
Emerging Risk Report – 2016

SOCIETY & SECURITY

Political violence contagion

*A framework for understanding the
emergence and spread of civil unrest*

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Executive summary

Events such as the Arab Spring and, more recently, the wave of violent jihadist extremism affecting parts of the Middle East, have demonstrated the potential for individual outbreaks of unrest to trigger similar events across the world. These events generate widespread disruption yet prove extremely difficult to anticipate.

This “contagion effect” can generate what this paper calls “pandemics” of political violence (PV). The findings of this report suggest that the interdependencies which create the conditions for PV pandemics are liable to become an increasingly important factor in determining international stability.

This report concludes that new approaches to risk assessment are required in order to make sense of the increasing speed and complexity with which PV can spread. The report describes a diagnostic methodology that combines quantitative data analysis to understand complex causal dynamics with guided qualitative

analysis to anticipate less tangible political and social behaviours.

Most studies on PV contagion have tended to use statistical modelling to make sense of the multiple possible causes and interdependencies. This can be problematic because many PV risk analysts who take contagion risk into account tend to be regional specialists and so may not necessarily have the modelling or statistical analysis skills needed to consider the wider impacts. Academic studies on PV contagion can yield useful findings but they often focus on specific types of conflict and, by taking an empirical data-modelling approach, are inherently retrospective.

This report is therefore intended to stimulate further development of analytical approaches that could enhance the identification and assessment of the mechanisms by which an outbreak of violence can escalate to a widespread PV pandemic.

Political violence contagion as an emerging risk: a new framework for assessment and anticipation

Political violence (PV) contagion is emerging as a poorly understood but highly important dimension of political risk. Sub-state conflicts triggering similar events across the international system – bouts of which are called “PV pandemics” in this paper – are a recurring phenomenon. The Arab Spring exemplifies a PV pandemic, as does the wave of violent jihadist extremism that followed in its wake. The findings in this report suggest that PV contagion as a complex systemic risk is – and will remain – an increasingly frequent and impactful risk exposure.

PV contagion has been a consistent feature of the international system since at least the 1960s. The research presented in this report suggests that instances of PV contagion (pandemics) have become more frequent, and the contagion effect ever more rapid and impactful. Prevailing trends, which include widening internet penetration, urbanisation and changing geopolitical balance, appear to be factors relevant to higher contagion risk. Growing complex interdependencies may make contagion one of the most important causal dynamics shaping how political violence emerges and spreads within and among states.

Contagion as a social or political phenomenon is widely understood intuitively, but not scientifically. Despite a body of academic work on contagion in political science, there is a lack of clear evidence of these studies being incorporated into political violence risk assessments. The reasons for this, given by underwriters during interviews conducted for this research, variously included scepticism that the findings are comprehensive, reliable or compelling enough to warrant investment in PV contagion models. For example, many doubted the contagion of the Arab Spring was even foreseeable and suggested it was a “Black Swan” event.

In learning lessons from the Arab Spring, the lack of adoption of PV contagion methodology may seem surprising but it is understandable. It is a complex systemic risk with no agreed definitive answer on what it is or how it works. In this study, contagion is defined as a complex process whereby the emergence of a conflict in one country facilitates, triggers or escalates the emergence of similar but independent PV events within another because of emulative, imitative, inspired or knowledge-enabled action.

Many studies on PV contagion tend towards statistical models to make sense of the bewildering array of possible causes and interdependencies. This often makes such studies all but impenetrable to anyone without a statistics background or a head for mathematics. This is problematic when one considers that many PV risk

analysts who should be taking contagion risk into account tend to be regional specialists, and so may not necessarily have the requisite modelling or statistics competencies to adopt such methodologies. It also means that such studies tend to be universal in their approach to data and causal factors, and not place the level of emphasis on historical, cultural, political or other idiosyncrasies that a regional specialist would argue is required for an assessment to be realistic.

