MISSING THE SLOW TRAIN
HOW GRADUAL CHANGE UNDERMINES PUBLIC POLICY & COLLECTIVE ACTION

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Last year, the global population grew by a mere 1.13 percent, yet the United Nations Population Division projects that it is likely to increase from 7.3 billion today to 11.2 billion at the century's end. The rate of global warming averaged over the past 50 years is just 0.13 degrees C per decade, increasing over time as more fossil fuels were burned. Yet the UN Intergovernmental Panel on Climate Change warns that if the world continues down its current carbon-emitting course, the average global temperature could rise

by up to a staggering 4.8 degrees C (8.6 degrees F) at the end of the century. Global deforestation has been creeping along at just under 1 percent annually, but this seemingly low figure is resulting in a loss of over 28 million acres per year.

These are examples of "Slow Problems," where small, hardly noticeable changes add up to produce large effects. Slow Problems all involve some form of deterioration occurring over a period of decades, generations or even centuries – time periods that historians regularly deal with but that stretch out beyond the timeframe in which governments make budgets or do strategic planning. In the U.S. government, where political appointees remain on average for two years, problems of this kind are typically treated as low priority or politically irrelevant, if they are noticed at all. The media, caught in the constant 24/7 push for clicks and hits, pays scant attention to these problems, except when slow change reaches some tipping point and results in disasters and high death tolls that capture front page headlines – and then these stories promptly fade.

Many Slow Problems could have grave consequences not that far beyond our normal planning horizons. In health care, for example, the World Health Organization describes the slow growth of antimicrobial resistance as a problem that "threatens the effective prevention and treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses and fungi… a problem so serious that it threatens the achievements of modern medicine."[1] A recent report by the International Diabetes Federation estimates that the number of people with diabetes will grow from roughly 285 million in 2010 to 592 million by 2035 – nearly a tenth of the world's population. According to the report, despite better treatments and improving education strategies, the battle to protect people from diabetes and its complications "is being lost."[2]

This pattern of slow deterioration fits many of our most serious environmental problems such as species extinction and climate change as well as resource-related problems like aquifer depletion and soil erosion. It also characterizes most of our major infrastructure challenges – decaying roads and bridges, railroad and transit systems, water and sewer systems. Problems of this kind are creeping forward in nearly every policy area.

We catch occasional glimpses of Slow Problems in newscasts or op-eds, but they seldom seem to reach the critical level of sustained visibility and concern they deserve. Without that awareness and sense of alarm the problems are likely to continue worsening until their impacts become severe and obvious, stressing our ability to respond or, in worst cases, passing tipping points where no amount of effort can prevent catastrophic failures.

We urgently need a better understanding of why Slow Problems are so difficult to deal with. No single explanation is sufficient. But insights from several different fields – evolutionary psychology and neuroscience, behavioral economics and decision theory and social psychology – can help us see what we are up against so we can devise better strategies for approaching this class of problems. We also need to better understand why the media spends so little energy on covering these problems and what the implications of transient or non-existent coverage are for collective action. But let's start with a trip back to our origins.
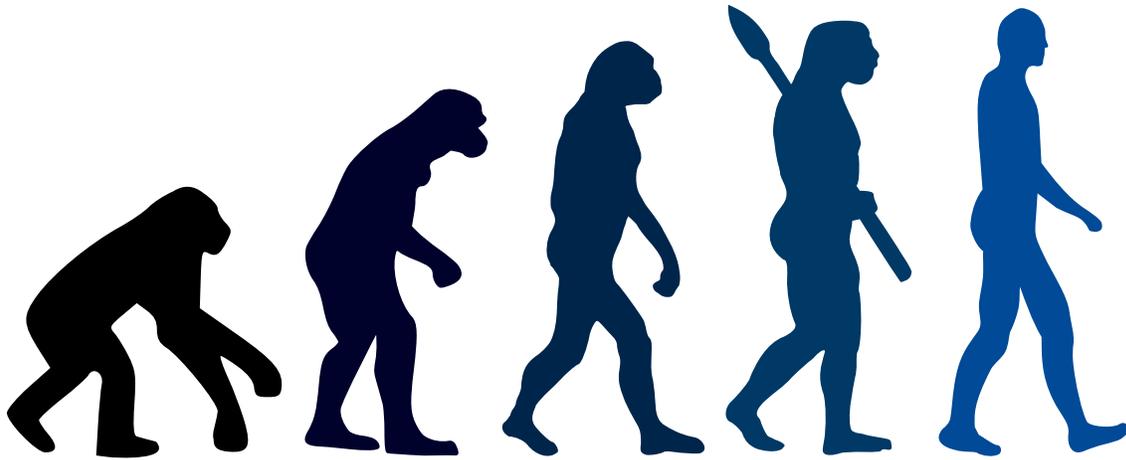
SURVIVING ON TWO LEGS

Even when Slow Problems grab our attention, they seldom galvanize people to action. A fundamental reason for this failure to react is that our brains are simply not wired to notice and respond to large, slow-moving threats.

