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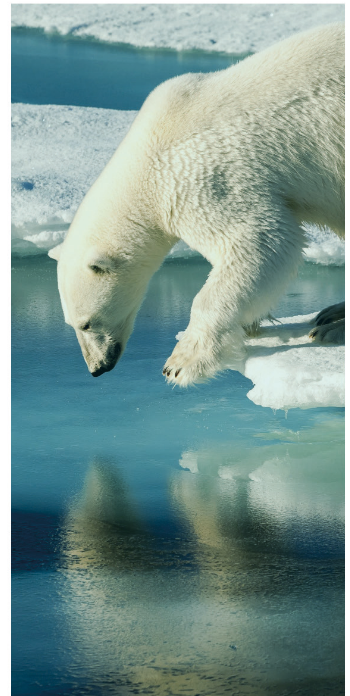

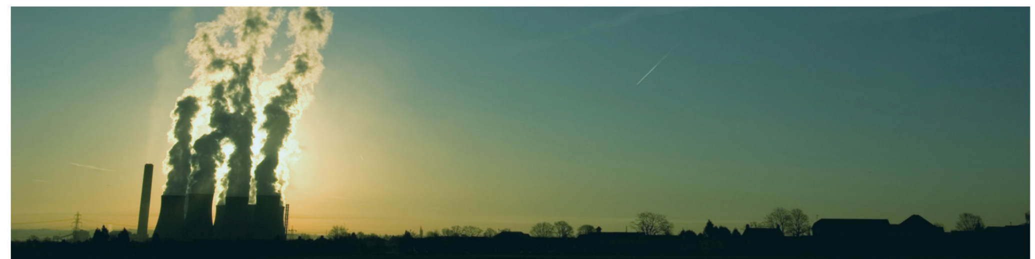

Global health disruptors

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Disruptions that shape global health

Ilona Kickbusch and Andrew Cassels introduce a collection on global health disruptors

With global governance and global health at a turning point, it seems apt to use the occasion of the 10th anniversary of the Global Health Centre at the Graduate Institute to look back at global health disruptors of the past two decades and to look forward at what will shape global health in the future.

Looking back, it is evident that the links and interplay between sources of disruption are more important than individual factors taken in isolation. AIDS linked health to global security, resulting in a fundamental recalibration of development finance (from millions to billions). The demand for more resources was fuelled by activist civil society; it brought more organisational players into the picture, and thus required more multi-stakeholder approaches to governance and partnership. Success in tobacco control and access to medicines created an appetite for greater use of international agreements and treaties. Global health governance is—we realise—about understanding change in interconnected living systems.

We also see a clear disconnect between the first and second decade of this century. If the first decade reflected the optimism and innovation in global health after the end of the cold war, the financial crisis loomed large over the second. International financing for global health has so far remained relatively unscathed, but the political fallout from the crisis—in which solidarity and shared sovereignty no longer prevail—provides the backdrop for any analysis of the future. Failure to provide funding for preparedness for the next flu outbreak is one clear symptom. There will be more to come.

Looking ahead forces us to think about the institutions of global health governance. The key challenges—reducing the price of medicine, combating antimicrobial resistance, tackling the determinants of non-communicable diseases, the health of migrants, and the health effects of environmental degradation and climate change—are of concern to all countries. They are deeply interconnected and multisectoral. Where current institutions often fail is in persisting with purely technical solutions to solve political problems; relying on linear thinking in a world dominated by complex systems; and expecting elegant concepts to translate from PowerPoint presentations into reality. Some of the contributors to this collection argue for a new generation of governance institutions better equipped to handle complexity. Others put their faith in the transformation of existing entities combined with a focus on consolidation and coordination. However we view this choice, the key point is that it has to be made in the face of the most fundamental disruption yet faced by global health.

The turning point we refer to—captured in detail in Stephen Morrison's piece about the decline of the postwar global order—is not related to one dominant event or health crisis. Rather it resembles an erosion, a growing feeling of uncertainty and threat in the face of a record number of problems; protracted humanitarian crises, substantial shifts in global power relations; and an increase in the malign influence of nationalist, nativist, and populist movements. The World Freedom Index finds that political rights and civil liberties around the world deteriorated to their lowest point in more than a decade in 2017.[1] A geopolitical shift is underway that challenges the norms, rules, and institutions of the postwar liberal international order—but it is not yet clear what will replace them.

Global health is beginning to experience the effect of a world that is more multipolar, less multilateralist, and more ideological. Support to international organisations and agreements can no longer be taken for granted, their value base is increasingly being questioned, financing mechanisms are no longer ensured, and political ideology increasingly trumps technical evidence.

Some argue that the concern is simply that the West is losing its power and that, as Kishore Mahbubani[2] stresses repeatedly, it is a matter of perspective. Developments such as China's Belt and Road Initiative undoubtedly represent more opportunity than crisis. Similarly, one can argue that "2017 was probably the very best year in the long history of humanity."[3] Never have so many people been able to move out of poverty; the global middle class is growing exponentially; more children reach the age of 5 years than ever before; the threat of hunger is receding for many; polio is nearly eradicated, and measles is not far behind; more countries give priority to ensuring that all their citizens have access to healthcare and medicines. South-South cooperation is booming, and it is to be hoped that Africa will at last be able to benefit from more investment rather than aid. At the same time, the results of the 2017 Global Burden of Disease study "shatter this comforting trend of gradual improvement and instead show plateauing death rates on a background of faltering and uneven progress, era defining epidemics, and dramatic health worker shortages."[4 5]

The Organisation for Economic Cooperation and Development identifies 56 countries as fragile; by 2030 these countries are where about 80% of the world's poor will live. [6] One in every 113 people on the planet is now a refugee—the number of people displaced by force has risen to a record 68.5 million in 2018. The Intergovernmental Panel on Climate Change has warned recently that we are reaching the point of no return for the impact of global warming.[7] We do not know the extent to which antimicrobial resistance will undermine medical progress. We are not yet sure whether advances in systems biology, genetic engineering, increases in computing power and informatics, and the development of materials science and nanotechnology will yield all the benefits that they promise.

Any one of these issues has the potential to be a disruptive force for global health, let alone all of them together. We are therefore at a turning point for two interconnected reasons. Firstly, these challenges are not yet fully accepted as being collective problems, requiring solidarity and a global response, as they are increasingly crowded out by short term domestic political concerns. Even with global agreement on the sustainable development goals, the willingness to invest in "others" and in global public goods is diminishing. Secondly, the UN and other multilateral institutions are currently ill prepared to deal with interconnected challenges and systemic breakdowns. The political environment for reform that will enable them to be more effective is lacking. These—and not viruses or diseases—are the threats that should keep us awake at night.

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1 Abramowitz MJ. Democracy in crisis. Freedom in the World 2018./https://freedomhouse.org/report/freedom-world/freedom-world-2018
2 Mahbubani K. *Has the West lost it? A provocation.* Allen Lane, 2018.
3 Kristof N. Why 2017 was the best year in human history. New York Times, Sunday Review, January 6, 2018. https://www.nytimes.com/2018/01/06/opinion/sunday/2017-progress-illiteracy-poverty.html
4 Global Burden of Disease Study. 2017. http://www.healthdata.org/gbd.
5 The Lancet. GBD 2017: a fragile world. *Lancet* 2018;392:1683.
6 OECD. *What are the key findings from contexts affected by fragility? States of Fragility.* OECD Publishing, 2018.
7 Intergovernmental Panel on Climate Change. Global warming of 1.5°C. UNEP and WHO. 8 Oct 2018. http://www.ipcc.ch/report/sr15/

AIDS

The AIDS movement changed everything—or did it, ask **Kent Buse, Sheila Tlou, and Nana Poku**

To say that the worldwide response to AIDS has been to global health governance what mobile telephones have been to banking and citizen accountability is not hyperbole—it has been a disruptor of unprecedented magnitude, breadth, and potential. This response, initially mounted by gay activists[1] in North America and Europe and community organisers in Africa[2] in the mid-to-late 1980s, showed what could be achieved with the power of strategic collective action and by refusing to accept the status quo.

Bold and creative advocacy led to ambitious targets. It also led to a change in how donors stepped up to a health challenge with investments surging from millions to billions—in the case of AIDS from less than half a billion US dollars in 1990 to $12bn (£9bn; €11bn) in 2012.[3] Advocacy led to the creation of UNAIDS, an unprecedented multi-agency response[4] within the UN, which led to another first in the UN—the representation of civil society on its governing body. Activism also triggered new institutional arrangements, which fostered unparalleled multisector action on the social determinants of HIV and new forms of accountability. As a result, the movement showed that treatment could be dramatically scaled-up through people centred services, even in resource constrained settings.

Three advances stand out. The first is that AIDS activism became the front runner of global health diplomacy. AIDS was the first health issue to be discussed in the UN security council in 2000,[5] and the first to be the subject of a UN General Assembly high level meeting a year later. The trend to use AIDS as an entry point in international relations continues. This is evidenced by the reference to AIDS as the first health related issue to be discussed in BRICS (Brazil, Russia, India, China, South Africa) summits[6] and in relations between China and Africa on local production of medicines. AIDS has been followed by a raft of other health challenges at global summits—for example in the G7.[7]

Secondly, AIDS activism enshrined the concept of inclusive governance. Taking a megaphone to the disability movement's motto of "nothing for us without us," the AIDS movement institutionalised the principles of GIPA (greater involvement of people affected by HIV)[8] in all facets of the response, including engagement in governmental reporting processes. People with HIV, as well as key populations such as sex workers, drug users, and men who have sex with men, became the drivers of global strategies rather than passive recipients.

Thirdly, the AIDS movement ushered in an era of rights based approaches in the health sector. Supported by activist lawyers, the movement claimed a range of rights related to government obligations and progressive social change. This included, most prominently, the right to treatment, which at times brought the movement into conflict with the state and the private sector.[9]

No one could deny that progress has been patchy and uneven for familiar and predictable reasons: faltering political and citizen engagement; the urgency of other global matters; profits before people; technocrats crowding out activists; and financial turbulence in donor countries undermining global solidarity. Added to this is the difficulty of maintaining the momentum of HIV prevention and supporting weak health systems to deliver everything from sexual and reproductive health to the prevention of mother-to-child transmission.

Larger, structural contexts also shape and limit what is generally termed "global health governance." Our intensely globalised world is made possible by powerful and effective sectoral governance—intellectual property, trade, production, and consumption—which are organised and sustained for purposes that do not include health but nevertheless affect the health and life chances of millions of people, including those with HIV. The Doha declaration, which made the production of generic antiretrovirals possible, was rightly hailed as a governance triumph as much as a medical one.[10] It was brought about by an extraordinary coalition of committed parties—from all sectors and walks of life. It now seems, however, that the Doha declaration might have been more of a tactical achievement than an enduring principle. The old commercial interests and the non-health governances that support these interests are re-asserting themselves.

We would be mistaken to suppose that the AIDS movement changed any of the structures of our world, fully or finally. There is no escape from politics—something that the earliest AIDS activists grasped immediately. This is not to discount our achievements, which are considerable and beyond what anyone in the 1980s might have deemed possible. But, in addition to the still considerable work that we face on the ground, perhaps the largest challenge is the ongoing struggle to ensure that the world does not accommodate AIDS but continues to confront it.