Academic studies on conflict contagion yield useful findings that further thinking on assessing the phenomenon as a risk, such as the higher susceptibility of autocracies and the centrality of emulative behaviours. They also often focus on specific types of conflict¹ but in taking an empirical data modelling approach, they are inherently and inevitably retrospective. Their predictive power is therefore limited and they are prone to fail with hitherto unseen events because the data on the variables and indicators they use – societies, cultures, attitudes, technologies, politics and so forth – are forever changing and interconnected. This means the potential for contagion to result in unforeseen and potentially high-impact events is high because new and unforeseen variables emerging as contributing causes are likely. Such studies are also constrained by a lack of reasonably provable cases of conflicts where contagion was a factor, and against which one may test models to identify statistically significant causes. This is partly because of a lack of an agreed definition of contagion. But also because asserting any single factor as a cause of a conflict – be it contagion or otherwise – is invariably an oversimplification.

Perhaps most importantly of all, data models are limited to modelling available data, which means they cannot factor less tangible or immeasurable causes or indicators of contagion for which no datasets exist. For example, how does one measure the perceptions of success (or success itself) among opposition groups that often inspire the emulative behaviours that drive contagion? As emulation is an inherently human but unquantifiable act, assessing the likelihood of people adopting the practices of others requires room for more idiosyncratic, expert, intuitive or qualitative judgments. A more effective approach to tackling contagion risk assessment therefore seems to lie in a blended approach that allows quantitative data analysis to make sense of complex causal dynamics alongside qualitative expert analysis to anticipate less tangible political and social behaviours.

¹See, among others: *Maves and Braithwaite (2013)* and *Midlarsky, Crenshaw, and Yoshida (1980)*.

Anticipating complex systemic risks

It is the inherent and often overwhelming complexities of systemic political risks that make assessing contagion risk so difficult for insurers and indeed other forecasters of conflict. It is also why so many scholars seem to seek solutions in highly complex data models. Such difficulties do not obviate the need to assess the risk of PV contagion more effectively than many presently do. But it does highlight the need for a practical and accessible approach that might better equip insurers – not to mention analysts and others tasked with anticipating future conflicts – even if only marginally. As one forecaster remarked to the researchers working on this report, a solution that can move the problem of foreseeing future bouts of conflicts spreading forward by 10% is better than an ambitious model that promises greater predictive power by unlocking big data, but is unreliable and impractical for other experts outside the realm of statistics.

Better anticipation of future pandemics is not merely a matter of improving country risk assessments; it should also alert insurers to emerging systemic risks of much greater impact. When contagion swept North Africa and the Middle East in 2011-2012, it all but collapsed

the entire system of the ostensibly secular Arab autocracies and had a profound impact on risks that exist today. In later analysis, the path of contagion the Arab Spring took, in terms of the most severely affected countries, proved curiously particular to Arab republics and had the effect of raising countries widely assessed as low risk (autocratic but stable) up to severe risk status almost overnight, while some countries with a recent history of civil conflict (which would typically have scored higher on political risk assessments), such as Algeria, Lebanon and Iraq, escaped the worst effects.

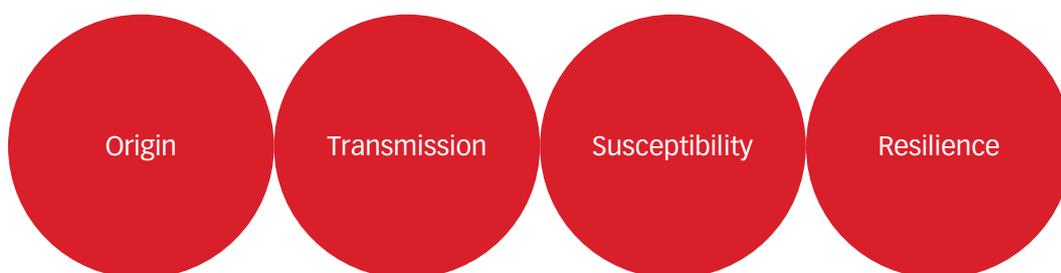
The aftermath of the Arab Spring also had the effect of triggering another pandemic as the upheaval rendered countries more vulnerable to further challenges by interest groups, and less resilient to withstand their rise. A second wave of contagion – jihadist terrorism – followed the Arab Spring almost immediately and rudely upended expectations of democracy sweeping the region. The resurgence of violent Islamist extremism, particularly in the guise of so-called Islamic State, poses a major PV risk not only to the Middle East and North Africa, but also in less volatile markets.

