Between 2009 and 2010 the twenty-first century experienced its first influenza pandemic. A new H1N1 influenza virus was discovered in North America, from which it rapidly spread to other continents. By this point many governments had already developed extensive pandemic preparedness plans because of the earlier H5N1 bird flu threat. In many cases, those older plans could simply be dusted off and then quickly activated for H1N1. Tamiflu once again moved into the public spotlight as the first line of defense against pandemic flu. A number of governments now also made their newly acquired Tamiflu stockpiles available to their populations for the first time. Those decisions would usher in the next significant stage—and controversy—in the life of Tamiflu.

With so many more people now taking the antiviral, several groups suddenly came forward demanding access to all the clinical trial data for Tamiflu. Doctors wanted to reassure themselves about the drug’s benefits before prescribing it to patients during the pandemic. That was especially important given the lingering concern about Tamiflu’s potential side effects prompted by the reports emanating mostly from Japan. Some journalists and research organizations also wished to scrutinize the data because of the considerable costs incurred to the public purse in creating the Tamiflu stockpiles, and because of the significant revenues that Roche was suddenly achieving from the drug. Access to the full clinical trial data for Tamiflu thus became the key battleground for issues surrounding its effectiveness, safety, and value for the money. There was just one problem: none of those groups could actually access all that clinical trial data for the simple reason that much of it was not in the public domain.

Data Backlash
Roche and Cochrane Square Up over Clinical Trial Data
Historically pharmaceutical companies have not routinely made all of their clinical trial data publicly available. Nor were they legally required to do so. Pharmaceutical companies like Roche were thus accustomed to carrying out the clinical trials for their products. Once completed, they would then confidentially share some of the data with the regulatory agencies during their applications for marketing approval. At their discretion, pharmaceutical companies could also permit selected studies to be published in scholarly journals—particularly where the studies pointed to a clinical benefit of their product. That is precisely how things initially unfolded with Tamiflu. Roche carried out the clinical trials and then shared information with the relevant regulatory agencies as required and permitted some studies to be published in academic journals. Yet all of this also meant that a significant proportion of the clinical trial data on Tamiflu was never made public.

Widespread use of Tamiflu during the H1N1 pandemic began to put considerable public pressure on those conventional arrangements around the handling of clinical trial data. One of the groups—a particularly influential research network called the Cochrane Collaboration—now wrote directly to Roche demanding access to all the detailed data. When Roche refused, it provoked a protracted public battle with the Cochrane Collaboration that would last for several years. Frustrated by their continued inability to access all the clinical trial data, those campaigning for greater public access to clinical trial data even turned Tamiflu into the new poster child for their wider campaign. Tamiflu quickly become the focus of much broader and politically charged questions like, Who should generate clinical trial data? Who should have access to it? How should the data be analyzed? Those bruising public confrontations point to a tenth, and final, challenge that is becoming increasingly salient in the quest to secure populations pharmaceutically: access to clinical trial data.

**The Case for Tamiflu as a Pandemic Preparedness Drug**

With the arrival of a new flu pandemic in 2009, governments were preparing themselves for increased levels of illness in the population and for heightened pressure on their health systems. Many governments therefore wanted to know whether Tamiflu could also help to prevent—or at least reduce—influenza-related complications leading to hospitalizations. If it could, that might help not only with saving lives but also with reducing the
intense pressure on stretched health-care facilities expected during a pandemic. The question of whether Tamiflu would—beyond reducing the duration of symptoms by around one day in otherwise healthy adults—also deliver such “harder” public health outcomes thus became critical for the purposes of managing the looming H1N1 pandemic.

Roche clearly believed that the drug could have such an effect and stated so publicly on many occasions. Indeed, it put this message out via a variety of different media and communication channels. For example, in one of its factsheets on Tamiflu published in 2005 (around the time that governments were considering the creation of stockpiles for H5N1) Roche claimed: “When administered according to its approved dosage (75mg twice daily for 5 days), Tamiflu delivers a 38 per cent reduction in the severity of symptoms, a 67 per cent reduction in secondary complications such as bronchitis, pneumonia and sinusitis in otherwise healthy individuals and a 37 per cent reduction in the duration of influenza illness. These data were derived from seasonal outbreaks of influenza” (Roche 2005: 1). This statement is doubly significant. First, it represents an unequivocal statement by the manufacturer of Tamiflu that it believes the drug to be able to reduce influenza-related complications. Second, the statement also makes clear that the data underpinning this claim stem from trials carried out with seasonal influenza, not with pandemic flu. We have already seen in an earlier chapter that such data could not be generated for pandemic flu because nobody could really know in advance exactly what a new pandemic virus would look like.

Beyond this fact sheet, similar claims about Tamiflu’s ability to reduce complications could also be found in other company communications. Some of Roche’s websites, for instance, made very similar claims (Jefferson et al. 2010: 79–80). Roche employees, too, would emphasize this message in public presentations. David Reddy, for example, invoked a modeling study that estimated how Tamiflu stockpiles might reduce and delay hospitalizations during a pandemic (Tierney and Reddy 2005). Penny Ward, working for Roche at the time, made a very similar observation in a special supplement in the Journal of Antimicrobial Chemotherapy: “If the goal is reduction in complications, hospitalizations and deaths and the consequent utilization of resources, then treatment seems a viable option” (Ward et al. 2005: i18). Such claims would prove integral to launching Tamiflu’s second life as a medical countermeasure for pandemic flu.
Yet where did the data underpinning those claims actually come from, and were those studies carried out by Roche or by independent groups? Looking back at the recent history of pandemic preparedness planning, it is clear that one study in particular proved pivotal to making such claims. That was a pooled analysis of 10 clinical trials involving a total of 3,564 patients and published by Laurent Kaiser et al. in the *Archives of Internal Medicine* in 2003. The aim of the Roche-funded study was to assess the effect of oseltamivir on the incidence of lower respiratory tract complications (LRTCs) leading to antibiotic treatment and hospitalizations following influenza illness. According to the now infamous study, “Our analysis found that early treatment of influenza illness with the neuraminidase inhibitor oseltamivir significantly reduced influenza-related LRTCs, associated antibiotic use, and the risk of hospitalization” (Kaiser et al. 2003). The study, in short, seemed to confirm that Tamiflu could also deliver those crucial public health outcomes as well.