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1 Parker R. Grassroots activism, civil society mobilization, and the politics of the global HIV/AIDS epidemic. *Brown J World Aff* 2011;17:21-37.
2 Piot P, Russell S, Larson H. Good politics, bad politics: the experience of AIDS. *Am J Public Health* 2007;97:1934-6.
3 Global Burden of Disease Health Financing Collaborator Network. Spending on health and HIV/AIDS: domestic health spending and development assistance in 188 countries, 1995-2015. *Lancet* 2018;391:1799-829. doi:10.1016/S0140-6736(18)30698-6
4 Friedman EA, Gostin LO, Buse K. Advancing the right to health through global organizations: the potential role of a Framework Convention on Global Health. *Health Hum Rights* 2013;15:E71-86.
5 UNAIDS. UN Security Council resolution 1308 (2000) on the responsibility of the security council in the maintenance of international peace and security: HIV/AIDS and international peace keeping operations. http://www.unaids.org/sites/default/files/sub_landing/files/20000717_un_scresolution_1308_en.pdf
6 Sanya declaration. BRICS. 2011. http://www.gov.cn/misc/2011-04/14/content_1844551.htm
7 Leaders' Declaration G7 Summit. 2015. https://sustainabledevelopment.un.org/content/documents/7320LEADERS%20STATEMENT_FINAL_CLEAN.pdf
8 UNAIDS. The greater involvement of people living with HIV (GIPA). http://data.unaids.org/pub/briefingnote/2007/jc1299_policy_brief_gipa.pdf
9 Heywood M. South Africa's treatment action campaign: combining law and social mobilization to realize the right to health. *J Hum Rights Pract* 2009;1:14-36. doi:10.1093/jhuman/hun006.
10 World Trade Organization. The Doha declaration explained. https://www.wto.org/english/tratop_e/dda_e/dohaexplained_e.htm

The end of the cold war

A new paradigm is unfolding in resourcing development assistance, says **Francis Omaswa**

The cold war was a period of extreme political tension between the Soviet Union with its satellite states and the United States with its allies. This tension was reflected in global multilateral agencies, including the World Health Organization. The end of the cold war transformed the dynamics of economic and health development at global, regional, and national levels. This political earthquake brought a seismic shift from international to global health.

The cold war enabled corrupt governments and illegitimate military dictatorships to become the norm in the developing world. We witnessed gross mismanagement, human rights abuses, and economic collapse in sub-Saharan Africa. The United Nations and related institutions became ideological and diplomatic battlefields in which newly independent African, South American, and Asian states were used as pawns. Rogue beneficiaries traded their votes for patronage and money from either side.

The end of the cold war in 1989 ushered in a new era of world politics and development in which health has played an ever increasing role. Two aspects are particularly important.

Firstly, the principles of development assistance were transformed from being purely donor and ideologically driven to a more negotiated practice guided by pacts, such as the Paris Declaration on Aid Effectiveness and the Accra and Busan accords. These instruments promote country led, sector-wide approaches, which advocate for integrated and sustainable programmes, rather than standalone project implementation.

But the reality has been very different from the principles. Impatience from some Western donors means that they instead championed the creation of disease focused global health initiatives such as the Stop Tuberculosis Partnership, the Global Fund to fight Aids, TB, and Malaria, Gavi, the Vaccine Alliance, Roll Back Malaria, and the Global Health Workforce Alliance. These initiatives shaped global health after the cold war. They provided an alternate outlet for funding streams, which supported the approach taken by the millennium development goals, but they have produced mixed results and their future remains uncertain. One of the survival strategies of these new institutions, such as UNAIDS, is to campaign against the "exceptionalisation" of HIV. Another is to promote an expansion of their mandate to include universal health coverage, as lobbied for by some Global Fund supporters.

Secondly, the rise of civil society and the movement on social justice, equity, and women's rights has shaped global health governance. This movement has led to more transparency and accountability by governments and non-government actors around the world, but in a very uneven way, with not enough voices from the global south or from women. Today, the influence of civil society is shrinking again, as liberal democracies are being weakened. But there is some hope, as the African Union is in the process of reforming itself to become a people centred organisation embracing governments and civil society. Today it has a strict zero tolerance policy on illegitimate

governments, which has had far reaching positive results. It has also prioritised health. Many new global health actors have emerged on the African continent, and funding has grown substantially.

Now a new paradigm is unfolding in resourcing development assistance. The Bretton Woods Institutions are being challenged by Japan and South Korea and by new development banks that have been created in Asia. China is emerging as a major donor, and Chinese investments can be accessed more easily than Western investments as they have fewer conditions. At the same time, countries receiving this Chinese aid are more vulnerable and face problems with the quality of outputs. As global negotiations become more difficult, there is an emerging tendency towards regionalisation. Examples include the America First Initiative, Brexit, and the European Union, and Japan is focusing more on supporting its neighbouring countries. All these are at the expense of supporting global multilateral agencies such as WHO, which is struggling to deliver its growing mandates with insufficient budgets.

There are currently no clear political blocs negotiating at the governing bodies of WHO, as was the case during the cold war. Many countries are now more regionally aligned, with submissions organised together and with shifting alliances becoming the norm. On key issues, negotiating groups form around the rich and poor, with developing countries rallying around the Group of 77 and China as a bloc. The EU, Latin America, the Caribbean, Africa, and Asia Pacific negotiate together. The world is less polarised than it was during the cold war, and health diplomacy is more flexible. But there are indications that the new multipolar world could lead to new ideological and economic divisions and, some say, a new cold war with the main differences being between the USA and China. This notwithstanding the global health agenda holds the promise that countries will join forces to implement the agreed sustainable development goals; as a common effort to deliver the required global public goods by 2030.

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Global health partnerships

They've shaped global health governance, now should global health partnerships broaden their influence, asks **Andrew Cassels**

Global health partnerships have had a disruptive, but largely positive, influence on global governance. But they are now facing pressure to change—should they stick to the specific causes for which they were established or take on a wider role in promoting healthy lives and wellbeing for all?

Global health partnerships are hybrid organisations in which private entities, civil society representatives, and, in some cases, communities affected by the targeted diseases have an equal say in decision making, alongside governments and international organisations.[1] Roll Back Malaria and Stop Tuberculosis started the trend, but the launch of Gavi, the Vaccine Alliance, in 2000 and the Global Fund to fight AIDS, TB, and Malaria in 2002 had the greatest effect.

Their influence is hard to dispute—an estimated 27 million lives have been saved by the Global Fund,[2] halving the number of children missing out on vaccinations in Gavi supported countries.[3] The world's sustained attention to the power of immunisation and the threat of AIDS, TB, and malaria owes a great deal to their advocacy. But how have they made global health governance what it is today?

They have increased the influence of civil society. Earmarked funding has made non-governmental organisations, civil society, and community organisations—and through them equity, gender, and rights—forces to be reckoned with. In addition, they have helped shape markets, reducing the cost of health commodities, although some argue they could have done more, particularly for vaccines.[4] But there is also the disruption that didn't happen. The idea of creating hybrid funds was to attract more private finance into global health, but despite ventures into innovative financing, most funding for both partnerships still comes from governments.

Their focus on results—lives saved and deaths averted—has been widely influential. It is a major selling point for their own investors, but of more dubious value when adopted uncritically by organisations with a broader repertoire, such as the World Health Organization (WHO).

They have provided a new model welcomed by bilateral donors: major disbursements through single transactions, ample opportunities to claim credit for success, and political distance at the first hint of corruption. And they have changed the balance of power in the multilateral system. Established as financing instruments, the intention was that the global partnerships would depend on partners from the United Nations to support implementation. In practice the reverse is true. UN organisations like Unicef and WHO are increasingly dependent on Gavi and the Global Fund—a strategic risk not dissimilar to their dependence on polio funding.

Lastly, partnerships have often distorted national spending priorities, but this is arguably only because other areas of health remain substantially underfunded. In low income countries grants disbursed on time sometimes give health workers their first experience of actually implementing something they have had a hand in planning. They have contributed to fragmentation. But we mustn't forget that most government contributors still run separate bilateral programmes, the UN Development System hardly operates as a seamless whole, and a growing number of new donors seek visibility and attribution. The real problem is that donor funding for global health incentivises competition over collaboration.

Looking to the future, partnerships are under pressure to change to support universal health coverage and achievement of the health sustainable development goals, to strengthen health systems, to promote domestic financing for health, to break down disease focused silos, and to avoid duplicative financial replenishments. Some would argue that this calls for greater breadth and consolidation, but this will be resisted by constituencies committed to sustaining the partnerships' core mission. Multi-stakeholder governance—a key innovation—has brought many benefits, but it risks gridlock and immobility. The key question is whether innovative governance can facilitate long term strategic decision making or whether the availability of donor financing will once again be the deciding factor. It would be sadly ironic if the future of global partnerships was determined by one of the main problems that their founders sought to overcome—the vagaries of donor financing. The fate of repeated attempts to streamline decision making in the Global Fund do not give great cause for optimism.

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1 Liden J. The Grand Decade for Global Health 1998-2008. Chatham House Working Group on Governance. Paper 2. April 2013. https://www.chathamhouse.org/publications/papers/view/190715#
2 The Global Fund to fight AIDS, TB and Malaria. Global Results Report, 2018. https://www.theglobalfund.org/media/7741/corporate_2018resultsreport_report_en.pdf?u=636722997240000000
3 Gavi, the Vaccine Alliance. Annual Progress Report 2017. https://www.gavi.org/progress-report/
4 High vaccine prices hamper immunisation efforts in Africa, but are missing from agenda of key vaccination conference. Médecins Sans Frontières. 2016 Feb 24. https://www.msf.org/access-high-vaccine-prices-hamper-immunisation-efforts-africa-are-missing-agenda-key-vaccination

Millennium development goals

The millennium development goal framework is a blueprint for current and future policy, says **Robert Marten**

The millennium development goals (MDGs)—comprising eight goals, 18 targets, and 48 indicators—served as the over-arching framework for development efforts, as well as most global health activities, from 2001 until the target date of 2015. All the world's countries and leading development institutions agreed to follow the MDGs to help meet the needs of the world's poorest people. Often overlooked as a critical transformation for global health governance, the MDG framework transformed the then emergent field of global health.[1]

Global governance scholars have argued that the MDGs represented a "super norm" for the global development agenda, as they created a broad consensus on ending poverty as the overarching objective.[2] Similarly, they were a super norm for global health—they helped define, consolidate, and reflect a nascent normative global health agenda in the early 2000s, which largely continues today. Despite some initial challenges in uptake before 2005, strong political commitment, multilateral momentum, and global champions helped establish and institutionalise the MDGs and ensure progress, particularly between 2010 and 2015.[3]

The framework created research and civil society networks and helped policy makers and institutions focus global health efforts on reducing child mortality, improving maternal health, and combating HIV/AIDS, malaria, and other diseases (MDGs 4, 5, and 6). As a result, the global under 5 mortality rate fell from 90 to 43 deaths per 1000 live births between 1990 and 2015, the maternal mortality ratio declined by 45% worldwide, and new HIV infections fell by approximately 40% between 2000 and 2013, from an estimated 3.5 million cases to 2.1 million.[3] The MDG agenda also revolutionised the collection and measurement of health data.

