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The danger of the single storyline

Obfuscating the complexities of managing SARS-CoV-2/COVID-19

Abstract

Chimamanda Ngozi Adichie showed how a single story is limited and thereby distorts the true nature of an issue. During this COVID-19 pandemic there have been, at least, three consecutive single stories – the 'lethal threat' story, followed by the 'economic threat' story, and finally the 'vaccine miracle' story. None of these single stories can convincingly and permanently capture the dynamics of the pandemic. This is because countries experienced different morbidity and mortality patterns, different socio-economic disadvantage, age and vulnerability of population, timing and level of lockdown with economic variability, and despite heavy promotion, vaccines were beset with a significant and variable degree of hesitancy. Lack of transparency, coherence and consistency of pandemic management – arising from holding on to single storylines – showed the global deficiency of public health policy and planning, an underfunding of (public) health and social services, and a growing distrust in governments' ability to manage crises effectively. Indeed, the global management has increased already large inequities, and little has been learnt to address the growing crises of more infectious and potentially more lethal virus mutations. Holding onto single stories prevents the necessary learnings to understand and manage the complexities of 'wicked' problems, whereas listening to the many stories provides insights and pathways to do so effectively as well as efficiently.

I. Introduction

Chimamanda Ngozi Adichie, a Nigerian storyteller, in her 2009 TED-talk 'The danger of a single story', illuminates the impact of the single story on the individual, and the use and abuse of the single story as a means of exerting power and control (Adichie, 2009). She provides a few examples, amongst them her childhood impression that the characters in books are supposed to be white people living in a northern environment, that Africa is just a continent of catastrophes, and, after living in the US for a while, that Mexican Americans are illegal migrants. Following Adichie's reflection, "*…the single story creates stereotypes, and the problem with stereotypes is not that they are untrue, but that they are incomplete. They make one story become the only story*." And she insists: "*Stories matter. Many stories matter. Stories have been used to dispossess and to malign, but stories can also be used to empower and to humanize. Stories can break the dignity of a people, but stories can also repair that broken dignity*." Yet, the main worry of the single storyline, according to Adichie, is the fact that we are highly impressionable to them.

Adichie did not have the corona pandemic in mind when giving her talk. Nonetheless, her reflections are highly relevant with regard to a dominant 'corona narrative' that underwrites much of the COVID-19 discourse. Using Adichie as a starting point, we examine three popular narratives about SARS-CoV-2 and COVID-19 and how these seemingly reinforce a single storyline, which advertently or inadvertently, has helped to divert public discontent with inconsistent government response, neglect, and public health policy failures. By highlighting

the dangers of this single storyline, we argue that the addition of other important stories is a crucial first step in capturing the complex nature of the SARS-CoV-2/COVID-19 pandemic and thus allowing for more sophisticated and effective response.

II. A trifecta storyline good enough for Hollywood

The 'lethal threat' of COVID-19

This single story has a simple logic: COVID-19 is a new, highly contagious and highly lethal infectious disease, amounting to an 'existential threat' to humankind (Elisabeth Paul et al., 2021a), which can be reinforced by absolute numbers shared with the public on a daily basis. Part of this story suggests that the virus is somehow 'clever', since it regularly develops new variants that become increasingly contagious. The virus is often presented as an unexpected and unforeseen threat to global society, but also a risk to national and global security, akin to a war-like effort justifying huge human and material sacrifices. After initial hesitation, many European, Southeast Asian and Australasian politicians imposed, 'knee-jerk like', largescale and *untargeted* lockdowns, which never had been part of the infectious disease control toolbox.

It's the economy, stupid

The economic story gained momentum as the predictable impact of lockdowns on the livelihoods and emotional well-being of large sections of the population took hold. Globally, political leaders concentrated on two different versions of their single economic story.

The US, UK and Brazil, countries with populist and nationalist leadership, downplayed the threat of the pandemic, insisting it is no worse than a bad flu. Since this is the case, they argued, lockdown cannot be justified as it threatens to cause a collapse of the economy, which would be much worse than the potential threat of SARs-CoV-2. This story was often presented as being zero-sum with no middle position possible.