The Kaiser study was published in 2003, before many governments decided to stockpile the antiviral. Yet it would later prove highly influential in repositioning Tamiflu as a medical countermeasure for pandemic flu. Others have already documented how several key organizations and health agencies later referred to the Kaiser study as evidence for the claim of the medicine’s utility for pandemic preparedness planning. The CDC, for example, cited it for several years to support the claim that Tamiflu reduces the risk of complications and pneumonia, and the study was also referenced in the US Pandemic Influenza Plan (Jefferson et al. 2010: 78). In the United Kingdom, the Kaiser study was also cited by the UK Department of Health in its decision to stockpile the drug (DOH 2009; cited in Cohen 2009). It was further cited by Professor Fred Hayden, who was also a named author on the paper and who advised the UK Department of Health and the World Health Organization (Cohen 2009: 1342). The Kaiser study thus became very influential in the context of worldwide pandemic preparedness efforts—and in ways that were not properly anticipated by the authors at the time they published it. Kaiser himself later revealed in a television documentary about Tamiflu that “I had never foreseen that my study would have been so extensively cited, even mis-cited and for sure cited out of context, to justify the use of Tamiflu and to buy millions of doses of this drug during the 2009 pandemic in England” (Tinari et al. 2011: 15).
There were at least two perceived problems with the Kaiser study. First, it was based on data that had been generated by Roche and analyzed through studies funded by Roche. Because running clinical trials is a complicated and costly enterprise, responsibility for carrying out or contracting them has historically mostly fallen to the companies making the drug. Yet this close connection between the manufacturer and the studies can also raise questions around potential conflicts of interests and about whether such studies have the proper levels of independent scrutiny.

This problem was compounded by a second one. Many of the trials forming the basis for the Kaiser study were not publicly accessible. Pharmaceutical companies would usually submit clinical trial data to the regulators in confidence, as would be required for the purposes of obtaining regulatory approval. Yet such data would not be made publicly available as a matter of course. Nor were pharmaceutical companies legally required to do so. Like many other companies, Roche could thus exert a considerable degree of control over the public disclosure of the full clinical trial data on Tamiflu. However, with all eyes now on Tamiflu as the first line of defense for pandemic flu, the clinical trial data on Tamiflu would begin to come under much more intense public scrutiny. In fact, the authors of the now notorious Kaiser study could hardly have predicted what would happen next.

**Digging Deeper: Hayashi’s Email Query to Cochrane**

It all started with a fairly unassuming query left on a public website by a Japanese pediatrician from Osaka named Keiji Hayashi. Hayashi was prescribing oseltamivir to children with influenza presenting in his clinic at the time, just like many other Japanese pediatricians. Yet he was becoming concerned about Tamiflu’s possible side effects (Tinari et al. 2011). He was also aware of the possibility of the rare but potentially severe side effects documented by Rokuro Hama, who was also based in Osaka (Cohen 2009: 1342). Sitting with his wife in the reception room of his pediatric practice, Hayashi recounted the fascinating story of what happened next (Hayashi 2014).

Hayashi explained how the arrival of pandemic flu in 2009 generated a difficult clinical dilemma for him. On the one hand, he remained concerned about Tamiflu’s potential side effects, which made him think twice before prescribing the antiviral to his patients, especially children. On the other hand, if the Kaiser study was correct, there could be potentially lifesaving
benefits for those who became infected with the new pandemic H1N1 flu virus. In that case he would probably not want to withhold treatment. If, in other words, the claim about complications was accurate, then the benefits would have to be balanced against the risk of side effects in his clinical decisions about whether to prescribe Tamiflu (H. Epstein 2011). So, with patients in his busy practice to attend to, Hayashi was keen to find out for himself if the justification for the claims about Tamiflu was sound (Hayashi 2014). Does Tamiflu actually work to reduce complications in the way that was being widely claimed?

Where would be the best place to find unbiased and reliable information on Tamiflu’s effectiveness? Hayashi initially turned to the highly regarded Cochrane Collaboration—an independent nonprofit and nongovernmental research organization made up of tens of thousands of volunteers around the world who review the evidence for medicines. Reviews carried out by the Cochrane Collaboration enjoy the international reputation of representing the “gold standard” in medicine because they summarize all the available data on a medicine and are periodically reviewed as more data become available (Goldacre 2014). When Hayashi consulted the latest Cochrane reviews of Tamiflu (oseltamivir) from 2006, he saw that they had endorsed the claims about the reduction of complications described in the 2003 Kaiser study. To see backing for this claim from the trusted Cochrane Collaboration would normally have been highly reassuring.

Yet Hayashi also spotted a potential problem with the Cochrane group’s finding. Like so many other official government documents, the Cochrane review too appeared to have relied on the Kaiser study to evidence the claim. The Kaiser study, in turn, was a pooled analysis of ten other clinical trials of oseltamivir. To be absolutely sure, Hayashi also wanted to personally review these ten clinical trials himself so he could double-check that their analyses had been performed soundly. So he set about to locate the original data for the ten clinical trials forming the basis of the Kaiser analysis.

That quest yielded a remarkable discovery. A quick look at the references for the ten trials forming the basis of the Kaiser analysis revealed that most of those studies had never been fully published. Of the ten studies, only two were published in full, another seven were published only as abstract proceedings of conferences, and one was not published at all (Sheridan 2016: 47). The two that were published, moreover, did not appear to provide evidence of these effects. It was therefore impossible for Hayashi to obtain the
information that he needed in order to make his prescribing decision. As he explains in a documentary:

His [Kaiser’s] literature reviewed ten data. I found that two had been published. When I looked at the two data, I found that Tamiflu lacked superiority in preventing complications such as bronchitis. So actually the eight remaining data, that are not published, are the ones that prove Tamiflu’s effectiveness in preventing complications. And another thing is when looking at the authors’ affiliation; four aside from Kaiser were from Roche. And another was a consultant who is paid by Roche. So I thought the literature was basically written by Roche. (Tinari et al. 2011: 4)

Hayashi could not get to the bottom of the matter because eight of the ten clinical trials used in the Kaiser study were not publicly accessible. How, then, could he decide with confidence whether or not to prescribe Tamiflu to his patients concerned about the H1N1 pandemic? Nor, for that matter, was it clear how the Cochrane reviewers could have obtained direct access to this trial data in order to support the claims in their independent analysis.

Fortunately for Hayashi, the Cochrane website gives readers the option of posting comments online. So on 14 July 2009, Hayashi’s next move was simply to leave a comment on the Cochrane Collaboration website. His comment pointed to the fact that the Cochrane conclusion too appeared to depend on the Kaiser study and not its own independent analysis of the underlying data: “We strongly suppose that the reviewer’s conclusion about the complications was mainly determined by these 8 RCTs [randomized control trials], we should appraise the 8 trials rigidly. Without this process it is difficult to conclude that Oseltamivir can prevent lower respiratory tract complications” (Hayashi 2009). Hayashi would not have realized it at the time, but his comment on the Cochrane website would soon go on to trigger a cascade of further events that eventually ended up helping to transform the way in which clinical trial data are published today.