The field of evolutionary psychology studies the "environment of evolutionary adaptedness" in which the human brain evolved. Psychologist Robert Gifford sums up the perspective of the field: "The human brain has not evolved much in thousands of years. At the time it reached its current physical development… our ancestors were concerned with their immediate band, immediate dangers, exploitable resources and the present time," not with problems that are "slow, usually distant, and unrelated to the present welfare of ourselves and our significant others."[3]

Psychologist Daniel Gilbert argues that our brains evolved to respond best to threats that have four properties: intentional, immoral, imminent and instantaneous. Of these, he is most inclined to emphasize the last two, "now" and "abrupt."[4]

Intentional Much of our mental capacity is devoted to thinking about what the people around us are thinking. Some scientists believe our need to understand the thoughts, feelings and intentions of other people is what drove the rapid growth of the human brain over the past two million years. We are "hyper-vigilant," Gilbert says, "to signs of human agency." We show comparatively little concern over the fact that influenza sometimes kills more than 40,000 people in one year alone in the United States. But if terrorists killed 40,000, or even a few dozen, people with a disease-spreading bioweapon, it would immediately dwarf every other news story on the planet and mobilize massive government action. Virtually all Slow Problems are like the flu: There is no villain, no intention to cause harm. No one is deliberately setting out to undercut the effectiveness of antibiotics, undermine the economy with debt or destabilize the global climate system.

Immoral Some kinds of human actions deeply offend our moral sensibilities and impel us to action. But Slow Problems, where there is no intentionality and responsibility is highly diffused, seldom confront us with anything that feels evil, indecent or impious. Our moral alarms never get tripped.

Imminent A large part of the brain is devoted to responding to clear and present threats, because a primary need when the human brain was evolving was the ability to quickly get out of the way of physical dangers. A much smaller part of the brain is devoted to thinking about circumstances that are

not yet here and getting out of the way of problems that are emerging slowly. Foresight is possible, but in evolutionary terms "it's still in Beta testing" and requires considerable effort.

Instantaneous People are especially sensitive to changes that occur quickly and are prone to ignore changes that happen slowly. As Gilbert says, the slow thinning of our hair as we age is given little attention, but if we woke up bald tomorrow it would be extremely alarming.

David Rejeski at the Woodrow Wilson International Center for Scholars suggests that there is a threshold rate of change, which he estimates at roughly 2-3 percent per year, below which many important social, economic, technological and demographic changes can occur without getting on the political and public radar screen. Things like global deforestation and the U.S. population, both growing at about 1 percent per year, are changing too slowly to attract much attention. But college tuition and health care costs, growing at more than 6 percent per year, make headlines. Slow Problems, by definition, fall below this kind of threshold of concern. And, as mentioned earlier, these changes are imperceptible within the timeframes of political decision-making, planning and budgeting in most governments.

Daniel Gilbert highlights the importance of another factor, certainty. We respond much more forcefully to threats that are certain than to those that are ambiguous and unsure. As the issue of climate change illustrates, the best strategy available to those trying to block action after a scientific consensus has been reached is to "keep the controversy alive" by working to foster continuing uncertainty and doubt.[5] Many Slow Problems do, in fact, involve various degrees of uncertainty about their causes, how quickly they are emerging and how serious they could ultimately be. Political adversaries and nay-sayers exploit this uncertainty to their advantage.