The MDGs influenced the allocation of billions of dollars of development assistance and had an impact on millions of people's lives. Moreover, they likely increased the overall amount of investment, especially for health.[4]

New institutions, like The Global Fund to Fight AIDS, Tuberculosis, and Malaria and Gavi, the Vaccine Alliance, provided huge financial commitments to global health and reflected the focus of the MDGs, which in turn shaped the focus of the emergent global health agenda. These global health partnerships also helped finance and deliver the MDGs. Despite being initially somewhat reluctant to commit to the MDGs, the US government made serious financial commitments aligned with the goals through the US President's Emergency Plan for AIDS Relief and the President's Malaria Initiative, among others. Later in 2010 UN secretary general Ban Ki-Moon initiated the Every Woman, Every Child campaign to continue progress to achieve the MDGs. By 2014 almost two-thirds of all official development assistance for health was directed towards the goals.[5]

At the same time, the MDG framework also presented challenges for global health. It "ignored the central role of health systems, overlooked emerging health concerns such as non-communicable diseases, injuries, and pollution, tended to exacerbate fragmented health systems by focusing on final health outcomes related to vertical programmes rather than on building integrated health systems, and at times contributed to inequities in health."[6] Another challenge was that the emphasis on health metrics sometimes promoted an overly simplistic linear input-process outcome model for health, which was reductionist and ultimately created new challenges for equity and progress. More broadly, the MDGs strongly shaped which issues were considered and which issues were not considered part of the emergent global health agenda, preventing some important topics, like non-communicable diseases or environmental issues, from being considered.

Although many of these problems continue to challenge global health,[7] the MDGs represented a revolution. The "MDG approach" has been a blueprint for ongoing and future global health efforts with advocates seeking to cascade and replicate many of the successful approaches from MDGs 4, 5 and 6 to other health issues. In this sense, the MDGs continue to shape global health policy and practice today.

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1. Marten R. How states exerted power to create the Millennium Development Goals and how this shaped the global health agenda: Lessons for the sustainable development goals and the future of global health. *Glob Public Health* 2018;Apr:1-16. doi:10.1080/17441692. 2018.1468474.
2. Fukuda-Parr S, Hulme D. International norm dynamics and the "end of poverty": understanding the millennium development goals. *Glob Gov* 2011;17:17-36
3. United Nations. The millennium development goals report 2015. http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20(July%201).pdf
4. Kenny C, Sumner A. More money or more development: what have the MDGs achieved? Center for Global Development Working Paper 278. 2011. https://www.cgdev.org/publication/more-moneyor-more-development-what-have-mdgs-achievedworking- paper-278
5. Dieleman J, Murray C, Haakenstad A. Financing global health 2014: shifts in funding as the MDG era closes. 2015. http://www.healthdata.org/policy-report/financing-global-health-2014-shifts-funding-mdgera-closes
6. Vega J. Universal health coverage: the post-2015 development agenda. *Lancet* 2013;381:179-80. doi:10.1016/S0140-6736(13)60062-8.
7. Marten R, Kadandale S, Nordström A, Smith RD. Time to move on: shifting global health governance from the MDG to the SDG era. *Bull World Health Organ* [forthcoming]

2008 financial crisis

We don't have the money to deliver the sustainable development goals, says **Ronald Labonté**

Collapse of Lehman Brothers bank in 2008 heralded the greatest financial crisis since the Great Depression in 1929. Immediate effects of the crisis were a sharp rise in unemployment, stagnating or worsening poverty rates, increased homelessness, and an excess in childhood deaths disproportionately affecting poorer populations—all of which had a negative effect on people's health and wellbeing.[1] The rapid shift into global austerity deepened the detrimental effects on health through cuts in public health and social protection spending, increased user fees for public services, and reductions in public sector employment.[1] And it seems likely that another meltdown lies just around the corner.

The backstory to the 2008 crisis is well known. Profligate lending by unregulated and highly leveraged banks propped up a real estate bubble against which many of the American middle class borrowed to offset stagnant incomes. Risky (subprime) mortgages were slipped into investment products that, with approvals from bond rating agencies, were sold worldwide, offloading the lenders' risks to other banks, pension funds, and retirement savings. When the real estate bubble burst, the entwined global financial system faced imminent collapse. By 2009 several countries were heading into recession.

Many of the world's governments acted with a coordinated alacrity unmatched by responses to any other global health or environmental crisis. Indebted governments, which had been reluctant to invest more heavily in global health development assistance, pumped $11tn (£8.6tn; €9.6tn) into failing banks, some as direct subsidies[2] and the rest by creating new money (quantitative easing) and keeping interest rates at historically low levels. These unorthodox monetary policies re-inflated a global financial system that was crumbling under its own greed. Heterodox economists, who had long predicted the 2008 crisis, imagined that global economies would move away from unfettered market liberalism towards a neo keynesian era of corrective government intervention into an increasingly unequal economy.

However, in under two years, governments that had been initially keen to publicly bail out private greed backtracked and embraced fiscal austerity, a variant of the discredited structural adjustment programmes of the 1990s. Greece became (and remains) the European example of how austerity destroys economies rather than the reverse. Internationally, the belt tightening measures of austerity were (and continue to be) experienced worst by those least responsible for the mess. The effects of the crisis and the ensuing recession and austerity on health have been largely negative.[3]

Promises were made in 2008 to re-regulate global finance to prevent future economic collapses, but these were only weakly implemented, if at all. Renewed discussion of a global financial transaction tax to curb financial speculation, which, coincidentally, would be sufficient to finance all 17 of the sustainable development goals (SDGs) in a year,[1] quickly distilled to a handful of (still reluctant) EU countries. The majority consensus is that financial reform after the crisis has been too little, too late. It is a global governance failure, which the former UK prime minister Gordon Brown described as "sleepwalking into a future crisis."[4] Bank profits have risen again, as has the bonus culture. Risky shadow banking and the derivatives market continue to trend upwards, re-inflating asset bubbles. Global debts are now almost twice as high as they were when the 2008 crisis began.[5]

When the next crisis hits—and it will—governments no longer have 2008's monetary salvage tools. Interest rates can't be reduced much further, and the global debt burden is a result of too much newly minted money. Global governance to mitigate financial crises is trickier now than a decade ago, so global health outcomes will be worse. Unless, and until, private global finance is effectively reigned in, the health outcomes promised in the SDGs will remain illusory rhetoric as the financing won't be available.

But the biggest governance price we are paying for the (ongoing) economic avarice of the few is the rise of right wing extremist politics, an expression of the failure of the established parties (right, centre, and left) to acknowledge the deep social, economic, and health wounds created by the 2008 crisis, and governments' temerity in applying only a few small policy bandages to a haemorrhaging tear in the social contract between those hoarding capital and the rest of us.

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1 Labonté R, Stuckler D. The rise of neoliberalism: how bad economics imperils health and what to do about it. *J Epidemiol Community Health* 2016;70:312-8.
2 Ortiz I, Cummins M. The age of austerity: A review of public expenditures and adjustment measures in 181 countries. SSRN Electronic Journal 2013 Mar 24
3 Margerison-Zilko C, Goldman-Mellor S, Falconi A, Downing J. Health impacts of the great recession: A critical review. *Curr Epidemiol Rep* 2016;3:81-91.
4 Elliot L. 'The world is sleepwalking into a financial crisis' – Gordon Brown. *Guardian* 2018 Sep 12. https://www.theguardian.com/politics/2018/sep/12/we-are-in-danger-of-sleepwalking-into-a-crisis-gordon-brown
5 Secretariat of the United Nations Conference on Trade and Development (UNCTAD). Trade and Development Report 2018: power, platforms and the free trade delusion. United Nations, 2018: 162. https://unctad.org/en/PublicationsLibrary/tdr2018_en.pdf

WHO Framework Convention on Tobacco Control

Gian Luca Burci discusses this breakthrough treaty that continues to stand alone

International tobacco control, signified by the World Health Organization Framework Convention on Tobacco Control (FCTC), has developed into a key testing ground for many aspects of global health governance and the development of international health law. The FCTC disrupted global health by providing a framework for regulating tobacco, its marketing, and its production processes. We now need to see whether the framework can significantly reduce smoking rates and control the influence of the tobacco industry around the world. If so, it could provide a blueprint for the control of the commercial drivers of other risk factors of non-communicable diseases.

The worsening tobacco epidemic, and the realisation that the tobacco industry was using the economic liberalisation of the 1990s to expand and consolidate, disrupted the global health community's approach to tobacco control, leading to an unprecedented legal solution. The FCTC is the product of the convergence of a possibly unique set of factors: a bold and powerful WHO director general—Gro Harlem Brundtland—who set tobacco control as an organisational priority, the massive mobilisation of influential and well resourced non-governmental organisations, the determination of a large number of states that were struggling with the spiralling health costs of tobacco, the growing social stigma around tobacco and its industry, and a spreading consensus that health is a paramount value in a globalised world.

The FCTC is a landmark treaty, being the first and only international instrument that regulates the consumption and commercialisation of a legal consumer product. It is also ideologically unique—it expresses the rejection and isolation of an entire commercial sector, which can never be a legitimate counterpart of the health community and should ideally go out of business. Feelings against the industry are so strong that the public are excluded from many FCTC meetings, to ensure that they are protected against any influence from industry representatives. This is unprecedented in UN meetings.

Although the FCTC is full of painful compromises, it has been successful and effective in many respects. With 181 parties as of October 2018, it is one of the most ratified UN system treaties. The conference of the parties—the FCTC's governance mechanism—has produced a growing body of guidelines to help strengthen the convention by assisting in its implementation. It also provides a forum for political declarations of support for health policies against corporate interference and serves as a catalyst for the mobilisation of civil society, which is crucial for maintaining momentum and shaming recalcitrant countries.

The FCTC has proved decisive in recent unsuccessful trade and investment lawsuits directed against national measures that affect industry profits, such as moves towards plain packaging for cigarettes. In these cases, the authority of states to implement policies for health protection purposes has largely prevailed over corporate economic rights. The FCTC and its guidelines were considered the expression of a normative consensus on effective and proportionate control measures.

These victories should reassure developing countries that have been pressured by the tobacco industry to abandon strong control measures under the threat of costly lawsuits. At the same time, national implementation of the FCTC has been uneven. The most recent progress report on the convention shows that progress on global smoking rates is stagnating, 13 years after the FCTC entered into force.[1] The FCTC protocol on illicit trade, which took six years to enter into force and had only 48 parties as of October 2018, is still untested and may prove costly and complex to implement both for parties and for its secretariat.[2] Moreover, the focus on tobacco has complicated regulatory responses against new products such as electronic cigarettes. Finally, the "heavy" treaty approach of the FCTC may have deterred countries, probably lobbied by commercial interests, from going down the same route of regulation for other risk factors of non-communicable disease, such as alcohol, highly processed food, or carbonated drinks. Regulation of these products and industrial processes largely relies on voluntary commitments.

