LANCET SERIES ON COMMERCIAL DETERMINANTS OF HEALTH

PAPER 1

Defining and conceptualising the commercial determinants of health

Gilmore AB, Fabbri A, Baum F, Bertscher A, Bondy K, Chang HJ, Demaio S, Erzse A, Freudenberg N, Friel S, Hofman KJ, Johns P, Abdool Karim S, Lacy-Nichols J, de Carvalho CMP, Marten R, McKee M, Petticrew M, Robertson L, Tangcharoensathien V, Thow AM. Defining and conceptualising the commercial determinants of health. Lancet. 2023 Apr 8;401(10383):1194-1213. doi: 10.1016/S0140-6736(23)00013-2.

The full text is available at: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(23)00013-2/fulltext

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Abstract

While commercial entities can contribute positively to health and society there is growing evidence that the products and practices of some commercial actors – notably the largest transnational corporations - are responsible for escalating levels of avoidable ill health, planetary damage and social and health inequity; problems increasingly referred to as the *'commercial determinants of health'*. The climate emergency, the non-communicable disease epidemic, and the fact that just four such industry sectors already account for at least a third of global deaths illustrate the scale and huge economic cost of the problem.

This paper explains how the shift towards market fundamentalism and increasingly powerful transnational corporations has created a "pathological system" in which commercial actors are increasingly enabled to cause harm and externalise the costs of doing so. Consequently, as harms to human and planetary health increase, commercial sector wealth and power increase, while the 'countervailing forces' having to meet these costs – notably individuals, governments, and civil society organisations - become correspondingly impoverished and disempowered, or captured by commercial interests. This leads to policy inertia – while many policy solutions are available, they are not being implemented. Health harms are escalating leaving health care systems increasingly unable to cope. Governments can and must act if we are to improve, rather than continue to threaten, the wellbeing of future generations, development and economic growth.

Key messages

- Current definitions of the commercial determinants of health vary widely and often overlook the diverse impacts of the commercial sector. This paper proposes a broad definition of the commercial determinants of health as *"the systems, practices and pathways through which commercial actors drive health and equity"*. This recognises that commercial entities are diverse and can make both positive and negative contributions to human and planetary health and equity. They do not act in isolation but alongside other actors, including governments, and within systems that currently enable, but have potential to constrain, commercially driven health harms.

- The paper develops a conceptual model of the commercial determinants of health which provides a simple means of understanding this complex issue. It identifies, *inter alia:* key commercial practices which, when inadequately regulated, harm health often in hidden and indirect ways; the pathways through which these practices harm health from the most upstream - influencing political and economic systems - to the more downstream including directly driving consumption of products damaging to health or limiting access to services and products essential to health for those unable to pay.

- The model also identifies the underpinning and systems level problems which explain why commercially driven health harm is hard to address and continues to escalate. In addition to externalities and power, these include often-overlooked issues such as the ubiquity of corporate norm shaping enabled by a media that increasingly represents their interests and the fact that major corporations have not only shaped downstream policies in their interests but have established regulatory approaches that make it harder to pass policies that would protect human and planetary health.

- The model can be used to guide solutions from specific interventions addressing commercial practices to system changes. It highlights that commercial entities will need to meet the true costs of the harm they cause, governments will need to exercise their power in holding commercial entities to account, and norms need to be reshaped in the public interest drawing attention to the right to health and governmental obligation to protect health and not just corporate freedoms

INTRODUCTION

Commercial entities can have positive impacts on health and society, not least the creation of products and services beneficial, or even essential, to health. However, there is now overwhelming evidence that some, particularly the largest multi- and trans-national corporations (TNCs, see Panel 1 for definitions of terms used throughout the series) are having increasingly negative impacts on human and planetary health, and social and health inequities.[1-6] These complex and often negative links between the commercial sector and health are increasingly referred to as the "commercial determinants of health" (CDoH).[1,7,8]

It is well established that a small number of industries whose primary products are damaging, so called unhealthy commodity industries (UCIs) (see Panel 1), have driven many of the world's greatest health problems including the rising burden of non-communicable diseases (NCDs) and the climate emergency.[2,3,9,10] Indeed, the products of just four industries already account for at least a third of global preventable deaths each year and likely far more (Panel 2 and Appendix p.2-4).[11]

Other industries whose products are often seen as benign also cause avoidable health and social harms. Examples include the financial sector's role in the 'deaths of despair',[12] social media's malign impact on mental health,[13] and the pharmaceutical industry's use of intellectual property protections to secure high prices limiting access to essential drugs including COVID-19 vaccines, despite massive public investment in their development.[14]

Indeed, it is the *practices* and not just the *products* of major commercial entities that can harm health and widen inequities both within and between countries. Their influence on and exploitation of weaker regulatory and enforcement standards in low- and middle-income countries (LMICs) contributes to inequities in unhealthy product use, environmental damage and workplace safety between countries.[15,16] For example, pharmaceuticals and pesticides banned for use in high income countries are exported to LMICs alongside toxic wastes.[16] UCIs have been shown to disproportionately extract income from and externalise their harms to LMICs, while transferring wealth and income to a small elite of shareholders and institutional investors based overwhelmingly in high-income countries (HICs), a trend increasing since the 1970s.[17] Over a similar period but across the corporate sector more broadly, executive compensation has increased exponentially while typical workers' have seen pay stagnate[18,19]

and conditions deteriorate.[5,20] The increase in precarious contracts has had impacts on mental and physical health[5,21,22] including higher rates of COVID-19.[23]

Despite growing recognition of these issues,[1,5,7,8] [20] there is still no clear, accepted definition or conceptualisation of CDoH.[24] Some definitions focus narrowly on how specific commercial entities drive consumption and use of unhealthy commodities.[8] Other are broader recognising many other ways in which a narrow focus on profit damages health regardless of industry sector.[7]

This lack of definitional and conceptual clarity inhibits research and policy action. This paper, structured in three parts, therefore seeks to do three things. First, it develops a consensus definition and second, a conceptual model of the CDoH. The model explains how commercially driven ill health is the result of a 'pathological system' in which dominant commercial entities are enabled to influence societal norms and values, political and economic systems, policies, environments, incomes and behaviours. As the health harms that result from this system increase the ability to address them declines as the governments, organisations and individuals needed to hold commercial actors to account are increasingly impoverished, disempowered or captured by commercial sector interests whose power continues to grow. Consequently, the problems are escalating, fundamentally threatening development, economic growth and the wellbeing of future generations.[5,25] The third part of the paper uses the model to explore in further detail how health harms and inequities are generated. While commercial entities can and do have positive impacts on health, the purpose of this paper is to create a robust foundation for understanding the problems. The other two papers in this series focus on the diversity of commercial entities involved in and potential solutions to the CDoH.

Panel 1. Key terminology and definitions

Term	Definition
Capitalism	An economic system in which "a substantial proportion of its means of production is owned and operated by private individuals in pursuit of profit."[26]
Commercial/ commerce	Related to the buying and selling of goods and/or services intended to generate a profit or return on investment.
Commercial entity	An entity engaged in buying and selling of goods and/or services (ie commerce) primarily for profit or return on investment. Commercial entities may take many forms including sole proprietorships, partnerships, companies, corporations or state-owned enterprises (see paper 2 for fuller discussion).
Commodity/ product	The goods and/or services produced by an entity.
Company/business/ firm/enterprise	Generalised terms for commercial entities.
Corporation, multinational corporation, and transnational corporation	A corporation is a specific type of commercial entity in which ownership is separated from management and owners (or shareholders) enjoy 'limited liability'. The corporation is a body of persons authorised by law to act as one person, granted certain rights and responsibilities (for example to own assets, loan and borrow money, sue and be sued and enter contracts).[27] Specific rules for corporations vary with the jurisdiction in which they are registered. The terms Multinational corporation (MNC) and Transnational corporation (TNC) are often used interchangeably for major corporations which operate in multiple countries. Where a distinction is made it is generally as follows: • MNCs are those which own or control production or services in one or more countries outside that in which they are headquartered, where they have a centralised management system. • Transnational corporations TNCs are more nationalised, with capital, personnel and research and development spread across national boundaries and thus able to (re)settle wherever serves its interests. For simplicity within this series we use the acronym TNC to refer to both largest MNCs and TNCs which represent a particular challenge to global health and governance.
Deregulation	The relaxation or removal of statutory regulation by which public and private sector actors are required to operate.[28] A key feature of neoliberalism (see below).
Externalities	Costs or benefits from the production, consumption or disposal of a product or service that are incurred by a third party that has no control over, and never chose to incur, those costs or benefits. Examples of negative externalities include biodiversity loss, environmental and health damage from the production, use and disposal of many food products, tobacco and fossil fuels. This results in these products being artificially cheap to produce and consume– the price fails to reflect the true societal cost – leading to over-use and often, to higher profit margins for those industries. This is a form of market failure.