One more factor, the growth of complexity, deserves attention. The simpler, small-scale social groupings in which humans evolved could be understood fairly well in terms of simple cause-and-effect relationships. But the complexity of our society and its problems has been increasing rapidly. Problems like energy, water and food production are interacting with each other in tangled webs of causality where doing things to solve one problem can make others worse. The more interwoven problems become, the more they require thinking in terms of complex mutual casual processes – not the kind of thinking our brains evolved to do best.[6]

What the Scientist Sees

CO_2 **End of an evolutionary phase**

One Million Years
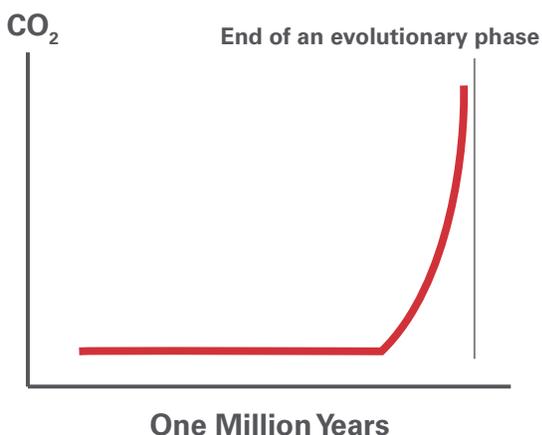
What Most Politicians See

CO_2 **End of my term**

18-24 months
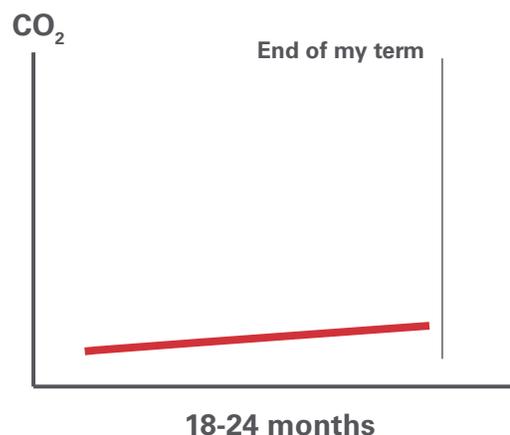
These findings from evolutionary psychology are supported by research in neuroscience. Most importantly, functional magnetic resonance imaging (fMRI) shows that the connecting lines between the amygdala, the emotional urgency center of thinking and the prefrontal cortex, the brain region associated with planning complex behavior, is to a large extent a one-way street.[7] Strong emotional reactions – as to intentional threats, immoral actions, clear and present dangers, rapid changes, etc. – can spark reasoning and planning, but not the other way around. Threats that our reasoning suggests may be important in the future do not normally trigger a powerful emotional urgency to act in the present.

Our brains are wired to respond to threats that involve:	Slow Problems have:
Intentional action to cause harm	No intentional action to cause harm
Immoral actions that cause revulsion and impel action	No moral alarms are tripped
Visible, clear and present dangers	Circumstances that are not yet here
Changes that occur quickly	Changes drawn out over years, decades or longer
High certainty	Often various degrees of ambiguity and uncertainty
Simple causality	Complexity

On top of our innate wiring, there is some emerging evidence that our hyper-connected lives are rewiring our brains. Recent research by Microsoft has indicated that our average attention span has dropped to eight seconds (from 12 seconds in 2000). Satya Nadella, the CEO of Microsoft, commented that in the future "The true scarce commodity will be human attention."[8]

It is no wonder, then, that Slow Problems often fail to galvanize our attention and trigger immediate action. They are all the more perilous because they evade every one of the major alarm systems our brains evolved to avoid danger. They fly in under the radar. And even when we do see them, we often have problems assessing their likely impacts.

I SAW THAT, BUT WAS IT IMPORTANT?

Our brains are not only poor at attending to Slow Problems, they also have trouble properly assessing risks the problems pose even when they are noticed. Neuroscientist Joseph LeDoux argued in his book The Emotional Brain that as the analytic capabilities of our brains evolved the amygdala was allowed to maintain its dominance in decision-making because of its ability to rapidly react to threats. So, while the "rational brain" is slow and deliberative, weighing evidence, the "emotional brain" is impulsive and quick to apply mental shortcuts in order to make quick decisions. The problem is, these shortcuts sometimes lead to poor decisions.[9]

There has been a great deal of interest in ideas like these in recent years, leading to groundbreaking work exploring how common decision errors arise from the way our cognition naturally operates. The most prominent work has been done by the Israeli-American psychologist and economist Daniel Kahneman, who refers to these two kinds of mental processes as the fast "System 1," which operates automatically with little or no effort and no sense of voluntary control, and the slower "System 2,"

which involves sustained mental effort and conscious rational calculation.