Even though the FCTC has validated the package of regulatory measures to tackle non-communicable disease risk factors, the jury is still out on whether it will pave the way for further international health law treaties. Nevertheless, the FCTC is a historic and successful instrument for global health, both for its approach and level of implementation, and for the political momentum that it symbolises.

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1 World Health Organization. Global progress report on implementation of the WHO Framework Convention on Tobacco Control. 2018. http://www.who.int/fctc/reporting/WHO-FCTC-2018_global_progress_report.pdf
2 World Health Organization. First Session of the Meeting of the Parties to the Protocol to Eliminate Illicit Trade in Tobacco Products. 2018. http://www.who.int/fctc/protocol/mop/en/

Doha declaration

Power imbalances threaten access to medicines for all countries, says **Sharon Friel**

The Doha Declaration on the Trade Related Aspects of Intellectual Property Rights (TRIPS) Agreement and Public Health was adopted in 2001 by members of the World Trade Organization (WTO), in response to concerns about access to medicines. It affirmed that the TRIPS agreement should be interpreted and implemented to protect public health and promote access to medicines for all. Moreover, it showed the power of developing countries to drive through an agenda in the interest of public health and at odds with drug companies and richer economies.

High drug prices are often the result of strong intellectual property protection. The 1995 TRIPS agreement introduced intellectual property rules into the multilateral trading system, including patents for drugs.[1] In theory, it enabled countries to bypass companies' patents, issue compulsory licences, and manufacture and export affordable generic versions of brand name drugs in public health emergencies. In practice, it was unclear how countries could make use of these safeguards. Concerns grew about patent rules restricting access to affordable medicines in developing countries, particularly access to antiretroviral drugs in the face of the HIV/AIDS epidemic.[2]

The Doha declaration marked a major shift in political and legal relations at the WTO. It established that a rules based trading system should be compatible with public health interests. In developing the declaration, members from developing countries had sent a clear signal that they would take steps to protect and advance their social interests.

Several elements were critical to successful development of the declaration. Members from developing countries showed that by establishing a core coalition, including Brazil, India, and South Africa, and maintaining it throughout a negotiating process, they could prevent themselves from being outmanoeuvred by the EU-US block. The goal of the core group was supported by networks of national and international civil society groups, particularly AIDS advocacy groups, which used clever framing strategies to raise public awareness about the health risks from TRIPS. Moreover, the core group had the support of a much wider circle of countries. The Doha meeting was part of a sequence of events around access to antiretroviral drugs over the preceding years and happened just one month before the launch of the Global Fund to Fight AIDS, Tuberculosis, and Malaria.

TRIPS elevated the WTO to a key player in global health governance because it took on the role of developing and regulating patent policy. The Doha declaration also arguably helped reassert the World Health Organization's authority as the main global health institution through dialogue with the WTO and its members. The declaration reminded the global north that the global south was not a pushover.

But this may all be irrelevant. Over the past decade, the multilateral system has been progressively abandoned partly owing to shifts in the economic power balance between countries and regions. This has led to increasing numbers of regional trade agreements and bilateral investment treaties. Wealthy countries have more bargaining power than low income countries to negotiate advantageous trade rules, including delaying the introduction of generic medicines and introducing restrictions on the operation of drug programmes that would undermine the regulation of medicine prices.[3] Corporations also hold disproportionate power in such agreements and are the beneficiaries of their rules. These power imbalances are compounded by a lack of accountability and transparency measures compared with the formal rules and dispute settlement procedures of the WTO system.

The outcomes achieved in the Doha declaration stand in stark contrast to the progressive "ratcheting up" of intellectual property rights in free trade agreements negotiated outside the WTO.[4] This resetting of global trade rules does not bode well for the future of global public health, with the issues of price and access to medicines now a concern to all countries.[5]

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1 World Trade Organization. Declaration on the TRIPS agreement and public health. 2001. www.wto.org/english/thewto_e/minist_e/mindecl_trips_e.htm
2 't Hoen E. TRIPS, pharmaceutical patents, and access to essential medicines: a long way from Seattle to Doha. *Chic J Int Law* 2002;3:27-46.
3 Lopert R, Gleeson D. The high price of "free" trade: US trade agreements and access to medicines. *J Law Med Ethics* 2013;41:199-223. doi:10.1111/jlme.12014
4 Sell SK. TRIPS-Plus free trade agreements and access to medicines. *Liverp Law Rev* 2007;28:41-75. doi:10.1007/s10991-007-9011-8.
5 Gleeson D, Friel S. Emerging threats to public health from regional trade agreements. *Lancet* 2013;381:1507-9. doi:10.1016/S0140-6736(13)60312-8

The rise of civil society

Civil society organisations have had profound influence on global governance, say **Nanoot Mathurapote and Weerasak Putthasri**

The disruption and challenges caused by neoliberal globalisation and the inability of global and national governing bodies to respond effectively has led to the emergence of new players, particularly civil society organisations.[1] These groups have caused a disruption in global health governance by advocating for change in many areas of development, including poverty reduction, gender equality, and climate change.

The Declaration of Alma Ata in 1978 and the Health for All Strategy in 1981 enabled civil society organisations to work side by side with health professionals. This opportunity to have a key part in global health governance was apparent after the emergence and spread of HIV/AIDS in the 1980s when networks of people with HIV and civil society organisations formed advocacy groups to campaign on human rights issues.

The success of AIDs advocacy groups in raising awareness, challenging attitudes, and triggering change showed the power that civil society can have on the global health agenda. Civil society organisations play a vital role in agenda setting, advocacy, brokering knowledge, mobilising resources, implementing, monitoring and evaluating policy, and—importantly—enabling the voices of marginalised communities to be heard.[1-4] The progress made on drug prices and treatment access, tobacco control, promotion of breastfeeding, and control of infant formula companies all reflect the strong will and capacity of civil society organisations.[2 4] Their bargaining power seems to have increased in all platforms of governance—that is, global health governance, global governance for health, and governance for global health.[5]

Civil society organisations have shaped the governance of global health in three ways. Firstly, they showed the credibility of a new model of governance where they work in partnership with governments and other sectors in terms of decision making. Gavi, the Vaccine Alliance, and the Global Fund to Fight AIDS, Tuberculosis, and Malaria, for example, are widely recognised as having civil society organisations as their constituents. Notably, we need more evidence to confirm their equal role and power in influencing decision making.[3] Nationally, Brazil established a health council in 1988 that has brought civil society organisations, service providers, and the government together to discuss health policies at national, state, and municipal levels. Thailand has had health assemblies where civil society organisations, academics, and government meet to discuss health in all public policies since 2008. Iran followed a similar model in 2017. These organisations have been successful at gaining trust and credibility from international organisations and governments after decades of successful engagement. This has helped them to contribute effectively to a model of multisectoral governance, collaboration, and action.

Secondly, the engagement and advocacy of civil society organisations has helped to scale up global health issues into global political issues. We must give credit to alliances such as the Framework Convention Alliance, which advocated for the Framework Convention on Tobacco Control to be included in the UN sustainable development goals. Credit also goes to the NCD alliance, which advocated for prevention and control of non-communicable diseases to be agreed in the World Health Assembly and the United Nations General Assembly. This is important because when global health issues are incorporated into broader global issues, the heads of governments are more obliged to take heed of them.

Lastly, civil society organisations have helped move global health issues on from decision making platforms to implementation, and vice versa. The International Baby Food Action Network has provided assistance to the World Health Organization and its member states in bridging implementation gaps and monitoring the International Code on the Marketing of Breast milk Substitutes, which was adopted at World Health Assembly in 1981. On the other hand, civil society organisations in public-private partnerships or alliances, such as the Global Health Workforce Alliance, Gavi, and the Global Fund, bring feedback from communities and their

experiences of implementing policies/programmes to improve efficiency of the implementation.[3]

In the era of the sustainable development goals, where health targets are distributed across all broader goals and where multiple determinants of health are considered, the role of civil society organisations, globally and nationally, is crucial. But they can only be effective in the right circumstances. We need the right environment—governance mechanisms, platforms, laws, and regulations—to enable these organisations to use their full capacity in solving global health problems, together with governments and the private sector. Civil society organisations also require adequate managerial, technical, and soft skills. Despite the influential and disruptive force that these organisations have been in global health, they need the alignment of governance platforms to successfully achieve the sustainable development goals.

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1 Lowensen R. 2003. Civil society influence on global health policy. Civil Society Initiative World Health Organization and Training and Research Support Center Zimbabwe. http://www.tarsc.org/WHOCSI/globalhealth
2 Lee K. Civil society organizations and the functions of global health governance: what role within intergovernmental organizations? *Glob Health Gov* 2010;3:suppl http://blogs.shu.edu/ghg/files/2011/11/Lee_Civil-Society-Organizations-and-the-Functions-of-Global-Health-Governance_Spring-2010.pdf
3 Storeng KT, de Bengy Puyvallée A. Civil society participation in global public private partnerships for health. *Health Policy Plan* 2018;33:928-36.
4 Gómez EJ. Civil society in global health policymaking: a critical review. *Global Health* 2018;14:73.
5 Kickbusch I, Szabo MM. A new governance space for health. *Glob Health Action* 2014;7:23507.

The Bill and Melinda Gates Foundation

The Gates Foundation has expanded the power of private philanthropic organisations, say **Marlee Tichenor and Devi Sridhar**

The Bill and Melinda Gates Foundation was established in 1997 with the goal of tackling diseases in the global south through data and technology driven approaches. As a private philanthropic institution without the same limitations on its investments as governments, the foundation has had the freedom to make its own decisions about where it chooses to invest its funding portfolio.[1] Over the past 20 years, the foundation has grown into one of the leading voices in global health, often sitting at the table with heads of state and heads of multilateral organisations as decisions are made about investment priorities. This has disrupted the nature of global health governance through changing the nature of what it means to be "public."

In 2017, the Gates Foundation provided $3.3bn (£2.5bn; €2.9bn) of the world's global health funding, tying the private philanthropic organisation in second with the United Kingdom for development assistance for health. The Gates Foundation's major investment in the World Health Organization, the Global Fund to Fight AIDS, Tuberculosis, and Malaria, and Gavi, the Vaccine Alliance—along with the global health partnerships it helped found, such as the Primary Health Care Performance Initiative and the Global Financing Facility—make clear in budgetary terms how influential the Gates Foundation is in setting the agenda and in managing the world's health.[2]

In the process, the Gates Foundation has simultaneously expanded its reach into the production of global health data, the dissemination of these data, and their uptake by global health institutions such as WHO and the World Bank. The expansion of private, albeit philanthropic, interests into domains that are perceived as public and independent raises major questions about the influence of private actors, the effects of the monopolisation of data, and the nature of accountability in global health governance. The present governance system provides no mechanisms to tackle these issues.

