that has not been sufficiently exploited by HTA practitioners. Evaluators

Table 1 Integrating Sociopolitical Dimensions in HTA

Proposed Changes and Their Goals	How Such Changes Could Be Implemented
1. Broaden perspectives *Goal:* Build a better understanding of the implications of health technology in society in order to tackle the issues that matter from a public policy point of view.	▪ Develop joint studies with anthropologists, sociologists, and political analysts of technology and health. ▪ Integrate social scientific research findings by learning how to refer to the relevant literature and hiring social scientists in HTA agencies (see no. 3 below). ▪ Make explicit political, ethical, and social issues embedded in technology (actors, flow of resources, knowledge, and power). ▪ Identify and contact groups affected by a given technology who have not been heard.
2. Expand methods *Goal:* Produce assessments that are informed by the multiple "rationalities" and values that prevail in a given society.	▪ Integrate qualitative research methods in assessments. ▪ Document in a more subtle way patients' and communities' experiences of technology. ▪ Develop health indicators and/or educational material with patients in order to better reflect what matters for them. ▪ Articulate different views (patients', experts') in order to identify potential contradictions, interests, and conflicts.

Table 1 Integrating Sociopolitical Dimensions in HTA (continued)

Proposed Changes and Their Goals	How Such Changes Could Be Implemented
3. Redesign HTA structures *Goal*: Create an organizational structure in which HTA may establish legitimate and productive relationships with social organizations and industry, and may trigger concrete actions.	▪ Establish in-house multidisciplinary teams of evaluators. ▪ Establish advisory committees with social organizations and industry representatives in order to circulate information and debate about technology. ▪ Enable patients' involvement in HTA design or in technology implementation and follow-up. ▪ Stimulate and informing public debate by organizing seminars and public forums (on methods and content of HTA).
4. Reconsider the object of inquiry *Goal*: Comprehensively capture the sociopolitical issues relative to the stages of development, diffusion, and in situ use of technology.	▪ Identify technological and/or social alternatives. ▪ Describe the sociopolitical configuration of a given technology. ▪ Conduct broader economic analyses (market structure, profitability, flow of resources).

could learn basic social science concepts, seek collaborations with social scientists, and refer more frequently to relevant social science literature. The four sets of issues we identified in the second part of this article (actors, knowledge, flow of resources, and power) represent a starting point when examining social science notions. In addition, by developing joint studies with sociologists, anthropologists, and political scientists, old assumptions built into HTA would be reexamined and new questions raised. What is known and what is yet unknown? By whom? Who has not been heard? How can they be helped to articulate their preferences? As stressed earlier, some groups may hardly be able to take a clear stand. Evaluators could assist diverse groups of lay persons in organizing available information, questioning evidence and knowledge claims sustained by experts, and formulating their own views.[15] This does not entail the "corruption" of HTA rational evidence with subjective anecdotes or politically persuasive opinions, but rather the acknowledgement, as comprehensive as possible, of the diverse belief systems that shape health decisions and policies in society. Evaluators should try to anticipate possible tensions and develop studies that assume and make explicit multiple definitions of the value of a technology, even when these are as yet unarticulated. As indicated above, telemonitoring cannot be reduced to its effects on well-established health status measures but should be understood in a much broader framework that would render explicit other definitions of the needs of the elderly.

Second, according to the perspective proposed here, the evaluator will have to draw on the different methods developed in the social sciences and other disciplines for building the articulation of potentially competing interests and perspectives into the analysis of a medical technology. This includes the experiences and concerns of less powerful actors. For instance, early results from pilot projects on telemonitoring showed that participants' satisfaction was high. Given that participants were volunteers for the remote monitoring project, this is hardly surprising. An in-depth qualitative study, including the views of elderly persons who refused to participate in the telemonitoring project (or dropped out), might have led to more nuanced conclusions (e.g., possible feelings of anxiety or dependence that might emerge in the long term). Qualitative methods—whether case studies, ethnographic, life history analysis, or action research—will make very different demands on the evaluator's