Financialisation	"[A] pattern of accumulation in which profit making occurs increasingly through financial channels rather than through trade and commodity production".[29] (For further details see Panel 3 and for health impacts of financialisation see Level 1)
Globalisation	"Processes by which nations, businesses, and people are becoming more connected and interdependent via increased economic integration and communication exchange, cultural diffusion..... and travel".[30] Economic integration has involved a growing role for supranational institutions and international trade and investment agreements which have relatively little direct democratic oversight.[30]
Health	We use existing definitions of human health as "a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity" and planetary health as " the achievement of the highest attainable standard of health, wellbeing, and equity worldwide through judicious attention to the human systems—political, economic, and social—that shape the future of humanity and the Earth's natural systems that define the safe environmental limits within which humanity can flourish."[31] This has also been more simply described as "the health of human civilisation and the state of the natural systems on which it depends."[31]
Limited liability	A legal status where owners or investors of a company will not be liable for the wrongdoings of the company and their personal assets will not be at risk if the company fails.[27]
Neoliberalism	A political approach and ideology often also referred to as 'market fundamentalism' or "free market" ideology, which has dominated since the late 1970s following a concerted political project.[32] It emphasises private property rights and free markets as the way of organising human interaction, promotes privatisation, trade liberalisation, deregulation and reductions in tax and welfare payments with the role of the state pared back to ensuring the functioning of the market [4,28,32] (Further details are provided in Panel 3 and its impacts on health are discussed under Level 1).
Power	There is no single conceptualisation or definition of power, but, drawing on Fuchs and Lukes, three interconnected forms of power have been identified as central to understanding corporate power and the CDOH: *instrumental* - the ability to influence other actors and most specifically their decision making; *structural* - the ability to use material conditions to shape the structures in which actors interact and thus influence their choices and options (both real and perceived); and *discursive* - the capacity to influence processes and opinions through the shaping of norms and values.[33]
Privatisation	The full transfer of an activity to private ownership, while outsourcing the activity remains publicly owned, but its performance is contracted out to the private sector.[34]
Industry	The set of all entities engaged primarily in the same or similar kinds of activities, for example the alcohol, tobacco or fossil fuel industry.
Public, private and third sectors	The boundaries between the private sector, public sector and third sector are often blurry, for example due to joint ownership or shared functions and definitions have varied over time (Paper 2 explores these boundary complexities in more detail). In this series: • The *public sector* is the "the part of a country's economy which is controlled by the State".[35] • The *private sector* is "part of a country's economy… which is privately owned and free from direct state control". [35]

	▯ The third sector consists of not for profit entities such as charities, voluntary organisations, and community groups.
Unhealthy commodity industry (UCI)	An industry whose primary product is considered an unhealthy commodity – one which causes significant health damage. Some definitions include only tobacco, alcohol, and ultra-processed foods,[9] while others also include breast milk substitute, gambling, palm oil, fossil fuel, automobile, and mining industries.[36]

Panel 2: Estimates of the harm from commercial products and practices

It is challenging to estimate the exact impact commercial sector products and practices have on health due to the lack of comprehensive data and specific studies on this topic. The 2019 Global Burden of Disease (GBD) study estimates that just four commercial products (tobacco, alcohol, ultra-processed food and fossil fuels) account for 19 million global deaths annually (34% of the 56 million total or 41% of the 42 million NCD deaths). They also provide a very conservative estimate that commercial practices cause over 1.2 million deaths globally, bringing the total annual deaths to 20.3 million (36% of total or 45% of NCD deaths). These are likely to be significant underestimates as they take no account of numerous other products (eg lead, prescribed opioids) or practices (eg dumping of toxic substances in water courses). Moreover, other data, including specific GBD studies, suggest a higher toll from some individual products. For example, deaths from unhealthy diets as a whole reach an estimated 11 million, air pollution from fossil fuels over 10 million, and alcohol 3 million. If we add these to the GBD estimate of 9 million deaths from tobacco, the total reaches 33 million annual deaths (58% of all deaths and 78% of NCD deaths globally). Sources and details: see Appendix p.2-4.

A DEFINITION OF THE CDoH

We define CDoH as: *"the systems, practices and pathways through which commercial actors drive health and equity."*

This definition aims to convey four key issues. First, it encompasses all commercial entities rather than just corporations because we recognise their diversity – from small stall holders to TNCs (see paper 2). Many play a vital role in society and a narrower focus would limit possible solutions involving, for example, alternative structures for and accountability of commercial entities and their investors (see papers 2 and 3). We use the term "actors" because major commercial entities rarely act alone but are supported by a diverse range of other powerful organisations, some of whom they fund and direct, albeit in often hidden ways to give the aura of independence. But they are also often enabled by the governments and intergovernmental organisations that should be holding them to account as part of a global political and economic system that privileges an increasingly wealthy and narrow elite at the expense of the many.[28,32,37]

The second issue the definition attempts to convey is this complexity. It goes beyond a simple focus on unhealthy commodities and profits as the sole driver, instead recognising that the links between the commercial sector and health are varied, involving complex political, economic and social systems.

Third, the definition is deliberately neutral, aiming to recognise positive and negative contributions and the potential for change.

Finally, we focus our definition on health (both human and planetary health which are inter-linked and co-dependent,[31]panel 1) - and equity as the primary outcomes of concern. Equity is deliberately highlighted because the commercial sector (including increasingly the financial sector) plays a significant yet often overlooked role in driving social and health inequity both within and between countries.[6,17]

A MODEL OF THE CDoH

An Overview

Our model (Figure 1 and Appendix p.6) illustrates this definition and the system nature of the problem. It shows the commercial sector on the left and the determinants of health sub-system through which health is impacted on the right. The two are separated to acknowledge that commercial actors are an important, but not the sole, influence on that sub-system.

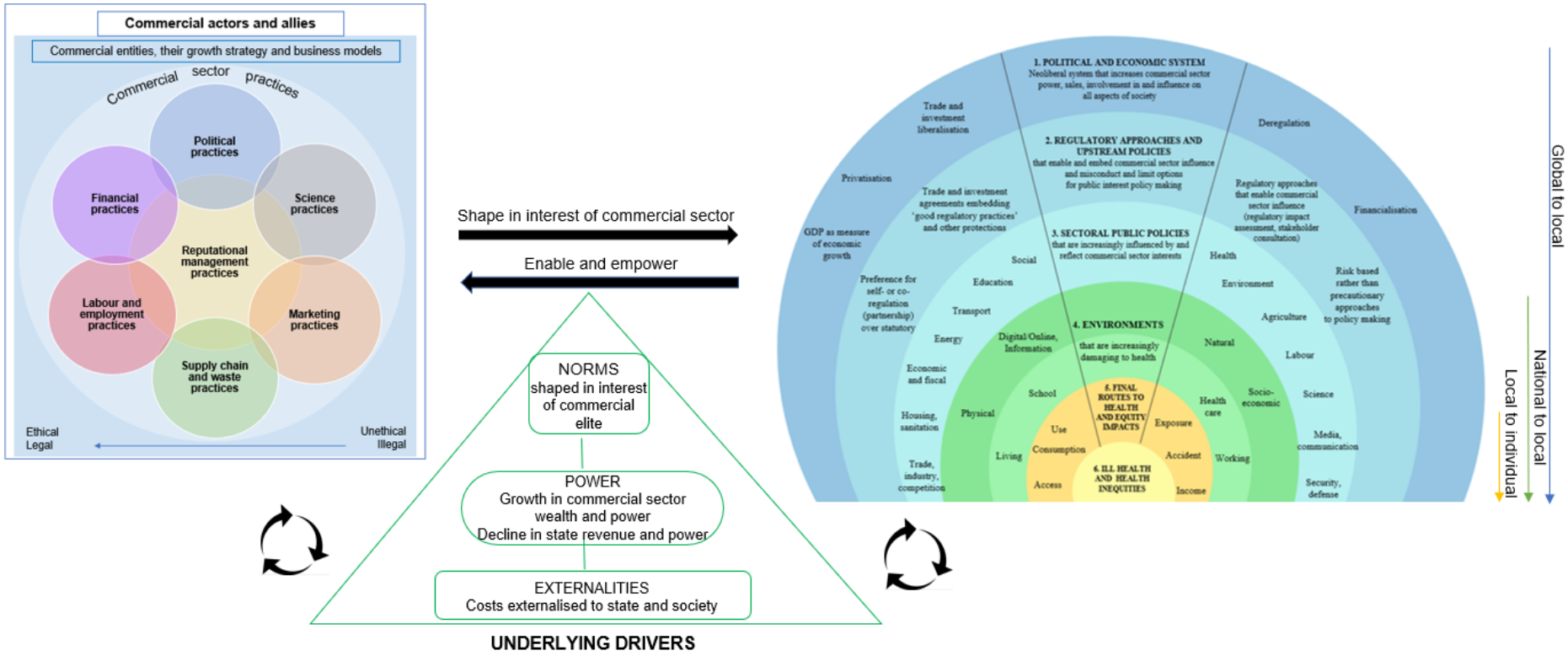
Within the square detailing the commercial sector, the inner blue box details commercial entities drawing attention to their growth strategies, business models and practices. These practices work interactively and often synergistically to influence health by impacting on one or more, and often multiple, levels of the sub-system. The surrounding white square labelled ‘commercial actors and allies’ allows for the other actors – think tanks and business interest groups, for example - that often act in concert with business entities and represent their interests.

