Are regulators doing the wrong thing?

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Many recipients of a service – such as financial advice or elderly care – do not have the requisite knowledge to determine whether or not the service they are receiving is of an appropriate quality. Furthermore, many such people are in a weak position to complain. As a consequence, many people can be receiving sub-standard service, which the supplier continues to deliver with impunity. Why does this market failure occur? Are regulators doing the wrong thing?

Three disturbing questions

Chris receives some advice on a financial service. How does Chris know that the advice is right?

Alex lives in a care home. How does Alex know that the work of the carers is appropriate, and of a suitably high quality?

Sam's school examination results are the entry ticket to a very promising future. Or not. How does Sam know that the grades are correct?

These questions are disturbing. Of course financial advisers give good advice. And carers care, that's what they do. And as for exam results – well, of course they're right.

But how do you know? Suppose that the financial adviser just happens to have been wrong, or – worse – has an undeclared vested interest. Or that a carer has had a domestic problem that morning, and has forgotten to give Alex the usual daily medication. And somewhere, deeply hidden behind the scenes, is some unknown person, up late at night, marking any number of examination scripts. Suppose, just suppose, that the marker made a mistake – a mistake on Sam's paper.

These questions are disturbing because they undermine something that we all cherish – a sense of trust; a sense of trust that helps make society run smoothly, and in a civilised manner. If that trust is eroded… oh! That's a bad place to be…

A bad place to be

Yes, it is indeed a bad place to be. But it's also a place which is very real, as these recent news extracts from the UK bear compelling witness:

"*Banks face a hidden bill of as much as £10bn to settle mis-selling claims linked to commercial real estate projects, according to research by one of the property sector's largest consultants.*"
(The Daily Telegraph, 2013)

"*Two healthcare assistants who abused elderly female patients on the geriatric ward of an under-fire hospital were jailed today.*"
(The Independent, 2013a)

"*Hundreds of GCSE, AS and A-level results have been regraded after errors were made in exam marking.*"
(BBC, 2014d)

The common thread across these stories is a combination of two important factors: ignorance, and weakness. Let me stress that I am not seeking to imply anything derogatory as regards Chris, Alex and Sam – rather I'm using the words 'ignorance' and 'weakness' in a true way: Chris just don't know whether the financial advice is correct or not; Alex often can't judge if the care is of high quality; Sam has no way of knowing if the exam results are right – all three have no basis of knowledge. And they are also in a weak position if they were indeed to feel that something isn't quite right. Chris might complain, but many people in Chris's position don't feel able to; Alex might ask a question of the organisation that employs the carer, but could well fear that no one cares; and Sam is more likely to think "Oh dear, I didn't do as well as I had hoped" rather than "The examiner made a mistake".

I contrast all this with what happens when you book into a hotel, and discover that the television isn't working. You have the required knowledge to determine whether the television is working or not, and you have no problem in going to reception, and requesting another room where the television does work. You have both knowledge and power. And something else too – you have choice, and a wide one at that: you can probably choose a different hotel next time. But when you visit, say, the bank for financial advice, you are allocated to whichever adviser next becomes free; most people being cared for have only very limited choice as to their carer, if any. And no-one can choose their examiner.

The picture I am painting is that there are a large number of services that we all receive, where the recipients of that service are not in a position to judge 'goodness' or 'badness' of service delivery; and where, even if they can judge it, they might be in a very weak position to do anything about it if they judge it 'bad'. If everything goes well, then there is of course no problem. But if something does go wrong, there is a possibility that even the 'victim' might not know, or is powerless.

Enter the regulator

One answer to this market failure is stronger regulation. Furthermore, the regulatory process should make it as easy as possible for alleged victims to complain, and for those complaints to be taken seriously: the innocent victim, by definition, is ignorant and weak, whereas the protecting regulator, by contrast, is knowledgeable and strong.

After so many years of experience of regulation, so many different forms of regulation, and so much intellectual endeavour by academics and policy makers alike (see, for example, Hampton, 2005, and Sparrow, 2008) – let alone any number of *ex post* enquiries – it would be reasonable to think that regulation would be working well. The empirical evidence, however, as verified by the newspaper reports already cited, and the continuing public outrage as yet another abuse is uncovered, suggests otherwise. Furthermore, the ubiquity of problems, which are not confined to the regulation of one particular market, or one particular context, suggests that the failure is not local, but systemic.

My purpose is therefore to explore this from a systemic point of view, using the methodology of systems thinking. If systems thinking, and the use of causal loop diagrams, are unfamiliar, no matter, I shall explain the key aspects as the story evolves: further details will be found in, for example, Morecroft, 2007; Sherwood, 2002; and Sterman, 2000.

How the current regulatory system works

Let's return to Chris, who fears she might be a victim of financial mis-selling. If Chris has the knowledge, and the courage, she can make a complaint that will start some form of enquiry. That enquiry might return the result "I'm sorry, but we confirm that you were treated fairly". But it might conclude "We confirm that your complaint is valid – you were mis-sold, and an error was made by your financial adviser. Here are the details of how you can claim compensation". In this latter case, the enquiry identifies that there has indeed been a service failure, a failure ultimately caused by some weakness in the quality of the execution, supervision or design of the service delivery process. We can represent these events in Figure 1:

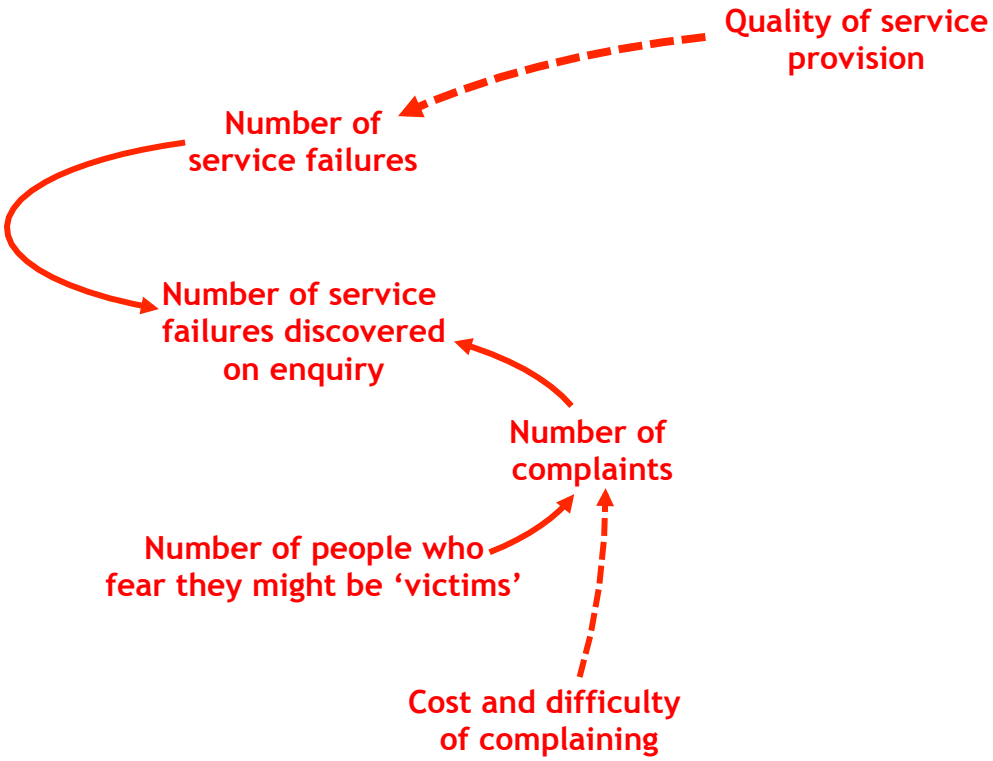

Figure 1: How complaints identify service failure

Figure 1 an example of a 'causal loop diagram', which shows a 'chain of causality'. So a *number of people who fear they might be 'victims'* might raise a corresponding *number of complaints*. These two variables are linked by a 'curly arrow', which shows the direction of causality: it's the *people who fear they might be victims* who give rise to the *complaints*, not the other way around. Furthermore, the greater the *number of people who fear they might be 'victims'*, the greater *the number of complaints* – these two variables move in the same direction, increasing (and indeed decreasing) together. The link between the *number of people who fear they might be 'victims'* and *the number of complaints* is therefore known as a 'direct' link, and is represented by a solid curly arrow.

A further factor which affects the *number of complaints* is the *cost and difficulty of complaining* – if it's very *costly and difficult to complain*, then the *number of complaints* is likely to be diminished, whereas if it's very *easy and cheap*, then the *number of complaints* will be higher. In this case, the variables at each end of the arrow are moving in opposite directions, and so the link between them is known as an 'inverse' link, as represented by a dotted curly arrow. At first sight the difference between a direct link and an inverse link appears to be confusing, and the corresponding use of both solid and dotted curly arrows seems to be adding clutter. As we shall shortly see, however, these distinctions are very important.

The next feature of Figure 1 merits some thought: the assertions that the *number of service failures discovered on enquiry* depends on the *number of complaints* (as indicated by the direction of the curly arrow), and that this link is direct (as shown by the use of a solid arrow), implying that the greater the *number of complaints*, the greater the *number of service failures discovered on enquiry*. There are two, different, ideas captured here. The first is that a complaint, by its very nature, initiates a search, a search that would not take place otherwise. And the second is that *service failures* are already present, waiting to be discovered. If in fact the *quality of service provision* is absolutely superb, then no *service failures* have happened, and there are none to discover. There could be as many *complaints* as people wish to make, but any enquiry will say "sorry, but you were treated fairly". Alternatively, if the *quality of service provision* is extremely poor, the *number of service failures* that have actually happened could be huge – but the service provider could be 'getting away with it' as long as no-one complains. The *number of service failures discovered on enquiry* is therefore determined both by the *number of service failures* actually present, and by the *number of complaints* investigated.

Why, though, would any organisation, commercial or public, tolerate *service failure*? Because – as shown in Figure 2 - providing high quality services costs time, effort, skill, conscientiousness and money. And if the service provider is under *pressure to reduce costs*, perhaps to compete more vigorously in the market, perhaps because of central budget cuts, or simply to make more money for the owners, then those cuts have to come from somewhere - so the greater the *pressure to reduce costs*, the lower the likely *quality of service provision* (hence the inverse link). Commercial realities put any number of pressures on service providers to sail as close to the wind as they can, and if they can get away with it, they will; and if the potential 'victims' are both ignorant and weak, then they might be able to continue to get away with it for a long time - as the various scandals which have come to light in the UK over the last few years demonstrate only too clearly.