15. Such collaborative activity should go beyond existing consensus conferences; its main outcome would not be a consensual expert-led report but a critically informed position paper endorsed by a lay group.

skills and entail new forms of collaboration (with researchers from other disciplines, health care providers, patients, etc.). The use of these methods may also require a brief incursion into epistemology, as the criteria by which their rigor can be ascertained are often of a different nature than the criteria at the root of the quantitative research tradition. Even an abridged epistemological inquiry should help critically (re)define what counts as "evidence." Overall, multidisciplinary collaborations and the development of versatile methodological skills are likely to strengthen evaluators' ability and confidence in addressing sociopolitical issues in relation to a more typical evidence-based approach.

Third, there is a need to redesign structural connections between HTA agencies and other social organizations. Until very recently, evaluators preferred to avoid regular discussion with patients' associations, as well as with other social groups in an explicit advocacy or lobbying role. Very few contacts of more than an ad hoc and sporadic nature have been established with the pharmaceutical or medical devices industries.[16] However, legitimate, transparent, and well-defined links could be established. Diverse advisory or consultative committees, comprising a set of representatives (patients' and parents' organizations, lay individuals, industry), could share their perspectives to help evaluators tackle the issues. These committees should neither exert a direct influence on the content of an assessment nor on its conclusion. Their role would be, essentially, to share information, debate about specific technologies with evaluators, and react to assessments. As chronic patients might be better organized compared with those suffering acute ill health, their organizations are more prone to actively seek to contribute to the design of assessments (Bastian 1998). Hence the selection of members to an advisory committee should include representation beyond the boundaries of these well-organized groups whose members are more articulated and, by definition, possess different characteristics than the broader population. By fostering negotiations between stakeholders before carrying out an evaluation, HTA practitioners may help create the conditions necessary for a productive exchange of views right from the outset. This proactive strategy might avoid the well-known locked-in political situation in which strongly polarized and entrenched positions of stakeholders impede any fruitful negotiation. Finally, as most HTA agencies were not explicitly mandated to trigger

16. In his analysis of HTA in Britain, Faulkner (1997:199) draws attention to the absence of the "voice of commercial exploitation" from the "formal discourse and practices of national HTA."

concrete activities in their jurisdiction, such as organizing public forums or establishing follow-up committees, one needs to reassess the resources they may need to expand their repertoire of dissemination activities accordingly.

Fourth, evaluators could examine the nature of a given technology by paying attention to the different "stages" that shape its career, from development to dissemination and use. As sociopolitical dimensions inform and may reinforce design choices negotiated by the engineers, promoters, and potential users involved in the development of a new technology, HTA could question the rationale behind an innovation. Both social and technological alternatives to a specific technology may be described and discussed in an HTA report as well. The objective would be to highlight perceptions of emerging technologies (and of relevant alternatives) that provoke early debate, and thereby to lay the ground for a consensual policy in which potentially competing interests have been articulated at an early stage. Evaluators may seek to establish the sociopolitical configuration of actors concerned by a technology, as well as the incentives at play. This means that they would describe and document the links and relationships of authority between planners, decision makers, physicians, hospital managers, third-party payers, patients, and manufacturers specific to each technology (Lehoux, Battista, and Lance 2000). One manufacturer may hold a position of monopoly in the market, which may invoke governmental regulation. Conversely, many manufacturers may be competing in a fragmented market, and there may be reasons to develop industry standards. For "big ticket" technologies such as CT or MRI scanners, hospitals (in public health systems) may be able to exercise a strong countervailing power. Similar effects are observable in the case of vaccines purchased and provided through public sector programs (Mowery and Mitchell 1995). End users (patients, consumers) may be well organized and vocal, or they may be unorganized and silent. Since the role of assessments is also one of triggering and feeding the public debate, HTA practitioners should be sensitive to sociopolitical variations, design their data collection plan accordingly, and render these differential positions transparent in their reports.