The determinants of health sub-system draws extensively on existing work and models of the structural, social, political and commercial determinants of health,[8,33,38-41] but emphasises

pathways through which commercial actors influence health. Like Dahlgren and Whitehead's work,[38] the model signals that an individual's health (at the centre) is influenced by a series of increasingly structural factors (moving towards the outside) which extend well beyond an individual's control. Levels 1 to 3 illustrate the political, economic and policy drivers of ill health, which operate largely from global to national level. Level 4 details the environmental drivers which shape and constrain individual behaviours, exposures and health practices (Level 5) and operate largely from national to local level (although environmental damage, including global warming, clearly transcends borders). These structural and environmental drivers lead ultimately to health and equity impacts through varying routes such as influencing product use, service access or exposure to pollutants (Level 6).

The model draws attention to three issues that lie at the heart of the CDoH - the political and economic system (top right), the commercial sector (top left) and key underlying drivers - power, externalities and norms (central triangle). The black arrows signal the complex interactive nature of the system: that commercial actors shape the political and economic system and are, in turn, shaped by it (straight arrows), while externalities, power and norms, if unchecked, can lead to escalating health harms (circular arrows). It is these checks in the system, which reflect the balance of power between public and commercial interests, that play a pivotal role in determining the extent to which the commercial sector has positive or negative impacts on health. We therefore illustrate the model under two scenarios: Figure 1 illustrates our current 'pathological system' and Appendix p.6 the model rebalanced in the public interest.

Figure 1. Model of the Commercial Determinants of Health



Note: Figure 1 illustrates our current pathological system that is damaging to health. Appendix p.6 shows how this might look once rebalanced in the public interest.

Using the model to understand the 'pathological system'

Closely inter-connected changes to these three issues, most notably the emergence of neoliberalism from the late 1970s (**Panel 3**), and consequently to the system's checks and balances, explain why the commercial sector is having an increasingly negative impact on health. These changes led to an increasingly globalised neoliberal political and economic system, truly transnational corporations with enormous power, influence and reach,[27] and the simultaneous decline in the power and role of the state and other 'countervailing' forces required to hold the commercial sector to account.[42,43] The consequent shift in wealth from the public to the private sector,[44] "extraordinary concentrations of wealth and power"[32] among a narrow group in which corporate executives and investors feature heavily, and the growing intersection of corporate and political power as the significance of corporate and financial actors in society increases have all been recorded.[32,37] What is less well known is the key role that major corporations played in pushing for these changes (**Panel 3**).

Panel 3: The changes to global political and economic systems and commercial entities that underpin the increasingly negative impact of the commercial sector on health

Changes in the way capitalism is organised have occurred repeatedly throughout modern history.[27] From the late 1800s onwards there was a shift away from small individual- and family-owned firms and partnerships towards the corporation as the dominant economic entity in the 20th and 21st centuries.[27] Key features of corporations – the separation of ownership from management and limited liability enabled, and in some jurisdictions required, corporations to prioritise shareholder profits over protecting people or planet.[27]

From the 1930s, unbridled capitalism gave away to a more regulated form, which culminated in the 'mixed economy' model of the 1945-1975. Subsequently, the late 1970s saw the emergence of a "free-market" capitalist system labelled "neoliberalism". This was characterised by a significantly reduced role for the state focused on ensuring the smooth operation and primacy of the market.[4,28,32] Key features of neoliberalism plus global economic integration led to the consolidation of many smaller corporations into a few larger and uniquely powerful TNCs[27]: deregulation led to reduced oversight of business; global economic integration and trade and investment liberalisation enabled corporations to expand globally; privatisation extended their reach into services once considered the function of the state.[27,28,32,45] Yet the competitive markets on which neoliberalism is premised often did not materialise with ever larger TNCs increasingly negotiating and enjoying monopolistic and oligopolistic positions,[46] especially when utilities such as water were privatised, with widespread externalities a cause of market failure.[28,32,45,47]

In most business sectors a handful of TNCs now dominate, their economic wealth and power outstripping that of many national governments, presenting novel challenges to governance and democracy. For example, Walmart has higher revenues than the governments of Australia or Spain,

and Exxon Mobil than the governments of Belgium or Mexico (Appendix p.5).[48] This monopoly concentration of most sectors reduced competition and the power of consumers. Simultaneously, globalisation increased the power of transnational private actors whose ability to act is not constrained by the national borders that restrict sovereign states. It made it easier to rapidly shift capital, avoid taxes, escape effective regulation and participate in (and secure influence over) the increasing complex systems and institutions of global governance.[49-51]

More recently, and consequent to financial deregulation, the accumulation of profit has increasingly occurred through financial channels rather than through trade and commodity production.[29] Financialisation involves new ways of profiting from financial transactions rather than from producing and selling products and has led to financial institutions including banks and private equity investors becoming major players in global economic systems and therefore important in CDoH.[5]

<u>The role of corporations in pushing for these changes:</u>

Recognising the opportunity to reduce tax and regulation, major corporations and the very wealthy played a substantial role promoting neoliberalism.[4,5,28,45] Many formed or became donors to neoliberal think-tanks such as the Institute of Economic Affairs[52] and Reason Foundation[53] which popularised neoliberalism in their home countries,[4] and the Atlas Network which developed a network of neoliberal think-tanks and promoted the ideology more widely.[32,54] To help mainstream neoliberal thinking, corporations funded business schools in prestigious universities and supported the creation of other powerful organisations including the World Economic Forum (WEF), the World Business Council for Sustainable Development and the International Chamber of Commerce.[32,55] By bringing together corporate executives and leaders from policy, academia and media, these organisations helped entrench and globalise their favoured political, economic and policy approaches,[56] set global economic norms[57] and translate TNC business interests into government action or inaction.[58] Neoliberalism's advocates came to hold positions of power in education, media, national and international institutions (such as the IMF, World Bank and WTO) With pressure from the US government in particular, this led to the IMF and World Bank becoming 'centres for the propagation and enforcement' of neoliberal orthodoxy, thereby helping mainstream and globalise a once marginal ideology.

In the 'pathological' system that emerged (Figure 1), increasingly powerful commercial actors can shape the political and economic system, its underlying regulatory approaches and policies in its own interests. Those in turn enable, rather than effectively regulate commercial actors, increasing their ability to externalise costs to others. Consequently, the costs of the harm caused by the production, consumption, and disposal of their products[28] - for example paying to treat the NCDs they cause, address the social harms of alcohol and gambling, clear up oil spills and plastic waste - are largely met by the states, families and individuals affected. This reduces their budgets for housing, health, welfare, and civil society organisations, further damaging health. Meanwhile, the corporate entities involved tend to enjoy excess profits and the power imbalance between TNCs and those needed to hold them to account continues to grow, fuelling the problem (circular arrows). Until this is recognised and addressed, poor health outcomes and inequities in health will continue to grow causing huge economic and social damage.[25]

USING THE MODEL TO UNDERSTAND HOW HEALTH HARMS AND INEQUITIES ARE GENERATED

OPERATIONALISING POWER

Health damage arises when commercial entities operationalise their accumulating power in all its forms – structural, instrumental and discursive – by engaging in practices and shaping norms which serve to make their organisational needs a higher priority than protecting health, the environment or social cohesion.[43,59,60]

Seven key commercial sector practices

We group the practices that commercial entities routinely engage in into seven overlapping and mutually reinforcing categories: political, science, marketing, supply chain and waste, labour and employment, financial and reputational management (Figure 1). Reputational management is positioned in the centre because, by enhancing the commercial actor's legitimacy and credibility,[61] it enables and is often integral to the other six practices.[62-64]

The extent to and ways in which each commercial entity engages in these practices, and whether they generate harm, depends in large part on that entity's product, business model and growth strategy[65] (as illustrated in Figure 1 and examined further in paper 2). Most evidence of significant harm, and certainly the most egregious, concerns TNCs (see Table 1 for examples). Practices also vary with the context in which entities operate, with TNCs more easily able to exercise power and influence and less likely to be held to account in LMICs.[66]

Growing evidence indicates that TNCs across diverse sectors not only engage in the same practices[64,67-69] but often also work collectively[32,70,71] with 'a shared interest in the defeat of bills such as consumer protection and labour law reform, and in the enactment of favourable tax, regulatory and antitrust legislation'.[32] This coordination is consistent with evidence of their growing financial,[72] operational[71] and board level[73] ties.

