

A conceptual framework for investigating the impacts of international trade and investment agreements on noncommunicable disease risk factors

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Abstract

We developed a conceptual framework exploring pathways between trade and investment and noncommunicable disease (NCD) outcomes. Despite increased knowledge of the relevance of social and structural determinants of health, the discourse on NCD prevention has been dominated by individualizing paradigms targeted at lifestyle interventions. We situate individual risk factors, alongside key social determinants of health, as being conditioned and constrained by trade and investment policy, with the aim of creating a more comprehensive approach to investigations of the health impacts of trade and investment agreements, and to encourage upstream approaches to combating rising rates of NCDs. To develop the framework we employed causal chain analysis, a technique which sequences the immediate causes, underlying causes, and root causes of an outcome; and realist review, a type of literature review focussed on explaining the underlying mechanisms connecting two events. The results explore how facilitating trade in goods can increase flows of affordable unhealthy imports; while potentially altering revenues for public service provision and reshaping domestic economies and labour markets—both of which distribute and redistribute resources for healthy lifestyles. The facilitation of cross-border trade in services and investment can drive foreign investment in unhealthy commodities, which in turn, influences consumption of these products; while altering accessibility to pharmaceuticals that may mediate NCDs outcomes that result from increased consumption. Furthermore, trade and investment provisions that influence the policy-making process, set international standards, and restrict policy-space, may alter a state's propensity for regulating unhealthy commodities and the efficacy of those regulations. It is the hope that the development of this conceptual framework will encourage capacity and inclination among a greater number of researchers to investigate a more comprehensive range of potential health impacts of trade and investment agreements to generate an extensive and robust evidence-base to guide future policy actions in this area.

Keywords: International trade and investment agreements, social determinants of health, lifestyle risk factors, noncommunicable diseases

Key Messages

- This article develops a conceptual framework, supported by a realist review, of the relationships between trade and investment policy and NCDs to encourage capacity and inclination among a greater number of researchers to investigate a more comprehensive range of potential health impacts of trade and investment agreements.
- The review and proposed conceptual framework explicates how provisions within trade and investment agreements condition and constrain key behavioural risk factors and social determinants of health driving NCD rates.
- Robust empirical evidence on the causal pathways between trade and investment agreements and health outcomes is greatly needed to more effectively assess the impacts of international trade and investment rules on NCD rates.

Introduction

Noncommunicable disease (NCD) morbidity and mortality together present one of the largest threats to social and economic development in the 21st century (World Health Organization 2013). Presently, NCDs are responsible for 38 million deaths annually, 42% of which occur prematurely (before age 70) (World Health Organization 2015). The World Health Organization (WHO) developed what has become a near ubiquitous framing of NCDs in a 4×4×4 framework: four key NCD outcomes (cardiovascular diseases, cancers, chronic respiratory diseases and diabetes); that are caused by four key metabolic risk factors (hypertension, hyperglycaemia, hyperlipidemia and overweight/obesity); which are in turn driven by four key lifestyle risk factors (tobacco use, alcohol use, unhealthy diet and physical inactivity) (World Health Organization 2015). Although the WHO has advocated more complex and comprehensive approaches to NCD outcomes and pathways in various fora, this highly pervasive and individualizing framework, which places the onus on individuals and their lifestyle choices (Roberto *et al.* 2015), has played an important role in directing NCD policy responses at behavioural determinants.

Increased knowledge of social and structural determinants of health (Commission on Social Determinants of Health 2008) has expanded the breadth of policy areas that are investigated as drivers of health outcomes, including macroeconomic policy areas such as trade and investment agreements. Upstream policy approaches such as these acknowledge that health behaviours, often framed as individual choices, are in fact conditioned and constrained by the policies that shape varying aspects of our lives such as our living environments, educational opportunities, employment conditions, distribution of resources and social norms. Although the public health community has been actively engaging with trade and investment policy for more than a decade examining multiple pathways between trade and public health (World Health Organization, World Trade Organization 2002), the literature still lacks a comprehensive review of, and conceptual framework synthesizing, the pathways between international trade and investment agreements and health outcomes. Existing frameworks have either been very broad, such as those examining the larger processes of globalization on health, at the expense of a detailed exploration of trade and investment provisions (Labonte 2004); or very specific, providing a sophisticated exploration of the health impacts of trade and investment agreements through one channel, such as food environments, at the expense of a more inclusive suite of intervening factors (Thow 2009; Legge *et al.* 2011; Friel *et al.* 2013b).

This article aims to bring together the growing body of literature connecting trade and investment policy to key lifestyle risk factors in the WHO's 4×4×4 NCD framework, specifically tobacco, alcohol and unhealthy dietary products [collectively referred to as health harmful commodities (HHCs) throughout this article] to develop the links between these health behaviours and structural-level policies. In an attempt to begin constructing more detailed and comprehensive frameworks, we introduce exploratory pathways from trade and investment to NCDs through access to medicines and select social determinants of health (SDH). This study can assist academics, civil society and policy-makers in thinking about an increasingly comprehensive range of pathways through which international trade and investment rules may be producing negative externalities for health, and encourage future research to enhance the functionality of the framework introduced here. Moreover, it can help expand the discourse on causal drivers of NCDs beyond individualizing paradigms to a focus on upstream policies and health equity.

Methodology

The conceptual framework was developed with the use of two methods: (1) causal chain analysis, a technique which sequences immediate causes, underlying causes, and root causes of an outcome (Global Environment Facility 2014); and (2) realist review, a literature review focussed on explaining the underlying mechanisms connecting two events and the context within which that connection occurs, used to assist in developing and validating the pathways of the framework, and to identify gaps in the literature that connect trade and NCD outcomes (Pawson *et al.* 2005).