Finally, the expansion of economic analyses is crucial. Despite attention to cost-effectiveness analyses, HTA does not take the most determinant economic issues (i.e., systemic flow of resources: from public financing of industrial research and development to corporate profits) into consideration (Lehoux 1997). To exclude the biomedical devices indus-

try's interests in, and impact on, the shaping of specific health services appears rather foolhardy.[17] In summary, we believe that a better understanding of the sociopolitical dimensions will help discover new ways of settling the problems raised by the dissemination and use of a given technology. More sophisticated (and perhaps complex) solutions—going beyond binary decisions such as buying or not buying, using or not using—will surface. These solutions will require the active participation of several actors concerned by technology, but who are not actually part of the authorized decision makers' circles.

Of course, one may wonder, Is our alternative of bringing practice into line with rhetoric politically naïve? Given national differences in political cultures (reflected in decision making, in the role of national governments in health care finance and provision, and in the organization of HTA), the search for a universal approach to the assessment of health care technologies is unrealistic. Established views regarding the roles of institutionalized advisory bodies typically place important constraints on the conduct of assessments (Elzinga and Jamison 1995). Like other "regulatory sciences," HTA has sought, on the one hand, credibility and influence in the policy-making process, and academic respectability on the other hand. The two are not wholly independent of one another. Scholarly standing and objectivity may be an asset in the search for political influence, and access to policy makers can be deployed in securing academic institutionalization. In both health care administration and in academic practices related to health, the medical profession is powerful, and this has led to the dominant role in assessments by clinical perspectives and data generated by clinical practice. Thus the attempt to appear "beyond politics" is comprehensible, given the political structures within which HTA has emerged. Nevertheless, we would argue that our alternative is not naive in that it reflects a better appreciation of current changes in the configurations through which health policies are now made. Neither health professionals alone, nor health professionals in uneasy partnership with government, now make health policy. A variety of distinctive industries, consumers with growing access to research findings through the Internet, and new groups of health providers are in effect shaping health policy. And complexity continues to grow. Naïveté, perhaps, lies in continuing to ignore this fact. According to our proposition, the products of HTA could contribute more fully to decision and policy making. By laying out the wider context in which a decision is going to be taken and by articulating the concrete implications for diverse groups, we believe that HTA would represent a legitimate and relevant source of information to a broader set of individuals.

17. We can illustrate our meaning by returning once more to the example of cochlear implantation. In the last three or four years, increasing attention has been paid to cost-benefit and cost-effectiveness analysis. Manufacturers have played an important role in commissioning such studies and in educating clinicians on the importance of demonstrating the value of the intervention in economic as well as clinical/audiological terms. A study might compare, for example, the costs of testing, device, surgery, and three years rehabilitation with the savings generated by moving an implanted child from relatively expensive special education to cheaper mainstream education (tallied over the number of years the child spends at school). Of course the difference can be multiplied by the number of children deemed eligible for implantation, and the total possible savings estimated. Questions can be raised as to the desirability of mainstreaming the implanted child, but the point we wish to make here is the more familiar one of *cui bono?* At what level are gains and losses set against one another? No deep reflection is required to see that in most systems of social service provision, these gains and losses accrue to different agencies. Health insurers pay the direct costs, and educational authorities reap the direct benefits. The manufacturer of the implant, which costs about $20,000 per device, also reaps a substantial benefit. More sophisticated analysis would be required to estimate the costs and benefits to the individual consumer or family. The point we are trying to make is that a procedure such as this entails a complex shift in the flow of resources, which are rarely (if ever) taken into account, but which are likely to weigh heavily in the politics of decision making.

Conclusion

This essay is concerned with the content around which HTA has been centered since the late 1970s. Costs and effectiveness of health technologies are extremely important dimensions to consider in public policy, but they are far from sufficient. Because health technologies embody a variety of social and political implications for individuals and society, technologies cannot be considered only through the narrow lens of cost-effectiveness (some more or less effective or affordable). Evaluators can hardly ignore the growing claims made by and on behalf of consumer groups, and public policies need to be informed by the multiple values that prevail in a given society.