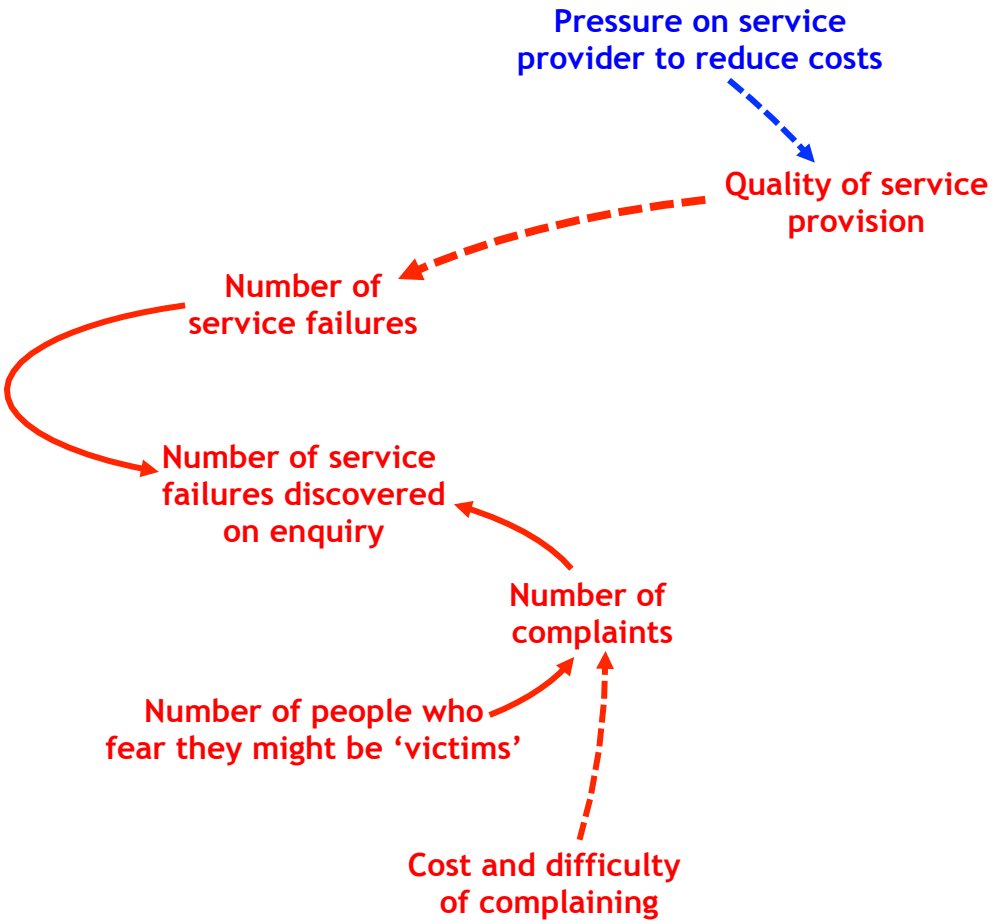

Figure 2: The reason behind service failure

A nasty vicious circle

If the *number of service failures discovered on enquiry* becomes rather large, or if they are in an area of public importance, it's rather hard to keep that quiet. Sooner or later, the news media will find out, as depicted in Figure 3:

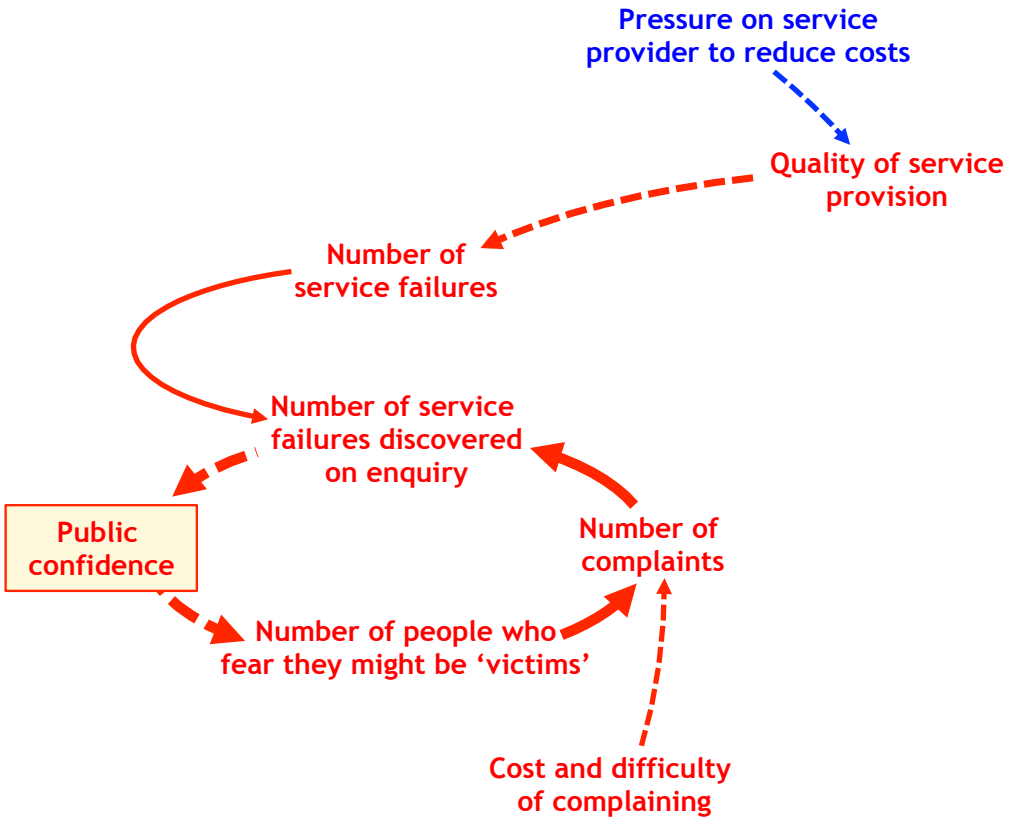

Figure 3: The escalating erosion of public confidence

As the *number of service failures discovered* increases, and as word begins to spread, *public confidence* plummets - hence the dotted curly arrow. The media then champion the victims, and other people start to think "might that have happened to me?". So, as *public confidence* goes down, the *number of people who fear they might be 'victims'* goes up - hence the next dotted curly arrow. I, and my neighbours, make a *complaint*; the *service failures* of which I and my neighbour are *victims* are duly *discovered*; this also gets into the news, which drives *public confidence* even lower… so fuelling a very nasty 'vicious circle' that spirals away under its own momentum…

The 'vicious circle' is evident from the closed loop highlighted in Figure 3. Technically, this is known as a 'reinforcing feedback loop' – a 'feedback' loop because it 'feeds back' on itself (as shown by the closed nature of the loop), and 'reinforcing' because it becomes ever stronger on each spin. This is what happens when there is a 'run on the bank', or when public fear of a shortage of, say, sugar causes everyone to go to the local shop to stock up on sugar, "just in case"… so causing a shortage of sugar. It's also what has happened with the UK PPI scandal (Financial Times, 2014), and is happening as regards appeals relating to the grading of school examinations:

"Schools and colleges that are aware of subjectivity in marking know an enquiry about results may lead to a change in marks. Where students' marks are just below a key grade boundary, the likelihood is their grade will improve or, at worst, stay unchanged as a result of the enquiry. This led some head teachers to describe the practice of entering enquiries about results just below the grade boundaries as a 'one-way bet'."
(BBC, 2014a)

"More than 45,000 exam grades from this summer have been changed after schools challenged the results, up by 15%."
(BBC, 2014e)

The closed loop in Figure 3 contains two inverse links. This is important, for a general rule of systems thinking, and of the interpretation of causal loop diagrams, is that "if there are an even number of inverse links within any closed loop – with zero counting as an even number – then the corresponding loop is a reinforcing loop, and will behave as either as a vicious circle or a virtuous circle" (see, for example Morecroft, 2007; Sherwood, 2002; and Sterman, 2000). The closed loop in Figure 3 contains two inverse links; two is an even number; therefore this loop is a reinforcing loop – which in this case is singularly vicious. As we shall see shortly, closed loops which contain an odd number of inverse links – known as 'balancing loops' – behave very differently, introducing stability.

Enter the regulator

One of the ways in which *the number of service failures* can be reduced, if not eliminated altogether, is by stronger regulation – regulation that ensures that the *quality of service provision* meets minimum standards, so that *service failures* just don't occur. Certainly, different regulators operate differently in different markets and in different jurisdictions, but in general, in many of the UK's consumer-facing markets, such as those concerned with health care, services and education, I suggest that the role of the regulator can be meaningfully captured as shown in Figure 4:

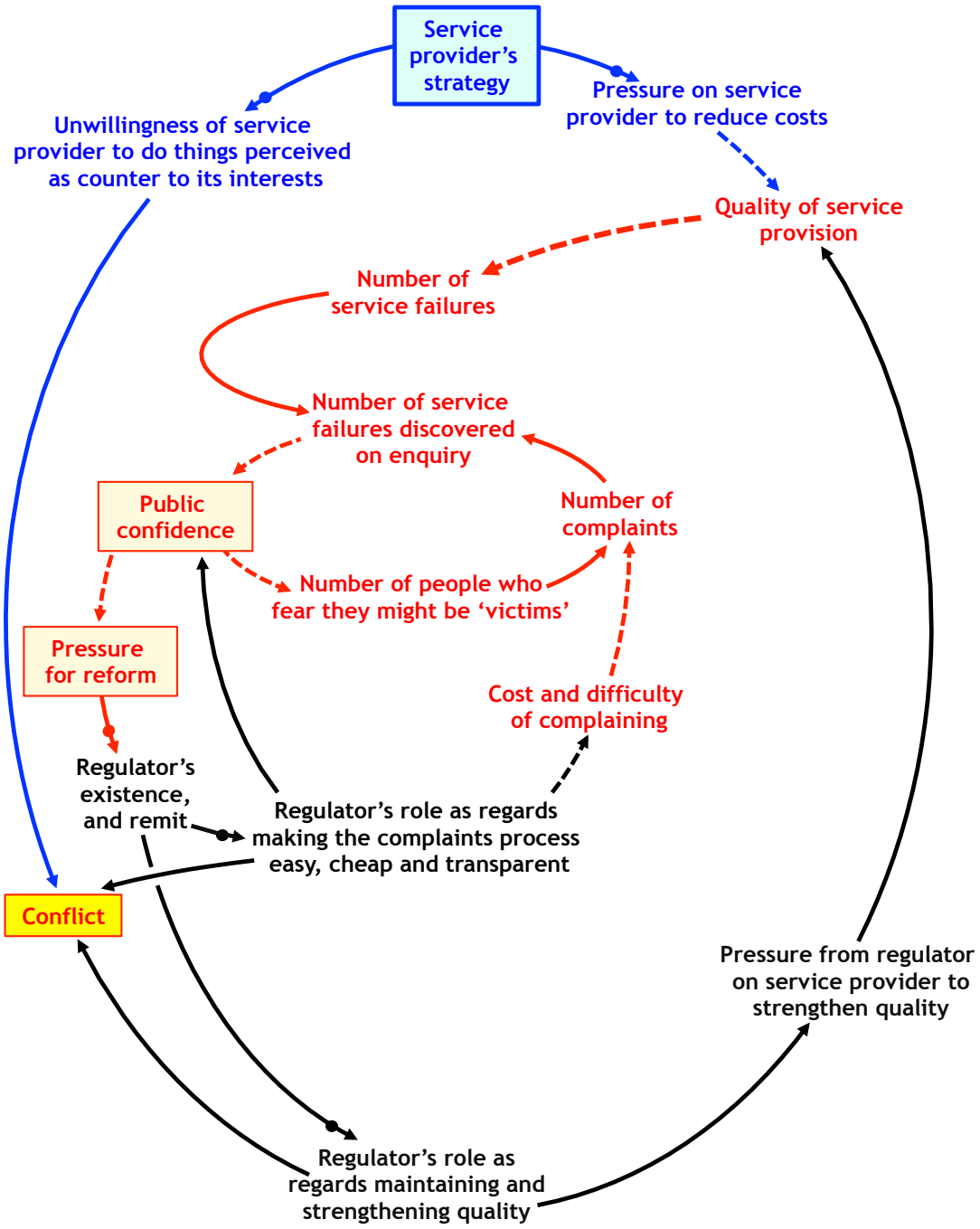

Figure 4: The current regulatory system

One important role of the regulator is to make it easier to *complain* – for example, by enforcing industry-wide rules as regards how complaints can be made, how quickly they need to be attended to, how much (or rather, how little) making a complaint should cost, and how to make any subsequent appeals. Furthermore, many regulators strive *to maintain and strengthen the quality of service delivery*, as achieved, for example, by supervising training, qualifications and the accreditation of individuals providing the

service; by auditing and validating processes; by carrying out site visits; and by penalising offenders.