An alternative approach

The Risk Advisory Group has developed and tested an alternative hypothetical method for assessing the risk of contagion and pandemics. This approach reimagines risk modelling, not as an empirically driven predictive exercise but as one part of a diagnostic process. It also allows for data modelling to guide and inform expert and intuitive human judgments on the likelihood of adoption of political violence from external influences. The diagnostic approach does not seek to find a “signal in the noise” or deliver predictions. Rather it aims to make sense of complexity, “reduce the noise” and rule out factors of low consequence. This more focused picture can then inform qualitative analysis on contagion risks in terms of probability and impact.

influenced by actors in conflict from another country (the point of causative origin). Resilience refers to state resilience to counter the most impactful effects of contagion and recovery. In this model, if transmission levels are high and susceptibility indicators are prevalent, the likelihood of contagion is high. Resilience indicators will give some sense of likely impact of that contagion on PV risk in that country.

This approach required the identification of socio-economic, political and other indicators that would characterise each phase and for which it is possible to find country data indices to test against past cases of conflict. For transmission, the factors identified



Source: Risk Advisory Group

This diagnostic approach is a hypothetical framework that builds upon studies on the subject and borrows analogously from epidemiology. It presupposes logic in PV contagion, in that it can only occur when certain elements combine to make the process possible. The logic starts by positing that, in order for contagion to occur, there must be a point of causative origin. Then, for it to spread within and between countries there must be a means of transmission.

And finally, for a country to then become “infected” it must be susceptible. Taking the analogy of disease contagion yet further, a country’s resilience (or “political immune system”) will then determine the impact of the “infection” and the time and extent of recovery. These phases of PV contagion – transmission, susceptibility and resilience – form the basis of this diagnostic framework and the basis of a risk assessment.

In this framework, transmission refers to the channels through which knowledge transfers from one country to another, and so enables the triggering of emulative or imitative effects by opposition groups in other countries. Susceptibility broadly refers to the propensity of social or political groups to emulate or be otherwise

included media freedom, internet and social media penetration, adult literacy and common languages, among others. For susceptibility, indicators of social, political and cultural commonalities, the nature of the political system for its proneness to contagion (this drew particularly on findings in academic studies that autocracies are at greater risk), as well as a spectrum of social and political indicators, such as urbanisation and infant mortality (indicating miserable living conditions) were considered. For resilience, measures of the strength of the state and its capacity to recover from emerging conflict conditions were looked at, and included indicators such as defence spending and the adaptability of political system.

To test the diagnostic framework, the Risk Advisory Group had to overcome the problem of testing against a large enough dataset of conflicts where contagion may have played a role. As there appears to be no definitive dataset of PV contagion events, the researchers created a heuristic theory of “super strains” of contagious conflict types that have resulted in recurring pandemics (cases of contagion bouts) in modern history. These super-strain pandemics enabled countries in a state of conflict to be coded as being exposed to suspected contagion events.

Defining pandemics and conflict super-strains

The hypothetical pandemics are identifiable as conflicts that have occurred in clusters and display symptomatic signs of contagion. The pandemic idea hypothesises that when PV contagion occurs, it is observable in the emergence of proximate conflicts in other countries that have comparable opposition movements, with comparable or common goals and methods.

potentially exposed to a pandemic. A fixed-effects logistic regression was run to identify the most statistically compelling causal indicators in each phase of our diagnostic model (transmission, susceptibility and resilience). The technical details have been omitted from this short paper in lieu of presenting the main results.²

Table 1

Super-strain pandemic type	Description
A	Anti-imperialist, independence movements, removing occupying force
B	Mass pro-reform protests against national government
C	Armed insurrection, insurgency, secessionist, may involve ideology (e.g. Marxism, Islamism)