Framework development—causal chain analysis

The initial draft of the conceptual framework was developed as a composite of existing frameworks which have sequenced the relationships between trade (root cause) and health outcomes through a set of underlying and immediate causes (Labonte 2004; Thow 2009; Friel *et al.* 2013a, b). As noted above, these frameworks were perceived as either too broad or too limited in their subject scope to guide more comprehensive approaches to evaluating the relationships between trade and investment agreements and NCD outcomes. The framework developed here focuses on trade and investment policy as a driver of the key lifestyle risk factors in the WHO's 4×4×4 framework on NCDs, specifically tobacco, alcohol and unhealthy diet. Physical inactivity was excluded from the present framework as it has received relatively little attention in relation to trade and

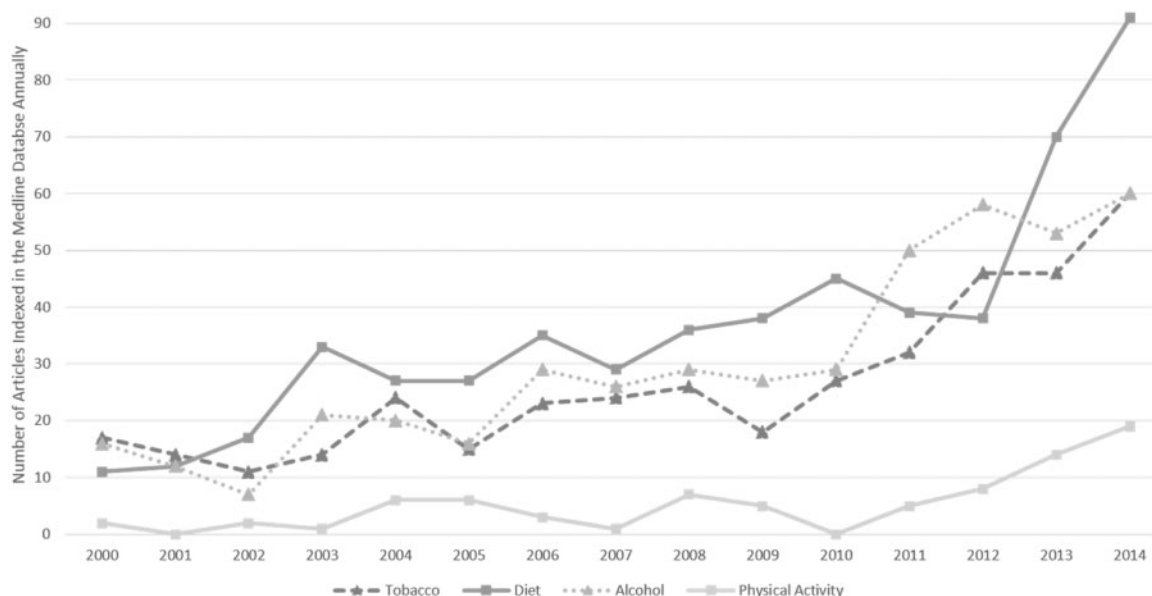


Figure 1. Medline (PubMed) trend for papers indexed with trade and various health topics

investment provisions (see Figure 1), and would generally be impacted in different ways than HHCs, which can be considered in aggregate. For example, while provisions regarding technical barriers to trade or regulatory coherence would be important for regulatory responses, such as labelling or advertizing restrictions, to increasing volumes of HHCs, facilitated by lower tariff rates; physical inactivity lacks a direct relationship with tariff rates or compensatory regulatory responses. The complex indirect relationships between trade and investment agreements and barriers or opportunities for increased physical inactivity should be explored in future studies and incorporated into future revisions of this framework.

To enhance the comprehensiveness of this framework, access to medicines was included on the rationale that pharmaceuticals play an important role in attenuating NCD outcomes by preventing the development of metabolic risk factors or limiting their ensuing health effects after increased exposure to HHCs; and that access to medicines has been a key area of study in the literature on trade and health. In addition, we integrated potential impacts of trade and investment agreements on select SDH—income, employment and health and social services. We theorized that trade and investment provisions would present several avenues to affect change in these identified domains, which could each have direct and indirect impacts on HHC consumption and NCD outcomes. For example, the level of disposable household income—theoretically impacted by trade and investment liberalization, including through altered employment opportunities—may determine monetary resources available for the purchase of HHCs; while new employment conditions may trigger changes in levels of stress and subsequent consumption of HHCs as a coping mechanism. Negative health outcomes of elevated HHC consumption can be mediated by access to health services—either through government provided services, employer provided health insurance or disposable income for out-of-pocket payments—all of which are possibly influenced by trade and investment provisions. This example demonstrates that SDH have the capacity to influence health behaviours, and mediate health outcomes, through a number of complex interactions. The current framework attempts to integrate some of this complexity but will benefit from ongoing development in this area.

The initial framework was generated by a core development team of three experts in trade and health and was modelled on an existing framework mapping the pathways between trade liberalization and nutrition transition (Thow 2009). This was then augmented with novel constructs present in the remaining existing frameworks (Labonte 2004; Friel *et al.* 2013a, b), and expanded to capture tobacco and alcohol, access to medicines and the selected SDH. The first draft of the framework was then distributed for feedback to the remaining four members of a larger research project team and subsequently revised. The revised framework was next circulated to a five member expert advisory panel. Members of the project team and the advisory panel were selected based on expertise in health policy, trade policy, law and political science from academia and civil society; as well as involvement in the development of the previous frameworks. Two iterations of this process were completed before the framework was finalized.