Political, science and marketing practices primarily cause health harm by maximising use of potentially harmful industry products either directly or by enabling TNCs to block, delay or weaken policy, and deter litigation.[64,67-69] Labour, supply chain and financial practices - all enabled by political practices which help drive down regulatory standards - harm health when a narrow focus on 'profit at any cost' fails to consider societal impacts.[5] Slave labour working

conditions in fashion industry "sweatshops",[74] illegal discharges of hazardous substances,[75] deforestation leading to climate change, biodiversity loss and infectious diseases[76,77] are examples of TNCs acting against the public interest.[5,27]

As the model shows, within each practice category, activities vary from legal to illegal with many in the grey zone in between. For example, political practices vary from lobbying[67] to bribery;[51] financial practices vary from tax avoidance[78] to evasion including smuggling.[78,79] Even scientific practices, often seen as essential and therefore tax deductible, have led to conviction for fraud and untold health damage when the dangers of corporate products or the benefits of interventions to address those dangers have been deliberately hidden from users and governments.[64,80-82] Even where regulations are implemented, commercial actors often fail to comply or find cost-saving unethical work-arounds such as Volkswagen's now infamous "diesel dupe".[5]

TNC practices and governmental failure to address them, is such that the system no longer operates in the public's but increasingly in the TNCs' interest. For example, although externalities can be corrected with fiscal measures, TNCs have been uniquely successful in using their financial and political practices to reduce their various tax liabilities and extract state subsidies.[17,78,83,84] Effective tax rates on even the most harmful TNCs have fallen steadily since the 1970s[17] and Tax Justice Network estimates that corporations shift 40% of all profits made abroad into tax havens.[78] Combined with wealthy individual's use of tax havens, countries are losing, on average, the equivalent of 9.2% of their health budget annually.[78] Lower income countries are disproportionately affected, losing an equivalent of 52.4% of their health budgets, while high income countries facilitate 97% of these direct tax losses. Additional indirect tax losses occur when governments then reduce tax rates in an attempt to reduce this profit tax evasion; the International Monetary Fund (IMF) estimating that these are at least three times larger.[78] The negative impact on government revenues then enables TNCs to present what they should have paid in tax as 'gifts' through tax-deductible reputation management efforts which divert attention from the harm they cause, buy access and influence, perpetuating the problem.[36] This came to fore during the COVID-19 pandemic when UCIs in particular sought to leverage the situation to their benefit[36] (see Table 1 reputation management section for examples).

When it comes to science, recent decades have seen a shift away from state towards commercial funding.[85] With evidence that corporations across diverse sectors consistently engage in similar strategies to shape science in their own interests,[64] this funding shift raises the possibility that whole evidence bases will increasingly favour commercial actors and their products.[64] Moreover, TNCs growing control over the technology and intellectual property that emerges from this research means they can capture it to advance their goals and veto its use when it does not contribute to profitability, even when this harms health.[3,86] For example, the forerunners of ExxonMobil patented low emissions vehicles as early as 1963 but dropped this line of work fearful it might reduce demand for oil or increase regulatory pressure, stalling the development of the electric car.[87] Similarly, profits from products developed in or with significant funding from the public sector, have accrued almost exclusively to commercial actors who then limit access to those able to pay the often inflated prices. Examples include pharmaceutical companies using intellectual property protection to limit access to drugs and vaccines for HIV and COVID-19,[88,89] and Apple making massive profits from GPS and touch-screen displays developed by the US government and military.[90] This conversion of public knowledge to 'intellectual property' means it no longer 'belongs to humanity' as Pasteur claimed and that the public (including governments) often pay twice – to fund the research and then purchase the product.

More recently technology companies have begun to do the same with 'private knowledge' commodifying personal information in what Zuboff labels "surveillance capitalism".[91] In the absence of appropriate regulation, they collect personal information, sell it to others or use it to refine algorithms to modify human behaviour for commercial and political ends. For example, Facebook's (now Meta) role in the targeted marketing of unhealthy commodities (often contravening regulations); amplifying misinformation, racism, sexism and xenophobia; harming mental health; and influencing voting patterns has all been established.[13] Whistleblowers allege the company understood potential dangers but declined to act because doing so would reduce profits.[13]

It is important to stress that these behaviours often threaten the small and medium enterprises that make a disproportionately high contribution to inclusive economic growth and employment.[92] TNCs' ability to act in this way reflects their power and legal structures, notably limited liability, which makes it difficult to hold them to account.[27,43] But it also reflects the

fact that they have so successfully reshaped norms that such conduct is now considered inevitable if not beneficial.

Table 1. Commercial sector practices and examples of how they negatively influence health and social and health inequity

Practices	Definition	Exampless of negative impacts
Political practices[62]	Practices to secure preferential treatment and/or prevent, shape, circumvent or undermine public policies in ways that further corporate interests	The commercial sector seeks to influence diverse policies at all levels of governance - from global to local. There is growing evidence of joint working[70,71] and consistency in approaches across diverse industries including: direct involvement and lobbying; building 'constituencies' of support including third parties through which they operate; producing and using (often misleading) information to make the industry's case that the policy will be ineffective and economically disastrous; threating and taking legal action, and intimidating opponents.[62,67,93,94] The specific strategy varies with the context and the industry's standing. In LMICs policy influence is often more audacious:[66] Some of the best evidence covers the tobacco industry and shows that British American Tobacco (BAT) made extensive payments to politicians, civil servants and others in Africa to secure policy influence, in one instance paying as little as $3000 to change legislation in Burundi.[51] In Thailand, BAT claimed "the only means of negotiation with politicians is dollar and cent".[95] Seriously threating advocates in LMICs also occurs.[96] By contrast, where the tobacco industry is denormalised, lobbying efforts are increasingly directed through third parties, the scale of which can be overwhelming. In the case of standardised tobacco products in the UK, 82 third parties with links to the tobacco industry opposed the policy giving a misleading impression of widespread opposition.[97] The tobacco industry routinely threatens, and sometimes legally challenges legislation, using its power to exert a chilling effect – although the industry is almost always unsuccessful, legal costs can be prohibitive.[98] In multilateral settings industry often operates by gaining the support of powerful governments which can be a particular challenge for LMICs.[70,94]
Science practices[64]	Practices involving the production and use of science to alter product and/or otherwise secure industry favourable outcomes	TNCs influence every step of the scientific process from evidence production to dissemination and use with clear evidence that diverse industry sectors act in the same way.[64] Examples include: • in 1999 Merck launched a large clinical trial on the anti-inflammatory drug refocoxib (Vioxx). When the study was published, the company misrepresented the trial's results to hide evidence of refecoxib's cardiovascular toxicity. Despite Merck being aware of Vioxx's health risks, the company strongly promoted the drug to health professionals providing them with misleading information.[99] This led to thousands of avoidable cardiovascular events in patients taking the drug.[100] • In 2015 the International Agency for Research on Cancer (IARC) classified glyphosate as "probably carcinogenic to humans". Monsanto continued to argue that its glyphosate-based herbicide is safe and internal documents reveal that the company tried to influence the scientific debate. The control over the scientific process happened at multiple levels, for example - attempting to influence editorial decisions and distorting the peer-review process and engaging scientists who signed Monsanto ghost-written reports which were then published in scientific journals.[101] The goal was to both discredit the IARC decision and to prevent other regulatory agencies from conducting a re-evaluation of glyphosate.[102]