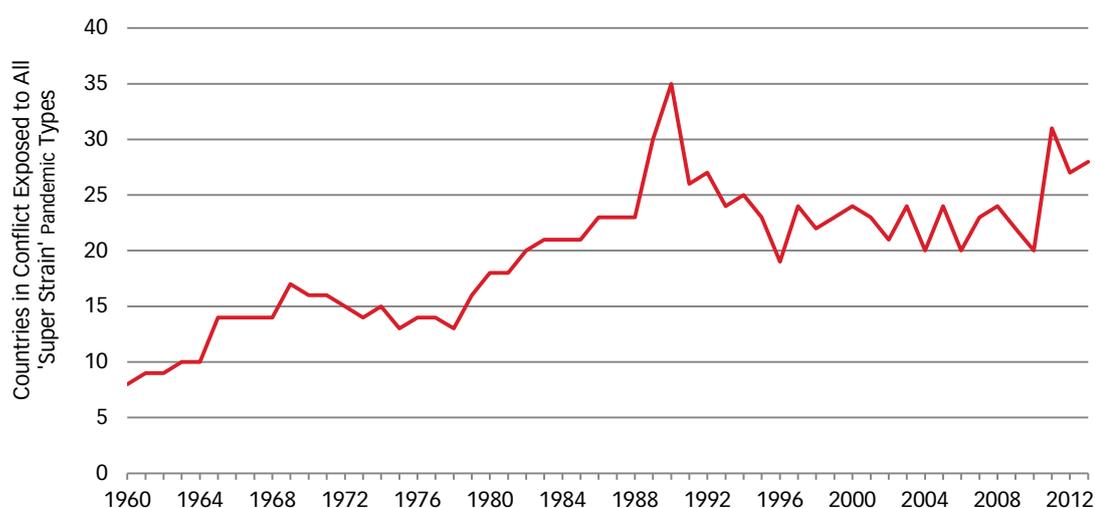
Such commonalities point to emulation as a defining trait of contagion – such as imitation of protest tactics, adoption of comparable armed struggle tactics toward comparable goals, and so forth. Based on this hypothesis of commonalities, three overarching super strain pandemic categories of conflict types were created for testing, as described in Table 1 above

Every country was then coded according to whether or not it experienced a pandemic each year since the end of the Second World War. The coding identified whether a country in a given year had experienced one or more super-strain types of conflict and so was

Findings

The research revealed that super-strain pandemics have evolved historically in two waves. Most of the rise in pandemic frequency happened in the last category (super pandemic Type C) over the past 50 years. The first wave occurred during the Cold War followed by a brief transition period and subsequent stability since the 1990s. Urban concentration, military spending, and media access appear to serve as key risk factors for these pandemic waves following the end of the Cold War, circa 1989 to 2013.

Figure 1: Political violence pandemic frequency (all types) 1960-2013



Source: The Risk Advisory Group plc

²Please see Annex for a slightly more detailed and technical explanation of the data treatment and results, including methodological limitations.

Figure 1 illustrates the number of countries in a state of conflict in a given year that demonstrated exposure to all three types of super-strain pandemics worldwide, between 1950 and 2013. The chart suggests conflict contagion cases have progressively become more frequent since the late 1970s.

The frequency of all three super-strain pandemics exhibited strong persistency before the end of the Cold War in the late 1980s. It subsequently jumped by over 50% as states broke away from the Soviet Union in an apparent major bout of contagion, and then returned to the level reached before the Soviet Union's collapse. The frequency of super pandemic occurrence persists from the early 1990s to today. Some of the observed increases are due to countries entering the sample dataset.

The research presented in this report suggests that these same factors – urban concentration, military spending, and media access – appear to change pandemic risk given exposure to external conflicts, capturing the potential for contagion. For a given level of potential exposure and similar political and socioeconomic conditions, it was found that increased media access (a transmission factor), youth

concentration (a susceptibility factor), and low military spending (a resilience factor) are all associated with increased chances of a country being exposed to pandemics, and hence at higher risk from PV contagion. These findings appear to be fairly robust after accounting for some of the typical biases and sampling issues associated with cross-country studies.