In an ideal world, of course, we wouldn't need regulators, for everyone, naturally and voluntarily, would do 'the right thing'. In the real world, however, that – regrettably – doesn't happen. So regulators spend their entire lives influencing, cajoling, and threatening the regulated to do things they would not voluntarily choose to do of their own accord. So *conflict* is intrinsic to the system – as explicitly shown in Figure 4. Importantly, the variable *conflict* has three curly arrows going in and none coming out, implying that *conflict* is an inevitable result of the system's operation.

Figure 3 also shows another new variable, the *service provider's strategy*, associated with two rather different curly arrows – solid arrows with 'blobs'. These 'blobbed curly arrows' represent influence rather than 'directional causality'. To explain: recall that as the *number of people who fear they might be 'victims'* increases, so does the *number of complaints*, implying that the link between these two variables is direct, as represented by a solid curly arrow. This makes sense because the *number of people who fear they might be 'victims'*, and the *number of complaints*, can both be counted, and subsequent measurements can be bigger or smaller than earlier ones. The *service provider's strategy*, however, is a variable of a very different type: it cannot be measured, nor can it be associated with degrees of 'strength' or 'weakness' – in contrast, for example, to *the pressure to reduce costs*, which, as every manager knows, can be very strong indeed. The strategy might be judged 'good' or 'bad', but that's rather different, being largely subjective, and often only confirmed after-the-event. We'll all agree, though, that even though it can't be measured, the *service provider's strategy* is an important factor, for it will determine, for example, the service provider's policies (such as how close to the wind it wishes to sail, if close at all), as well as what its *interests* are, and so the likelihood of being in *conflict* with the regulator, or indeed not. So the *service provider's strategy* is legitimately shown in Figure 5 as a significant variable, acting as a driver of the system and exerting important influence. But since this influence is neither necessarily 'direct' nor 'inverse', the representation of the influence is shown differently, using the 'blob'.

A further feature of Figure 4 is a recognition that, sooner or later, an erosion of *public confidence* builds up an increasingly strong *pressure for reform* (hence the inverse link), which can also have significant influence: influence on the regulator's *remit* - what it does, and what its powers are (as is happened in the UK recently with the regulation of the press), and indeed on the regulator's very *existence*. Which explains all those tombstones standing gloomily in the UK regulator's graveyard, bearing names such as the Financial Services Authority, the Commission for Social Care Inspection, the Qualifications and Curriculum Authority…

Figure 4 is my 'mental model' of the world-as-it-is-today for many regulators in the UK. Yes, it is a simplification, and there are many variables

I haven't included. Not (I don't think) because I haven't noticed them, but because I think they are less significant, for one of the key benefits of systems thinking, and of causal loop diagrams, is the way in which they allow you to capture, clearly and succinctly, the important essence of an otherwise overwhelmingly complex system, so enabling you to see the 'wood' of the 'big picture' for the 'trees' of all that real, but often confusing, clutter. But my 'mental model' is just that – a 'mental model', a 'picture' of how I believe the world works. You might believe something different. Great. How can we combine our different mental models so that our respective views of the world are both enriched? I welcome dialogue!

Why regulation is currently failing

You might expect, after so many years of regulatory experience, that regulators would have learnt enough to get it all right. If so, then why do scandals continue to happen? Scandals from Stafford Hospital:

"*Mid Staffordshire NHS Foundation Trust is to be broken up and key services moved to neighbouring hospitals. The Health Secretary Jeremy Hunt said the move would secure "the safe and high quality services that the people of Stafford deserve.*"
(BBC, 2014c)

to teachers 'gaming' the school examination system:

"*Michael Gove is changing league table rules in England to try to stop schools from "gaming the system.*"
(BBC, 2013a)

to the mis-selling of electricity supply contracts:

"*Thousands of SSE customers are entitled to a share of a £5m compensation fund set up by the energy giant today. The company, which has 10 million customers, has been fined £10.5m by Ofgem, the industry regulator, for lying to customers and for "prolonged and extensive" mis-selling.*"
(The Daily Telegraph, 2014)

These are recent examples, in three very different domains, from the UK alone! And in all of these cases, and many others too, the victims have been ignorant and weak, the perpetrators have been knowledgeable and strong, and the poor regulators have been at best blind-sided, if not fast asleep. And let's remember that these are just the ones that have hit the papers…

If regulation were working well, these events would be rare. They are not. They are frequent. And they are not isolated to one particular sector, say the electricity market, nor to one particular location, such as 'town [X]'. If they were, then the problem would be attributable to something happening within a single specific sector (perhaps as a result of some sort of cartel), or locality (perhaps the failings of a particular manager). But the fact that these problems are so widespread implies that they are not specific but

rather systemic. They are not the ‘fault’ of ‘wicked people’ (that nasty cartel), or of ‘that incompetent manager’. Rather, these failures are the result of the way the regulatory systems have been designed, and the way in which these systems operate.

This systemic failure is clear from Figure 4, when looked at in the ‘right’ way. For if - as I assert – Figure 4 is a reasonable, and meaningfully simplified, representation of many of the highly complex systems of regulation in the UK, then the reason why these systems fail so frequently is evident from two particular features of Figure 4, one explicit, and one implicit.

The explicit feature is that *the only way of discovering a service failure is by making a complaint*. Now, the only people who are likely to make a complaint are ‘victims’ of the service failure. But, as I have explained, many of these are ‘ignorant’ of what ‘good’ service should be, and even if they feel that they are ‘victims’, they may be too ‘weak’ to complain. So the system has been *designed* to put the burden of identifying service failure on those who are in the worst possible position to make a complaint! On dear!