Marketing practices	Practices to promote sales of products or services	Marketing practices increase the demand for and consumption of products including unhealthy commodities[103,104] including by changing physical and information environments, such as physical alterations to bars[105] and increased outlet and marketing density[106] in ways that drive consumption.[106-108] Marketing also exaggerates structural inequalities[6] by targeting specific geographic areas[109] and population subgroups categorised by ethnicity[110] or vulnerability, such as the homeless and mentally ill.[111] It shapes new cultures and norms to drive consumption: the normalisation of youth smoking was facilitated by child-friendly advertising, with Camel cigarettes' Joe Camel having approximately the same recognition as Mickey Mouse among children.[112] Similar efforts by the alcohol industry normalised drinking in young people[113] and women through "pink washing" leading to increased consumption.[114]
Supply chain and waste practices	Practices involved in the creation, distribution, retail and waste management of products or services	TNCs adopt supply chain and waste practices that impact negatively on human and planetary health. For example, extractive companies frequently despoil the environment and externalise the costs of restoration. Local communities (often Indigenous or multiply disadvantaged) are left living in these despoiled areas with mental and physical health impacts. Less stringent regulation, often enabled by political practices which help drive down standards and costs, means that environmental damage is often worse in LMICs. Specific examples include: • Rio Tinto, a mining company, destroyed two 46,000-year-old Aboriginal rock shelters in Western Australia's Juukan Gorge.[115] Such destructive practices have contributed to the gap between Indigenous life expectancies and those of the rest of the population.[116] • Australian/Canadian conglomerate Oceana Gold subjected El Salvador to a lengthy multimillion dollar lawsuit when the country denied it permission to mine gold deposits there after its prospecting led to significant concerns about impacts on water supplies, among other things.[117] • Coca-Cola's bottling plant in Kerala, opened in 2000, led to groundwater contamination and toxic waste release. Eventually, the plant was closed but local communities never received full compensation.[118,119]
Labour and Employment practices	Practices to manage those employed directly within or under contract to the organisation within its supply chain	Commercial actors actively seek ways to destabilise, outsource and offshore the responsibility for the costliest aspects of production. Enabled by a weakening in labour market regulation, this has led to a range of perverse working conditions and practices which disproportionately affect low-income workers, especially in LMICs, and lead to physical and mental ill health.[5,23] Examples include: • a growth in modern slavery and informal and zero-hour contracts that offer no stability of income. For example, Western companies continue to support forced labour in the garment industry by purchasing low-cost supplies from the Xinjiang region of China, where Uyghur and other Muslim ethnic and religious minorities held in 're-education' and detention facilities are forced to produce and/or process cotton and textiles.[120] Clothing retailers offset losses from COVID 19 onto their suppliers and workers who could least afford it leading to an increase in forced labour while retailers received public bail out funds and continued to sell at below-cost prices.[121] • an increase in child labour in mines with extreme physical, psychological, and social dangers.[122] • a decline in private-sector union coverage that has reduced workers' ability to protect themselves against policies and practices that weaken job safety[16] leading to workplace injuries. Workplace fatalities in South Africa's mining industry, four times higher than those in Australia, are attributed to weaker occupational health and safety legislation there.[123] Comparative statistics also show that some businesses in the

		same industry incur higher injuries suggesting their practices are the cause; Amazon warehouse employees are injured at twice the rates than those working in other companies' warehouses.[124]
Financial practices	Practices to support financial position of the organization	Financial practices include tax avoidance and evasion; mergers, acquisitions and buyouts (including to limit competition and remove superior or healthier products from the market place); price fixing; promoting credit and debt; accounting and securities fraud; financial flows in (investor relations) and out (investment strategy, government subsidies). These practices, often enabled by political practices, have collectively reduced potential state revenues and disposable income for many with direct and indirect impacts on health and welfare often exacerbated by rising costs of healthcare. Specific examples include: • Pricing strategies: in 2021 Taro Pharmaceuticals USA, Inc., Sandoz Inc and Apotex Corporation were fined $447.2 million for price fixing various generic drugs in the US,[125] while in the UK, Auden Mckenzie and Actavis UK (Accord-UK) were fined £260m for price hiking the drug hydrocortisone which led the National Health System to pay inflated prices for this drug for nearly 10 years.[126] • Tax avoidance and evasion[96]: Specific examples of tax avoidance include Amazon, which reportedly paid no corporation tax in Europe in 2020, despite a sales income of €44bn (£38bn),[127] and British American Tobacco and Imperial Brands which over 10 years paid almost no corporation tax in the UK where they are headquartered, having engaged extensively in all forms of tax avoidance alongside other transnational tobacco companies. Corporations subject to other taxes, such as excise duties levied on harmful products intended to correct market failures and reduce product use, lobby heavily against them, often successfully reducing them.[128,129] Finally, some even orchestrate the smuggling of their product to evade those duties and, despite their involvement, then use the problem of smuggling to push for further excise tax reductions.[78,79] • Credit, debt and the global financial crisis: through mortgages, credit cards and loans the financial sector encouraged consumer debt, beyond what borrowers could reasonably afford, to ensure that falling real incomes for many as a result of the labour practices above[130] did not discourage spending.[131] The complex packaging of these debts by the financial sector led to unduly high individual indebtedness, homelessness and ultimately the 2008 global financial crisis. Most countries responded to the crisis with large bail-outs for the major banks that had caused the problem, financed in large part with cuts to social spending with further impacts on wellbeing particularly for the least well off.[132,133] In Australia damaging practices of banks were so detrimental to their customers that a Royal Commission[134] was established. It gathered gut-wrenching stories of "people who'd lost their homes and their livelihoods due to misconduct, bad management or straight-out illegal behaviour" with obvious health impacts.[135]
Reputation management practices	Efforts to shape legitimacy and credibility, reduce risk and enhance corporate brand image	Reputation management practices are diverse but can be grouped in two main categories: 1. Corporate social responsibility (CSR); environmental, social and governance (ESG); and sustainability - all broadly similar concepts which involve commercial entities making voluntary commitments to uphold ethical norms and refrain from causing harm.[136] While some of these efforts have real and meaningful impact, often they contribute more to reputation building than to generating real benefits for society.[63] Supporting US legal rulings that genuine CSR or corporate philanthropy is illegal,[27] evidence indicates that CSR is at

		best a superficial, public relations exercise[137] and at worse a tax deductible way to shape policy outcomes that work against public welfare.[61,63,138] It is engaged in most heavily by corporations whose core products are harmful.[36] Examples include: • In Thailand, a large donation by an alcohol company to the Thai government after the 2004 tsunami enabled direct access to the Thai Prime Minister to present the company's preferred policy option.[139] • During the COVID-19 pandemic the brewing company AB InBev committed to distribute more than 1 million litres of drinking water to communities in Brazil. Since water insecurity is an area of reputational vulnerability for the alcohol industry, this created an opportunity for the company to present itself as a responsible partner in water stewardship.[36] • In Greece, after tobacco transnational Philip Morris International (PMI) donated ventilators for the COVID-19 response, its CEO was invited to join a Chamber of Commerce roundtable discussion on the COVID-19 vaccine alongside the Greek Prime Minister, in contravention of Article 5.3 of the Framework Convention on Tobacco Control.[140] Although recent data on PMI's payment of taxes in Greece are not available, the tobacco industry's involvement in tobacco smuggling involving the Greek islands is documented[141] as is its wider involvement in tax avoidance.[84] 2. The institutionalisation of public private partnerships (PPPs), where state and commercial actors are "involved in multilevel governance networks with weak enforcement mechanisms and lack of democratic control".[142] The United Nations Global Compact (UNGC), developed jointly by state and commercial actors to engage corporations in improving their social and environmental impact, has continued to be a highly influential governance device globally, despite a decade of data that "conclusively demonstrates that the UNGC failed to induce its signatory companies to enhance their CSR efforts and integrate the 10 principles in their policies and operations"[143] A recent review concludes that, despite being "an omnipresent policy tool in public health … the focus on private sector-driven PPPs in global health ultimately undermines the attempt to significantly improve global health." [144]

Shaping norms

Norms are social expectations, often unwritten, about how individuals, communities, and organisations should behave.[145] While commercial actors respond to existing norms, above all they assiduously seek to shape norms, ideas, beliefs and values in their own interest using the practices outlined above.