In contrast, countries like Korea, Australia, New Zealand, most Western European countries, justified lockdown as necessary to protect national security by drastically 'flattening the curve', 'circuit breaking' or 'eliminating' (not to be confused with eradicating (Skegg & Hill, 2021)) the virus and preventing the otherwise inevitable high hospitalisation rate resulting in the collapse of the health system. However, this story fails to reflect another story that helps explain why lockdowns were a necessary measure of last resort. Namely, that successive governments had failed to invest in pandemic preparedness and preventative health promotion (Cambon et al., 2021b), that governments had failed to implement or comply with the International Health Regulations, and that investments in health system strengthening had seriously waned under conditions of austerity. As a result, the story remained that it was the exceptionalism of COVID-19, and not compounding governance failures, which justified individual and financial sacrifices.

The vaccine miracle

Once the single story about the extraordinary danger of the corona pandemic was firmly in the lexicon, sparking divergent and at times contradictory corona control policies, other emerging therapeutic stories (e. g. the utilisation of hydroxychloroquine, a well-established anti-malarial drug (Abella et al., 2021), or of Remdesivir, an antiviral (Ohl et al., 2021), all promptly shown to be ineffective) were quickly side-lined by the 'arrival of the vaccine cavalry' (E. Paul et al., 2021b). With breakneck speed and massive government support, scientists were able to create – using well established as well as new innovative technologies – a surprising variety of safe and highly effective vaccines against the virus. This discovery not only justified the use of lockdowns to prevent mass fatalities but created a final 'savour' storyline. Namely, hold on a bit longer, let's get everybody vaccinated as fast as possible (national level of course), since nobody will be safe as long as a single person remains unvaccinated. As part of this ontology, governments quickly granted all vaccines emergency approval for mass immunization. For governments who stumbled early, this story afforded some vindication, renewed political capital, and a symbol of national prestige, since people could see that their governments were finally doing something that would directly save lives.

However, as Adichie emphasises, single stories are one-sided – while true, they are incomplete. Thus, to properly understand and manage the SARS-CoV-2 pandemic and its sequalae, COVID-19, we need to engage with other – often much more complex – stories. This is because something as multi-layered and complex as this pandemic (e.g. the role of social, environmental, commercial and political determinants of health) cannot possibly be captured by single storylines that insist on binary options and other simplicities. Therefore, without us intending to be comprehensive, we now suggest some important alternative storylines that we think should also be told.

III. The missing stories about the dynamics of the pandemic

The dynamic nature of the pandemic entails several interrelated stories – about the nature of the virus, its ability to spread, its mortality, its ability to mutate, and the need for policy transparency. Although representing only part of the story, these additional five narratives are important, since they temper and help contextualize the more dominant storylines outlined above. By contrasting them here, it allows for a more nuanced reflection, while opening up alternative or complimentary policy options, which may have been ignored or side-lined as single storylines became dominant and under-scrutinised.

Coronaviruses do not come 'from outta nowhere'

Since the late 1960s we have known that human coronaviruses – types 229E, NL63, OC43, and HKU1 – usually cause mild flu-like illnesses (Estola, 1970; Raoult et al., 2020). They are responsible for roughly 10-20% of all flu epidemics and scientists and governments have known of potential coronavirus risks for many years.

SARS-CoV-2 appeared in 2019 and was first observed in Wuhan, China. Its origin remains unclear, but with zoonosis being most likely from bats – with 1,400 species of bats being the second largest order of mammals and a large reservoir of known and unknown germs. Although bats remain biologically part of the story, recent findings have eluded to other possible mechanisms of the first human infection, including insufficient protocol adherence resulting in a laboratory escape (Piplani et al., 2021).

These stories directly challenge the common discourse that suggested that SARS-CoV-2 took everyone by surprise and was unforeseen.