Even if HTA practitioners tend to attribute what they perceive as a lack of influence to inadequate dissemination of their analyses, we have tried to show that rather more is involved. Claims that HTA knowledge is authoritative are subverted by the potentially competing interests embedded in the technology analyzed. Sheila Jasanoff (1990: 250) made a similar point when she pointed out the "futility of calling on science to cut short a policy controversy before the groundwork has been laid for accord among disparate social and political values." For this reason we have tried to explain that making explicit the sociopolitical nature of health care technologies will increase the ability of HTA to address more fully the issues that matter from a public policy point of view. We have proposed four

potential changes. First, HTA requires a truly multidisciplinary approach. Second, both the content and process of assessments could be substantially enhanced by the introduction of qualitative methods. Third, HTA organizational structures could be redesigned in order to enable regular dialogue between evaluators and groups of actors concerned with health technology. Fourth, the ways in which the nature of technology is inherently political need to be recognized by evaluators. Our proposition needs to be examined in light of a social democratic tradition, where public representation and accountability mechanisms, as well as the right to debate and dissent are sought and instituted (of course, with some limitations). If scientific rationality has created its own set of criteria by which to judge its rigor and value, we believe that life in the polis also involves a valuable set of standards that could be applied to the field of HTA. In Stone's (1997) terms, we are simply proposing a new and more complex type of story in, through, and around which political process will continue. Such stories, we believe, are a form of analytic rationality better fitted to the fragmented political culture of the new century.

References

Abraham, J. 1993. Scientific Standards and Institutional Interests: Carcinogenic Risk Assessment of Benoxaprofen in the U.K. and U.S. *Social Studies of Science* 23:387–444.

Agence Nationale pour le Développement de l'Evaluation Médicale (ANDEM). 1994. *L'implant cochléaire chez l'enfant sourd pré-lingual*. Paris: ANDEM.

Akrich, M. 1995. User Representations: Practices, Methods, and Sociology. In *Managing Technology in Society*, ed. A. Rip, J. Misa, and J. Schot. London: Pinter.

Ashmore, M., M. Mulkay, and T. Pinch. 1989. *Health and Efficiency: A Sociology of Health Economics*. Buckingham, U.K.: Open University Press.

Banta, H. D., and P. B. Andreasen. 1990. The Political Dimension in Health Care Technology Assessment Programs. *International Journal of Technology Assessment in Health Care* 6:115–123.

Banta, H. D., and S. Perry. 1997. A History of ISTAHC: A Personal Perspective on Its First Ten Years. *International Journal of Technology Assessment in Health Care* 13:430–453.

Banta, H. D., W. J. Oortwijn, and W. T. van Beekum. 1995. The Organization of Health Care Technology Assessment in the Netherlands. The Hague: Rathenau Institute.

Bastian, H. 1998. Speaking up for Ourselves: The Evolution of Consumer Advocacy in Health Care. *International Journal of Technology Assessment in Health Care* 14:3–23.

Battista, R. N., H. D. Banta, E. Jonsson, M. Hodges, and H. Gelbland. 1994. Lessons from Eight Countries. *Health Policy* 30:397–421.

Béjean, S., and M. Gadreau. 1992. Nouvelles approches théoriques des organisations publiques: Leurs implications pour la politique hospitalière. *Politiques et management public* 10:1–30.

Blume, S. S. 1992. *Insight and Industry: On the Dynamics of Technological Change in Medicine*. Cambridge: MIT Press.

———. 1995. Cochlear Implantation: Establishing Clinical Feasibility, 1957–1982. In *Sources of Medical Technology: Medical Innovation at the Crossroads*, ed. N. Rosenberg, A. Gelijns, and M. Dawkins. Washington, DC: National Academy Press.

———. 1997. The Rhetoric and Counter-Rhetoric of a "Bionic Technology." *Science Technology and Human Values* 22:31–56.