Given identical risk factors, it was found that an increase in the share of internet users is strongly associated with an increased risk of pandemic. Like the internet, increased infant mortality (in percentage terms), population (in percentage terms) and urban concentration in the largest city are strongly associated with an increased risk of contagion. The risk of contagion appears to increase slightly for countries with younger populations as levels of exposure to external conflicts increases. At lower levels of pandemic exposure, higher military spending (as a share of GDP) is strongly associated with lower pandemic risk. However, this relationship weakens as the level of pandemic risk increases. In other words, military spending is less effective at higher levels of exposure to external conflicts.

Limitations and considerations for future research

These findings are merely suggestive, not conclusive, but they point to several areas where future methodology and assessments on emerging PV risk could develop. In the main, these findings enable at least one fundamental forecast that should stimulate action to be made: future bouts of PV contagion appear almost certain because contagion in varying degrees is a virtual constant in the international system.

Alongside the findings of other studies on contagion not elaborated on in this paper, the findings suggest that prevailing trends in many markets – the persistence of autocratic governments, high percentages of young people in populations, growing internet or media access, complex interdependencies, urbanisation and social and economic equalities – mean that pandemics are liable to become more frequent in their recurrence.³

Due to the time and space limitations of this paper, the data modelling results lack wider geopolitical or economic contextual analysis for each case of contagion. But analytical observations on specific cases of pandemics in history may be instructive for future diagnoses of risk. For example, past bouts of contagion or pandemics appear to have swept through countries that form part of a wider but still limited system – such as former British colonies, former Soviet republics, secular Arab republics or even Western liberal democracies. And it does not account for wider economic trends as triggers, such as global economic slowdowns, financial crises or sustained rises or falls of commodity prices, or even changes in the international

order and balance power (such as transitions from bipolar or multi-polar systems or hegemonic orders).

The prototype framework presented in this paper also does not provide granular insight or case studies into more specific suspected outbreaks of contagion – such as the Leftist international terrorism, the colour revolutions, the Arab Spring or the contemporary spread of jihadist movements. Though only briefly described, the framework idea presented here departs from predictive modelling and moves towards anticipation of future risk as matter of diagnosing risk in complex systems. Diagnosis of systemic risk advances the idea that in matters of political violence, statistical modelling may be more effective and practicable for flagging warning signs, and narrowing the scope of enquiry for more focused qualitative risk assessments.

More work is needed in this area to develop methodologies on contagion. But for now enough is known about the phenomenon for analysts and insurers to start questioning the contagion potential of a given conflict or contagion vulnerability of a given country they might otherwise not have thought to ask. Better anticipation and risk assessment would mark a much-needed step forward. As the Arab Spring showed, contemporary conflicts can be highly contagious and spread faster than many exposed businesses and governments can keep up with.

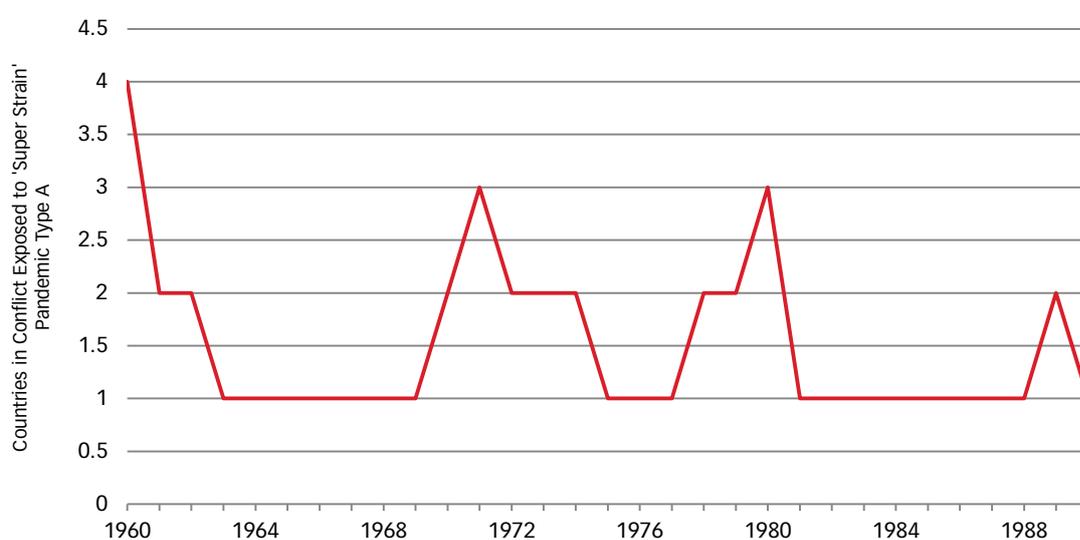
³See bibliography for a list of these studies, this list is not exhaustive of all works on the topic.