Infectivity of SARS-CoV-2 and what we mean when we say 'highly contagious'

It is yet unclear how infectious SARS-CoV-2 is (i. e. how many people exposed get infected) – accepted estimates are around 50% (Oran & Topol, 2020). It is now accepted that it is principally transmitted by exhaled infectious droplets in the air (Greenhalgh et al., 2021). However, the ratio of infected people getting sick, namely, the manifestation rate of an infection, remains elusive. Observations indicate that transmission patterns vary widely, and that about half of the people infected do not develop any kind of symptom, let alone severe disease (Raoult et al., 2020). Severe illness is significantly more likely in people with a considerable degree of co-morbidity (e. g. cardiac or pulmonary disease), genetic immune system disorders (Bastard et al., 2020; Zhang et al., 2020) and the elderly (Grifoni et al., 2020), while asymptomatic infections may be caused by cross-immunity with 'common cold' coronaviruses (Grifoni et al., 2020).

What these alternative stories suggest is that earlier variants of SARS-CoV-2 were potentially less contagious than often portrayed by politicians and the media. Or, at a minimum, that it was not possible to determine infectivity of the virus with any certainty and that most response policies were actually operating under inflated guestimates.

Mortality 'from' SARS-CoV-2 and a reverberating fear of death

There is no doubt that SARS-CoV-2 is a fatal virus with other potential lingering effects (long-COVID (Callard & Perego, 2021; Mahase, 2020; Scherlinger et al., 2021)), and that it is comparatively more dangerous than common influenza. However, the perception that SARs-CoV-2 is exceptionally deadly, thus necessitating extreme measures, mostly arose from governments, centres of 'excellence' and the media, who often used the 'total number' of notified infected cases and number of deaths 'associated with the virus'. Although deadly, when presented via absolute numbers, the story depicts an uncontextualized picture of risk and fear of death. For example, we know that approximately 0.25 – 0.4 % of infected people will die from infection (the infection fatality rate – IFR), varies across ages: estimated age-specific IFR is very low for children and younger adults (e.g., 0.002% at age 10 and 0.01% at age 25) but increases progressively to 0.4% at age 55, 1.4% at age 65, 4.6% at age 75, and 15% at age 85 (Levin et al., 2020) (these figures may differ for the delta variant) (Bhopal et al., 2021; Ioannidis, 2021; Levin et al., 2020; O'Driscoll et al., 2021). These numbers are three to four times greater than having an aggressive 'normal' influenza infection (app 0.1% (Statista, 2021; Wong et al., 2013)), a malaria attack (at least 0.14%, but various by type, and much higher for cerebral malaria (Bartoloni & Zammarchi, 2012; Mayo Clinic Staff, 2021)) and or dengue fever (app 0.02-0.04% (Byard, 2016; Smith et al., 2019)) Yet, it is debatable if this is a high or a low figure. If only seen in absolute terms one may be inclined to say that it is high,

but when seen as percentages, the perception of risk could be low. Moreover, without comparisons to other health risks, such as non-communicable heart disease, or other communicable diseases (and forgetting about everyday risks like driving a car (Bonnet et al., 2020)), it becomes difficult to accurately measure SARS-CoV-2 risk and the justification for corresponding countermeasures.

Mutation

SARS-CoV-2, like all viruses, is constantly and rapidly mutating. So far more than 7,000 variants have been identified (Mercatelli & Giorgi, 2020). While most are more harmless than the original 'model', there are 'variants of concern' emerging (Alpha, Epsilon, Beta, Kappa, Delta, Gamma and Eta strains), requiring ongoing monitoring of their immune-evasion capacities (Lazarevic et al., 2021). The more infectious Delta variant (Davies et al., 2021) results in up to a 0.4 % 28-day 'case fatality rate' (Public Health England, 2021). However, over time, virus variants that are more infectious, tend to be less deadly, and will become dominate over other variants (Lavine et al., 2021). Although it remains to be seen if the same holds true for SARS-CoV-2 (Day et al., 2020), at the moment, the virus is mutating typically, which undermines narratives that portray the virus as more 'clever' than other known pathogens.