———. 1998. Early Warning in the Light of Theories of Technological Change. *International Journal of Technology Assessment in Health Care* 14:613–623.

Blume, S. S., and I. Geesink. 2000. Vaccinology: An Industrial Science? *Science as Culture* 9:41–72.

Bourdieu, P. 1984. *Homo academicus*. Paris: Editions de Minuit.

Brown, A. R., and G. P. Mulley. 1997. Do It Yourself: Home-Made Aids for Disabled People. *Disability and Rehabilitation* 19:35–37.

Carter, R., and D. Hailey. 1999. Economic Evaluation of the Cochlear Implant. *International Journal of Technology Assessment in Health Care* 15:520–530.

Celler, B. G., N. H. Lovell, T. Hesketh, E. D. Ilsar, W. Earnshaw, and L. Betbder-Matiber. 1995. Remote Home Monitoring of Health Status of the Elderly. In *Proceedings of MEDINFO 95*, ed. R. A. Greenes, H. E. Peterson, and D. J. Protti. Edmonton, Alberta: Healthcare Information Management and Communications Canada.

Charles, C., and S. DeMaio. 1993. Lay Participation in Health Care Decision Making: A Conceptual Framework. *Journal of Health Politics, Policy and Law* 18:881–904.

Conseil d'Evaluation des Technologies de la Santé du Québec (CETS). 1996. *Exploration et détermination des priorités d'évaluation dans les services ambulatoires*. Montreal: CETS.

———. 1997. *The Cochlear Implant in Adults, Adolescents, and Children*. Montreal: CETS.

———. 1998. *La télémedecine et la télésante au Québec. Etat de la question*. Report prepared by P. Lehoux. Montreal: CETS. English version available.

Coyle, D., L. Davies, and M. F. Drummond. 1998. Trials and Tribulations: Emerging Issues in Designing Economic Evaluations alongside Clinical Trials. *International Journal of Technology Assessment in Health Care* 14:135–144.

Cozzens, S. E., and E. J. Woodhouse. 1995. Science, Governments, and the Politics of Knowledge. In *Handbook of Science and Technology Studies*, ed. S. Jasanoff, G. E. Markle, J. C. Petersen, and T. Pinch. Thousand Oaks, CA: Sage.

Creditor, M. C., and J. B. Garrett. 1977. The Information Base for Diffusion of Technology: Computed Tomography Scanning. *New England Journal of Medicine* 297:49–53.