Annex: technical synopsis of definitions, methodology and findings

Figure 2 (below): The three charts illustrate the number of countries in a state of conflict in a given year that demonstrated exposure to each super-strain pandemic type (Types A, B, C) between 1950 and 2013. Type C (armed insurrection, insurgency, secessionist, may involve ideology) appears to represent by far the most contagious form of political violence (although this may also reflect the wider trend of civil

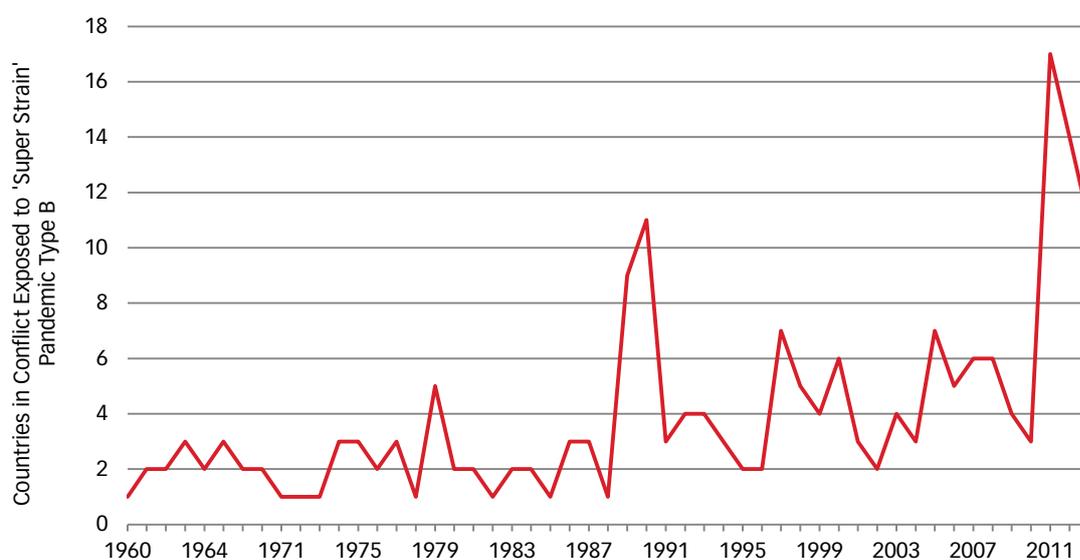
conflict representing by far the most prevalent form of armed conflict today). Type B (mass pro-reform protests against national governments) pandemics tend to be more cyclical and occur in spikes, and appear to precede the incidence of Type C outbreaks or, in other words, popular mass uprisings may trigger or at least contribute to the spread of armed insurrections.