Transparency about what we really know about infectiousness and death

The true number of infections and the true number of 'deaths *from* the virus' rather than '*with* the virus' are hard to come by. These figures depend not only on testing rates, but also on how a 'coronavirus death' is defined – both are highly variable between countries. Based on the best available IFRs, one can estimate that approximately 150 million people in the US, 40 million in the UK and 30 million in France have already been infected, the great majority without having noticed any serious signs of infection (Wamai et al., 2021). A German population based study showed that 40% of infected people are completely asymptomatic (consistent with the latest systematic review (Sah et al., 2021)), and that 25-44 years-old people are 1.7 times more likely to be infected than those 65-88, but remain generally asymptomatic (Wild & Studie, 2021).

The exact pathophysiology of COVID-19 remains unclear, although immune compromise is likely to play an important role (Bastard et al., 2020; Garvin et al., 2020; Grifoni et al., 2020; Li et al., 2020; Renu et al., 2020; Zhang et al., 2020). However, across all ages, the presence of co-morbidities like high blood pressure or diabetes significantly increases the risk of infection and mortality (Elezkurtaj et al., 2021; Renu et al., 2020).

Geographic and population demographics appear to modify the risk for SARS-CoV-2 infection and COVID-19 disease (Baggett et al., 2020; Oran & Topol, 2020; Rolland, 2020; Tan et al., 2021). Previous exposure to a wide range of infections including malaria might also protect populations, as suggested in sub-Saharan Africa (Wamai et al., 2021). In Africa, countries with a younger mean population age may also allow greater barriers from disease, since the dangers caused by the virus for people under 40 years is significantly reduced (Rice et al., 2021). In lower resource settings, there are also mitigating factors regarding basic demographic data. For example, in Senegal, in 2013, according to the general population census, 65.2% of deaths were not reported, with a significant difference between urban areas (31.7%) and rural areas (85.8%) (Agence Nationale de la Statistique et de la Démographie, 2014). As a result, understanding how infection translates to fatal disease within a population

is complicated by basic data collection and management, making final determination of any story immensely difficult.

What these other stories suggest is that COVID-19 is far more complex than the single stories being offered and that a significant part of the confusion involves inconsistent monitoring, reporting and poor allowance for contextual variations within data analysis.

IV. The missing stories beyond the socio-economic impact

The story about the harms to the social and economic spheres ($25 trillion in stimulus packages and estimated GDP loss as of November 2020) is common, and tightly linked to stories of public policy failing to protect economic interests as well as heart breaking personal testimonials of financial hardship. Yet, the economic story is often only implicitly linked to other stories related to costs to society and population health writ large, and associated discourses about what is the acceptable balance between lives saved today versus long-term health and societal damage (Jessop, 2020). Below are just a few of the many storylines that provide a subtext to better understanding the impacts of COVID-19.

Long standing neglect of public health led to health policy failures

The US and UK laissez-faire approach towards the role of public health policy revealed major structural problems in preparedness for major public health threats (WHO, 2005). The US-driven market ideology prevented the development of a strong primary care system and enabled Trump to essentially abolish the public health sector altogether. The National Health Service in the UK did not fare much better and the sudden rise in demand for care revealed the consequences of a chronically underfunded, understaffed and undersized health system fixated on promoting cost-saving technical efficiencies at the cost of adaptive capacities. In Canada and France, COVID-19 has resulted in recognised underfunding of health systems and has led to the creation of new public health reform commissions (Cambon et al., 2021b; Or et al., 2021; Rozenblum, 2021). In response to the health crisis in Africa, France has financed more than 17 million euros to the research community (Pasteur, INSERM, Merieux, IRD), but at least 90% of this has been allocated solely to biomedical and clinical studies to the detriment of public health or health systems research, forgetting the complexity of the phenomenon (Cour des comptes, 2021).