With Amos Tversky and others, Kahneman explored how the mental biases and heuristics employed by System 1 sometimes distort judgment and cause us to misperceive risks. His findings challenged the assumption of human rationality at the foundation of mainstream economic theory and helped found the field of behavioral economics. Kahneman was awarded the Nobel Prize in Economic Sciences in 2002. His recent book Thinking Fast and Slow provides an overview of his work and the work of many others in this field.[10]

The cognitive biases these researchers have identified apply to how we approach many kinds of problems. Unfortunately, people's views of the risks involved in Slow Problems are particularly vulnerable to distortion by these biases. Below are several examples.[11]

Social Discounting – People tend to undervalue future risks, a fundamental problem in trying to convince people of the importance of Slow Problems.[12]

Short-Term Bias – People are consistently more sensitive to short-term costs than to long-term costs. They are reluctant to accept short-term losses even if they are necessary to prevent much larger long-term losses. This is especially true if there is any uncertainty about the extent of long-term losses. As a result, people are reluctant to make sacrifices now to head off Slow Problems and avoid much larger costs in the future.

Optimism Bias – People generally assume they face lower risks than others do: Other smokers are more at risk of a heart attack, other drivers are more likely to have an accident, and so on. They may grow pessimistic about the economy or the future more generally, but individually still believe they are at less risk than others from any threats and tend to ignore information to the contrary.[13] So even when people become aware of a Slow Problem, they are likely to minimize the impact it might have on them.

WYSIATI: What You See Is All There Is – People often jump to conclusions based on the limited evidence they see at first and fail to allow for the possibility that they are missing information critical for making a good decision. They often stop seeking information as soon as they have a consistent "story" of what's happening, because it is the consistency of information that makes for a satisfying story, not the quantity or quality of evidence.[14] Seeing that a Slow Problem is not so serious today can cause people to jump to the conclusion that it is simply "not serious," cutting off efforts to gather more information and understand how serious it could eventually become.

Loss Aversion – In situations where both a gain and a loss are possible, people tend to give more attention to avoiding losses than to pursuing gains. This occurs even where the potential gains are considerably larger than the potential losses.[15] So it can be difficult to get people to incur costs to address a Slow Problem, even when doing so would not only keep things from getting worse but also make things better.

Affect Heuristic – People often make decisions by consulting their emotions or "going with their gut."[16] They substitute the answer to an easier question (how do I feel about it?) for the answer to the harder question (what do I think about it?). Because people do not want a problem to be disruptive and costly, they are often inclined to decide the problem is not really serious.

Certainty Effect – People tend to give less weight to outcomes that are almost certain than their probability justifies, causing them to underestimate even problems that cannot be denied.[17]

Availability Bias – People are disposed to make up their minds on the basis of evidence most readily at hand. They may assume they are using all available information to make decisions but are actually making them on what they remember best, which tends to be recent experiences or dramatic events highlighted in the media.[18] This leads to overestimating the dangers of recent events and underestimating the dangers posed by more distant threats. The availability bias also undermines efforts in organizations to undertake effective scenario planning, a technique which might help support better decision-making under conditions of uncertainty.[19]

Confirmation Bias – People tend to notice and seek out information that supports already-established views.[20] When people hold erroneous views about problems, it is hard to get information through to them that might change their minds.

These cognitive biases are not just a matter of theory; they have been confirmed by hundreds of carefully designed experiments repeated with all kinds of people. You can even verify the reality of some of them with simple self-tests. For example, imagine you are offered a gamble on the toss of a coin. If the coin comes up tails, you lose $100. If it comes up heads, you win $150. Would you accept the gamble? The gamble's expected value is highly

positive, because you stand to gain considerably more than you could lose. But, like the great majority of people, you probably dislike the bet. The prospect of loss looms larger in your mind than the prospect of gain.[21] That's the *Loss Aversion* bias.

Cognitive biases like these clearly make it harder to deal with Slow Problems. The biases can be overcome, and we often do that in our own personal and work lives. If that were not so, our lives and our society would be in a drastically worse condition than they are. But overcoming the biases requires mental effort – in Kahneman's terms, a greater use of System 2 slow thinking to move beyond our System 1 fast thinking. We need more Slow Thinking to deal with our Slow Problems.

I SAW IT, BUT SOMEBODY ELSE WILL DEAL WITH IT

Beyond our cognitive biases and the way our individual brains are wired, there are social and psychological dynamics that sometimes keep us from accepting the reality of problems or agreeing on policy actions to deal with them. Here is a sampling.