Framework development—realist review

The search strategy for the realist review included multiple combinations of search term sets (see Table 1) using three multidisciplinary databases: Web of Knowledge, Proquest and Scopus. Articles were restricted to the timeframe between January 2000 and June 2014 to cover the vast majority of the period of expansion of contemporary trade and investment agreements (World Trade Organization), while maintaining feasibility of the review. Search terms within the *economic issues* subset were intended to capture the selected SDH; however, to restrict the vast coverage of trade and economic issues in the literature, we paired economic terms with health and risk factor search terms to keep the results within scope and relevant to our review. Thus, the terms from *trade* and *economic issues* in Table 1 were always paired with either *food supply*, *tobacco*, *alcohol*, *access to medicines* or *health*. Searches combining terms from *trade*, *trade and health policy issues* and *policy* were included to cover topics applicable to all HHCs. The initial search results returned 24 343 articles. Inclusion criteria required articles to be within the timeframe, published in English, and to connect trade and investment to any one or more of the following areas: diet, tobacco, alcohol, access to

Table 1. Realist review search terms

Concept	Terms
Trade	trade, investment, liberali*, globali*
Trade and health	marketing, label*, tax*, ban*, packag*, warn*, additive*, flav*,
policy issues	advertis*, licens*, dispute*
Economic issues	FDI, welfare, economic growth, employment, unemployment, labo*,
	poverty, neolib*, income, wage*
Food supply	fast food, processed food, prepared food, snack food, obesogenic food, soda, soft drink,
	packaged food, convenience food, sugar sweetened beverage, grocery, food retail,
	food market*, food advertis*
Tobacco	tobacco, smoking, nicotine
Alcohol	alcohol, liquor, wine, spirits, beer
Access to medicine	medicine, patent, data exclusivity
Policy	regulat*, policy space, policy capacity, FCTC, codex alimentarius, domestic
Health	nutrition*, diet*, overweight, obes*, malnutrition, non-communicable disease

Table 2. Types of international and domestic trade and investment liberalization

Type of Agreement	Description	Example
Multilateral	International trade and/or investment agreement between all members of an organization (generally referring to the agreements of the World Trade Organization)	Trade-Related Aspects of Intellectual Property Rights (TRIPS)
Plurilateral	International trade and/or investment agreement between a subset of members of an organization (generally referring to the agreements of the World Trade Organization)	Agreement on Government Procurement (AGP)
Regional	International trade and/or investment agreement between two or more countries connected by a geographical region	Trans-Pacific Partnership (TPP)
Bilateral	International trade and/or investment agreement between any two countries	U.S.–Korea Free Trade Agreement (KORUS)
Unilateral	Domestic trade and investment policy of a single country	The Philippines' Foreign Investments Act of 1991

medicines or NCDs directly. In order to capitalize on available evidence, the realist review included all forms of trade and investment liberalization (see Table 2).

A round of eliminations by title and then by abstract based on the inclusion criteria reduced the results to 6493 articles and 191 articles, respectively. The 191 articles were then reviewed and coded by two team members using NVivo 10 software for validation or refinement of the framework pathways. Coding began deductively using a line-by-line technique based on the hypothesized pathways from the initial framework. Inductive coding was also incorporated when new relationships within the framework became evident from the reviewed articles. After this first phase of coding was completed, targeted searches within the Google Scholar database, without timeframes, were performed to explore evidence for pathways that had emerged during the iterative development of the framework, and for pathways where little or no evidence had turned up from the initial search strategy, which resulted in 46 additional articles in the realist review.

Results

This section begins by outlining the structure and key principles of the framework. It then provides an overview of the changes to the underlying and immediate causes of NCDs as a consequence of the facilitation of: (1) trade in goods; (2) services and investment; and (3) changes to domestic policy space. Policy space is defined here as, "...the freedom, scope, and mechanisms that governments have to

choose, design, and implement public policies to fulfil their aims" (Koivusalo *et al.* 2009). Within the discussion of each of the three main pathways (i.e. goods, services and investment and policy space), the text opens with a general introduction to the relevant trade and investment provisions before turning to a more in depth exploration of the pathways between trade and NCDs through HHCs and the social determinants of health, based on the reviewed evidence.

Framework structure

It is important to acknowledge at the outset that the influence of trade and investment liberalization on health can be mediated by a country's health system's capacity to respond to these challenges, existing levels of systemic inequities within and between countries, and economic and social policies enacted at national and international levels (e.g. tax systems, social welfare policy, structural adjustment programmes). The framework has been designed with neutral language to permit either positive or negative health outcomes depending on the domestic context within which the causal chain occurs, although at present the content focuses disproportionately on health risks rather than health opportunities given the focus on the WHO 4×4×4 framework exploring risk factors. In addition, in contrast to systems thinking which focuses on a dynamic and complex interacting system, causal chain analysis examines cause and effect using a linear approach (Global Environment Facility 2014). Nevertheless, it is recognized that the proposed causal chains