The most vulnerable carry the burden of hard lockdown policies

Countries that implemented early hard lockdowns have, so far, contained the pandemic, and were able to provide all necessary care to those with severe COVID-19 disease. However, the associated collapse of small business led to mass unemployment requiring governments to provide substantial welfare payments to already struggling individuals and families, and subsidies to ensure the survival of small businesses, the engine of the economy (Hudson et al., 2021). Paradoxically, the main beneficiaries of these support measures were big rather than small business (Greive, 2020; Montpetit et al., 2020; Morris, 2021; Ngo, 2020; "Nonregular workers at big firms left out of virus-related benefits," 2021), perpetuating

already high levels of economic inequalities (Chakrabarti et al., 2021). While the pandemic in Europe brought to the forefront the harsh and discriminatory policies against immigrants (Carillon et al., 2020; Gautier et al., 2021), in the Democratic Republic of Congo, COVID-19 control measures had particularly negative impacts on social cohesion, security, household revenues, and access to basic commodities, including food (Vinck, 2020). What these issues expose is a story about socioeconomic and racial disparities and their relationship to premature morbidity and mortality (Egger et al., 2021; Jessop, 2020). Moreover, there are stories to be understood about the long-term effects of growing unemployment and underemployment on population health and their connection to sustainable health security (Rios, 2020). There are further considerations about exacerbated aid dependency and related global inequalities as a result of current COVID-19 response. For example, in Senegal, of the XOF 773 billion (including just 112 billion for the health sector) spent on the response, 84% was financed by international donors (including loans), the state contributed 13% and individuals or national companies 6% (République du Sénégal, 2021).

There are no free lunches: The balance between economic and health concerns

The political discourse has often prioritised the economy over other concerns and was seemingly only allowed to be undermined with the use of statistical 'worst-worst-case' projections, which were often presented as predictions (i.e. 250,000 deaths in the UK by December 2020). There are many stories to be told here, but they are not simple ones, nor stories that are absent of what philosophers call 'moral remainders' and 'dirty-hands' (Coady, 2018). In other words, the pandemic has triggered some hard, and perennial, questions to be asked, each reflective of real storylines that have played out during COVID-19: Is health and the prevention of death always the most important goal regardless of its cost (Jessop, 2020)? Does the drive for economic prosperity justify a certain number of extra deaths from a disease (Jessop, 2020)? What threshold of general population sacrifice is appropriate in order to protect vulnerable people? Should those that sacrifice the most at greater personal cost (e.g. young adults) be entitled to greater compensation?

The long-term personal and community costs of the pandemic

The immediate consequences of the pandemic on personal and family health are manifest – increases in mental health problems, partner and family violence, and suicide rates. For many, the pandemic is their first major life catastrophe leading to lasting unforeseen health consequences (Turcotte-Tremblay et al., 2021). These include mental health problems usually associated with acute shock (e.g. PTSD and depression) (Salari et al., 2020), the consequences of neglected care for otherwise treatable conditions (e.g. malaria, Tb and HIV ("The Impact of COVID-19 On HIV, Tb And Malaria Services And Systems For Health: A Snapshot From 502 Health Facilities Across Africa And Asia," 2021)), maternal health and birth outcomes (Chmielewska et al., 2021), loss of educational attainment and loss of life years (Alexander et al., 2021; Christakis et al., 2020), negative effects on family cohesion (Mazza et al., 2020), and diminished community relations resulting from missed interactions and increasing mistrust. Again, these are lived experiences that temper any simple storyline, complicating our understanding of the pandemic and how best to respond now and to future outbreaks.

The missing stories about treatments

'Flatten the curve until we are rescued by vaccines' has been the dominant storyline that largely scripted our policy response (E. Paul et al., 2021b). However, this narrative often came at the expense of important and complementary therapeutic stories. The two largest clinical trials on COVID-19 treatments (RECOVERY and Solidarity), have to date been unable to elicit an effective and safe treatment, except for dexamethasone (The RECOVERY Collaborative Group, 2020). Yet, this precludes a more systematic and patient-centred (by opposition to virus-centred) approach. For instance, while it has been known that COVID-19 caused blood clots, it is only recently that a study confirmed that prophylactic anticoagulation treatment was probably 'optimal therapy' for COVID-19 patients (Vaughn et al., 2021). Likewise, it is known that COVID-19 may cause hyper-inflammation and may be associated with bacterial co-infections, suggesting the case for preventing inflammation and providing antibacterial medication when needed (Byttebier et al., 2021; Fedson, 2021). Finally, severe cases of COVID-19 are more likely among people with comorbidities, justifying the need for increasing prevention (e.g. nutritional supplementation) and surveillance of most vulnerable people (Vaughn et al., 2021). As a result, vaccine discovery and rollout cannot, and should not, be the whole story, since it side lines and/or underplays other complimentary or potentially harmful interventions.