Cultural Cognition People tend to develop viewpoints that are consistent with the values held by others within the groups with which they self-identify: their extended family, church, work colleagues, community organizations, political party and so on. Especially when assessing prominent and controversial issues and actions to deal with them, people often reject or accept empirical claims on the basis of the values held by those groups.[22] Cultural identity overrides facts. This social process plays a large role in shaping views about controversial Slow Problems like the Federal budget deficit or climate change.

Ideological Frames Framing is a sociological concept that deals with the context or pattern of interpretation we give to social events.[23] The same events can appear very different depending on the frames we bring to them. When looked at through a Malthusian frame, global population growth appears dramatically different than when viewed through a religious frame involving a divine injunction to "be fruitful and multiply." The natural phenomenon being looked at is the same in both cases, but the "social constructions of reality" are almost opposite. Various ideological frames common in our society can inhibit our ability to deal with critical problems. For example, some religious viewpoints lead people to believe that humans could not possibly have significant impacts on God's creation; an extreme faith in the ability of free markets or technological advances to solve nearly all problems can restrict the range of policy actions people are willing to consider.

Collective Avoidance Without being told what to think about, or what not to think about, societies arrive at unwritten agreements about what can be publically acknowledged and what should be avoided.[24] People can have information about a problem or threat but not think about it in daily life. They can understand the information in the abstract but fail to connect it to their personal lives. This pattern of behavior is especially common under repressive regimes where it helps resolve the conflict between a moral imperative to resist and the need to protect self and family. But it occurs in societies of all kinds as a way to avoid the disturbing thoughts and emotions of fear and helplessness that serious problems and threats can evoke.

Cognitive Dissonance Cognitive dissonance is the mental stress and internally conflicted state that occurs when people confront information that conflicts with their existing beliefs, values, behaviors and ways of life.[25] It leads people to search for ways to reduce the stress, often through strategies of evasion and denial.

The concept rose to fame in research on smokers who feared that their smoking could give them

cancer, creating a strong dissonance between their knowledge and their behavior. One way to resolve the dissonance is to stop smoking, but many smokers find it hard to break the habit. Research found that people who kept smoking used four main strategies to deal with the dissonance. They could minimize the significance of their behavior ("I really don't smoke much compared to some people"); start to doubt how big the danger is ("My father smoked three packs a day and lived to 90"); bring in compensating factors ("I exercise so much it will help keep me healthy"); or go into outright denial ("The so-called evidence that smoking leads to cancer is a hoax").

Those four basic strategies can be used to resolve the cognitive dissonance caused by all kinds of problems whose solution requires significant change in people's ideas, values or behavior. Climate change illustrates the parallel pattern. "I know that CO2 released from burning fossil fuels causes global warming and I know I have a large carbon footprint." These two thoughts create cognitive dissonance. I don't want to spend a lot of money or change my lifestyle to dramatically reduce my carbon footprint, but I can reduce the dissonance by minimizing the significance of my behavior (the amount of CO2 I generate is miniscule and, besides, China is the big polluter now); starting to doubt how big the danger is (I've heard there's been a "pause" in global warming so maybe it's not such a big problem); bringing in compensating factors (I switched some of my old light bulbs to LEDs); or going into outright denial (climate change is a hoax).[26]

Bystander Effect In its original and narrow sense, the bystander effect refers to situations where individuals do not offer help to a victim when other people are present. Interest in this type of behavior was triggered by the murder of Kitty Genovese in 1964, an incident connected to the idea that many people were watching the crime but no one acted to prevent it. Experiments using staged emergency situations have demonstrated that the probability of

someone helping is inversely related to the number of bystanders. This is one of the strongest, most replicable effects discovered in the field of social psychology. In its broader sense, the bystander effect refers to a phenomenon in which the more people we assume know about a problem, the more likely we are to ignore our own judgment and watch the behavior of others to identify an appropriate response. If many others appear unconcerned, we are unlikely to act concerned.[27]

IS IT NEWSWORTHY?

For our ancestors, warnings came in the form of marauding animals or flash floods. Today they arrive via *Twitter*, the *New York Times,* or *Vice* and the chances slow threats will make it through the media screen are very low.   One of the main reasons why Slow Problems receive less attention than they deserve is that they so seldom meet the criteria for being "newsworthy." Over the years, reporters and journalism professors have developed lists of factors that help journalists decide if something is newsworthy or not. The factors that regularly appear in these lists are:[28]

- *Timeliness* – what's happening this day, this hour, this minute

- *Significance* – number of people affected and level of impact

- *Prominence* – involves famous people: politicians, movie stars, CEOs etc.