Dahl, R. A. 1989. *Democracy and Its Critics*. New Haven, CT: Yale University Press.
Domenigehtti, G., R. Grilli, and A. Liberati. 1998. Promoting Consumers' Demand for Evidence-Based Medicine. *International Journal of Technology Assessment in Health Care* 14:97–105.
Elzinga, A., and A. Jamison. 1995. Changing Policy Agendas in Science and Technology. In *Handbook of Science and Technology Studies*, ed. S. Jasanoff, G. E. Markle, J. C. Petersen, and T. Pinch. Thousand Oaks, CA: Sage.
Epstein, S. 1996. *Impure Science*. Berkeley: University of California Press.
Faulkner, A. 1997. "Strange Bedfellows" in the Laboratory of the NHS? An Analysis of the New Science of Health Technology Assessment in the United Kingdom. In *The Sociology of Medical Science and Technology*, ed. M. A. Elston. Oxford: Blackwell.
Fox, R. C. 1996. The Institute of Medicine's Workshop and Report on Xenotransplantation: A Participant Observer's Account. *Making the Rounds in Health, Faith, and Ethics* 2:8–15.
Garber, A. M. 1994. Can Technology Assessment Control Health Spending? *Health Affairs* 13:115–126.
Giacomini, M. K. 1999. The *Which*-Hunt: Assembling Health Technologies for Assessment and Rationing. *Journal of Health Politics, Policy and Law* 24:715–758.
Goodman, C. 1992. It's Time to Rethink Health Care Technology Assessment. *International Journal of Technology Assessment in Health Care* 8:335–358.
Guston, D. H. 1999. Stabilizing the Boundary between U.S. Politics and Science. *Social Studies of Science* 29:87–112.
Heller, M. A., and R. S. Eisenberg. 1998. Can Patents Deter Innovation? The Anticommons in Biomedical Research. *Science* 280:698–701.
Hutton, J., C. Politi, and T. Seeger. 1995. Cost Effectiveness of Cochlear Implants of Children. In *Advances in Otorhinolaryngology*, ed. A. S. Uziel and M. Mondain. Basel, Switzerland: Karger.
International Network of Agencies for Health Technology Assessment (INAHTA). 1997. *INAHTA Newsletter*. Stockholm: INAHTA.
Jasanoff, S. 1990. *The Fifth Branch: Science Advisers as Policymakers*. Cambridge: Harvard University Press.
Klarman, H. E. 1974. Application of Cost-Benefit Analysis to the Health Services and the Special Case of Technologic Innovation. *International Journal of Health Services* 4:325–352.
Koch, E. B. 1995. Why the Development Process Should Be Part of Medical Technology Assessment: Examples from the Development of Medical Ultrasound. In *Managing Technology in Society: The Approach of Constructive Technology Assessment*, ed. A. Rip, T. J. Misa, and J. Schot. London: Pinter.
Lane, H. 1992. *The Mask of Benevolence*. New York: Knopf.
Lehoux, P. 1997. Conceptions de l'évaluation des technologies de la santé. *Politiques et management public* 15:1–42.
Lehoux, P., C. Sicotte, and J.-L. Denis. 1999. Assessment of a Computerized Medical Record System: Disclosing Its Scripts of Use. *Evaluation and Program Planning* 22:439–453.

Lehoux, P., R. N. Battista, J.-M. Lance. 2000. Monitoring Health Technology Assessment Agencies. *Canadian Journal of Program Evaluation* 15(2).
Lindberg, C. C. S. 1997. Implementation of In-Home Telemedicine in Rural Kansas: Answering an Elderly Patient's Needs. *Journal of the American Medical Informatics Association* 4:14–17.
Lomas, J. 1991. Words without Action? The Production, Dissemination, and Impact of Consensus Recommendations. *Annual Review of Public Health* 12:41–65.
McKinlay, J. B. 1981. From Promising Report to Standard Procedure: Seven Stages in the Career of a Medical Innovation. In *Technology and the Future of Health Care*, ed. J. B. McKinlay. Cambridge: MIT Press.
Morgall, J. M. 1993. *Technology Assessment: A Feminist Perspective*. Philadelphia: Temple University Press.
Mowery, D. C., and V. Mitchell. 1995. Improving the Reliability of the U.S. Vaccine Supply: An Evaluation of Alternatives. *Journal of Health Politics, Policy and Law* 20:973–1004.
Nathan, D. G. 1995. *Genes, Blood, and Courage*. Cambridge: Harvard University Press.
National Association of the Deaf (NAD). 1991. *Cochlear Implants in Children: A Position Paper*. Silver Spring, MD: NAD.
Nelkin, D., and L. Tancredi. 1989. *Dangerous Diagnostics: The Social Power of Biological Information*. New York: Basic Books.
Norman, L. E., P. A. Hardin, E. Lester, S. Stinton, and E. C. Vincent. 1995. Computer-Assisted Quality Improvement in Ambulatory Care Setting: A Follow-up Report. *Journal on Quality Improvement* 21:116–131.
Porter, T. M. 1995. *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life*. Princeton, NJ: Princeton University Press.
Puskin, D. S. 1995. Opportunities and Challenges to Telemedicine in Rural America. *Journal of Medical Systems* 19:59–67.
Reese, W. L. 1980. *Dictionary of Philosophy and Religion: Eastern and Western Thought*. Atlantic Highlands, NJ: Humanities.
Rettig, R. 1994. Medical Innovations Duels Cost Containment. *Health Affairs* 13:7–27.
Roberts, J. H. 1999. Coalition Building and Public Opinion: New Reproductive Technologies and Canadian Civil Society. *International Journal of Technology Assessment in Health Care* 15:15–21.
Rothman, D. J. 1997. *Beginnings Count: The Technological Imperative in American Health Care*. New York: Oxford University Press.
Stone, D. 1997. *The Policy Paradox*. New York: W. W. Norton.
Summerfield, A. Q., and D. H. Marshall. 1995. *Cochlear Implantation in the U.K., 1990–1994*. Nottingham: MRC Institute of Hearing Research.
U.S. Congress Office of Technology Assessment (OTA). 1976. *Development of Medical Technology: Opportunities for Assessment*. Washington, DC: U.S. Government Printing Office.
———. 1978. *Assessing the Efficacy and Safety of Medical Technologies*. Washington, DC: U.S. Government Printing Office.
U. S. Food and Drug Administration (FDA). 1990. *Approval of 22 Channel Cochlear Implant for Use in Children*. Washington, DC: U.S. Food and Drug Administration.