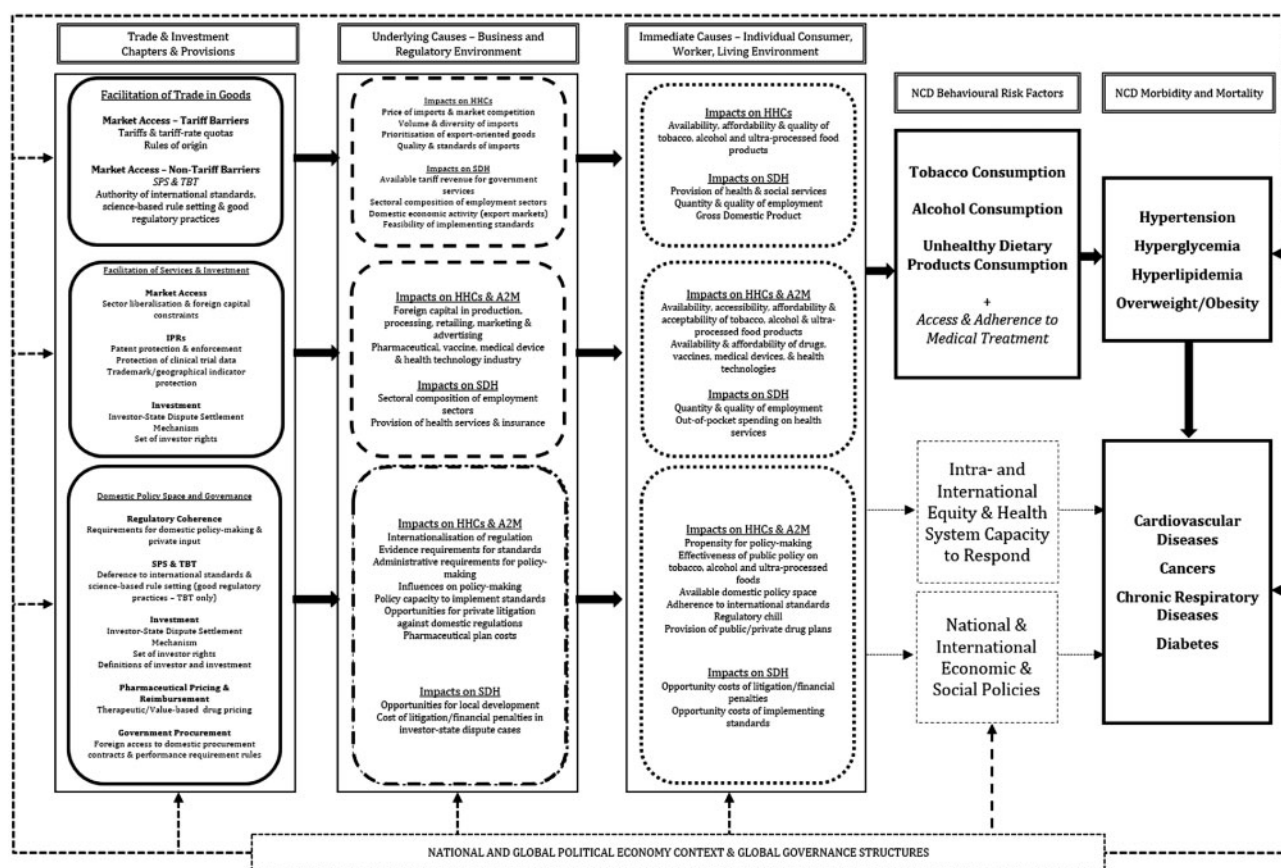


Figure 2. Conceptual framework of international trade and investment agreements and NCD

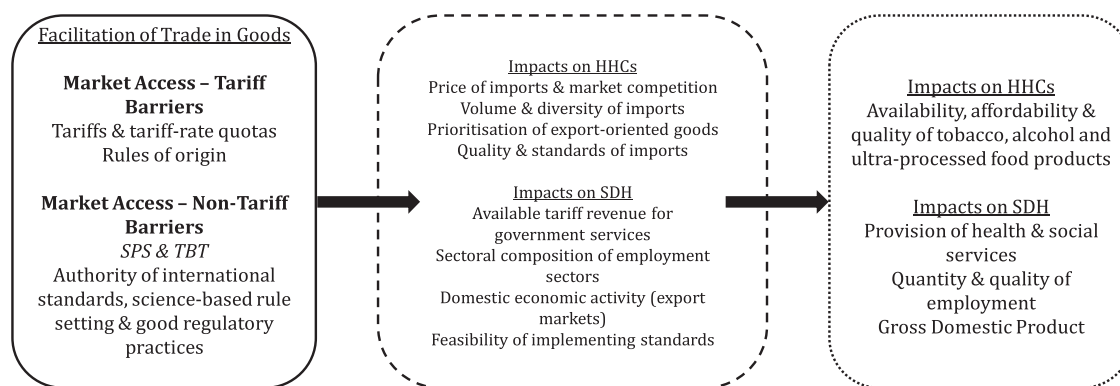


Figure 3. Facilitation of trade in goods pathway

are a part of a larger policy system and that the processes and outcomes of each stage have the potential to feedback into earlier processes creating loops and interactions throughout the framework.

Trade and investment policy provisions

The first column on the left of the framework (see Figure 2) identifies key provisions with relevance for NCD outcomes within a trade and investment agreement (the root cause). It is divided into three sections: (1) facilitation of trade in goods; (2) facilitation of services and investment; and (3) domestic policy space and governance. The structure of this section was informed by the North American Free Trade Agreement (NAFTA), proposed chapters in the Trans-Pacific

Partnership (TPP) agreement, and existing frameworks within the literature, as noted earlier.

Underlying and immediate causes

The second and third columns from the left identify the theorized underlying and immediate causes, respectively, of the identified provisions. In general, the underlying causes are those that pertain to the business and regulatory environment, that is, changes relevant to industry and investors regarding how they operate and to governments and policy-makers regarding how they regulate. Immediate causes are those that pertain generally to the individual and their immediate environment, as a consumer, as a worker and as a resident

of a particular community or country. The pathways between trade and investment provisions and NCD morbidity and mortality are divided into impacts through HHCs and access to medicines, and impacts through the selected SDH.