- *Conflict and controversy* – a major source of interest, without which there would be little literature or drama

- *Immediate loss of life or destruction of property* – "if it bleeds, it leads"

- *Human interest* – appeals to emotions with amusement, humor, sadness

- *Novelty* – when "man bites dog," that's news

- **Something goes wrong** – an incident, scandal, act of incompetence, etc.

- **Something exceptional happens** – record breaking, extraordinary quality

- **Titillation value** – something that stimulates or excites, sexual or otherwise

Slow problems typically meet few or none of these criteria of newsworthiness, leaving experts who are concerned about them frustrated at their inability to attract public and political attention. As David Pimentel, professor of ecology at Cornell, said recently, discussing the estimated loss of half the world's topsoil, the difficulty is that "erosion is a slow and insidious process" and "who gets excited about dirt?"[29]

Slow Problems may make a breakthrough into the news when a major report is published or some other temporary "news hook" appears, but before long they plummet back below the media horizon, unable to compete in the fierce struggle for space in the highly limited universe of print, television and online viewing time, which includes not just news but a multitude of things that are more pleasant to contemplate such as sports, celebrity gossip and reviews of the latest smart phones. As a result, the problems remain largely invisible to the general public and policymakers. The recent Ebola outbreak dominated the media for months, while coverage of chronic diseases with massive social and economic impacts both domestically and globally, such as Alzheimer's and diabetes, has remained minimal and virtually unchanged for years (see graph below).[30]

Articles about Selected Global Health Issues from the *New York Times* and *Washington Post* (1994-2014 YTD)
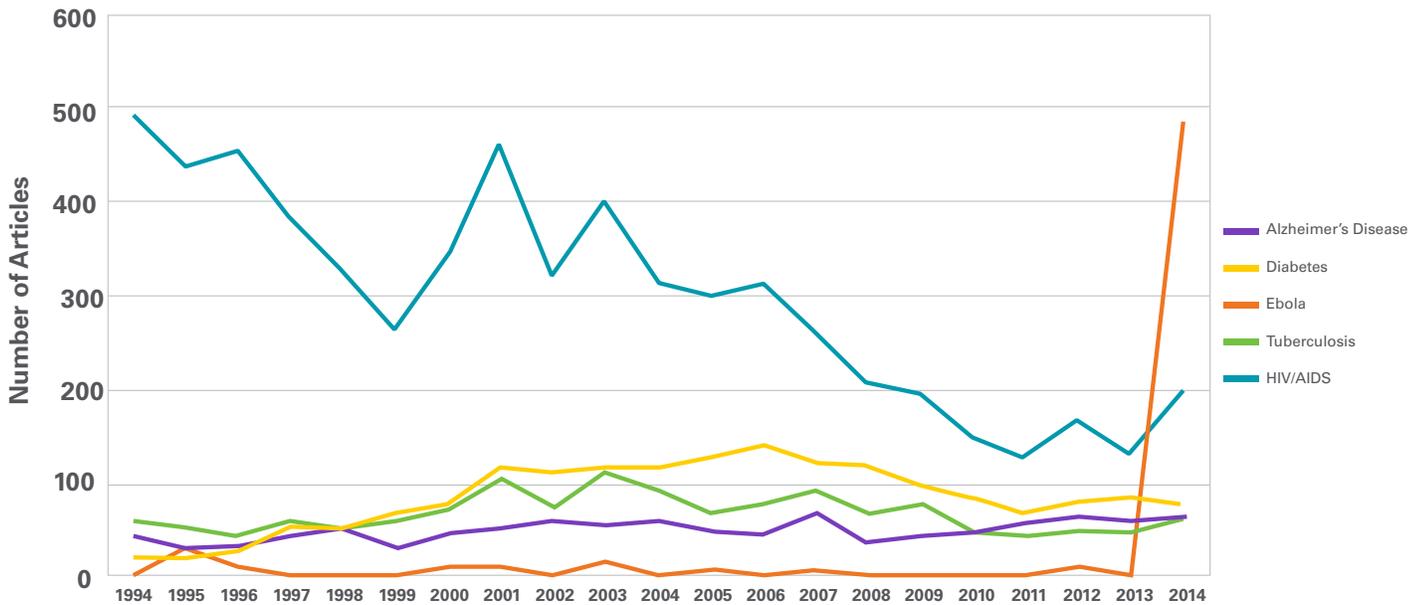
Slow Problems can sometimes become prominent – for a time – before fading from view again in what political scientist Anthony Downs called an "issue-attention cycle."[31] Looking at the rise and decline of interest in environmental problems in the 1960s and early 1970s, Downs described a cycle with five stages. In the first *pre-problem stage*, some undesirable condition already exists and is getting worse. Some experts and interest groups may be alarmed by it, but it has not yet captured much attention. In a second stage, *alarmed discovery and euphoric enthusiasm*, the public becomes aware, interested and alarmed because dramatic events capture media attention (such as Earth Day/oil spills/a burning river). Downs argues that in American politics this alarmed discovery is always accompanied by a burst of enthusiasm about society's ability to deal with the problem, putting strong pressure on political leaders to express confidence that they can solve it and take at least some action.