The Gates Foundation financially backs the Institute for Health Metrics and Evaluation (IHME), part of the University of Washington, through an initial grant of $105m and a follow-up grant of $279m to produce global health data. IHME produces global burden of disease data, national estimates of health spending, and development assistance for health data. The IHME is required by the Gates Foundation to produce new estimates every year on the world's health problems through the Global Burden of Disease study. The Gates Foundation uses these data to inform its funding portfolio. Never before has one institute had such a defining power through analytics.

These data are then published in the global burden of disease studies, with the flagship studies published exclusively in the *Lancet*, a highly esteemed, open space for global health debate.[3] As is common practice in the publishing industry, the Gates Foundation pays for these studies to be open access. The Gates Foundation helps increase the influence of these data and shapes how global health problems are discussed, as is evident in the high number of citations of these studies.

Furthermore, in May 2018, the IHME and WHO signed a memorandum of understanding, which noted that from 2019 there will be a single global burden of disease study published in the *Lancet*, rather than one produced by WHO and one by IHME. WHO has agreed to use IHME data in their own 2019-23 general programme of work and for their own estimates for burden of disease, and WHO data specialists will be seconded to the IHME. There are advantages to taking the global burden of disease analysis out of WHO. For example, the Gates Foundation and IHME have more available resources, and the partnership will require IHME and WHO to deal with tensions at the heart of their methodologies.

However, there are also downsides. The methods used are increasingly complex and incomprehensible even to global health experts, and it leaves us dependent on a single partnership for global data production. The agreement is also an indication of how the Gates Foundation has expanded its ownership of the measurement of global health problems into the heart of the foremost global health institution and ensured that only these data will be accepted globally. The Gates Foundation has guaranteed that its own preferred methodologies for measuring global health data take precedence. It is too early to know how this partnership will affect country involvement in the production of estimates.

This disruption has not been sufficiently discussed in global health. What does it mean for public and impartial global health spaces to be influenced by private philanthropic interests in this way? What does it mean for public organisations to be tied, even indirectly, to a private foundation with particular investment interests to shape the discussion about which global health problems count the most and how we should tackle them? By occupying and changing the nature of public spaces in global health, the Gates

Foundation has expanded the power of private philanthropic organisations while not opening new means of holding such actors accountable. This global health governance challenge must be tackled, as data and algorithms will play an ever expanding role in defining approaches and setting priorities.

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1 Gates B. JP Morgan Healthcare Conference speech. 8 Jan 2018. https://www.gatesfoundation.org/Media-Center/Speeches/2018/01/JP-Morgan-Healthcare-Conference?mod=article_inline
2 Clinton C, Sridhar D. *Governing global health: who runs the world and why?* Oxford University Press, 2017.
3 Shiffman J. Knowledge, moral claims and the exercise of power in global health. *Int J Health Policy Manag* 2014;3:297-9. doi:10.15171/ijhpm.2014.120

SARS and Ebola

SARS and Ebola redefined the World Health Organization but didn't resolve its funding problems, says **Suerie Moon**

Protecting the world from outbreaks of infectious disease requires a World Health Organization (WHO) that is able and willing to confront the most powerful stakeholders, because even its own member states do not always act in the interests of global public health. Countries may conceal important information, hoard vaccines or drugs, block trade, or ban travellers without justification—all of which can hamper outbreak control. Two major disruptors—severe acute respiratory syndrome (SARS) in 2002-03 and Ebola virus disease in west Africa in 2014-15—have shown the health consequences of outbreaks as well as the economic and security crises they could spark. This pushed health security to the top of the political agenda and reshaped the identity of WHO. SARS and Ebola prompted important reforms at WHO but didn't generate the steady financing that the organisation needs.

From the first suspected cases in China's Guangdong province in 2002, the previously unidentified and deadly SARS virus quickly spread to nearly 30 countries, sowing panic and bringing travel and tourism to a standstill. China initially withheld information on the outbreak from WHO and the global community, prompting Gro Harlem Brundtland, head of WHO at the time, to publicly call for greater transparency from the government—at considerable political risk. She also issued a travel advisory for Toronto after cases were identified, despite protests from the city mayor and Canadian government. By the end of the outbreak, at least 8000 people had fallen ill, and economic losses had reached at least \$11.8bn (£9bn; €10bn), primarily in east Asia and Canada.[1]

The legacy of SARS on the global governance of outbreaks was profound. The crisis prompted a major revision of the International Health Regulations, one of only two binding global health treaties in existence. Governments delegated greater authority and responsibility to WHO in health emergencies, such as allowing it to consider outbreak information from non-state actors when formulating its judgments and advice.[2] It redefined WHO's identity as not only a technical organisation supporting its members, but also a political actor with decision making power that could have global consequences. SARS also reminded world leaders that all countries—even the wealthiest—depended on WHO to gather, interpret, and share highly sensitive information on emerging outbreaks to enable faster, better responses to the threat of infectious disease.

SARS may also have helped convince the Chinese government to invest substantial diplomatic capital in backing Margaret Chan, who led Hong Kong's response to the outbreak, to become WHO's director general in the 2006 special election.

Both Brundtland and Chan were strong leaders, but with contrasting philosophies regarding how much deference WHO should give to its sovereign member states. This difference was clear during the west African Ebola crisis a decade later, when WHO was facing resistance from the government of Guinea in calling greater international attention to the outbreak. Led by Chan, WHO waited five months after the first case of Ebola was confirmed to declare an international emergency, despite clear signs that the outbreak was out of control in urban areas of Liberia and Sierra Leone. With its searing images of patients dying in quarantine and health workers in full body protective gear, Ebola caused panic worldwide and reminded policy makers that weak health systems anywhere heighten the risk of pathogens everywhere.

After two years, 11 000 deaths, and several billion dollars in response spending, the outbreak was over but with lasting consequences for the three hardest hit countries and the global health community. WHO faced a crisis of confidence in its ability to fulfil its mandate as guardian of global health security. At the same time, Ebola underscored that no one could afford a weak WHO. After a plethora of reviews, a concerted push for change yielded important, but partial, reforms—most importantly, an invigorated peer review system for national preparedness and revamped capacity at WHO to respond rapidly on the ground to outbreaks supported by a new contingency fund.[3] Outbreaks remain a high priority in WHO's current programme of work.

But WHO's unstable financial foundation, which makes it difficult to challenge member states or to build a coherent, highly capable organisation, is still not resolved. Between 2000 and 2018, the proportion of WHO's budget guaranteed by its member states fell from 40.8% to 21.6%,[4,5] leaving it increasingly reliant on voluntary contributions to meet expanding demands (its total budget also doubled during this time). Governments were not willing to back a proposal to increase significantly their obligatory contributions to WHO, seeming to prefer an organisation that they could more easily control.

In brief, legal reforms after SARS envisioned a politically robust WHO able to put the global public interest above the narrow interests of any single country, but financing reforms after Ebola fell short of building it. The incumbent director general

Tedros Adhanom Ghebreyesus has his work cut out in tackling this unfinished reform.

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1 Keogh-Brown MR, Smith RD. The economic impact of SARS: how does the reality match the predictions? *Health Policy* 2008;88:110-20. doi:10.1016/j.healthpol.2008.03.003
2 Fidler D. From International Sanitary Conventions to Global Health Security: The New International Health Regulations. *Chin J Int Law* 2005;4:325-92. doi:10.1093/chinesejil/jmi029
3 Moon S, Leigh J, Woskie L, et al. Post-Ebola reforms: ample analysis, inadequate action. *BMJ* 2017;356:j280. doi:10.1136/bmj.j280
4 Clift C. *What's the World Health Organization for.* Chatham House R Inst Int Aff Lond, 2014.
5 World Health Organization. Financing of the programme budget 2018-2019: report by the director general. 2018. http://apps.who.int/gb/ebwha/pdf_files/WHA71/A71_30-en.pdf

Decay of the postwar multilateral Western order

Global health is a product of the Western postwar liberal international order—an order that is today besieged, says **Stephen Morrison**

In the past two decades, we have witnessed an expansion of investments into global health that have been rooted in humanitarianism, the rule of law, and democracy. Underlying this action have been the principles of multilateralism, alliances, and partnerships. It has been consistently argued that investments outside home borders will not only save and improve lives but also promote economic growth and the stability of communities.

In surprising and unforeseen ways, global health also benefited enormously from the post 9/11 counter terror doctrine that came to dominate the security strategies of the major Western powers. That doctrine aggressively advanced the argument that uncontrolled infectious diseases pose major transnational threats. It put a spotlight on smaller countries beset by weaker governance and fragile infrastructure, where grave health challenges can fuel armed, internal violence. Counter terror gave rise to the belief that focused investments—"smart power"—would achieve concrete results in improving lives while also winning hearts and minds in a global struggle.

Today, the western liberal international order is under siege and eroding, with grave long term consequences for global health. The principal driver is a widespread populist nationalism, in the United States, the United Kingdom, across Europe, Brazil, and elsewhere. Rooted in societal discontent, alienation, and economic marginality, an anti-global outlook espouses a deep suspicion of traditional diplomacy, migrants, foreign aid, trade and security alliances, science and public health, and multilateral partners. Sovereignty is the dominant, vaunted principle. Rhetoric focuses on protecting the homeland from invasion, from "theft" through errant trade relationships, and from outdated foreign entanglements that distract us from home priorities. The preference is for relationships that are transactional and short term, that reward friends and punish foes, and that bring material rewards at home. Getting agreement on what are authoritative facts has become highly problematic. Women's reproductive rights are under threat in the US and across the world.

Counter terror has faded as the dominant security doctrine, including the belief that foreign aid is an important counter terror tool. The over-riding concern of Washington's new national security strategy seems to be about competition among the US, China, and Russia.

Africa, centre of most donors' global health investments, is an afterthought, if a thought at all. The Ebola outbreak in eastern Congo, the first in an active war zone, is now in its fifth month. Efforts to contain and arrest the outbreak are not going well, and it has been difficult to rally high level attention in Washington, London, and European capitals. Official US civilian experts are not permitted to operate in the epicentre of the outbreak, in the face of security threats. Other Western donors have quietly followed the same path.

The old liberal consensus is now explicitly broken. What this disruption will

ultimately mean for global health is still an open question, as is true of the larger question of what is to replace the old order. The staying power of populist nationalism remains uncertain. But it is safe to predict that this disruption won't disappear anytime soon and is likely to have several lasting effects. It will stop further progress on many of the gains achieved over recent years, and in some areas it will significantly reverse progress and weaken the major operational institutions. It will have a sharp dampening effect on finance, including the viability of international financial mechanisms, and will make concerted, coordinated international action slower and more arduous. It will raise the risk that health security crises like the one now unfolding in eastern Congo will escalate at a high cost.

Outwardly, the situation currently might not look so bad for global health—which accounts for the apparent lack of panic—but that should not be reason for complacency. By contrast with trade and security alliances, major global health programmes and institutions have not been targeted up to now, and the leadership of WHO, Gavi, the Vaccine Alliance, the President's Emergency Plan for AIDS Relief, and the Global Fund to Fight AIDS, Tuberculosis, and Malaria remained reasonably strong. Germany, France, Canada, and Japan continue to be visibly active and committed. Major bilateral agencies, such as the Department for International Development, USAID, and the Centers for Disease Control and Prevention have not yet suffered major setbacks. But these realities do not reflect the widespread nervousness and uncertainty that surrounds global health. Nor have they stood in the way of the steady, dangerous erosion of budgets and the continued assault upon annual budgets and multilateral partners.