The implicit feature is something that is not shown on Figure 4, but is there, in the background. Figure 5 throws the spotlight onto a key variable that is, so far, ‘hidden’...

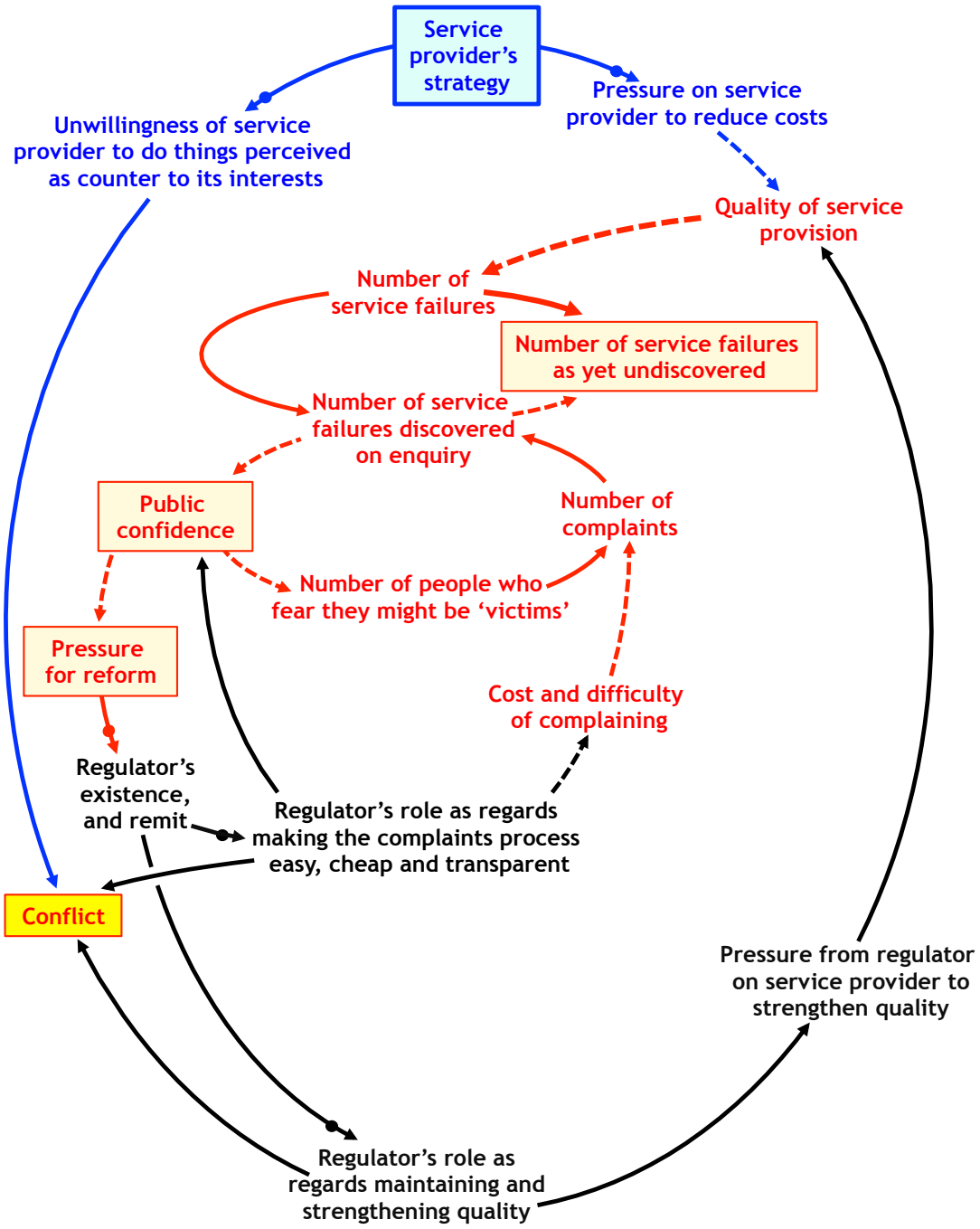

Figure 5: The key problem - undiscovered service failures

The *number of service failures as yet undiscovered*. Service failures that are there, because they have happened. But haven't been discovered because the corresponding victim has been too ignorant, or weak, to complain.

As can be seen from the diagram, this newly-introduced variable, the *number of service failures as yet undiscovered*, is connected into the rest of the diagram by two 'curly arrows' – one from the *number of service failures* and the other from the *number of service failures discovered on enquiry*.

There are no arrows leading away from the *number of failures as yet undiscovered*, implying that this variable is a ***result*** of other things happening, and not a ***cause***. The *number of service failures as yet undiscovered*, like *conflict*, is therefore an end-result of the way the system has been designed, and that number of errors will stay there undiscovered ... unless or until someone makes a complaint. And if no-one complains, there will stay there for ever. Such that the service provider will say "no-one has complained, therefore our service is perfect!".

Let me make that real. In England, Wales and Northern Ireland, twice a year – in November and (in greater numbers) in June – 16-year-olds sit a public examination in a range of subjects, known as 'GCSE', and 18-year-olds sit an examination at a higher level, and in a narrower ranges of subjects, known as 'A level' (students in Scotland sit examinations too, but they have different names). These examinations are important – grades at A level open the door to higher education and employment, and grades at GCSE are a major milestone along that way. GCSEs and A levels are regulated by a 'non-ministerial government department' known as 'Ofqual' and after every examination round, Ofqual publishes copious statistics, including data about investigations arising from complaints that a candidate might have been awarded the wrong grade.

According to Ofqual's *Statistical Bulletin* (Ofqual, 2015), for GCSEs sat in the summer of 2015, a total of 5,610,550 qualifications were awarded, each qualification being the award, to a given candidate, of an examination grade in a given subject. At the time of writing, the grades awarded are A*, A, B, C, D, E, F and G. Officially, there is no pass or fail – each candidate is simply given a grade. An important performance measure for schools, however, is the percentage of awards graded A*, A, B or C, so the C/D boundary is of especial importance. The number of grade awards – 5,610,550 – made in 2015 is similar the numbers in recent years – 5,777,700 in 2011, 5,822,100 in 2012, 5,872,050 in 2013, and 5,528,750 in 2014.