Under the rules of the Cochrane Collaboration, the authors of the Tamiflu review were obliged to reply to Hayashi’s comment within six months. The relevant Cochrane review had been carried out by Thomas Jefferson along with a number of coauthors. Looking at the comment, Jefferson—by his own admission—realized fairly quickly that he had made a mistake in
relying on the Kaiser study. So he set out to get the original data directly from the scholars who authored the Kaiser study. He first emailed Professor Frederick Hayden, who was the corresponding author for the Kaiser study. Hayden replied that he could no longer locate the data for a number of reasons and that Cochrane would need to go to Roche instead. Jefferson received a similar response when he next contacted Professor Laurent Kaiser, the study’s lead author (Cohen 2009: 1343). This meant Jefferson would have little choice now but to approach Roche directly and get the data from the company.

When Jefferson wrote to Roche requesting the data, the company insisted that he first sign a confidentiality agreement preventing him from sharing the data openly. According to the proposed confidentiality agreement, Jefferson would not even be permitted to publicly disclose the existence of the confidentiality agreement (Doshi 2009). That request posed a dilemma for Jefferson. After all, the whole ethos of the Cochrane Collaboration is to make its data sources and methods public so that others can also understand how the conclusions are arrived at and even contest them if they think errors have been made. As Jefferson felt that the Roche requirements for this confidentiality agreement were contrary to the Cochrane ethos, he was not willing to sign the agreement (Jefferson et al. 2010: 77). When he queried this stipulation with Roche, he did not receive a reply (Cohen 2009). David Reddy, head of Roche’s pandemic task force at the time, later explained that there was a legal issue at stake for the company, because the data included patients’ initials and birthdates, which legally could only be seen by regulatory agencies, doctors, and Roche’s study managers, but not by others unless they promised confidentiality (MacKenzie 2009).

When asked, in the context of researching this book, why the company did not immediately release all the data to Cochrane, spokespeople for Roche also pointed out that it would not have been standard practice to do so. Such a request, they argued, would have been unprecedented at the time: “Our strategy for dealing with Cochrane was one of caution. It was an unprecedented request, and while we had shared information with regulatory authorities, we were not set up to provide the requested clinical documents to a non-statutory body. Our primary concerns were to make sure we could protect the confidentiality of patients and to ensure any scientific assessment was completed using valid methodology. As mentioned before, we
had and maintain serious reservations about the approach suggested and then employed by Cochrane” (Rollerhagen and Braxton 2016: 6). Roche therefore proceeded very cautiously in response to the Cochrane request.

However, Roche did then get in touch with Cochrane again in October 2009 in response to a follow-up email by Jefferson—this time to inform Cochrane that it had since given the data to a different group for further analysis. This, the company now claimed, prevented it from also providing the data to Cochrane (Cohen 2009; Goldacre 2012: 84). Ben Goldacre, who described the story in his book _Bad Pharma_, counters that such a response from Roche “was a non-sequitur: there is no reason why many groups should not all work on the same question. In fact, since replication is the cornerstone of good science, this would be actively desirable” (Goldacre 2012: 84). Perhaps that also helps to explain why, only shortly thereafter, Roche did then send Cochrane seven documents—each around a dozen pages long—containing excerpts of the clinical study reports for the 10 trials that formed the basis for the Kaiser study (Cohen 2009; Goldacre 2012: 84). It looked like the Cochrane group was finally making some progress in the matter.

Again, however, disappointment soon followed. Upon closer inspection of the documents sent by Roche, the Cochrane researchers quickly realized they did not include all the detailed information that they felt they needed in order to properly analyze the issue of complications (Goldacre 2014), and they struggled to reconstruct the unpublished data sets on the basis of the information they had just received (Cohen 2009). They were also stumbling across other startling discrepancies and inconsistencies. One striking finding, for instance, was that different regulatory agencies—who would have seen clinical trial data as part of the process of regulatory approval—had come to very different conclusions on the issue of Tamiflu’s effect on complications. The relevant European regulator EMEA (subsequently renamed EMA) indicated in its 2009 review of product characteristics that oseltamivir did reduce the risk of complications (Cohen 2009: 1344). Yet a 2008 review of the information contained on the product label approved by the FDA in the United States read: “Serious bacterial infections may begin with influenza-like symptoms or may coexist with or occur as complications during the course of influenza. TAMIFLU has not been shown to prevent such complications” (quoted in Cohen 2009: 1344).
That last finding was again doubly significant. First, it showed that different regulators had come to differing conclusions on the issue of complications after looking at the clinical trial data. Second, it meant that one of the internationally most highly respected regulators had explicitly found that there was not sufficient evidence to make such a claim about complications. When asked further by the *BMJ* and *Channel 4 News* about this discrepancy, an FDA spokesperson explained: “The clinical trials in a variety of different populations (healthy adults and children, nursing home patients, adults and children with underlying cardiac/respiratory conditions) failed to demonstrate any significant difference in rates of hospitalization, complications, or mortality in patients receiving either Tamiflu or placebo, probably because these are relatively rare events. The clinical trials, although relatively large, were not powered to detect these clinical endpoints” (quoted in Cohen 2009: 1344). All of this leads to the question of how different regulators looking at the clinical trial data could come to such differing conclusions. It would be very difficult to know for certain without being able to access all the detailed clinical trial data for Tamiflu.

What is more, the Cochrane Collaboration now also faced a dilemma of its own. The group had since been commissioned by UK and Australian government agencies to update its review of oseltamivir (Cohen 2009: 1343). Unable to secure access to the full clinical trial data underpinning the Kaiser study, and with their internal deadline for their update looming, what position should the Cochrane team now take on the crucial issue of Tamiflu’s effect on complications? The group decided on methodological grounds that it would have to exclude the Kaiser data in its next evaluation of Tamiflu—to be published in December 2009—because it could not independently verify the data. It was a highly significant decision leading to an important change from the previous Cochrane review. The updated 2009 Cochrane guidance concluded that it was impossible to say whether or not oseltamivir reduces complications (Jefferson et al. 2010).