Global health's exceptionalism up to now, reliant on a range of constituencies that have defended these investments (legislators, advocates, faith community, private sector, foundations) may be only temporary and may mask deep underlying risks of regression. The erosion of the Western international order is disquieting. It erases the common normative consensus and creates confusion, uncertainty, fear, and inhibitions. It stifles creativity and innovation, and significantly weakens the ability of advanced economies to act with any clear headed consensus and sense of purpose to meet the multiple, far flung, pressing global health challenges. It greatly limits the ability of those key states to think and act expansively about achieving Universal Health Coverage, tackling non-communicable diseases, and carrying forward the unfinished business on HIV, TB, malaria, polio, and maternal and child health.

In the face of this disruption, incentives are stacked heavily in favour of defending the status quo, holding on to what one has, and lowering one's visibility and risk.

Global health partisans are innately optimistic, and few believe that all will be lost. Many are still in denial that the decay of the Western order is real, advanced, and a grave threat. The disruption will likely do deep damage, and as that process unfolds, it may trigger a counter reaction that seeks to rescue things, hopefully soon enough for corrective actions to be possible.

In the US and elsewhere, the disruption has already begun to stir a democratic response. Thinking is centred outside government circles, among political scientists, parliamentarians, and civil organisations. This emerging crisis provides an opportunity for an updated global health vision that could be focused in the wider effort to create a liberal counter argument to populist nationalism. Certain themes will be central: the need for a reaffirmation of core values, including the rights of vulnerable refugee and displaced populations, and the shared threat of a world that could be over-run by human crises and unmanaged health security challenges. Existing programmes need to be refreshed, and made more accountable and resilient, guided by clearer end goals and targets for partner countries to assume ownership. To be most effective to anxious and sceptical voters in donor countries, this vision needs to connect with trade and security goals, including competition with China and Russia. And it has to be communicated convincingly and intelligibly. The usual language used to discuss global health is an impediment to persuading the average citizen of its importance.

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The Belt and Road Initiative

Haik Nikogosian asks whether China's infrastructure strategy will reshape global health

The Belt and Road Initiative—China's plan for the "new Silk Road"—marks one of the largest developments of the 21st century, affecting economies, infrastructures, and trade in a vast part of the world (Asia, Africa, and Europe). But will it disrupt global health as well?

The initiative encompasses economic, infrastructure, transport, and consequently environmental policies in the region and is strongly embedded in trade, investment, development, and foreign policies of the participating countries. Health has its own interface with these domains, underlining the potential benefits and risks that the initiative will have on public and global health.

Major public health matters, such as communicable diseases, health security, healthy lifestyles, illegal substances, and road safety, will inevitably be affected by the increased flow of people, information, goods, and services along the proposed land and sea corridors. Opportunities will arise for increased trade in health products, services, and technologies, as well as for establishing cross border laboratories for better health security and healthcare hubs to attract medical tourism. New or better roads, energy supplies, and telecommunications will promote access to health facilities and improve primary care—a key part of universal health coverage. Increased international cooperation may contribute to regional and global health security.

New forms of cooperation in research and knowledge sharing will also be established. Cooperation networks for health policy research, public health, and human resources, as well as the Hospital Alliance and the University Alliance of the Silk Road, have all recently been started. These professional exchanges provide an opportunity to improve evidence based standards and solutions in and between countries.

Finally, national and regional institutions and mechanisms supporting the initiative have the potential to enrich the governance for global health.[1] This already manifests through the public health stance of regional political and economic organisations with overlapping membership with the initiative, such as the Asia Pacific Economic Cooperation, the Shanghai Cooperation Organisation, and the Eurasian Economic Union. Health "clubs," such as the meetings of health ministers of China and central and eastern Europe and the high level forum of China-Africa Health Cooperation, have also contributed.

But there are also risks. From a public health point of view, countries with weaker health systems may not be able to cope with the health effects of such vast infrastructure projects, an influx of trade, and increased cross border movement, unless health protection and promotion is adequately embedded in the initiative's agenda. There are also risks around the spread of infectious diseases in countries with lower vaccination rates, freer supply of products like tobacco and unhealthy food, and environmental and road safety concerns. Moreover, the rapid development of new infrastructures, without sufficient consideration of the effect on health, may escalate already existing health gaps. Risks will also be associated with macro effects, such as the level of protection by employment laws and the health effects of increased debt.

From a governance point of view, the scarcity of international agreements specific to the Belt and Road Initiative may disrupt the expected positive effects on global health governance. We should make use of prominent global and regional health agreements and processes that participating countries are already members of, such as global and regional treaties (including WHO's Framework Convention on Tobacco Control and Protocol on Water and Health), International Health Regulations, and the European environment and health process. Further, "club" positions on topics such as tobacco, occupational health and safety, and trade and investment agreements, may slow and potentially impede global health negotiations. Risks will also be associated with potential divergence from national and global agendas, such as on non-communicable diseases, a major global priority that was not specifically referred to in the recent Health Silk Road Communiqué.[2]

Links between the Belt and Road Initiative and China's rising role in global health are evident. The latter has manifested itself in bilateral assistance in emergencies and outbreaks, building medical facilities abroad, export of medical knowledge and technologies, and increased engagement in multilateral health forums, including in influential clubs such as the G20 and the BRICS countries. This direct engagement from China on health is now being reinforced by the health effects of massive infrastructure investments along the Belt and Road, with the new financial institutions such as the Eurasian Infrastructure Development Bank and the Silk Road Fund fuelling these prospects.

Although health is not at the core of the initiative, it is nevertheless integral and must be considered. Health will be disrupted, with considerable gains, but if unchecked there will also be risks, owing to the large economic, trade, and infrastructure projects that span the vast corridor linking China with Europe and beyond.

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1 Kickbusch I, Szabo MM, et al. A new governance space for health. *Glob Health Action* 2014;7:23507. doi:10.3402/gha.v7.23507
2 National Health Commission of the People's Republic of China. Beijing Communique of the Belt and Road Health Cooperation and Health Silk Road. en.nhfpc.gov.cn/2017-08/18/c_72257.htm

Research and development

Edward Whiting outlines the changes needed for research and development to realise its potential

Research and development has been a powerfully disruptive force in global health governance. The discovery of a new treatment, product, or insight can shift understanding of what is possible in the eradication or control of a disease and can create a new impetus for collective action, often forcing existing governance mechanisms to work better or reform. Over recent decades, the discovery of treatments (such as antiretroviral drugs for HIV or new vaccine candidates for Ebola) has forced the creation of new organisations and delivery models—such as the Global Fund to Fight AIDS, Tuberculosis, and Malaria, UNAIDS, and the Coalition for Epidemic Preparedness Innovations—to ensure their prompt and equitable availability.

The "spark" created by these discoveries has the potential for even greater disruptive power by fuelling the urgency to break political impasses and rebalancing the power dynamic between donor and recipient countries. Here's what needs to happen to realise this potential.

Firstly, ensuring equitable access to the products of research and development is likely to become more challenging as biomedical innovation becomes more expensive and its products more personalised. A 2017 study by Deloitte estimated that research and development returns to the drug industry have fallen to 3.2% from 10.1% in 2010.[1] Declining profitability has contributed to an accelerating rate of exit from key areas of late stage drug development, such as new antibiotics. The balance between optimal use of public money, private investment, and affordability of end products is increasingly precarious. This pressure will only be exacerbated as treatments become more personalised. We may need new alliances and partnerships to look at how public and private money can be invested across the development pipeline most sustainably for global benefit.

Secondly, global health governance needs a broader understanding of what constitutes research and development. As well as basic science, innovations in tackling non-communicable disease may come from behavioural, economic, and social science disciplines. Our global health governance will need to find creative ways to advocate for interventions that are often politically challenging. Similarly, the global health community should continue to study the role of underlying social factors in, for example, vaccine hesitancy or epidemic response. Our ability to do this will determine the degree to which disease responses and health systems improve. The global health community will need to support more context specific research, like the new THIS institute in Cambridge, focused on the "unglamorous" work of improving performance quality in the NHS through robust research and analysis.

Thirdly, we need to ensure that global health governance creates the best incentives to support the speedy adoption of affordable new discoveries at scale. The WOMAN trial, for example, recommended the use of tranexamic acid for the treatment of postpartum haemorrhage, at cost of $2 (£1.50; €1.80) a dose.[2] We need to have the right global health governance systems in place to quickly help bring new discoveries, like promising new TB vaccines, to patients who need them around the world.

Finally, new research and development investment and activity have the potential to increase the power of countries with the greatest disease burdens around the negotiating table at major global health meetings. Over recent years several funders have increased investment into networks and institutes of scientific excellence in low and middle income countries, through initiatives like AESA (https://www.aesa.ac.ke/), H3Africa (https://h3africa.org/), and Grand Challenges Africa. Domestic investment in research and development in African countries, towards the agreed target of 1%, remains sluggish. The World Bank's recent Money and Microbes report set out a compelling argument, with recommendations, for increasing investment into domestic clinical trial capacity across Africa.[3] The field is open for countries and new regional funders to take greater charge of how global health research is prioritised. The African Development Bank, the Asian Development Bank, and the Inter-American Development Bank, for example, provided $674.4m for global health in 2017.

How we respond to these challenges will determine the degree to which research and development is an "accelerator" of progress towards the health related sustainable development goals. If we can successfully support new knowledge, products, and centres of power, we will see the governance of global health transformed over the coming years.

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1. Deloitte. A new future for R&D? Measuring the return from pharmaceutical innovation. 2017. https://www2.deloitte.com/uk/en/pages/life-sciences-and-healthcare/articles/measuring-return-from-pharmaceutical-innovation.html
2. The Lancet. WOMAN: reducing maternal deaths with tranexamic acid. *Lancet* 2017;389:2081. PubMed doi:10.1016/S0140-6736(17)31111-X
3. World Bank. Money and microbes: strengthening research capacity to prevent epidemics. https://www.worldbank.org/en/topic/pandemics/publication/money-and-microbes-strengthening-research-capacity-to-prevent-epidemics

The global healthcare market

Thinking differently about how to harness health markets could provide more health for more people, says **Jeffrey L Sturchio**

The global healthcare market is now estimated to be worth some $10tn (£7.7tn; €8.9tn) and is growing at a faster rate than GDP in many countries.[1] This market spans both the public and the private sectors. In some cases, like vaccine procurement, it operates mainly in the public sector, whereas in others, such as digital innovations, we are seeing an explosion of private sector entrepreneurship that is leapfrogging health system gaps in many countries.