Morbidity and mortality are age and gender dependent

Males have more severe disease and higher mortality rates than females (Pradhan & Olsson, 2020). People under 40 years of age may experience lesser benefits from SARS-CoV-2 vaccination since most remain asymptomatic or develop very mild COVID-19 disease, however, the emerging Delta strain behaviour suggests that this age group is also the most likely to spread the virus between age groups. People over 70 are benefiting most from vaccination as they are highly likely to develop COVID-19 resulting in the need for hospitalisation, and due to the need for prolonged stays threaten the collapse of hospital systems (Higgins et al., 2021). This paints an alternative storyline from the one suggesting that SARS-CoV-2 is a highly lethal infectious disease amounting to an 'existential threat' to all humankind. The reality is that SARS-CoV-2 is a lethal infectious disease that targets some demographics much harder than others, but where general concerns about protecting vulnerable populations will also require actions by those with less risk. This alternative storyline might be too complicated for mass consumption and policy action, as many behavioural scientists (John & Stoker, 2020; Yates, 2020) suggested, but it is a story that needs to be told if we are to better reflect upon the lessons learned from COVID-19.

The obligatory vaccination of frontline health care workers

Developing COVID-19 disease appears to be related to viral load exposure (de la Calle et al., 2021; Fajnzylber et al., 2020). While face masks, personal protective equipment, and social distancing provide some defence, vaccinating frontline health care workers adds personal protection. Not only are healthcare workers at a greater risk of contracting SARS-CoV-2, they are also sources of spread to vulnerable populations, like the elderly in residential aged care. As a result, Australia has now made it a condition of employment for all aged care workers to be vaccinated (Australian Government Department of Health, 2021). Yet, the story is more complex with obvious policy implications. For example, evidence would suggest that many frontline heath workers have been infected already and that staff who had been infected with

SARS-CoV-2 have developed *natural immunity* (Shrestha et al., 2021). There are also questions about whether to vaccinate those who have already been infected, in addition to workers without antibodies, since there is emerging evidence to suggest that natural immunity elicits equally protective (if not better – polyclonal) and persistent immunity (Rosenberg, 2021; Shrestha et al., 2021). Again, this moderates the rationale to vaccinate all health workers as a blanket policy, since doing so increases cost, diverts resources, and importantly, may not provide additional protective benefit.

Universal vaccination could worsen existing inequalities

50% of the world's population and up to 90% of the population in LMICs, like many countries in sub-Saharan Africa, is under 40 years of age. Moreover, it has been estimated that vaccinating two thirds of the population in the Democratic Republic of Congo would cost up to 1 billion USD, but vaccinating only high-risk groups, would be 30 million USD. This raises questions about the best use of scare resources and public health finances, especially in low-resource settings. A different story could be that by targeting only the most vulnerable, the savings could be invested in other public health and system strengthening initiatives, which in the long run may serve those countries better with long-term population health benefits. In addition, the benefit of vaccinating people with a history of previous SARS-CoV-2 infection remains questionable (Shrestha et al., 2021). As a result, '*vaccine equity*' might not be best understood as simply vaccine access for everybody, but vaccine access for *everybody in need* – the elderly and people affected by other chronic diseases such as diabetes and hypertension, frontline health care workers and workers in essential services.