Not surprisingly the group’s decision caused quite a political stir at the time. After all, such claims had underpinned the costly public investments made by governments in creating extensive Tamiflu stockpiles for pandemic preparedness purposes. At the same time, their contentious decision also appears to have spurred Roche into finally committing to make the full clinical study reports of the clinical trials available. Why was access to those
full clinical study reports so critical for the Cochrane researchers? When later recounting the story from their perspective, some of those involved in the effort explained: “Clinical study reports contain the same information as journal papers . . . but have far more detail: the study protocol, analysis plan, numerous tables, listings, and figures, among others. They are far larger (hundreds or thousands of pages), and represent the most complete synthesis of the planning, execution, and results of a clinical trial. . . . When regulators decide whether to register a new drug in a manufacturer’s application, they review the trial’s clinical study report” (Doshi, Jefferson, and Del Mar 2012). Following the crucial change in Cochrane’s position on the issue of complications, Roche now pledged to release the “corresponding full study reports” for the 10 trials “within the coming days to physicians and scientists undertaking legitimate analyses” (J. Smith 2009)—though the company would not actually do so for another several years (Goldacre 2012: 86). Some of the stated reasons Roche cited for not releasing all the detailed information sooner included ongoing concerns about patient confidentiality, questioning the independence of some of the Cochrane researchers, and complaining that journalists were being copied onto email correspondence with the company (Goldacre 2014).

Even after the critical change in the Cochrane assessment, Roche continued to assert considerable control over who would have access to the full clinical trial data for Tamiflu. None of this was illegal. Yet with all eyes now on Tamiflu because of the H1N1 pandemic, the whole question of who should be able to access all of the clinical trial data was fast becoming a hot political issue and the new battleground for verifying all the claims about its effectiveness, safety, and utility against pandemic flu. The issue even began to attract high-level attention from several professional societies, public health organizations, medical journals, the media, and investigative journalists.

Tamiflu as a Poster Child for the Data Access Campaign

All of this public attention on Tamiflu suddenly also made it very attractive to campaigners advocating for greater transparency around clinical trial data more generally. They now seized upon the Cochrane Collaboration’s frustrating experience with Tamiflu as a particularly vivid illustration of all the problems surrounding existing arrangements for accessing clinical trial data. Those arrangements meant that researchers could not indepen-
dently review all the clinical trial data for the simple reason that they could not get access to it. Regulators could see the data but in the past would not share all such data with third parties. Those wanting to review the data would have no choice but to rely only on those studies openly published in the scientific literature.

What exactly is the problem with relying on such published data alone? There are at least two different issues at stake. First, researchers have no way of knowing how many clinical trials have been conducted in total and therefore what proportion of the existing data they are looking at. Second, pharmaceutical companies can also be quite selective in terms of which studies they permit to be published. Studies with negative or inconclusive findings may never be published—either because companies would not have a commercial interest in publishing them or because many journals tend to be less interested in publishing them than ones with positive findings. Both of those problems generate a risk of publication bias, whereby only the most favorable studies are published, leading to a potentially skewed picture of a drug’s overall efficacy and safety in the published literature.

This problem of publication bias is certainly not new, but campaigners now sensed a valuable tactical opportunity to use the ongoing experiences with Tamiflu as a way of reinvigorating their wider campaign. Tamiflu, Ben Goldacre explains in an interview for this book, “is a poster child [for the campaign] because of the amount of money that was spent on it. It means you can go on TV and say here is an example Tamiflu, and this is no small thing because of the amount of money spent and it is very rigorously documented” (Goldacre 2015). In fact, those campaigning on this issue could publicly portray the Tamiflu situation in seemingly incredible and almost comical terms. As Fiona Godlee, editor in chief of BMJ (formerly the British Medical Journal), put it in a documentary, “In this case almost all of the data is in the hands of the manufacturer of the drug. So the data were generated by employees of the company, they were evaluated by employees of the company, they were authored by employees and people paid by the company—academics paid by the company. So we have no independent evaluation of this drug and because the data aren’t available we have to say, we cannot judge the effectiveness of this drug” (Tinari et al. 2011: 5). Under Godlee’s leadership, BMJ would remain at the forefront of international efforts to highlight this problem over public access to clinical trial data for many years to come.
Yet given Roche's steadfast refusal to make all of the Tamiflu data public, what tangible leverage did the campaigners actually have to materially improve the situation? How could they go up against such a powerful and well-resourced pharmaceutical company as Roche? The campaign first tried to mobilize public opinion in order to create greater pressure on the company. *BMJ* thus teamed up with investigative journalists to expose the way in which key influenza scientists with industry links had also been involved in developing WHO guidance on neuraminidase inhibitors (Cohen and Carter 2010). Their joint investigation found that “key scientists advising the World Health Organization on planning for an influenza pandemic had done paid work for pharmaceutical firms that stood to gain from the guidance they were preparing. These conflicts of interest have never been publicly disclosed by WHO, and WHO has dismissed inquiries into its handling of the A/H1N1 pandemic as “conspiracy theories” (Cohen and Carter 2010). Many of those links were described in a startling exposé published in *BMJ*—casting doubt on the integrity of the guidance and the decision making, as well as strengthening the case for greater independent scrutiny of the underlying clinical trial data.

The public reach of the story was considerable. Many international newspapers, newswires, and radio and television outlets covered it. The report into the potential conflicts of interest at WHO was mentioned more than 1,000 times by media organizations around the world (BIJ 2010a). Yet all this public pressure notwithstanding, Roche was still not budging. The company continued to refuse to release all of the detailed data that the Cochrane Collaboration wanted access to. So the Cochrane Collaboration next turned to a second strategy.

**Targeting the Regulators**

If Roche was not going to release all the data voluntarily, perhaps there was someone else with access to the data who could be persuaded to share it instead. Regulators, in particular, would have to have seen at least some of the data in the course of deliberating the regulatory approval of Tamiflu. Perhaps they could be convinced—or even pressured—to release it. Members of the Nordic Cochrane Centre had earlier deployed such a strategy in the area of antiobesity drugs, where there had been a very similar issue over access to unpublished trial data. In that case, researchers wrote to the European regulator (EMA) in June 2007 requesting the data from
them. The EMA responded at the time that it would not release the data—
citing intellectual property and the commercial interests of pharmaceutical
companies as relevant factors to consider (Goldacre 2012: 71). Initially this
alternative strategy of turning to the regulator therefore looked like another
dead end.

Before giving up, however, there was at least one other angle the Co-
chrane Collaboration could try. If it could not persuade the regulators to
hand over the data voluntarily, perhaps there was someone else who had the
power to compel the regulator to do so. Thus, they next approached the
little-known office of the European Ombudsman. This organization is
charged with independently and impartially investigating instances of mal-
administration in the institutions of the European Union. It can launch
investigations either on its own accord or in response to formal complaints.
Openness and public access to documents is one of its primary areas of
activity, covering around a third of its inquiries per year (European Omb-
udsman 2011).