der Bruggen, K., and C. Tils. 1996. *Doelmatigheid van zorg: Hoe kan MTA eraan ijdragen?* The Hague: Rathenau Institute.
Kammen, J. 1999. Representing Users' Bodies: The Gendered Development of nti-Fertility Vaccines. *Science Technology and Human Values* 24:307–337.
ent, A. 1992. *Modern Political Ideologies*. Oxford: Blackwell.
ke, J. R. 1997. Older Adults' Responses to an Automated Integrated Environental Control Device: The Case of the Remote Gateway. *Technology and Disility* 7:103–114.
stein, M. C., and W. B. Stason. 1977. Foundations of Cost-Effectiveness Analysis r Health and Medical Practices. *New England Journal of Medicine* 296:716–721.
ten, P., F. Mair, and B. Collins. 1997. Home Telenursing in Kansas: Patients' Perptions of Uses and Benefits. *Journal of Telemedicine and Telecare* 3(supp. 1):67–).
avsky, A. 1966. The Political Economy of Efficiency: Cost-Benefit Analysis and ogram Budgeting. *Public Administration Review* 26:292–310.
s, E. 1997. The Prostatic Imperative and the Social Relations of Medical Technolgy. *International Journal of Technology Assessment in Health Care* 13:602–612.
ner, L. 1980. Do Artifacts Have Politics? *Daedalus* 109: 121–135.

State Legislative Staff Influence in Health Policy Making

Carol S. Weissert
Michigan State University

William G. Weissert
University of Michigan

Abstract State legislative staff may influence health policy by gathering intelligence, setting the agenda, and shaping the legislative proposals. But they may also be stymied in their roles by such institutional constraints as hiring practices and by turnover in committee leadership in the legislature. The intervening variable of trust between legislators and their support staff is also key to understanding influence and helps explain how staff-legislator relationships play an important role in designing state health policy. This study of legislative fiscal and health policy committee staff uses data from interviews with key actors in five states to model the factors important in explaining variation in the influence of committee staff on health policy.

State legislators face great uncertainty. They are often there for a short legislative career because in most states being a legislator is a grueling job done in addition to a full-time occupation from which the legislator earns her or his primary living. While some large states have traditionally had professional legislators who serve nearly full-time and for many years, term limits in California, Michigan, and Ohio, among other states, have dramatically shortened the length of the legislative career trajectory and left little time for legislators to learn their roles and to garner expertise in a subject area. Most important, state legislators often serve on a given policy committee too briefly to build a trusting relationship with policy committee staff and indeed may serve in the position of chair without having prior experience on the committee, or even an interest in the issues within its jurisdiction.

This research was supported by the Political Institutions and Public Choice Program at Michigan State University.

Journal of Health Politics, Policy and Law, Vol. 25, No. 6, December 2000.