The ability to shape norms in this way requires substantial resources and is the most hidden form of power (panel 1).[33] In addition to their extensive use of public relations firms, TNCs fund and even create third party organisations including 'dark money' think tanks and astroturf organisations (fake grass roots organisations like patient support or smokers' rights groups) to convey their messaging, recognising that the apparent independence of the source gives their framings greater credibility.[97,146]

The media, ownership of which has become concentrated among a wealthy elite, has been shown to increasingly serve that elite, including global corporate interests.[147] Herman and Chomsky describe how 'money and power are able to filter out the news fit to print, marginalize dissent and allow the government and dominant private interests to get their messages across to the public'.[37] Consequently, the role of commercial actors in norm-shaping is often overlooked. Few realise the term "litter bug" was coined by the plastics industry[148] and "carbon footprint" by British Petroleum – both to detract from corporate harm by pointing the finger of blame at individuals via well-funded public relations (PR) campaigns.[149]

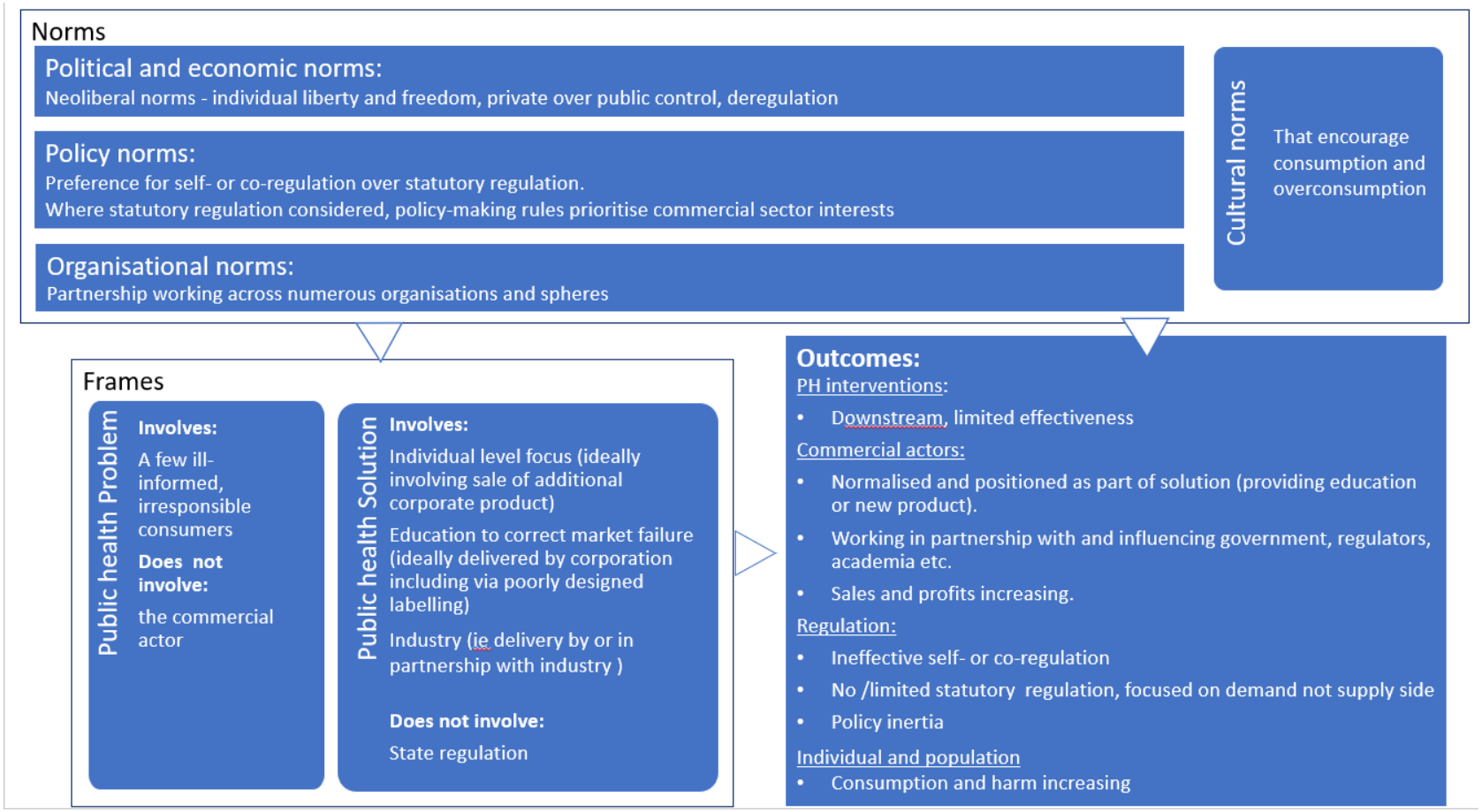
These norms exert their influence through all levels of the model and have played a key but often hidden role in driving commercial harm. For example, major corporations and the very wealthy played a substantial role in promoting and shaping neoliberalism as the dominant political and economic norm, funding a diverse set of think tanks, business schools and other organisations through which they could secure influence (see Panel 3).[4,5,28,45] The same actors promote deregulatory policy norms with a focus on self- and co-regulatory (partnership or 'multi-stakeholder') approaches to policy-making.[150] Such approaches, which allow commercial actors to decide which of their practices need restricting and how, are of limited effectiveness and are exploited by commercial actors to prevent more effective statutory regulation.[138,151,152] Industries then use partnerships with government in one arena to create the expectation of participation in others (eg academia).[150] These organisational norms of

partnership have been so successfully established that many institutions including UN bodies and governments have shifted towards working in partnership with commercial actors even within the health arena[143,153] where the norm that UCIs are credible 'partners' persists despite both fundamental conflicts of interest (COI) and evidence that partnership approaches are ineffective.[150,152] Moreover, these partnership approaches in both delivery and policy making reinforce commercial actors as part of the solution to the problems they have created[138,143,144,150] thus serving primarily as corporate reputation management initiatives (see reputation management practices, Table 1).

Figure 2 illustrates how commercial actors and their allies use these broader norms to frame public health problems, possible solutions and their role within this leading to outcomes that favour commercial and shareholder interests but are detrimental to public health. Problems such as climate change, obesity, drinking, smoking, gambling and abuse of pharmaceutical opioids are overwhelmingly framed as "poor individual choices": the "problem gambler"; "irresponsible drinker"; Facebook's "passive" user more likely to be harmed by social media over-use, and so on.[154-156] This framing, reinforced by TNCs' influence on science[64] and an increasingly supportive mass media (see above)[37] helps absolve corporations, and indeed governments, of blame and narrows the range of possible solutions to downstream individual-focused interventions, notably education to correct market failure ostensibly by helping "consumers" make "better choices". These individual-focused solutions are less effective than upstream population-level solutions.[6,10] Consumers do not have capacity (time or resources) to make the 'right' choice, however much education is done.[28] Worse, TNCs have been shown to withhold or deliberately confuse the information consumers need.[3,82]

Simultaneously, marketing reshapes cultural norms to further drive sales. It has been used *inter alia* to create a broad "consumption ideology" which drives overconsumption[151] and combat norms which restrict consumption - reinterpreting the Qu'ran to undermine the status of smoking as *haram* (prohibited), for example.[157]

Figure 2. Industry norms, frames and their outcomes



Panel 4: An illustration of the CDoH model through the case of sugar-sweetened beverages (SSB) consumption in South Africa. (The **bold text** refers to the levels and the underlined text to the commercial practices in the model (Figure 1)).

Levels 6: In SA, 39.6% of women and 15.4% of men (18≥years) are obese,[158] type 2 diabetes, cancer, dental caries and cardiovascular disease are all increasing (**level 6)**[159] and inequalities in these disease patterns are marked, with rates of disease higher in Black South Africans.[160]

Level 5: While the causes of these problems are of course complex and multifactorial, high SSB consumption[161] is a key modifiable risk factor[162] as is the consumption of other highly processed food products of which it serves as an example. School-aged children consume 2.3 servings daily (1 serving = 340ml)[163] and South Africa is one of the top 10 global consumers of Coca-Cola products.[161]

Level 4: In the context of South Africa's weak regulatory environment, widespread marketing practices that particularly target poor, mostly Black South Africans[164] and extensive availability of SSBs in supermarkets, convenience stores and street vendors in densely populated urban areas and remote rural villages has created physical and cultural environments (**level 4**) persuasive of consumption (**level 5**). SSB branding is prolific: school and shop signs,[165] billboards and TV channels[166] increasingly expose children to SSBs while public health messaging on nutrition and harmful effects of SSB consumption is almost non-existent. Marketing has also reshaped **cultural norms** by emotively linking SSBs with local music, popular sports, and traditional clothing so that SSBs are now perceived as symbols of wealth within SA's value system.[167]