The researchers from the Nordic Cochrane Centre now decided to make
two complaints to the ombudsman over the EMA's refusal to hand over
information on the diet drugs: first, that the agency had provided an insuf-
cient justification for its decision to withhold information, and second,
that the claim about commercial interests could not be justified in that the
data requested only related to safety and efficacy of the drugs (Goldacre
2012: 73). The EMA did not respond for four months, maintained its posi-
tion over the coming year, and—two years into the standoff—then raised
additional concerns about patient confidentiality that might be breached by
such releases (Goldacre 2012: 73–74).

After going through some of this information itself, however, the Euro-
pean Ombudsman came to the view that the EMA had indeed failed in its
duty to give an adequate explanation and made a preliminary finding of
maladministration (Goldacre 2012: 74; Gøtzsche and Jørgensen 2011). The
ombudsman instructed the EMA to either release the data or provide a bet-
ter explanation for not doing so (European Ombudsman 2010; Goldacre
2012: 74). Eventually, the EMA agreed to allow the claimants access to the
data (European Ombudsman 2010). The Ombudsman’s full report was
published at the end of November 2010, a good three years after the initial
complaint (Goldacre 2012: 78). The researchers finally received the data they
had requested about the antiobesity drugs from the EMA in February 2011
(Gøtzsche and Jørgensen 2011). However, another crucial outcome of the whole episode was that it also led to a fundamental change in the data release policy at the EMA (Jefferson, Jones, Doshi, and Del Mar et al. 2014: 496).

Sensing, perhaps, that the political winds were beginning to change in relation to clinical trial data access, and also confronted with the significant change in the Cochrane assessment, Roche finally sent the Cochrane Collaboration some 3,195 pages of study reports from the Tamiflu treatment trials on 31 December 2009—only a few weeks after the 2009 Cochrane update had been published (Doshi, Jones, and Jefferson 2012; Jefferson, Jones, Doshi, and Del Mar et al. 2014: 494). This may initially sound like quite a large volume of information. Upon closer inspection, however, it turned out that the documents only included the first “module” of each clinical study report, although the tables of contents indicated that these reports contained four to five modules each (Doshi, Jones, and Jefferson 2012). When they wrote to Roche again requesting the full study reports, Roche replied that it believed that the group now had all of the information it needed to do its job (Jefferson, Jones, Doshi, and Del Mar et al. 2014: 494).

So the Cochrane Collaboration next turned to the regulator and filed a Freedom of Information request with the EMA for additional information on these studies—especially as the EMA had in the meantime introduced its new data release policy (Jefferson, Jones, Doshi, and Del Mar et al. 2014: 496). The EMA then sent the Cochrane Collaboration another 25,453 pages of material covering module 2—but still mostly missing modules 3–5 (Doshi, Jones, and Jefferson 2012). Yet those last three modules were especially crucial to the Cochrane researchers, because they detailed the trial protocols and amendments. The Cochrane researchers were therefore adamant about wanting access to the entire clinical study reports to carry out their independent review properly. In the meantime, however, they would use this additional data just obtained from the EMA (along with some other data) to publish a further update of their review in January 2012 (Jefferson, Jones, Doshi, and Spencer et al. 2014).

How, then, could the Cochrane group obtain access to those remaining modules? EMA had already confirmed that it did not hold these additional modules (Doshi, Jones, and Jefferson 2012). So, following a similar strategy to the one that the Nordic Cochrane Centre had earlier adopted in relation to the diet drugs, Thomas Jefferson next submitted a formal complaint
specifically about oseltamivir to the European Ombudsman on 15 October 2012. He alleged that the European regulator made its 2002 authorization decision regarding Tamiflu on the basis of incomplete information (Jefferson 2012). The complaint asked the ombudsman to request that “EMA correct their error by summoning the missing data from Roche and either reanalysing it or make it widely available to the scientific community” (Jefferson 2012). The group had since also submitted a separate freedom of information request to the FDA in January 2011, who they believed also held the relevant data (Doshi, Jones, and Jefferson 2012). Getting full access to all the clinical trial data on Tamiflu was proving to be a slow and arduous process—with neither Roche nor the regulators initially appearing to be particularly accommodating in opening access to the full clinical trial data (see Goldacre 2012).

In a further escalation of public pressure, BMJ then also decided to openly publish the Cochrane Collaboration’s extensive correspondence relating to its ongoing efforts to obtain the full data for Tamiflu on a dedicated and high-profile website: http://www.bmj.com/Tamiflu. That correspondence also formed the basis for a wider BMJ open data campaign and helped to stimulate the prominent AllTrials campaign (Jefferson, Jones, Doshi, and Del Mar et al. 2014: 497). Under such mounting public pressure, the major breakthrough finally occurred in April 2013, when Roche emailed the Cochrane Collaboration that it could get access to the clinical study reports for all 74 Roche-sponsored trials on Tamiflu over the next couple of months—running to more than 100,000 pages (Jefferson, Jones, Doshi, and Del Mar et al. 2014: 497; PMLive 2013).

Roche indicated that these data would now be released in a staggered process in which the documents would first be assessed for issues of patient confidentiality and commercial interest (Cohen 2013). According to the company, “Due to their age, some of the documents requested were not in a fully electronic format (hard copy documents had been scanned) and as such we had to identify a process and redact the documents semi-manually. In total, clinical study reports for 74 studies were shared, amounting to more than 138,900 pages of documents. Collating, sorting and redacting this volume of material was a huge undertaking, especially when such care needed to be taken to ensure patient privacy was maintained” (Roller-hagen and Braxton 2016: 6). With all the data being finally released, Cochrane could now begin the painstaking processes of independently reviewing
all of the original Tamiflu data—especially the claims about its impact on complications that had proved so critical for pandemic preparedness and international stockpiling efforts.

Most people would probably have given up trying to get access to all the clinical trial data for Tamiflu much sooner—especially given the great resistance the group encountered along the way. However, the Cochrane team’s dogged determination and unconventional tactics had finally begun to pay off. After a protracted battle with Roche, the Cochrane Collaboration had managed to break new ground with this significant development. Indeed, its Tamiflu report would mark the first time in its history that a Cochrane review would be based on “all relevant full clinical study reports of a family of drugs, integrated by regulatory comments” (Jefferson, Jones, Doshi, and Spencer et al. 2014). It was a major breakthrough the Cochrane Collaboration had fought fiercely and long to achieve, and Tamiflu stood at the center of all of these fascinating developments.