Vaccine side effects apply to all vaccines, not just the 'cheap ones'

The emergence of significant SARS-CoV-2 vaccine side effects has been rare in relative figures (Centers for Disease Control and Prevention, 2021). Nonetheless, vaccine side effects do exist and are part of the story, relating to all COVID-19 vaccines, not just those associated with being 'cheap' or Western 'castaways'. In particular, the 1/100,000 risk of cerebral clots with the Astra-Zeneca vaccine is no different to any other COVID-19 vaccine. Moreover, this particular risk is 400 times less than the estimated upper limit of and IFR of 0.4%.

This is not to dismiss known side-effects, or elevate them, but to let them have a place within the narrative. For example, there was some mention of vaccine side effects like intermittent paralysis of the facial nerve (Bell's palsy) and myocarditis (1/50,000 (Vogel & Couzin-Frankel, 2021)) associated with the mRNA vaccines. Yet, due to selective media attention, these particular side effects were discussed more than the fact that (e. g. German population) 0.01 % of vaccinations with *Comirnaty* (from *BioNTec*) and *Spikevax* (from *Moderna*) and 0.03 % of vaccinations with *Vaxzevria* (from *AstraZeneca*) cause 'serious' side effects (Paul-Ehrlich-Institut, 2021). In view of the 3.6 billion doses of vaccines applied world-wide so far, it can be estimated that at least 400,000 people were affected by these 'serious' side effects. Likewise, part of this story is that the long-term side effects of vaccinations are unknown due to the lack of an adequate observation period, being an understandable concern for some. Vaccines are not, therefore, simply an unproblematic 'calvary' sent to the rescue.

Long-term vaccine efficacy

Current SARS-CoV-2 vaccines offer an excellent short-term protection against developing severe COVID-19 disease. However, the virus is mutating rapidly with over 7,000 variants known so far, with some being more infectious and/or virulent (as seen by the Delta strain) than the original version. Current vaccine efficacy appears to wane quickly and is less effective against the transmission of the Delta strain (Planas et al., 2021), while still preventing hospitalisation. *Pfizer* already recommends a third and potentially further annual 'jab' (Neergaard, 2021), and has started the development of a Delta-specific COVID-vaccine (Mandavilli, 2021). This again provides an alternative subplot to the 'delay, vaccinate, and then eliminate COVID-19' storyline, by greatly complicating the best-case scenario often telegraphed by national governments.

V. Lessons Learned

We presented key themes of the "*many stories* [that] *matter*". None of them alone represents the 'truth', but together provide a much broader perspective about the pandemic. One that better contextualises and recognises the experiences of different stakeholders. If nothing else, the stories we have highlighted exposes that the pandemic is 'wickedly' complex, that it has many interconnected and interdependent threads, and that it is constantly evolving in unexpected ways (Grifoni et al., 2020; Klement, 2020; Joachim P Sturmberg, 2020; Joachim P. Sturmberg & Martin, 2020). As a consequence, the single story should be viewed accordingly, as an oversimplification that obfuscates the complexities of managing SARS-CoV-2/COVID-19 – with negative effects.

In the first instance the single story has prevented us from appreciating the interdependencies between the virus, the pandemic, its acute care and public health management, and its political and economic impacts. Managing complex problems requires a systems thinking frame (Ackoff, 1994; Meadows & Wright, 2009; Rogers et al., 2013; J. P. Sturmberg et al., 2020; Swanson et al., 2012), however, leadership uniformly embraced a linear cause-and-effect' approach to tackle the virus – explicitly: find a specific vaccine and we will be fine.

Second, COVID-19 has been presented as an 'entirely new and exceptional disease' (Elisabeth Paul et al., 2021a) despite science quickly identifying its relationship to immune system disorders (Bastard et al., 2020; Garvin et al., 2020; Grifoni et al., 2020; Li et al., 2020; Renu et al., 2020; Zhang et al., 2020). Reiterating the story rather than adapting to the sciences allowed for 'entirely new and exceptional politically motivated' interventions.

Third, the pandemic has shown a lack of focus on well-proven basic medical and public health approaches, and an entirely neglected or markedly under-funded health promotion or public health system. Indeed in some countries these are never funded (Cambon et al., 2021a).