The 2015 *Statistical Bulletin* tells us that, following the publication of the 2015 grade awards, a total of 345,500 awards were challenged, resulting in a total of 62,150 grade changes, of which 61,750 were upwards (implying that the candidate had officially been given a grade lower than he or she truly deserved), and 400 were downwards. This implies that 18% of complaints resulted in the uncovering of service errors.

The 2015 *Statistical Bulletin* also publishes the number of complaints received each year over the preceding four years: 160,100 in 2011; 207,600 in 2012; 234,050 in 2013; and 292,350 in 2014. This number has been steadily rising year-on-year, even though the total number of grade awards has been more-or-less the same, around 5.7 million. Does this bring to mind the reinforcing loop in the centre of Figures 3, 4 and 5?

And then there is the number that is not published (or maybe it was – but I didn't find it). The number of grading errors in the population of awards

that were not challenged. Given that 345,500 complaints were made from a population of 5,610,550 qualifications awarded, then 5,265,055 certifications remained unchallenged. We know that, of the 345,500 complaints actually made, 62,150 errors were discovered. *These errors must have been present when the examination results were published, and were discovered only because a complaint was made*. So how many errors are there in the remaining 5,265,055 unchallenged results, errors that are still there, but have not been discovered, simply because no complaint was made?

It could, of course, be the case that the complaints process is very 'clever', and that all the errors were unmasked. But...

This is just one instance of the systemic flaw in regulation – and an instance supported by considerable data since Ofqual put a lot of information into the public domain. But the generalised point remains. The system should not rely on the ignorant and the weak, the vulnerable and the trusting, to discover errors.

The fatal flaw

If the key roles of many regulators are as shown in Figure 5, then these failures aren't, directly, the regulator's fault. For, as is evident from the Figure, the system itself is fatally flawed: integral to the structure of the system is the fact that the *number of service failures as yet undiscovered* is an end-result of the system's operation. Even worse is the fact that the only mechanism for *errors to be discovered* is for the ignorant and the weak to *complain*, or for some brave 'whistle-blower' to complain on their behalf. If no-one complains, the system could be full of *service failures*, *failures which remain undiscovered* because no-one has looked for them; *failures which remain undiscovered* even though the regulator has approved the directors as fit-for-purpose, as recently happened at the UK's Co-op Bank:

"*Approving local councillor Paul Flowers as chairman of Britain's Co-op Bank was a mistake but only with the benefit of hindsight, the regulator who played a key role in the appointment conceded on Tuesday.*"
(Reuters, 2014)

Failures which remain undiscovered despite the fact that the regulator visited the site and gave it "good" marks, only a few months before it was shut down:

"*The coroner said that her inquiry into the death of 19 residents at the "state-of-the-art" home run by now defunct provider Southern Cross showed that all had received "sub-optimal" care and criticised the industry watchdog - the Care Quality Commission - for giving it a "good" rating in 2010.***"**
(The Independent, 2013b)

This last is just a recent example of a sport which has a long, and 'distinguished' history: the sport of hoodwinking inspectors, in which, it seems, Russia is a long-term gold medallist - the story of the 'Potemkin Villages', which popped up during the reign of the Empress Catherine the Great, is (probably!) true (Alexander, 1989); Nikolai Gogol's *The Government Inspector* is (certainly) engagingly crafted fiction (Gogol, 2011)!

Yes, it's all too easy to throw bricks, to criticise. What can we actually do to make the system work differently, and better?

What, then, is the solution?

Well, that's not so difficult to discover: in fact, Figure 5 tells us exactly what to do. The systemic problem is the fact that *the number of service failures as yet undiscovered* is an end-result of the system's operation. The solution is therefore to stop it from being just an end-result, and link it in to the system. The central problem, the problem that needs to be fixed, is that Figure 5 has a 'missing link', a missing link that can be filled as shown in Figure 6:

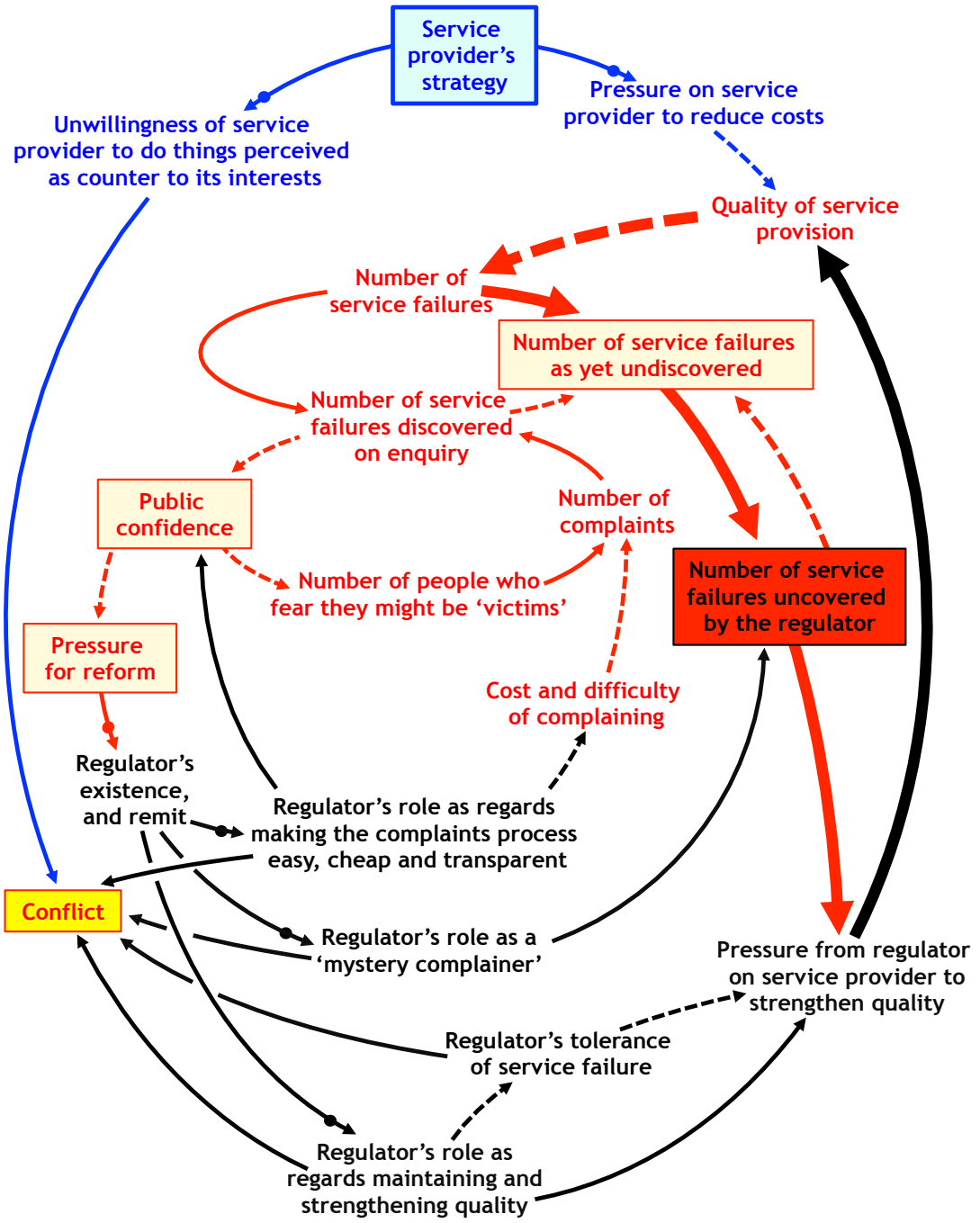

Figure 6: The solution to the regulatory problem

Figure 6 introduces a new variable – the *number of service failures uncovered by the regulator*, for this directly addresses the key question "how many service failures are there, remaining undetected, simply because no-one has complained, or perhaps because complaints that have been made have been ignored?". Clearly, the best way to find out is by having the regulator act as a tenacious '*mystery complainer*', deliberately seeking to uncover *service failures*, on behalf of those who have neither the

knowledge nor the power to have done so on their own behalf; *service failures* that have remained hidden and buried, because the victim has been too ignorant or weak to complain.

Pragmatically, this can be achieved by well-planned statistical sampling. The total number of people who have been receiving the service is probably known, or can be determined, and from this the regulator can select a representative random sample. The regulator can then pursue 'complaints' on behalf of that sample, and so determine how many service failures have occurred in relation to that sample. As a result, the regulator can then make a good estimate of the total number of service failures likely to have taken place in relation to the whole population.

At which point, the regulator can wield a very big stick indeed. The size and weight of the stick should, pragmatically, be determined by what might be determined as an '*acceptable*' *level of service failure*. So, if, having acted as a '*mystery complainer*', the regulator estimates that the actual number of *service failures* is significantly greater than the '*acceptable*' level, then the regulator uses its powers to force the service provider to increase the *quality of service provision*; if, however, the estimate of the actual number of *service failures* is within *tolerance*, the regulator can continue to keep just enough pressure on the service provider to ensure that *service quality* is maintained to (at least) the required standard.

This of course begs the question of what an '*acceptable*' *level of service failure* might be. I don't have a specific answer to this, and it may, sensibly, be context-dependent. My starting point, however, is that the '*acceptable*' *level* should, in general, be very low indeed: If six sigma can reduce errors in manufacturing to a vanishingly small level, then services can, and should, do likewise.

From a formal systems standpoint, the introduction of the link from the *number of service failures as yet undiscovered* to *pressure from regulator on service provider to strengthen quality* by way of the *number of service failures uncovered by the regulator* not only embeds the *number of service failures as yet undiscovered* within the system, it does something else too – it forms a new closed feedback loop, as shown by the 'heavy' arrows.

This new loop exhibits a behaviour different from that of the loop we have already examined - the closed loop linking *service failure*, *public confidence*, *number of victims* and *number of complaints*. This loop, as we saw, got bigger and bigger on each turn; in contrast, the new loop through *service failure*, *failures left undetected*, *failures uncovered by the regulator*, *regulator pressure* and *service provider rigour* stabilises on whatever number of *service failures* complies with the appropriate *tolerance*. A loop which 'grows' is, as already mentioned, called a 'reinforcing feedback loop'; a loop which 'stabilises' is called a 'balancing feedback loop'.

How can you tell the difference? For any closed loop, go round the loop, and count the number of inverse links. If that number is odd (1, 3, 5…) then it's a balancing loop, and will in general stabilise (rather like a thermostat controlling the temperature of a room). If the number of inverse links is even (2, 4, 6… and also 0 too), then it's a reinforcing loop, which will ultimately blow up (like the population of rabbits in Australia, in the absence of natural predators), behaving as a 'vicious' or 'virtuous' circle (depending on your view of, for example, whether lots of rabbits is a good or a bad thing!). So that's why it's important to identify, and distinguish between, the direct links and the inverse links – counting the number of inverse links within any one close loop determines how that loop behaves, so allowing you to infer how the whole system behaves.

Regulators should regulate outcomes, not processes

What this is all about is for regulators to regulate outcomes, not processes. Processes can always be made to look good, and clever people know how to paint over the cracks when the inspector calls. But if regulators were to measure outcomes in the way I have described, raising 'complaints' as if they were 'victims', then the ignorant and the weak would not be anywhere near so vulnerable as they are now. And the world will certainly be a better place.

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