**Updating the Cochrane Review**

What conclusion did the Cochrane team come to after having the chance to analyze all of the additional data? After the many years of battling on, had they actually discovered anything markedly new or different from what the company had initially claimed? The updated Cochrane review (Jefferson, Jones, Doshi, and Spencer et al. 2014)—which runs to well over 500 pages—found that oseltamivir reduces time to first alleviation of symptoms in adults by 16.8 hours, representing a reduction from 7 to 6.3 days. That was broadly in accordance with the findings of several other studies that had already been published. However, the authors also concluded that “treatment trials with oseltamivir or zanamivir do not settle the question of whether the complications of influenza (such as pneumonia) are reduced, because of a lack of diagnostic definitions” (Jefferson, Jones, Doshi, and Del Mar et al. 2014). The study, in other words, did not find sufficiently compelling evidence to support Roche’s earlier and very public claims about Tamiflu’s ability to reduce complications that had also formed part of the rationale for government stockpiling.

Among many other findings, the Cochrane review also reminded readers that any benefits of the antiviral would still have to be balanced with its harms: the “trade-off between benefits and harms should be borne in mind when making decisions to use oseltamivir for treatment, prophylaxis, or
stockpiling” (Jefferson, Jones, Doshi, and Spencer et al. 2014). In characteristic style, Ben Goldacre helps to visualize some of these “trade-offs” in much more accessible—if also quite graphic—terms: “Since percentages are hard to randomize, we can make those numbers more tangible by taking the figures from the Cochrane review, and applying them. For example, if a million people take Tamiflu in a pandemic, 45,000 will experience vomiting, 31,000 will experience headache and 11,000 will have psychiatric side-effects. Remember, though, that those figures all assume we are only giving Tamiflu to a million people: if things kick off, we have stockpiled enough for 80% of the population. That’s quite a lot of vomit” (Goldacre 2014). The updated review, in short, was not a great outcome for Roche and would do little to rebuild public trust in the public battering that Tamiflu’s reputation had already taken. Not surprisingly, Roche quickly contested the findings of the 2014 Cochrane study. “We disagree with the overall conclusions,” the company pointed out in a statement and warned that this could also “potentially have serious public health implications” (Gallagher 2014). Roche has since also written an extensive and detailed response to the Cochrane review (posted on the Cochrane website) running to some 69 pages (Clinch et al. 2014).

Broadly speaking, there are at least three key areas of contestation between Roche and Cochrane. One of Roche’s chief concerns is that the Cochrane report fails to take into account the totality of data available for Tamiflu—namely, that it only considered 20 out of 77 clinical trials available to them in the end and that it excluded real-world data from observational (nonrandomized) trials (Rollerhagen and Braxton 2016: 6). One key area of ongoing debate between the researchers and the company thus revolves around the question of which kinds of data should be included in forming a view on this issue. Should all of the clinical trials be included or only a proportion of them? Moreover, should analysts solely consider randomized controlled trials or also other forms of evidence, such as that coming from nonrandomized studies that observe patients in their clinical settings?

A second major area of ongoing debate is the extent to which data from seasonal flu can be applied to making decisions about pandemic flu. Roche argues that “clinical data reviewed by Cochrane specifically looks at the effectiveness and safety of Tamiflu in seasonal influenza, and excludes data relating to the use of the medicine in a pandemic setting. To this end, it is insufficient to infer conclusions on the use of Tamiflu in pandemic influenza”
The clinical trials, in other words, were designed with the intention of obtaining regulatory approval for seasonal flu and not really to answer wider questions about their public health use (ECDC 2016: 18). Irrespective of the findings of the Cochrane review, there would therefore be limits to how well the findings based on seasonal flu data could also be applied to a future flu pandemic—as the Janus-faced nature of flu begins to rear its head once more.

Yet a third area of contestation revolves around the question of whether these studies were ever designed to be sufficiently powerful to answer this question of complications. “The included trials in the latest [2014] systematic review,” three influenza experts argue, “were not appropriately designed or powered to assess the effect of neuraminidase inhibitors on life-threatening complications, and absence of a reliable signal on the reduction of complications from such underpowered RCTs does not imply absence of effect” (Nguyen-Van-Tam et al. 2014). Peter Openshaw, director of the Centre for Respiratory Infection at Imperial College, London, even expressed concern that because of the media headlines generated by the 2014 Cochrane review “we risk losing one of the few weapons we have, because of overly negative publicity” (quoted in Butler 2014).

On the one hand, then, the political campaign around making the Tamiflu data public has been remarkably successful. The combination of mobilizing public opinion, targeting the regulators, and using the little-known office of the European Ombudsman seems to have eventually forced Roche’s hand and produced the desired outcome for the Cochrane Collaboration. On the other hand, the major breakthrough has arguably also come at a price. Some members of the scientific and public health communities are concerned that the lines between science and campaigning may have become blurred in the course of the protracted Tamiflu skirmishes. Kevin McConway, a professor of applied statistics at Open University in the United Kingdom, thus argues that the Cochrane review was an impressive piece of work but that “it is a potential limitation of this study that the work has been carried out alongside campaigning on access to trial data” (quoted in Gallagher 2014). In his view “The writers of the review have a clear position in this controversy, and, although I personally do generally agree with their position, I feel it does at times lead to some confusion between reporting the results of the review of these particular drugs and commenting on the gen-
eral position on access to and use of unpublished data” (quoted in Gallagher 2014).

Even though the campaign on Tamiflu was ultimately successful in terms of getting the data released, then, some remain uncomfortable about the perceived blending of science and campaigning that occurred along the way. It is also worth noting that, the generally very high reputation of Cochrane reviews notwithstanding, in the case of Tamiflu its findings have not been accepted uncritically. Both the CDC and the Infectious Diseases Society of America, for instance, issued statements explicitly clarifying that they would not be changing their recommendations in light of the latest Cochrane report.

All of that said, there is also one final twist to this whole chapter in the life of Tamiflu. It is not very widely known that Thomas Jefferson, who led the Cochrane review of Tamiflu, had himself worked for Hoffman-LaRoche as an ad hoc consultant in the past. Anyone who takes the time to read the small print on his publications can easily discover this for themselves, as Jefferson has openly declared this relationship within the context of conflict-of-interest disclosures required by many scientific journals. An article from 2011, for example, notes that Thomas Jefferson “has been an ad hoc consultant for Hoffman-La Roche” (Cochrane Neuraminidase Inhibitors Review Team 2011: 1303). His employment at the company was also confirmed by Roche: “Thomas Jefferson was a consultant for Roche; he worked on data sets related to Tamiflu. He contributed to a number of abstracts exploring the efficacy of Tamiflu and its impact on reducing complications” (Rollerhagen and Braxton 2016: 7). It turns out that the researcher leading the Cochrane review of Tamiflu was himself a former consultant for Roche who had worked on Tamiflu for the company.