Level 3: The South African government could have regulated to restrict such practices, but the post-apartheid government had quickly embraced neoliberalism[32] and its emphasis on deregulation. This made it easier for the SSB MNCs to use their scientific and political practices to delay progress. They distorted the scientific evidence linking SSBs to obesity,[168] promoted ineffective voluntary actions,[165] positioned themselves as delivering key services which government had failed to implement and using the resultant public private partnerships (reputation management) as leverage. In these ways they weakened and delayed evidence-based regulations including the sugar tax and front of pack nutritional labelling.[168,169] While health policies have therefore failed to reduce SSB consumption, other sectoral policies - also influenced by industry - have worked to increase it.[170,171]

Levels 1, 2, and Norms: This policy incoherence and difficulty passing public health legislation is the legacy of the upstream policy-making systems (**level 2**), and the neoliberal paradigm (**level 1**) and policy norms that emerged post-democracy. The same norms eased and promoted the entry of the SSB MNCs to South Africa with new bi-lateral, and multilateral trade and investment arrangements and the de-regulation of local industries making sugar and thus SSBs more affordable and available,[172] leading to increased consumption.[173] Changed political and economic **norms** entrenched corporate influence while new formal requirements to conduct extensive public hearings for and economic impact assessments of proposed policies mirrored requirements corporations had pushed for elsewhere,[174] gave greater credence to negative impacts on business than potential health benefits made it harder to regulate in the public interest. The embedding of SSB TNCs within key policy fora enabled their direct input on policies despite the clear conflict of interest.[175,170]

Other issues: SSB TNCs are making record profits in South Africa[176] which in part reflects their ability to externalise their costs, likely enabled by South Africa's permissive approach to corporate taxation, another feature of its neoliberal approach.[177] Meanwhile the government has to bear the exponentially growing health care costs associated with SSB consumption. With TNCs now dominating most nodes in the SA food and beverage value chain,[178] and SA their entry-point to the African market,[179] the problems detailed here may be replicated elsewhere in the region.

THE ROUTES TO ILL HEALTH AND HEALTH INEQUITY

The commercial sector practices and norms detailed above influence health in direct and indirect ways which can be understood by exploring their impacts on health through each level of the determinants of health model (Figure 1). We now explore how this happens while Panel 4 provides an overview of the whole model using a case study of how the sugar-sweetened beverage (SSB) industry contributed to obesity and NCDs in South Africa.

Level 1 - Political and Economic System

The increasingly globalised economy of the 20th century weakened states relative to transnational private actors, and some post WWII institutions engaged in global governance exacerbated this problem. This shift towards transnational governance also created the institutional conditions for neoliberalism, which major commercial actors had concertedly promoted (Panel 3), to flourish. The health impacts of specific features of neoliberalism, are briefly outlined below. Further details, including growing evidence that neoliberalism has been damaging to health and equity, are available elsewhere and suggest that outcomes, other than for a small wealthy and corporate elite, have largely been detrimental.[4,5,32,180,181] Impacts, however, vary somewhat between jurisdictions according to the extent to which they adopted (or were required to adopt) neoliberal approaches, or cushioned their effects through welfare policies.[4,5]

Neoliberalism's almost exclusive focus on encouraging economic growth as measured through gross domestic product (GDP) encouraged unsustainable growth with negative impacts on health and the environment,[182] ignoring the fact that both are prerequisites to economic development.[25]

While deregulation can enable entrepreneurship it has also led to the removal or weakening of regulation across many spheres and made it harder to pass new legislation that would protect human and environmental wellbeing (Table 1). Within a globalised economy it encourages "a race to the bottom" in regulatory standards.[16,78]

Deregulation of the financial sector played a key role in the emergence of financialisation (Panel 1) which has harmed health[5,183] and, above all, equity largely by increasing economic

volatility (precipitating repeat banking crises) and debt and stifling economic growth.[184] Indeed, despite neoliberalism's single-minded focus on growth, it has generated much lower growth than did the more regulated capitalism of the early post-WWII era. This is because many neo-liberal policies, contrary to what its supporters say, have dampening effects on economic growth in the longer run.[28,34,45] In particular financialisation has reduced investments by, first of all, increasing instability in the economy, which shrinks the investor's time horizon, and by increasing the pressure on corporations to maximise short-term profits by cutting back on spending on investments (e.g., in equipment, R&D, worker training).[28] Among the financial practices most damaging to health are the speculation in food and other basic necessities leading to large fluctuations in food prices and resulting hunger;[185] and securitisation of home mortgages which prompted the banking crisis, individual indebtedness, evictions and homelessness (Table 1).[186]

Trade and investment liberalisation can stimulate economic growth and employment and, by reducing barriers to trade and investment, increase the availability and reduce the price of products. However, when the product is damaging to health, this almost inevitably increases harm.[9,187,188] The many examples include the rise in SSB consumption in Philippines[188] and South Africa (Panel 2), and the significant increase in smoking in the former Soviet Union following the lifting of restrictions on foreign direct investment.[189] These policies have played a key role in globalising the tobacco, obesity and NCD epidemics while also constraining access to NCD medicines.[188,190] Additional harm occurs because globalised supply chains cause climate change and biodiversity loss with international trade now a major driver of global carbon emissions.[76]

Privatisation has led to commercial actors becoming actively engaged in the provision of education, health care, social care, housing and water, and other services essential to health.[38,41] While privatisation can improve efficiency in some sectors when the process is well managed, overall there is little evidence that privatising public services improves quality or lowers cost.[34,191] Instead, it often leads to price increases and restricted access to services essential to health, such as water or heath care, particularly for the least well off.[180,191,192] The World Bank has noted the difficulties the public sector is likely to face in governing public-private partnerships with equity impacts prove particularly difficult to monitor.[191] Nevertheless, recent decades have seen increasing privatisation of health care with negative outcomes.[193,194]

While the IMF and the World Bank promoted and even required the above policies as part of loan conditionality,[195] in the case of the IMF doing so even for UCIs when negative health outcomes were predictable,[196] major corporations pushed for and benefitted from these changes. Their (mis)conduct also exacerbated the harms.[5,46] For example, by aggressively advertising their products, ignoring or overturning existing regulation, lobbying against any further restrictions on their practices, and even directly drafting policies in their own interest – they drove particularly large increases in unhealthy commodity consumption after liberalisation and privatisation.[46]

Level 2 – Regulatory approaches and upstream policies

The preference for self- or co-regulation over mandatory regulation across all levels of governance, despite their significant limitations, has already been established. Yet even once mandatory regulation is considered, deregulatory norms have been further operationalised through a suite of policy-making rules which have largely remained hidden yet have far reaching implications for public interest policy-making. We refer to these as 'upstream policies' as they limit the options for, make it harder to pass, and easier for commercial actors to challenge downstream public policies (level 3). There is growing evidence that diverse corporations have played a key role in establishing these rules which work to systematically advantage their interests.[58] Some have been labelled a threat to democracy because they bring policy-making under an unprecedented level of corporate control.[197] They take three main forms:

Risk based approaches to policy-making: TNCs (including tobacco and pesticide companies) have embedded industry-friendly scientific standards into decision-making by promoting risk-based - instead of precautionary-based – approaches to decision making.[64] These aim to prevent product regulation by setting a high regulatory bar (for example, that a product has a relative risk over 2 before it can be regulated). These approaches are often dressed up as being "science-" or "evidence-based" and are promoted by benign sounding industry third parties (the American Association for the Advancement of Science, for example)[71] to hoodwink those genuinely interested in using science for the public good.[198] Yet while corporations push for impossibly high evidential standards to prevent and delay regulation,[64,199] the standards required for market approval are generally lower, in some instances resulting in significant

harm before regulations can be introduced as occurred with glyphosate and some pharmaceuticals.[200-202]

Regulatory approaches involving stakeholder consultation and business impact assessment: Many jurisdictions now require stakeholder consultations and regulatory impact assessments for every policy which would appear to be good practice. However, evidence shows tobacco, food, chemical, fossil fuel and other companies collectively promoted such rules, known in the EU as 'Better Regulation', expressly to make it harder to pass public health and environmental policies.[71,203] They have since used them to that effect – to prevent, slow, weaken and challenge policies by flooding consultations with responses from third party organisations they have funded and with highly misleading evidence they have commissioned.[97,204,205] These approaches advantage powerful commercial actors: stakeholder consultations embed their right to participate (even where a COI exists) and provide a route through which they can channel their (often highly misleading) evidence; impact assessments taking a cost benefit approach prioritise impacts on business over others, such as health or the environment.[174,203] These requirements are being expanded. For example, a major tobacco company played a key role in promoting Zambian legislation requiring regulatory impact assessment just as the country was attempting to pass tobacco control legislation.[206]