In the third stage, *realizing the cost of significant progress*, there is a gradually spreading recognition that the problem is actually hard to solve. Needed actions may be financially costly, require sacrifices by some groups in the population, be opposed by powerful interests, go against many people's views of the proper role of government, or require unpopular changes in behavior or the ordering of society. As more people realize how difficult the problem is, the cycle enters a fourth stage, *gradual decline of intense public interest*. Some people get discouraged, some get bored and others feel threatened by thinking about the problem and so suppress those thoughts. With public interest declining and other issues competing for space in the news, the issue enters the final *post-problem stage*, a twilight period of lowered attention or occasional recurrences of interest.

Some of the most important slow problems have gone through a process much like what Downs described. Concern about population growth

peaked between 1966 and 1970, triggered in part by Paul Ehrlich's book *The Population Bomb*. During the 1960s, 93 percent of news stories and 100 percent of editorials on population growth in the *New York Times* identified it as an important and dangerous issue, but by the early 1980s the issue had virtually disappeared.[32]

Media coverage and public concern about climate change peaked, faded away and now is going through a recurrence of interest. It peaked in the middle of the first decade of the century, stimulated by developments like Hurricane Katrina in 2005, the documentary film *An Inconvenient Truth* produced by former Vice President Al Gore in 2006 and news coverage of the 4th Assessment Report of the Intergovernmental Panel on Climate Change in 2007. But by 2010 the climate issue had faded to the point where the *New York Times* did not run a single lead item on it during the year.[34] Now developments like Hurricane Sandy and the UN climate change conference in Paris have rekindled interest.

NOW WHAT?

Everything reviewed here – the evolutionary limitations on how our brains respond to dangers, the built in cognitive biases that cause us to misperceive risks, the personal and collective ways we avoid facing problems and the constricting criteria of what's newsworthy, – make it difficult to deal with the Slow Problems worsening across many policy areas. Taken together, this listing of potential barriers to action is sobering. But the good news is that all these barriers are well understood and strategies for overcoming these limitations, at least on a personal level, have been documented.

However, most of the challenges we face today are collective action problems involving complex systems that cannot be overcome by individuals acting alone, no matter how enlightened. A retrospective analysis by the European Environmental Agency of 88 slow moving problems – from lead in the environment to climate change – found that only four were genuine false alarms. The

rest were collective action and policy failures that occurred despite years or decades of warnings.[35]

Tackling Slow Problems will require a combination of leadership and organizational change to improve foresight capabilities in business and government to bring the potential long-term consequences of slow changes into current awareness. Another potentially important approach is to take a lesson from the "Slow Movement," which has affected everything from food to urban design, travel and lifestyle choices, by creating a space for reflection about Slow Problems protected from daily hyperbolic media headlines, knee jerk analysis and politics. Deeper study of how to counter all the dynamics that tend to keep us from dealing with

Slow Problems can lead to strategies useful for a wide variety of problems. Slow Problems require a "permanent engagement" strategy that few organizations can maintain over time. Therefore, it would be helpful to have an institution or research group whose mission is to study Slow Problems as a distinct kind of threat and to assure that important Slow Problems are made more visible, continuously discussed and hopefully acted upon. Creating a Slow Threats Initiative or an Institute for Slow Problems would require that rare funder willing to take the long view. But it would be a high-leverage investment, because the best way to deal with this class of problems is to keep the spotlight on them and head them off before they become ever more difficult to deal with.

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