**The Roche Response: Managing the Cochrane Fallout**

By this stage in the ongoing data “wars” over Tamiflu it looked as though events were beginning to overtake Roche and that the company was going to have to surrender a significant degree of control over access to the full clinical trial data for Tamiflu. Given its concerns about the Cochrane approach, what options did the company have to pursue its own interests? Even though the company could not control what Cochrane ultimately did with the Tamiflu data, Roche could still use its considerable financial
muscle to populate the public space with a number of additional studies that would—it hoped at least—show Tamiflu in a more favorable light. Roche was certainly not going to roll over without putting up a fight.

First, Roche approached other leading scientists and invited them to re-analyze the clinical trial data underpinning the original Kaiser study. In 2010 Roche thus made the Tamiflu data available to Marc Lipsitch at Harvard University. This new Harvard analysis would end up broadly confirming an effect of Tamiflu on complications, albeit a slightly more modest one than the Kaiser study had initially reported (Hernán and Lipsitch 2011: 277). Yet if Roche had hoped that this new study would resolve the brewing controversy, it was mistaken. The Cochrane Collaboration quickly countered by raising a number of concerns about the Harvard study. It questioned whether it was even possible to meta-analyze complications in this manner—especially as the trials did not use standardized definitions of secondary complications. The Cochrane group was also concerned that the study appeared, in its view, to engage in selective reporting, or “cherry-picking,” by focusing only on some indicators of complications but not others. Finally, the group also expressed concerns whether sufficient cross-checks had been performed on the data and reiterated the need to secure access to the full clinical study reports (Jones 2011). Instead of resolving the issue of complications, the battle over access and control to the data only heated up further.

Roche next funded a separate, larger study of the impact of Tamiflu on complications. To do so, the company even helped to set up a whole new consortium called the Multiparty Group for Advice on Science (MUGAS) which would help enhance “public health security by addressing unsolved scientific issues that hamper public health guidance” (MUGAS 2014b). The core idea was that the new MUGAS consortium could provide greater clarity in areas where there are confusing, ambiguous, or mixed messages: “When confusion threatens to hamper public health policies, the MUGAS Foundation offers a solution to settle the scientific debate” (MUGAS 2014a). Tamiflu’s role in reducing complications was the first controversy ever to be considered by the new MUGAS consortium. In fact, it remained the only project the initiative has taken on at the time of writing.

In the case of Tamiflu, the MUGAS study wished to analyze the impact of oseltamivir in the treatment of seasonal influenza, looking at symptom alleviation, complications, and safety. Rather than just carrying out yet
another study with the data for the original Kaiser study, however, this would now be a bigger study including all published and unpublished Roche-sponsored randomized placebo-controlled, double-blind trials of 75 mg oseltamivir administered twice a day in adults (Dobson et al. 2015). The new study would also be based on individual patient data rather than on aggregated study results—which is often seen to be preferable for meta-analyses (Kelly and Cowling 2015: 1701). Like the Harvard study before it, the results of the MUGAS study seemed to broadly confirm the earlier findings of the initial Kaiser study (Dobson et al. 2015: 1729).

And just like the earlier Harvard study before it, the new MUGAS study too would not settle the controversy. That is because the entire initiative was perceived to suffer from at least one major drawback. The MUGAS study was funded through an unrestricted grant from Roche. The grant clearly stipulated that Roche would not be involved in the analysis in any way, barring providing the necessary data dictionaries and data sets (Dobson et al. 2015: 1732). Roche provided access to the individual patient data via secure web access and provided data clarifications, but it was not involved in the design, conduct, or reporting of the meta-analysis (Dobson et al. 2015: 1730). The results were also not shared with Roche until the analysis had been completed (Dobson et al. 2015: 1732). Still, the MUGAS initiative tends to divide opinion. For some people, including members of the Cochrane Collaboration, the fact that the funding still comes from the industry ultimately taints the findings and undermines its overall credibility (Couzin-Frankel 2015; Silverman 2015). Those backing the MUGAS initiative counter that these questions are ultimately very important for public health and that it would be extremely complicated to try to secure public funding for such studies.

In either case, the arrival of the H1N1 swine flu pandemic in 2009 would also present Roche with a third opportunity for generating more information about this vexing issue—this time by considering a different type of data altogether. The two studies discussed above had been carried out with randomized, placebo-controlled trials for seasonal flu. Generally speaking, randomized controlled trials are viewed as the least biased type of evidence for assessing pharmaceutical products. That is also why the Cochrane Collaboration only uses such trials for conducting its meta-analyses. Yet public health organizations often also consider other types of “weaker” data, such as observational data, especially where such trial data do not
exist. With the arrival of the H1N1 pandemic, it would now be possible to also look at such observational data from the use of Tamiflu during the H1N1 pandemic.

Professor Jonathan Nguyen-Van-Tam, who also worked for Roche in the past but now works at the University of Nottingham, led a team carrying out a meta-analysis of patient data to look at the effects of neuraminidase inhibitors on deaths for hospitalized patients with confirmed or suspected H1N1 infection. The Post-Pandemic Review of Anti-Influenza Drug Effectiveness (PRIDE) study was again made possible by an unrestricted educational grant from Roche. The headline results suggested that neuraminidase inhibitors were associated with statistically significant reductions in mortality risk (Muthuri et al. 2014). As Nguyen-Van-Tam put it at the time, “I continue to believe neuraminidase inhibitors are a useful drug for patients with severe flu who are hospitalised. Cochrane only accepted randomised control trials. If we had that sort of data we would give it primacy, but we don’t live in that world. We needed to use observational data” (quoted in Jack 2014).

Like the previous two studies, however, this one too would not put an end to the controversy. Within 48 hours of the study being published in *Lancet Respiratory Medicine*, the *BMJ* published an article claiming that the new study “was based on flawed analysis” (Nguyen-Van-Tam 2014). Nguyen-Van-Tam expressed both concern and surprise that the PRIDE consortium, which had undertaken the study, received no forewarning about the *BMJ* piece. The group was also not offered the customary right of reply (Nguyen-Van-Tam 2014). Yet such heated exchanges reveal just how contested and tense the whole debate about Tamiflu had become over the years. Indeed, a different study of the effect of oseltamivir on mortality in 2009A/H1N1 influenza patients has since also found insufficient evidence to support the view that oseltamivir reduces the risk of mortality for such patients (Heneghan et al. 2016).