Trade and investment agreements (TIAs) which operationalise the liberalisation in trade and investment detailed in level 1 have been used to globalise these policy-making rules.[207] Under the moniker 'good regulatory practice' TIAs often require implementation of risk-based regulation, stakeholder participation in formal policy development,[208] or a focus on partnership and co-production.[209] There is evidence that TNCs influence the content of these agreements[207,210] to ensure they include, for example, protection of intellectual property and international investors. Such protections make it easier for them to stifle and challenge public health regulation and they have used them for both purposes.[211,212]

Level 3 – Sectoral public policies

Consequently, it is increasingly difficult to get statutory regulation on the agenda and then to shape it in the public interest once there. Policy debates become drawn-out 'David and Goliath' battles in which TNCs use their significant power advantage to block, weaken and delay policies, with evidence this has occurred from local through to supranational levels.[62,69,93,94] Even once enacted, TNCs work to undermine, circumvent and overturn policies, through legal and other means.[62,67]

Influence extends to diverse policies, including agriculture, social, environmental, labour, trade and fiscal policies which all impact on health, often contributing to policy incoherence.[213] A particularly egregious example was how Coca-Cola and Ambev exploited a Brazilian government tax policy to secure a subsidy of 5-10 US cents for every can of soft drink consumed in Brazil. Now in place for over 20 years,[83] this directly undermines the country's obesity, environmental and even economic policies and means the Brazilian government and each resident (to the tune of $10 a year) are paying Coca Cola to cause health harm – 26% of the population is obese and 60% overweight. Yet, repeat governments and extensive efforts by the judiciary have been unable to reverse this policy (which is making Brazil one of Coca-Cola's most lucrative markets) because of Coca-Cola's misconduct and the internecine links between powerful corporate and individual political interests.[83]

Level 4 - Environments

Environments are the settings within which behaviours take place. We consider these under two levels. First, broad environments - physical, socio-economic, digital and so on. Second, the more specific settings through which those environments touch on our lives – living, school, work, for example (Figure 1). Commercial actors seek to influence both types of environments and also inadvertently damage others. The natural environment, for example, is increasingly degraded from the 'production and consumption of stuff.'[214]

They have altered diverse aspects of the physical environment in order to maximise sales such that they are becoming increasingly 'obesogenic'[215] - where healthier food options are harder to access, and 'alcogenic' - where physical alterations to bars[108] and increased outlet and marketing density encourage consumption.[106] Less well known is how the automobile, tyre and

fossil companies influenced the built environment and dismantled electric public transport systems in the US to increase dependence on, and thus sales of their products.[151,216]

Often overlooked is how public health harms also proliferate through information or, increasingly, 'misinformation' environments. Building on the scientific practices detailed above but amplified through media and social media, thinktanks and public relations organisations paid for, and sometimes specifically established, by industry,[64,146,217] an entire ecology of misinformation has developed creating what has been described as "post-truth" or agnogenesis – the deliberate creation of ignorance.[82] In the case of climate change it is now established that, over decades, ExxonMobil's public communications (notably advertorials) were even more misleading than its science and deliberately misled the public.[81] Social media with its "pay per click" revenue model plays a growing role in spreading misinformation.[82]

The increasing unequal socioeconomic environments that follow the concentration of wealth, lead to poor societal outcomes on a range of measures including life expectancy.[180] Schools have become venues where harmful industries disseminate industry-friendly framings and misinformation[218,219] while working environments also important determinants of health,[38] have become increasingly damaging to health.[5,220]

Level 5 - Final Routes to health and equity impacts

At the individual level the final routes to ill health occur, largely but not exclusively, through consumption and use of products damaging to health; reduced access to products and services beneficial to health (medicines, health care, healthy foods, leisure and exercise facilities); injuries in the workplace and beyond; and exposure to pollutants, toxins and allergens – many playing a role in cancer aetiology that has long been hidden by corporate interests and their state supporters.[221] Finally, low income, job security, long working hours[222] and stress, characteristic of changes to labour practices driven by the commercial sector have important impacts on health.[5] The growing socio-economic inequities detailed above mean these outcomes are increasingly unequally distributed with the least well off multiply disadvantaged with, for example greater illness and less access to healthcare, particularly in privatised systems.

MOVING TOWARDS SOLUTIONS

This paper advances understanding of the CDoH in three main ways. First, by bringing some consensus around the scale, scope and complexity of the issue. Second, by identifying the importance of underpinning and systems level problems which explain why commercially driven health harm is hard to address and continues to escalate. In addition to externalities and power, these include often-overlooked issues such as the ubiquity of corporate norm shaping enabled by a media that increasingly represents their interests[37] and the fact that corporations have not only shaped downstream policies in their interests but established regulatory approaches that make it harder to pass policies that would protect human and planetary health. Third, by developing a model which provides a simple way of understanding the CDoH and can be used to guide solutions from system changes, for example rethinking the way capitalism is organised including looking beyond GDP to other ways of measuring progress,[34,223] to specific interventions such as regulating harmful commercial practices. Rather than replacing existing models of the social and political determinants of health which remain valid, our model draws on one of those models[38] to highlight how commercial entities interact with those determinants to shape health. Like those models, it highlights that public health is currently focused too far downstream - at the centre of our model on treating ill health and changing individual behaviours - to create sustainable health improvement. More sustainable, equitable and cost-effective progress will only be achieved by moving outwards in our model.

Reshaping the model in the public interest (Appendix p.6) will therefore require the political and economic changes that are increasingly being called for.[34,223] Commercial entities will need to meet the true costs of the harm they cause; governments will need to exercise their power in holding commercial entities to account; and norms need to be reshaped in the public interest drawing attention to the right to health and governmental obligation to protect health and not just corporate freedoms. This paper makes clear that such change is urgently needed and until it occurs health and equity continue to be threatened causing significant economic and social damage.[25] Papers 2 and 3 focus on how this can be achieved.

Acknowledgements:

We would like to thank David Fig and Petronell Kruger (University of Witwatersrand) for input on Panel 4, Andrew Crane (University of Bath) for discussions on the categorisation of commercial practices, and Sarah Dance (University of Bath) for assistance with literature retrieval, research and administrative support.

Funding statement:

ABG and AF were supported by the SPECTRUM Consortium (MR/S037519/1), which is funded by the UK Prevention Research Partnership (UKPRP). UKPRP is an initiative funded by the British Heart Foundation, Cancer Research UK, Chief Scientist Office of the Scottish Government Health and Social Care Directorates, Engineering and Physical Sciences Research Council, Economic and Social Research Council, Health and Social Care Research and Development Division (Welsh Government), Medical Research Council, National Institute for Health Research, Natural Environment Research Council, Public Health Agency (Northern Ireland), The Health Foundation and Wellcome. AE, KJH, and SAK were supported by the SAMRC Centre for Health Economics and Decision Science (Grant number 23108). AB was supported by a PhD scholarship funded by University of Bath. JLN was supported by the Victorian Health Promotion Foundation. LR was supported by fellowships from the New Zealand Heart Foundation and a Royal Society Fast Start grant UOO2028.

Declaration of interest:

All authors have completed the ICMJE uniform disclosure form. ABG reports grants from: Bloomberg Philanthropies (Stopping Tobacco Products and Organizations), WHO Euro, Dutch Lung Fund, the Heart Foundation, the Dutch Cancer Society, the Thrombosis Foundation and the Diabetes Fund, NIHR, CRUK, UKRI, GCRF, and MRC; consulting fees from World Bank; support for attending meetings and/or travel from WHO, Prince Mahidol Award Foundation, and European Health Forum Gastein. ABG is European Editor of Tobacco Control and is an unpaid member of the Royal College of Physicians Tobacco Advisory Group, Council of ASH, WHO International Expert Group on the Commercial Determinants of Health, WHO International Expert Group on smoking and COVID-19, European Respiratory Society, Executive Committee, Framework Conventional Alliance strategy development working group. FB reports royalties from her books published with Oxford University Press; support for travel from the organisers of the PMAC annual meeting in 2019 and 2020. FB is Chair of the Global Steering Council of the People's Health Movement and Board Member of Cancer

Council of South Australia. LR reports grants from Bloomberg Philanthropies (Stopping Tobacco Products and Organizations), New Zealand Heart Foundation, Royal Society of New Zealand (Marsden), and Otago Medical Foundation Trust; support for attending meetings and/or travel from Bloomberg Philanthropies. MP is a co-investigator in the SPECTRUM consortium which is funded by the UK Prevention Research Partnership. The remaining authors declare no other relationships or activities that could appear to have influenced the submitted work.

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