Noncommunicable disease outcomes

The fourth column from the left identifies the beginning of the WHO 4×4×4 framework on NCDs, starting with the key lifestyle risk factors which are concerned principally with individual health behaviours including consumption of tobacco, alcohol and unhealthy dietary products. This model has been altered here with the exclusion of physical inactivity and the addition of access and adherence to medical treatment. The final column on the right identifies changes to metabolic risk factors and our key health outcome of interest, NCDs, specific to the key risk factors and key outcomes identified by the WHO framework (World Health Organization 2015).

Facilitation of trade in goods

Trade and investment policy provisions

This section of the framework conceptualizes the pathways between trade in goods and NCDs (see Figure 3), highlighting the role of reduction (or elimination) of both tariff and nontariff barriers in facilitating trade. Market Access chapters in trade and investment agreements list the maximum tariffs (import or border taxes) and tariff-rate quotas (a two-tiered tariff that provides a starting tariff rate and then an increased tariff rate when import volumes exceed a specified quota). Tariff schedules cover all goods, including tobacco, alcohol and agricultural products (including ultra-processed food products and key agricultural inputs such as corn, sugar and soy), as well as pharmaceuticals, vaccines, medical devices and health technologies to diagnose and treat NCDs.

Trade in goods is also influenced by non-tariff barriers, and so trade and investment agreements include chapters on sanitary and phytosanitary standards and technical barriers to trade. Sanitary and phytosanitary standards indicate how governments can apply food safety standards and animal and plant health measures. Key provisions include references to international standards (including the *Codex Alimentarius*) and the rules regarding the role of 'science' and 'evidence' needed to justify standards perceived as more stringent than those agreed upon internationally. Technical barriers to trade aim to ensure that domestic technical regulations, standards, and conformity assessment procedures are non-discriminatory and do not create unnecessary obstacles to trade. Provisions may indicate the level of protection of domestic policy space, formation of standards, opportunities for private actor involvement in policy-making, and any hindrances to the policy-making process. These types of commitments, while highly relevant to trade in goods, influence health outcomes primarily through restrictions on domestic policy space and governance regarding quality standards and regulatory matters of NCD risk factors, such as HHCs. Thus, further exploration of these chapters is included in the final pathway: domestic policy space and governance.

Underlying and immediate causes

Health impacts through HHCs. Liberalizing market access can generate changes to import and export flows which, in turn, impact availability and affordability of HHCs. Reduced tariff rates, alongside the harmonization of product standards, may result in changes to: the price of imports and intensified market competition; the

volume and diversity of products; and the quality of traded goods. Tariff reductions often mean a reduction in the cost of imported goods (Thow and Hawkes 2009; Zeigler 2009; Pouliot and Larue 2012). The health implications of this will vary based on whether the increased volumes reflect health-harmful or health-promoting products. Lower priced goods can be beneficial for consumers, specifically, lower priced, healthful food imports (Auslin 2012); however, imports can also have negative effects when the price of HHCs is driven down as in the case of tobacco or alcohol (Hill 2004; Lee *et al.* 2009, 2012b). Market competition may also create a situation where cheaper but less healthy imported products replace traditional domestic goods, as seen in the case of Samoa where processed and hydrogenated oils replaced locally produced coconut oils after an episode of trade liberalization (Thow *et al.* 2011).

The reduced cost of imported goods after tariff reduction is associated with increased volumes and diversity of imported products. Increased flows of imports often include HHCs like tobacco, alcohol and ultra-processed food (Hawkes 2006; Clark *et al.* 2012). For example, reduction of import tariffs in Samoa and Fiji during periods of unilateral liberalization resulted in increased import of processed and packaged goods from around the world, including confectionaries, pastries and cereals (Thow *et al.* 2011); and imports of US chocolate, candy, cookies, pastries, popcorn, chips and confectionary grew across Central America after a free trade agreement with the United States (Thow and Hawkes 2009). The impact of trade and investment liberalization on availability and affordability of consumer products, including HHCs, might not always be uniform: after the implementation of NAFTA consumer food prices decreased in Canada, while food prices rose significantly faster than inflation in Mexico (Otero 2011).

Health impacts through the SDH. Market access can influence NCDs via three main SDH pathways: how it impacts economic activity and income; the extent to which tariff reductions may remove a revenue stream for government-provided social and health services; and the nature of the changes to a country's export production and new import-competition and associated alterations to the domestic economic structure and labour market. Shifts in what a country imports and exports as a consequence of tariff reductions have important implications for its domestic economy and labour markets. The health case for trade liberalization usually rests on the assumption of health-enhancing benefits of economic growth induced by free trade (Dollar 2001; Dollar and Kraay 2004; Berger *et al.* 2013; Francois *et al.* 2013). However, there is no general agreement in the literature on this, except that the implications of trade and investment agreements for domestic economies and labour markets are highly nuanced and context-dependent (Lopez-Acevedo and Robertson 2012; McNamara 2015). For example, evidence shows that NAFTA created very little economic gain for Mexico (Arnold 2006), with gross domestic product (GDP) growth in Mexico in the first 10 years of NAFTA (1995–2005) remaining below historic averages (Moreno-Brid *et al.* 2005; Pacheco-López 2005), while the United States experienced a growth boost post-NAFTA. Similarly, a recent econometric analysis of the TPP's impact expects mild economic losses for developed TPP economies (−0.04% average annual GDP change) but some growth for developing economies (+0.22% average annual GDP change) as directly resulting from the deal (Petri *et al.* 2011).