It cannot be the aim of this book to determine who is right or wrong in these debates about the role Tamiflu in reducing complications and mortality. Some of those involved in the extensive Cochrane review themselves acknowledge how “even among institutions that aim to provide the least biased, objective assessments of a drug’s effects, determining ‘the truth’ can be extremely difficult” (Doshi, Jefferson, and Del Mar 2012). Yet there are a number of reasons why all of these protracted controversies and disputes
around Tamiflu are also highly significant for the whole area of medical countermeasures more generally.

First, they reveal just how intense the interest in the full clinical trial data (and also other data) became once Tamiflu entered into the political limelight as the first line of defense against pandemic H1N1 flu. It was precisely at the moment when there was the very real prospect of Tamiflu being administered to large parts of the population that the whole question of complications suddenly erupted as a major source of tension, debate, and controversy, putting the clinical trial data for Tamiflu under unprecedented scrutiny. Too much was at stake now to simply leave the analysis of all those data to the companies or the regulators alone. For any medical countermeasure that is going to be widely distributed to the population during a future emergency, there is likely to be intense public pressure to make all the data publicly available for further scrutiny.

Second, they suggest that in the face of such pressure, even powerful pharmaceutical companies (and regulatory agencies) will struggle to preserve traditional arrangements for accessing detailed clinical trial data. As a large pharmaceutical company, Roche tried to use its considerable power and influence to manage the persistent requests to hand the data over to the Cochrane Collaboration. Roche did this mostly by using its financial muscle to fund a number of additional studies on the issue. Those financial resources stood in stark contrast to the workings of the Cochrane Collaboration, which is a much looser network of people carrying out their work on what is, by comparison, a shoestring budget. According to Jefferson, the members carrying out the Cochrane review mostly “talk through Skype or via e-mail because we are penniless! We receive funds from the English government to perform this review, but they are pretty meagre” (Tinari et al. 2011: 8). The power differentials at play between different stakeholders in the Tamiflu data wars could not be starker.

Yet Roche still ended up releasing the information in the face of mounting public pressure. The European Medicines Agency too has since introduced a whole new policy on open access to clinical trial data for all new medicines approved for human use in the European Union. It has now become the first regulatory agency in the world to commit to making all clinical study reports submitted by pharmaceutical companies as part of their marketing applications openly available to researchers in the future (EMA 2016). All of this suggest that companies and regulators will ultimately
struggle to preserve traditional arrangements in this area—especially when it comes to high-profile medical countermeasures used in an emergency.

Finally, the various responses and debates prompted by those additional studies also show that none of Roche’s three strategies have ultimately succeeded in putting the Tamiflu controversy to bed once and for all. Despite the underlying power differentials and the multiple new studies produced, groups like the Cochrane Collaboration can still have a significant impact on the public debate and can be quite effective in terms of getting their voices heard—through use of the media, through online networking, through public campaigning, and so forth. Overall, this has led to an increase in the plurality of actors now commenting on these kinds of issues and to a diversification of perspectives on some of the key questions involved.

As a result, there are now several contrasting views circulating about which data sets should be included in analyses about the potential role of Tamiflu in pandemic preparedness. There are also diverging views among stakeholders about how exactly such analyses should be performed and who should pay for them (Boseley 2015). Different organizations even place different emphasis upon what types of data should ultimately count, on how to weigh different categories of evidence, and on what lessons can also be extrapolated from seasonal flu data for pandemic preparedness purposes (Hurt and Kelly 2016). Nor does it appear likely that much more meaningful clinical trial evidence will emerge over the next 5 to 10 years to clarify this issue, because of the difficulties associated with running such trials (Hurt and Kelly 2016). All of that also makes it much more challenging to create certainty and clarity for the publics who may eventually be asked to use—and ultimately also pay for—medical countermeasures like Tamiflu.

In the end, then, the protracted battle between the Cochrane researchers and Roche over access to Tamiflu’s full clinical trial data also points to the tenth challenge that can arise around medical countermeasures more generally: access to data. During an actual emergency, detailed clinical trial data are likely to become the battleground for answering key questions about a medical countermeasure, such as “Does it work?” and “Is it safe?” The pressure for full public disclosure of all those data will probably be intense during such an emergency, when a medical countermeasure faces the very real prospect of suddenly being mass-distributed to the population in a short period of time.
In the case of Tamiflu, securing access to the data was thus deemed to be particularly important precisely because of the prospect of it being rolled out on a population-wide basis. “While the evidence base for all approved drugs should be sound,” the Cochrane Collaboration argued in this regard, “the evidence base for public health drugs must be of the highest quality, publicly available and open to independent scrutiny” (Jefferson et al. 2010: 79). Medical and public health groups will be keen to have access to all the data in an emergency so that they can review it independently, while patients will also want to have independent reassurances that the product is safe and effective before taking it.

Yet there are also wider political reasons why calls for independent scrutiny of clinical trial data are likely to intensify for medical countermeasures, such as the considerable public expenditure involved in their procurement and stockpiling. Governments do not want to be seen by their electorates as squandering vast amounts of scarce public resources on treatments that cannot be shown to be effective or as unnecessarily propping up the profits of the pharmaceutical industry. Such financial considerations also formed a significant motivation for governments in commissioning the Cochrane Collaboration to update its review of Tamiflu. “The Cochrane Review update,” Ben Goldacre explains, “was specifically triggered by the British and Australian governments writing to Cochrane and saying: we are considering spending a lot of money on stockpiling this, could you please update your review. So, the Cochrane review was actively solicited by governments because they were stockpiling” (Goldacre 2015). There are thus both public health and political considerations generating stronger demand for access to all the data for medical countermeasures.

More generally, then, recent experiences with Tamiflu also suggest that traditional arrangements for accessing clinical trial data—whereby access is principally controlled by pharmaceutical companies and restricted to regulators—may not be politically viable in relation to medical countermeasures during future emergencies. Too much is at stake, and other groups will also want to see all the data because of the potential safety issues and costs involved. Yet control of such data is also something that has historically been very important to the pharmaceutical industry, and which it has fought very hard and long to retain. At the end of the day, those pharmaceutical companies do not just produce “bare” molecules but what Andrew Barry calls “informed materials”—that is, molecules embedded in a thick
"informational" and data-laden environment (Barry 2005). Companies view the data produced along the commercial development pathway as being absolutely integral to the pharmaceutical products that they end up selling. The fact that there will likely be greater political pressure to make all such data publicly available during an emergency can thus complicate matters further—especially from the perspective of pharmaceutical companies considering the development of new medical countermeasures. Determining which groups can access the full clinical trial data—and how—is therefore a tenth challenge to arise more generally around medical countermeasures. This tension also completes the final group of deployment challenges that can arise once an emergency has transpired and a new medical countermeasure is actually distributed to the population.