Forth, the focus on 'absolute numbers' of infections and death had a detrimental effect on the well-being of people and communities. While it is 'scientifically important' to record and analyse these figures, it is equally important to interpret them in their proper context (i.e. as

percentages in relation to population seize, those infected, levels of disease severity, and 'at-risk' populations). Not doing so quickly leads to increased fear and panic while providing excuses for poorly thought through and often socially damaging policy response (Kurlantzick, 2021). Over time such poor communication increases confusion, fear and anger which in turn exhausts people's capacity to cope, and to cooperate (Black, 2021) in what Drucker called '*doing the right thing*' (Drucker, 2001).

Fifth, the rapid development of effective and safe vaccines is evidence of what a concerted collective effort can achieve. However, it is disconcerting that these efforts are not implemented in such a way that all are equitably benefiting, and it is likely that many LMICs will soon write further stories about their worsening health and economic conditions.

Lastly, the suppression of 'other stories' has prevented us from meaningfully harnessing what Aristotle called 'wisdom of the crowds' and undermines Marquis de Condorcet's mathematical theorem of epistemic democracy (you are more likely to find the right answer by combining multiple inputs rather than only a few) (Dietrich & Spiekermann, 2013; Landemore, 2012). The single story has fostered divisions amongst people, scientists and political elites, creating essentially insurmountable rifts for serious collaboration and collective action that can benefit all involved. Moreover, the single story has prevented the in-depth study of important issues such as the degree to which we develop natural immunity?; What are the best therapeutic approaches for the severely ill?; How does physical distancing effect the mental health of people and communities?; How do we ensure that civil rights are maintained/restored post pandemic?; and: How do we prepare for the inevitable outbreak of another pandemic in the future?

We are convinced that these 'other stories' provide a more complete picture of the nature of this pandemic. As Adichie suggests, "*stories have been used to dispossess and to malign, but stories can also be used to empower, and to humanise, stories can break the dignity of people, but stories can also repair that broken dignity*." We hope for the latter.

VI. Conclusion

As the Delta variant of the SARS-CoV-2 virus threatens to cause another epidemic, the single storyline appears to have looped back to the first one. Namely, a story of fear and imminent disaster. The fact that we are looping back to this singular story highlights the grand failure of government – to communicate effectively, to manage the situation, and to provide support, especially for the most disadvantaged. Instead, most governments have become ever more autocratic, nationalistic, and have determined to "*treat the people like they were stupid*"(Grant, 2021).

What is clearly missing is an understanding of the complexities amongst the many stories. None is divorced from the other, none is more or less important that the others, and each influences how others adapt their stories in light of changing knowledge and circumstances (Joachim P. Sturmberg, 2018). Health and disease are emergent states resulting from adaptive social and biological network interactions (Joachim P. Sturmberg et al., 2019). Thus, to

manage the SARS-CoV-2 pandemic successfully requires the simultaneous attention on all its domains (Fig 1), which can only successfully be understood by listening attentively to various stories and understanding their merits and shortfalls.

Insert Fig 1 about here

Despite worldwide efforts no known origin of SARS-CoV-2 could be identified. While the emergence of a highly contagious virus has been expected by scientist for some time, governments have neglected to plan for such an event. When confronted with the 'new reality' they responded the only way they know – a top-down command-and-control response focused on 'one' strategy at a time (left). The result of this approach can be seen by everyone.

The alternative, but much more 'messy' approach, is to recognise the complex adaptive dynamic nature of a pandemic. Any infective organism 'irreversibly' disrupts the current status quo. To 'get on top' of the problem one needs to understand the linkages and their interactions – their interdependencies – within and across the agents of 'definable' organisational layers, as outline on the right. Appreciating these interdependencies – the figure at this stage is by no means providing 'the complete' picture – it is a *sine-qua-none* to devising multiple potential solutions that can be evaluated for their potential impacts 'on the whole'. A systemic approach invariably provides 'better' but never 'perfect' solutions – approaches can be 'easily adapted' to anticipated emergent changes in 'all considered' agents.

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Fig 1 – The interdependencies amongst the COVID-19 stories