How trade and investment agreements impact tariff generation can also affect access to NCD preventive services or treatment. Tariffs can be a valuable source of government revenue for public

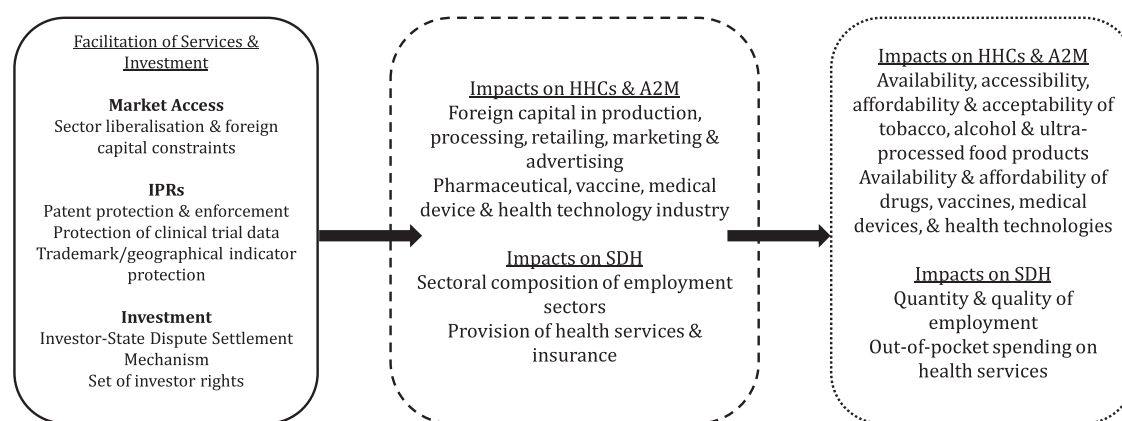


Figure 4. Facilitation of trade in services and investment pathway

services, including health expenditure; although, an individual country's reliance on tariff revenue and its ability to replace such revenue after liberalization through other means, such as domestic excise taxes or increased employment taxes, varies (Cagé and Gadenne 2014). Middle-income countries have been able to recover between 40 and 60% on average, while low-income countries have fared worse, recovering between 0 and 30% on average (Labonté 2012). Thus, the impact of lost revenue is likely to be more perceptible in the world's poorest countries which rely on tariffs for 25–50% of all public revenue (Labonté 2012). Whatever health and social services are being publicly provided in these countries are likely to suffer when tariffs are reduced. The implications of liberalization may compound when labour market insecurities rise simultaneously with tariff losses, which may diminish a state's capacity to finance health and social support programs to offset labour insecurity (Labonté *et al.* 2007; McNamara, 2015).

Changes in the composition of labour sectors are another important consideration as they drive the quality and quantity of employment, including labour conditions. Current evidence suggests that the impacts of trade and investment agreements on labour markets and employment conditions are highly variable (Salvatore 2007). While a shift in what a country imports and exports has important implications for its domestic labour market, this impact will vary among individual sectors creating winners and losers. NAFTA, for example, was beneficial for many fruit, vegetable and coffee producers in Mexico that had advantages in climate, geography and labour costs; while Mexican grain producers lost due to disadvantages in climate, mechanization and US government subsidies to their domestic producers (Fairbrother 2007).

Increased trade and investment liberalization may also be related to the recent rise of precarious and informal employment, which may have impacts on NCD rates through increased HHC consumption driven by chronic stress, or more directly through material deprivation due to bouts of unemployment, greater exposure to hazardous work environments and lack of access to health benefits (Benach *et al.* 2007). For example, many agricultural labourers in Mexico lost their jobs during the implementation of NAFTA, with informal employment after NAFTA accounting for 46% of all Mexican employment (Arnold 2006). In addition, labour implications are often stratified, such that high-wage areas gained while regions with more low-skilled labour lost. In the USA, these losses have been mitigated in part by trade adjustment assistance (Salvatore 2007), something not all countries are able to provide. Labour market re-structuring is by no means caused by trade liberalization alone, but is a parallel process argued to

be in response to global competition that, in part, is increased through liberalization.

Facilitation of services and investment pathways

Trade and investment policy provisions

This section of the framework conceptualizes the pathways between the facilitation of services and investment and NCDs (see Figure 4). Trade in services is facilitated by providing foreign investors new or greater market access to domestic service sectors, usually specified within a services chapter. The promotion of foreign direct investment (FDI) is more multifaceted and FDI inflows depend on a series of factors like political and economic stability, infrastructure, wages, tax structure and proximity to main markets (Morisset and Pirnia 2000; Lim 2001). One mode of service sector liberalization, commercial presence (discussed below), is specific to the promotion of FDI. Moreover, intellectual property rights were subsumed under the trade and investment regime on the premise that a strong national intellectual property system would encourage FDI, particularly FDI into research and development in the industrial and scientific fields (Idris 2003). Expansive investor rights and the inclusion of investor-state dispute settlement mechanisms in trade and investment agreements may also assist in fostering FDI inflows; however, as with sanitary and phytosanitary standards and technical barriers to trade, these topics will be reserved for in-depth exploration in the final pathway (domestic policy space and governance) as they affect health outcomes primarily through their impacts on policymaking processes.