Traditional health industries are being reshaped by new opportunities arising from breakthroughs in science, technology, policy, and finance. Other industries, including nutrition, sports and fitness, telecommunications, and banking, are broadening the reach and impact of global healthcare markets. The production and provision of health related goods and services, employment in the health workforce, new technologies, and capital invested in hospitals, clinics, and other health infrastructure affect the prospects for stable economic growth and employment in economies around the world. And these effects in turn lead to improvements in population health.[2]

Many in the global health community see this as problematic. If access to healthcare is a human right, how, they ask, can the private sector play a constructive role in helping to ensure health for all? But health outcomes are necessarily linked to the healthcare markets that supply interventions to the populations that need them. This complex global economy of health is already creating disruptions in traditional practices in global health delivery, as the scale, scope, and efficiency of the private sector create and shape markets in new ways. Making markets work better for health—by reducing transaction costs, increasing market information, balancing buyer and supplier risks, and using innovative business models to reach underserved populations—will lead to better use of resources and continued improvements in health in both rich and poor countries.[3,4]

What implications will these disruptive effects have for global health governance? As Tedros Adhanom Ghebreyesus, director general of the World Health Organization has observed, "Health cannot be left to health ministers alone. Ministers of finance and of the economy need to be involved, too. Their policies can have a profound impact on the health of the population and on an equitable outcome to health system reforms."[5] This was highlighted by the 2008 Tallinn Charter on health systems for health and wealth, which defined a health system as "the ensemble of all public and private organisations, institutions, and resources mandated to improve, maintain, or restore health."[6] This encourages us to think of health systems as ecosystems of different actors bringing complementary skills and resources together to achieve more than the sum of their parts. Rather than ask whether healthcare markets have a role in improving global health, we should be asking how to make the private sector work for innovation and equity.

What possibilities do healthcare markets offer for improving countries' prospects of achieving universal health coverage and the sustainable development goals? Consider the scale of financial flows in the global health marketplace: the World Health Organization's investment case for the next five years is $14bn or about $2.8bn a year—a tiny fraction of annual global financial flows in the health economy.[7] What if we could disrupt the usual patterns of investment in global public health by thinking differently about how to harness health markets in the service of health for all? A small change in the allocation of these resources could be transformative for billions of people around the world. A good start would be to encourage bankers, institutional investors, and corporations in all sectors to understand better the robust returns to investment in health versus other potential investments, thus mainstreaming health into financial decision making in a sustainable way.[8]

What does the future hold? The challenge will be to find appropriate ways to adapt stewardship mechanisms for mixed health systems in which both public and private actors and resources are deployed to provide more health for more people. We will need to pay attention to transparency, equity, and accountability—for public and private sector actors alike. The recent report of the Independent Accountability Panel for Every Woman, Every Child, Every Adolescent acknowledges that this is contested terrain but concludes that "when the public sector is strong and government is responsive to its citizens, the private sector can thrive, enhance growth and wellbeing, and accelerate innovation to achieve the 2030 agenda."[9] By working together in new ways, in the spirit of collaboration and cooperation, we can develop new mechanisms of global health governance that incorporate the potential of the global healthcare marketplace in ways that will make a real difference in tackling the

health challenges that all countries will face on the path to universal healthcare coverage.

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1 World Health Organization. *Together on the road to universal health coverage: a call to action, WHO/HIS/HGF/17.1*. World Health Organization, 2017: 3.
2 Kickbusch I, Franz C. Conceptualizing the health economy. In: Sturchio JL, Kickbusch I, Galambos L, eds. *The road to universal health coverage: innovation, equity and the new health economy.* Johns Hopkins University Press, 2018: 16-40.
3 US Agency for International Development. *Healthy markets for global health: a market shaping primer.* USAID, 2014.
4 Clayton M. Christensen, Michael E. Raynor and Rory McDonald. What is disruptive innovation? *Harv Bus Rev* 2015;(December):44-53. https://hbr.org/2015/12/what-is-disruptive-innovation
5 Ghebreyesus TA. Foreword. In Sturchio JL, Kickbusch I, Galambos L, eds., The road to universal health coverage: innovation, equity and the new health economy. Johns Hopkins University Press, 2018): v.
6 Kutzin J, Sparkes SP. Health systems strengthening, universal health coverage, health security and resilience. *Bull World Health Organ* 2016;94:2. http://www.who.int/bulletin/volumes/94/1/15-165050.pdf. doi:10.2471/BLT.15.165050
7 Ghebreyesus TA. Launch of WHO investment case. Remaks at WHO Headquarters. 19 September 2018. http://www.who/int/dg/speeches/2018/launch-of-who-investment-case/en/
8 Krech R, Kickbusch I, Franz C, Wells N. Banking for health: the role of financial sector actors in investing in global health. *BMJ Glob Health* 2018;3(Suppl 1):e000597. doi:10.1136/bmjgh-2017-000597
9 Independent Accountability Panel for Every Woman. Every Child, Every Adolescent. *Private sector: who is accountable? for women's, children's and adolescents' health. 2018 Report*.http://iapreport.org/img/pdf/IAP18001_REPORT_B_020_WEB.pdf

Fourth industrial revolution

We must ensure a digital future that is safe and inclusive for all, say **Flavia Bustreo, Siddhartha Jha, and Stefan Germann**

Digital concepts and solutions that were considered science fiction only a few decades ago are now coming to fruition. Remarkable developments in areas such as nanotechnology, connectivity, and artificial intelligence (AI) are unprecedented in scope, velocity, and impact, allowing for endless possibilities as well as disruptions. This is our fourth industrial revolution, and its disruptive potential for healthcare is only beginning to be grappled with.[1]

With each opportunity, the fourth industrial revolution also brings critical questions such as, who owns our data? What bias is within these data? Who has access to the data? And how will the data be regulated? These are key matters that need to be tackled before global health governance and equity can be secured.

Digital disruptions have changed the nature of healthcare delivery. AI innovations have increased the speed at which clinical researchers can generate potential molecular targets for accelerated drug development, and with help from AI we can monitor individual health with exceptional accuracy. Further yet, the use of AI applications could result in enormous saved healthcare costs, whereby we move from reactive disease management to proactive prevention and health promotion, thus disrupting the entire healthcare sector.[2]

We have many reasons to be optimistic that AI could prove transformative for healthcare, including in resource poor settings.[3] But the extent to which everyone will benefit remains to be seen. The data that feed into AI systems deserve critical attention. To ensure value for all human beings—irrespective of race, ethnicity, region, gender, or age—we need unbiased and fully representative data. Without inclusivity and accessibility, the exponential developments of the fourth industrial revolution will only increase the gap between those who can benefit and those left behind. We need to foster environments suitable for AI and data governance frameworks across the world and to proactively engage governments, communities, and public and private players in discussions at every level, to generate unbiased, accurate, and secure data.

The technological drivers of AI, big data, and digital solutions have major implications for global and national health governance and policy making. The speed at which these innovations develop requires us to change the nature of traditional, analogue management mindsets. Current approaches to ethical, legal, and regulatory frameworks are not sufficient to regulate new forms of data or the speed at which this change is happening.

As Daniel Zajfman, president of the Weizmann Institute, said: "It seems that for the first time in human evolution, the speed of change is outpacing our evolutionary brain capacity to cope with it."[4] Evidence tells us that the rapid growth in health data is facilitating an unprecedented understanding of our health and wellbeing like no other in human history. In Nigeria, for example, satellite and mobile phone data enabled the identification of 80 000 people showing high risk of malaria transmission.[5]

Unfortunately, current trends show a move towards the privatisation of health data by the global tech giants and insurance companies. With this is mind, the data that work to combat diseases could be harnessed as another commodity shared with only the highest bidders. Initiatives such as the Open Data Barometer show a readiness by some governments to adopt more transparent data frameworks, but all actors in global health governance must make a collaborative effort for all health data to become a global public good.[6]

We should look to the Indian government's recent introduction of the World Health Assembly resolution on digital health as a starting point towards the creation of health data as a global public good.[7] But this still needs to be heavily built upon. Privacy, confidentiality, access, ethics, and ownership issues must be efficiently tackled, and the recently launched UN secretary general's high level panel on digital cooperation should take the governance and management of health data into consideration if it is to ensure a digital future that is safe and inclusive for all.[8] At the same time, we should develop and harness innovative solutions to unlock the value of this data to advance global health and wellbeing. Only then can we ensure that the fourth industrial revolution will live up to its promise in terms of our future health.

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1 Schwab K. The fourth industrial revolution. New York: World Economic Forum; 2017.
2 Collier M, Fu R, Yin L. *Artificial intelligence: healthcare's new nervous system.* Accenture, 2017.
3 Wahl B, Cossy-Gantner A, Germann S, Schwalbe NR. Artificial intelligence (AI) and global health: how can AI contribute to health in resource-poor settings? *BMJ Glob Health* 2018;3:e000798. doi:10.1136/bmjgh-2018-000798
4 Zajfman D. Curiosity driven research as driver for high value innovation. Presentation at 5th Agora round-up held in Zürich on 3 September 2018.
5 Global Partnership for Sustainable Development Data. Goal 3; good health and wellbeing. http://www.data4sdgs.org/sdg3
6 World Wide Web Foundation. International open data conference. webfoundation.org/2018/09/join-us-at-the-international-open-data-conference/
7 World Health Organization. Digital health. 21 May 2018. apps.who.int/gb/ebwha/pdf_files/WHA71/A71_ACONF1-en.pdf.
8 United Nations. Secretary general's high level panel on digital cooperation. http://www.un.org/sg/en/content/sg/personnel-appointments/2018-07-12/secretary-generals-high-level-panel-digital-cooperation

The urban planet

The solution to badly planned and unhealthy cities lies in local public and private engagement, says **Evelyne de Leeuw**

In movies and novels, the global cityscape of the 21st century is a spatially and demographically multilayered grey chaos—think Fritz Lang's *Metropolis*, *Blade Runner*, and Philip K Dick's other dystopian urban futures. In these "urban planets" there is very little space for nature, sustainable ecology, and thriving human social endeavour. And that is exactly what the United Nations declared about a decade ago: more people than ever live in cities, and cities are by far the most prominent geospatial and socioeconomic features on the planet.

We may have reached "peak urban"—a critical tipping point from which there is no way back to quiet, nature based, pastoral life. Humans now shape the planet—whether intentionally or through neglect.

Urbanisation has been cast, often by pastoral romantics, as problematic. Cities create pollution and many social and environmental challenges, and they place an ecological footprint on the land that extends far beyond their own spatial limits. But are cities, as Jaime Lerner, the former mayor of Curitiba in Brazil, has said, not the problems but the solutions to the 21st century?

There is hope. The New Urban Agenda sets out a vision of human and ecologically scaled development and provides a roadmap for planning, managing, and living in cities.[1] In the agenda, leaders (including academics and political figures) have committed to plans to make cities more healthy, resilient, sustainable, environmental, age friendly, safe, and green. This has been the pursuit of a global movement called "new urbanism" or "healthy cities" since the mid-1980s.

But the reality for most people living in urban areas is not like this. Many of the world's cities are badly planned, polluted, provide inequitable access to healthcare, and exacerbate social isolation, social inequalities, and economic hardship. Access to green space is often limited, and inadequate housing and unacceptable living conditions have a detrimental effect on inhabitants' health and wellbeing. The many millions of slum dwellers and people in "invisible" or hidden cities are a concern for global governance, resources, and service delivery, not to mention the risks to their own health, wellbeing, and future.[2] This is a permanent social and ecological disruption built by an urban-industrial complex of malevolent planners, politicians, and developers.