Figure 2: Political violence pandemic frequency (Type A) 1960-2013



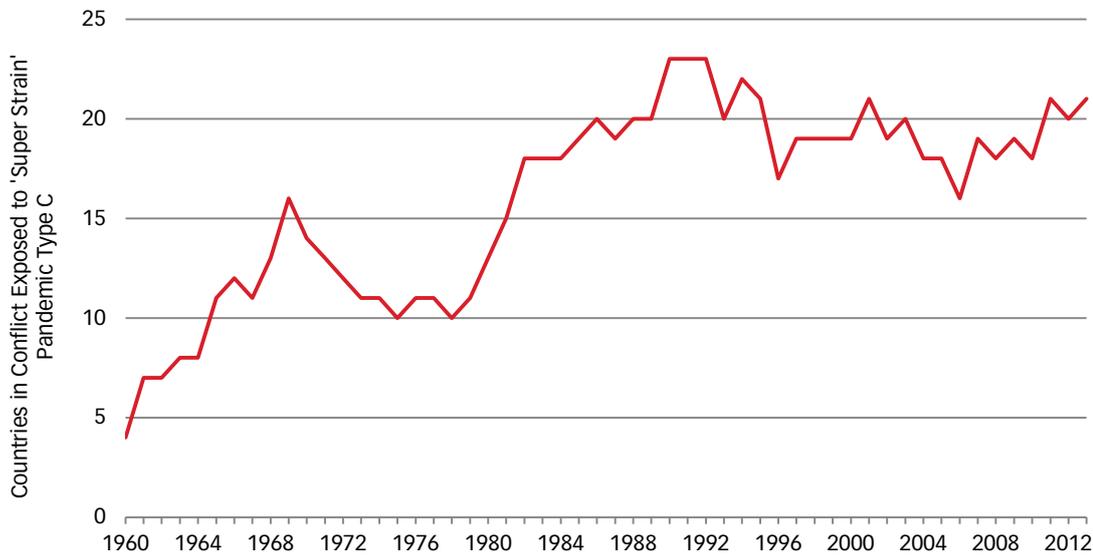
Source: *The Risk Advisory Group plc*

Figure 3: Political violence pandemic frequency (Type B) 1960-2013



Source: *The Risk Advisory Group plc*

Figure 4: Political violence pandemic frequency (Type C) 1960-2013



Source: *The Risk Advisory Group plc*

To determine which variables indicate increased contagion risk, statistical models were constructed and estimated using a fixed-effects logistic regression. This method uses variation across countries and time to identify the impact of different variables on pandemic risk. To start, a list was drafted of the variables or characteristics hypothesised to play a role in a country in conflict experiencing or being exposed to pandemic.

Contagion is defined in this study as a process whereby the emergence of a conflict in one country facilitates the emergence of comparable but independent political violence events in another country through emulative, imitative, inspired or knowledge-enabled action. This definition excludes external aggression such as military attack or invasion.

A pandemic is defined as a major bout of contagion. Pandemics are identifiable as conflicts that have occurred in clusters and display symptomatic signs of contagion. The pandemic idea hypothesises that when PV contagion occurs, it is observable in the emergence of proximate conflicts in other countries that have comparable opposition movements, with comparable or common goals and methods.

These variables were arranged into the categories of:

- 1) Transmission
- 2) Susceptibility
- 3) Resilience (see Table 2, below, for definitions)

These umbrella groupings are used to describe the types of factors affecting whether or not a country would be exposed to pandemic. Metrics were also established to measure contagion exposure, which rely on either political systems or geography. The political-system-based measure draws on a dataset of political regime types, and the geographic measure uses the pandemic rate seen in neighbouring countries.

The list of variables to use was finalised based on dataset availability and reliability (in terms of the robustness of their methodology) for the given period we sought to study (from 1960 to today). Ultimately, it was possible to find reliable, comprehensive year-on-year data for the following variables from the late 1980s to 2013: military expenditure as a share of GDP, size of the armed forces, media freedom, internet penetration, urban concentration, youth share of population, infant mortality, and regime types. Most of this data comes from the World Bank Development Indicators, Freedom House free media indicators and Polity IV.⁴

⁴Polity IV data is reconstructed into Vreeland's (2008) X-POLITY data to deal with the problems of Polity IV in respect of civil wars.