Services—market access. Trade in services encompasses an exceptionally wide range of domestic economic activity and can include all services that are commercially or competitively provided. Under the WTO rules, member states must provide most-favoured nation treatment to foreign service suppliers. WTO members cannot discriminate between the service suppliers of its trading partners, that is, the most favourable conditions provides to service suppliers from one trading partner must be provided to all trading partners. As well, listing a service creates two primary obligations on states, the first of which is to provide market access to that service sector for foreign individuals and enterprises. Market access is provided for under four modes of service provision: (1) cross-border supply of services, (2) consumption abroad, (3) commercial presence to provide a service; and (4) presence of natural persons to temporarily provide a service. The second obligation is to provide non-

discriminatory treatment within committed service sectors through the right to national treatment. National treatment prevents discrimination between domestic and foreign producers or providers, such that imported goods, services, or investments should be treated no less favourably than domestic goods, services or investments. Services agreements may permit each country to create a highly customizable schedule of commitments, placing limitations on market access and national treatment, and most-favoured nation exemptions. Recent regional trade and investment agreements, however, do not provide the level of customization available in the World Trade Organization's General Agreement on Trade in Services, and use a negative listing approach (only specified services are exempted), which is likely to lead to a greater number of sector liberalization commitments (Adlung and Mamdouh 2013; Elms 2013).

Intellectual property rights. An agreement on intellectual property rights establishes the minimum standards of protection including the subject-matter to be protected, the rights to be conferred and permissible exceptions to those rights, and the minimum duration of protection. Such provisions include patent protection terms, added time for delays in approval, or easing of the conditions for patent approvals such as allowing patents for new uses and methods of existing products regardless of additional therapeutic benefit (Monasterio and Gleeson 2014). Provisions may also introduce or extend the protection of clinical trial data, including for biologics, compounds produced through biological processes that are crucial for treatment of cancer and immune conditions like rheumatoid arthritis (Lexchin and Gleeson 2016). Assessing the health impacts of enhanced intellectual property protections must balance the potential negative impacts of increased public and private drug expenditures, against the incentives they might provide for research and development into new and needed therapeutic and diagnostic techniques and the extent to which increased profits from extended intellectual property protections will be (or are actually) re-invested in research and development.

Underlying and immediate causes

Health impacts through HHCs and access to medicine. The body of evidence measuring the outcomes of services and investment liberalization on HHCs is smaller than that examining the implications of trade liberalization on the same commodities. However, just as changes to tariff and non-tariff barriers affect the import and export flow of HHCs across borders, changes to service sector liberalization and foreign capital constraints can impact FDI flows into production, processing, retailing and marketing and advertising of HHCs (Reardon *et al.* 2004). Changing levels of foreign capital in these activities can influence the availability, accessibility, affordability and acceptability of HHCs, and subsequently NCD rates. Similarly, the nature of intellectual property rights protection can affect the availability, accessibility and affordability of drugs, vaccines, medical devices and other health technologies to diagnose and treat NCDs, including underlying metabolic risk factors, caused in part by HHC consumption.

Increased FDI inflows often lead to greater concentration of ownership and larger market share for transnational food and beverage companies (Clark *et al.* 2012), for example Wal-Mart de Mexico quickly became the country's leading retailer after the signing of NAFTA (Hawkes 2006). Changes in the food retail landscape linked to growing FDI flows, in turn, can impact HHC consumption patterns. One study found that much of the increased availability of unhealthy snack foods in Central America following liberalization was a result of US FDI rather than US exports (Thow and Hawkes

2009). FDI has also facilitated rapid growth in fast-food retail outlets, creating a growing demand for energy-dense foods (Hawkes 2005), while tobacco companies have used FDI to circumvent high tariff rates by establishing production within countries to drive down prices and increase sales (Lo 2010). FDI can further increase the availability and affordability of ultra-processed food products (Hawkes 2005; Lo 2010), but it can also introduce entirely new categories of (unhealthy) foods into a region, contributing to the emergence of obesogenic food environments (Thow *et al.* 2011).

While trade in services can influence the availability and affordability of HHCs, service liberalization introduces two additional pathways: what commodities are accessible (driven by the number and location of retail outlets), and what commodities are acceptable (driven by marketing and advertising) (Friel *et al.* 2013b). For example, liberalization of marketing and advertising services has been highly influential in the growth of tobacco, alcohol and fast food markets as it allows transnational companies to overcome one of the most powerful market entry barriers: generating consumer preference for foreign products (Lee *et al.* 2013).

The global regime of intellectual property rights promoted and protected by international trade and investment agreements has important implications for the availability and accessibility of drugs to treat NCDs. Provisions in bilateral and regional free trade agreements generally require stronger and longer monopoly protections, or enhanced enforcement measures, in comparison with the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement of the World Trade Organization. These provisions generate market exclusivity for a longer period of time on an increasingly expanding range of health technologies including pharmaceuticals, vaccines and medical devices. These exclusivity provisions delay the entry of generic competition into the market. The TRIPS Agreement introduced a minimum standard of 20-year patent-based monopolies for drug developers to prevent generic manufacturers from "free-riding" on the brand-name companies that bear the research and development costs (Draho and Braithwaite 2002). Expansive TRIPS+ protections introduced in more recent trade and investment agreements have been based on this same rationale.

TRIPS+ protections in trade and investment agreements have reduced the availability and affordability of these products. As an example, the cost of antiretroviral therapy for human immunodeficiency virus (HIV) decreased from US\$10 000 per person when on patent, to US\$100 per person when made available generically (Kapczynski 2015). New biologic drugs are particularly costly, with some cancer drugs estimated to cost over US\$100 000 per year per patient (The Cost of Cancer Drugs 2014). Estimates suggest that medicines expenditure increased by 17% in Jordan from 1999 to 2004 as a result of intellectual property protections introduced during its accession to the World Trade Organization and the US-Jordan Free Trade Agreement (Abbott *et al.* 2012). In the case of the Comprehensive Economic and Trade Agreement between the European Union and Canada, it was recently estimated that additional annual costs to the Canadian health system would be around CA\$850 million when the agreement is fully phased in (Lexchin and Gagnon 2013). Moreover, one study found that the TRIPS+ provisions of the TPP could reduce HIV treatment coverage in TPP member country, Vietnam, from 68 to 30% of eligible people living with HIV (Moir *et al.* 2014). Although two of these studies focused on infectious disease, specifically HIV, similar trends can reasonably be expected for NCD treatments.