Infectious diseases, such as Ebola and Zika, are harder to control in a badly governed urban environment, and they can become far bigger threats (to health and society) than they would in rural or remote contexts. In well managed areas, they may also be dealt with more efficiently through service delivery and community action.

Is there a way out from badly planned and unhealthy cities—apart from massive number crunching[3,4] and the calls to action by UN Habitat (http://nua.unhabitat.org/) and greeny visionaries?

Some positives signs of change come from communities and local governments that have explicitly chosen to seek a governance role on the global stage. Global and local networks like Sustainable Cities, United Cities, and ICLEI (Local Governments for Sustainability, https://www.iclei.org/) embrace multiprofessionalism, the value of connected research and development, the power of committed communities and diversity, and open and transparent exchange of experience by communities, political leadership, and academic "experts." These governance arrangements are rapidly evolving and may cause a spin-off disruption of note. Political analyses have shown that local government and community engagement create policy innovation that national and international governance systems watch with envy.[5,6]

Perhaps the nation state is dead, and local level formal and informal, public and private engagement will have to save the day. Tobacco control, responses to the refugee crisis, and climate change mitigation begin, and are effective, locally and through policy diffusion spread horizontally (to other localities) and upward (to higher levels of government). The connections between horizontal and vertical networks of communities and governments will be critical for our future. Recognising this new local reality and acting this out nationally and globally will shape our world and stabilise urban progress for greater wellbeing. UN sustainable development goals 3 and 11 would be well served by such a recognition—as would all global sustainability aspirations.

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1. UN. The New Urban Agenda: key commitments. https://www.un.org/sustainabledevelopment/blog/2016/10/newurbanagenda/
2. Dodman D, Leck H, Rusca M, Colenbrander S. African Urbanisation and Urbanism: Implications for risk accumulation and reduction. *Int J Disaster Risk Reduct* 2017;26:7-15 doi:10.1016/j.ijdrr.2017.06.029 .
3. Rydin Y, Bleahu A, Davies M, et al. Shaping cities for health: complexity and the planning of urban environments in the 21st century. *Lancet* 2012;379:2079-108. doi:10.1016/S0140-6736(12)60435-8
4. Lowe M, Whitzman C, Badland H, et al. Planning healthy, liveable and sustainable cities: how can indicators inform policy? *Urban Policy Res* 2015;33:131-44 doi:10.1080/08111146.2014.1002606.
5. Intersectoral Governance for Health and Equity in European Cities, Healthy Cities in Europe. *Health Promotion International 2015* https://academic.oup.com/heapro/issue/30/suppl_1
6. World Health Organization. Healthy cities. Promoting health and equity—evidence for local policy and practice. 2014. http://www.euro.who.int/__data/assets/pdf_file/0007/262492/Healthy-Cities-promoting-health-and-equity.pdf?ua=1

Non-communicable diseases

Tackling non-communicable diseases will require new technologies and societal change, says **Sania Nishtar**

Non-communicable diseases are front and centre of the discourse around global health. Our emphasis has been on lack of funding, but the issue is much deeper. Non-communicable diseases will radically disrupt the future of global health, and we don't have the right institutional competencies to deal with it.

They are not just disruptive because of the epidemiological damage that they cause. They are equally disruptive in terms of the political, economic, technological, societal, and health systems responses needed to make a sustained difference.

To mount an effective response, we need a societal transformation towards healthier lifestyle choices; a re-engineering of health systems for chronic care; new cross government norms in trade, commerce, and fiscal decision making; new values underpinning profitability and investment, and a culture of cross government and public-private partnerships that delivers on public outcomes.

We are increasingly aware that we need to tackle non-communicable disease owing to several high level UN summits, institutional advocacy, and its inclusion as a target in sustainable development goal 3.4. This has led to a huge demand for technical assistance from countries.[1]

But technical assistance will have narrow influence given the limited leverage of ministries of health on the full spectrum of the determinants of non-communicable disease. National and international organisations are not prepared, and do not have the skills and resources, to deal with the issue. The institutional structures that we have developed for infectious diseases will not work for non-communicable diseases. This enormous shift in disease patterns and the necessary response is forcing us to think differently.

Today, health systems are being re-engineered not by ministries of health, but by financial and online retail institutions. Ensuring that this achieves equity of access and high quality care will require a deeper understanding of how we can use new technologies, which are part of a growing healthcare market.

The solutions are also dependent on societal changes and a shift towards healthier lifestyles, which are currently largely limited to affluent settings. The potential for increasing digitisation, smartphone connectivity, and the wellness industry—the fastest growing global market currently estimated at $3.72tn (£2.86tn; €3.29tn)[2]—to disrupt the global health landscape is huge. These developments need to be harnessed to achieve sustainable development goal 3.

Precision medicine may soon become the default option for disease management. This is evidenced by the declining cost of genome sequencing, advances in pharmacogenetics, use of biobanks, and flexible small volume manufacturing, coupled with the rise in artificial intelligence, big data analytics, and supercomputing power. Most of these developments are part of growing solutions to tackle non-communicable diseases, but financial access barriers will widen.

The future of health may be about the future of non-communicable diseases, but many governance imperatives are emerging in the wake of new technologies and partnerships, in relation to norms and standards and ethical, patient safety, regulatory and human resource capacity issues. Governance mechanisms and capacity are needed to negotiate policy space for non-communicable diseases within existing initiatives, to exercise stewardship when countries are reluctant to enact public health measures for fear of trade or investment disputes, and to support companies and investors that move to divest from products and industries that endanger health.

No existing organisation has the capacity to tackle all aspects of non-communicable diseases. I remain of the view—as I did in 2007[3]—that a new, multi-stakeholder, "cooperative" governance mechanism is need for non-communicable diseases, with input from different sectors and scope beyond the health sector. A strong governance infrastructure is a fundamental step on which to build on the momentum from the third UN General Assembly high level meeting on non-communicable diseases. Without attention to this we will be setting ourselves up for failure.

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1. World Health Organization. WHO delivering for results Changing ways of working for effective and efficient delivery. http://www.who.int/about/finances-accountability/budget/20170113_delivering-for-results_background-paper_draft.pdf
2. Global Wellness Institute. Wellness now a $3.72 trillion global industry—with a 10.6% growth from 2013-2015. https://globalwellnessinstitute.org/press-room/press-releases/wellness-now-a-372-trillion-global-industry/
3. Nishtar S. Time for a global partnership on non-communicable diseases. *Lancet* 2007;370:1887-8. doi:10.1016/S0140-6736(07)61791-7

Climate change

Reducing our use of fossil fuels will lead to a healthier society, says **Jonathan A Patz**

If we continue to burn fossil fuels at the current rate, the earth will be 1.5°C hotter than pre-industrial levels in 12-34 years, the latest report of the United Nations Intergovernmental Panel on Climate Change says.[1] This extent of warming would kill 70-90% of our coral reefs and damage terrestrial crops and ecosystems. Climate change also threatens to disrupt public health through exposure to more intense heat waves and storms, air pollution, malnutrition, climate sensitive infectious diseases, and social dislocation.[2]

The report found that limiting global warming to under 1.5°C—a preferred goal set in the 2015 Paris climate agreement—would require a 45% drop in global net emissions of CO_2 by 2030, and "net zero" emissions would need to be achieved by 2050.[1] So, are we doomed or can we find reasons for optimism?

Though it might seem paradoxical, the global climate crisis gives us an incredible opportunity, particularly regarding our health. Consider the following: the World Health Organization estimates that 7 million people die prematurely every year from air pollution, rates of obesity and chronic diseases are rising dramatically across almost all regions of the world,[3] and physical inactivity from sedentary lifestyles causes an estimated five million deaths a year.[4]

The common link to these health challenges is burning fossil fuels, which releases dangerous pollutants such as fine particulates ($PM_{2.5}$) alongside the greenhouse gases that are heating the planet. So using clean sources of energy (such as wind or the sun) could both reduce climate change and save lives. Recent studies even show health benefits outweighing investment costs of clean energy technology. In the United States, for example, monetised health benefits associated with improved air quality can offset between 26% and 1050% of the cost of low carbon policies[5]; in other words, health dividends could be up to 10 times greater than the costs of clean energy technology. Of course, health benefits from clean air will be even larger in many highly polluted cities across the globe.[6,7]

What's the link between fossil fuels and upward trends in obesity and chronic diseases, such as diabetes and heart disease? Many cities, especially in the US, prioritise and set metrics for how fast street networks can move cars instead of focusing on people (California is a notable exception). Herein lie even more opportunities for public health by adopting other modes of transportation, especially those that promote "active transport" by foot or by bicycle. A growing body of evidence shows substantial health benefits from active transport.[2] In the US, cities with the highest levels of active transport have obesity rates that are 20% lower and diabetes rates that are 23% lower than cities with the lowest levels. Bicycling commuters in Copenhagen have a 39% lower mortality rate than non-cycling commuters, and in Shanghai, China, active travel could reduce colon cancer risk by over 40%. In short, exercise and fitness, along with improved air quality, can enhance health in the urban population.

The urgency of curbing fossil fuel consumption is abundantly clear if we hope to avoid catastrophic disruption of the earth's climate system. At the same time, accelerating rates of chronic disease are inextricably linked to our use of fossil fuels to generate power and for transportation. Reducing our use of fossil fuels will lead to a healthier, flourishing society. And this change just might be the greatest health advance in our lifetimes.

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1 UN Intergovernmental Panel on Climate Change (IPCC). *Global Warming of 1.5 °C, an IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.* Cambridge University Press, 2018, (forthcoming).
2 Patz JA, Frumkin H, Holloway T, Vimont DJ, Haines A. Climate change: challenges and opportunities for global health. *JAMA* 2014;312:1565-80. doi:10.1001/jama.2014.13186
3 NCD Risk Factor Collaboration (NCD-RisC). Trends in adult body-mass index in 200 countries from 1975 to 2014: a pooled analysis of 1698 population-based measurement studies with 19·2 million participants. *Lancet* 2016;387:1377-96. doi:10.1016/S0140-6736(16)30054-X
4 Lee IM, Shirona EJ, Lobelo F, Pusha P, Blair SN, Katzmarzyk PT, Lancet Physical Activity Series Working Group. Impact of physical inactivity on the world's major non-communicable diseases. *Lancet* 2012;380:219-29. doi:10.1016/S0140-6736(12)61031-9
5 Thompson TM, Rausch S, Saari RK, Selin NE. A systems approach to evaluating the air quality co-benefits of US carbon policies. *Nat Clim Chang* 2014;4:917-23. doi:10.1038/nclimate2342
6 UK Health Alliance on Climate Change. Moving beyond the air quality crisis. http://www.ukhealthalliance.org/wp-content/uploads/2018/10/Moving-beyond-the-Air-Quality-Crisis-4WEB-29_10-2018-final-1.pdf
7 WHO. Air pollution and child health: prescribing clean air. http://www.who.int/ceh/publications/Advance-copy-Oct24_18150_Air-Pollution-and-Child-Health-merged-compressed.pdf?ua=1

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