Table 2

Contagion process element	Reasoning	Indicator examples (quantitative and qualitative)
Origin	Origin profiles the country that is hosting the conflict, and the ostensible source of spreading conflict. This enables commonalities to be drawn with other countries to identify any that may be particularly susceptible to contagion, as well as connections and interdependencies.	<ul style="list-style-type: none"> • Political system • Ethnic make up • Languages of country • Urbanisation • Media freedom • Age of government • Nature of conflict • Motives or ideology of opposition movement in conflict
Transmission	<p>Pathways that enable conflicts to spread by contagion (emulation, imitation, transfer of tactics and ideas) rather than force. These are the means of knowledge transfer and information transmission between host (or origin) country and receiver country.</p> <p>Transmission includes not only the ability to send and receive information, but also to learn, observe and understand events and be influenced and take action. Common languages as well as historical, cultural, ethnic, social, religious and political references can enhance transmission.</p> <p>Greater volumes of combined factors of transmission point to greater speed and volume of knowledge transfer, and so greater potential for contagion, in greater speed and across greater range (e.g. mass transfer may result in mass unrest; clandestine transfer may result in clandestine actions such as terrorism).</p>	<ul style="list-style-type: none"> • Access to media • Censorship and media freedoms • Internet penetration • Social media usage • Smart phone and personal computer ownership • Satellite television penetration • Common languages • Literacy in host and receiver countries • Geographic proximity • Common histories and cultural, political and social references or contexts between Origin and receiver
Susceptibility	<p>The susceptibility of a country to conflict contagion from conflict in another country.</p> <p>Susceptibility to conflict contagion refers to underlying vulnerabilities but also to particular sensitivities to PV events in other particular countries, not in general. Like transmission, commonalities are important.</p> <p>Susceptibility indicators are therefore cross-referenced to origin indicators, as greater weighting of commonalities may indicate greater risk.</p>	<ul style="list-style-type: none"> • Political system - autocratic regimes at greater risk • Civil society • History of conflict • Socio economic indicators, such as unemployment, urbanisation, urban density, average age • The existence of pre-existing opposition movements • Corruption • Presence of activism and opposition movements
Resilience	The capacity and ability of a state to limit the impact of contagion and to recover.	<ul style="list-style-type: none"> • Defence and security spending • Fiscal reserves • Ability of government to adapt or respond to demands (political system, social contract) • Infrastructure

Next, the countries were coded to indicate whether they were exposed to or experienced a pandemic in a given year. From 1960 to 2013, countries were coded yearly as to whether or not they experienced a super-strain pandemic based on our definition. They were then further coded into three types of pandemic strains

in order to reference several case studies in history that we assessed to be pandemics, including the breakaway of the Soviet Union, the emergence of jihadism, etc.

These pandemic typologies were then broadly categorised into the following:

Table 3

Super-strain pandemic type	Description
A	Anti-imperialist, independence movements, removing occupying force
B	Mass pro-reform protests against national government
C	Armed insurrection, insurgency, secessionist, may involve ideology (e.g. Marxism, Islamism)

Based on regional expertise, case studies of pandemics and available data, the study focused on South Asia, Asian-Pacific, Sub-Saharan Africa, North Africa,

Middle East and Eurasia. High income countries, as defined by the World Bank, were excluded.

Figure 3: Examples of coding countries

Example 1: No pandemic for that year

Country	Year	Super Pandemic (Y/N)	Super Pandemic Strain Type I	Super Pandemic Strain Type II	Super Pandemic Strain Type III
Algeria	1950	N	-	-	-

Example 2: Pandemic in that year, but only anti-imperialist protests and mass pro-reform protests

Country	Year	Super Pandemic (Y/N)	Super Pandemic Strain Type I	Super Pandemic Strain Type II	Super Pandemic Strain Type III
Algeria	1962	Y	A	B	-

After estimating the statistical model, it was possible to distil the three most statistically significant factors that affect the risk of contagion (or exposure to the three types of pandemic). These factors include media access (transmission), youth concentration (susceptibility), and military spending (resilience). These findings appear fairly robust, accounting for typical biases and sampling issues associated with cross-country studies.

The exposure variable (political and geographic variables discussed above) bore no direct, strong statistical relationship with pandemic risk. This means

that pandemic and a country's exposure to pandemic is more determined by local conditions, and according to the findings in this study, specifically by the above three risk factors.

This study attempts to determine how pandemics start but does not account for why or how they persist or end. More in-depth analysis of how or why they persist, and when pandemics end, would require more country-level data with longer time dimensions - e.g. monthly - which is not currently available.

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