Health impacts through the SDH. Liberalization of the health sector may result in increased privatization of health services and health

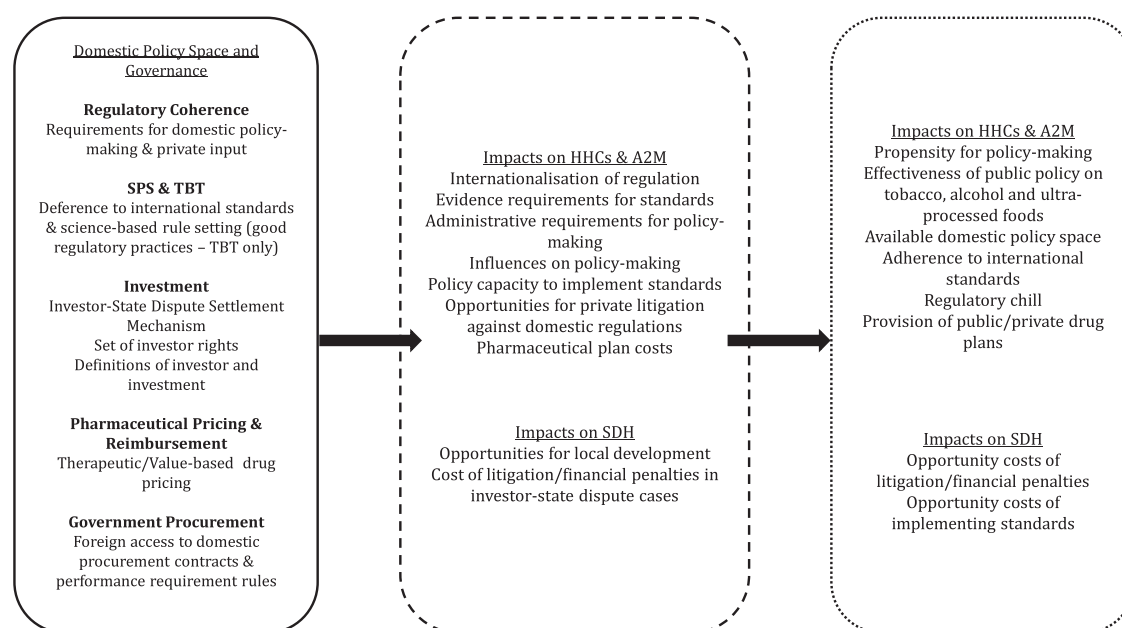


Figure 5. Domestic policy space and governance pathway

insurance, although more empirical evidence is needed to better understand the links between trade agreements and privatization of health services. As of 2004, 54 members of the World Trade Organization had made some liberalization commitments under health services, although this number rises to 78 when commitments under private health insurance are included (Spiegel *et al.* 2004). When privatization of health services occurs as a result of liberalization, it also may lead to increased out-of-pocket spending on health services, and thus could result in medical poverty. The United States, one of the few developed countries without a universal health care system (Fisher 2012), spent 17.1% of total GDP on health expenditures in 2015. This can be contrasted against countries like Canada, New Zealand and Australia which spent 10.9, 9.7 and 9.4%, respectively, under public systems (World Bank 2016). Cumulative public and private spending on healthcare in the USA is higher than almost any of the common measures of health (Morris 2012).

As with trade in goods, the liberalization of trade in services has the capacity to alter the composition of employment sectors within a domestic economy. Competitive advantages within the domestic economy, including human capital, labour standards and natural resources, will help determine which, if any, service areas will be desirable to foreign investors. Many of the implications for employment and the domestic economy discussed under the facilitation of trade in goods pathway are equally applicable here, as are their implications for NCDs through the distribution and redistribution of resources for a healthy lifestyle. Although evidence is still scarce, the presence of foreign investment has been associated with higher wages (Lim 2001; Lipsey and Sjöholm 2004). However, FDI inflows may also be inequality-enhancing, as the positive impact on wages is greater for skilled than for unskilled labour (Waldkirch 2008).

Domestic policy space and governance

Trade and investment policy provisions

This section of the framework conceptualizes the pathway between domestic policy space and governance and NCDs (see Figure 5). The

main pathways we identify in the framework include regulatory coherence provisions that establish governance mechanisms for the development of domestic policy; sanitary and phytosanitary standards and technical barriers to trade chapters that establish regulatory standards; special annexes on publicly provided pharmaceutical coverage plans; expansive investor rights and the inclusion of investor-state dispute settlement (ISDS) mechanisms; and government procurement provisions that regulate government contracts. Relative to the previous two pathways, there was considerably less empirical evidence for the relationships in this pathway captured in our literature review, largely due to the novelty of such provisions in trade and investment agreements. Therefore, the relationships in this pathway are largely supported by theoretically informed deductive reasoning at this time.

Provisions in a regulatory coherence or cooperation chapter, first seen in the Canada–European Union agreement and in the TPP, have the potential to impact domestic policy space for the regulation of HHCs (Kelsey 2012, 2013). Provisions in such a chapter may include new rules governing the process of developing policy, requirements to provide opportunities for private sector input (including private corporations based in other countries party to the agreements), and new documentation required for all current and proposed regulatory policies. Contemporary agreements may also begin including provisions on pharmaceutical pricing and reimbursement procedures that could impact the availability and accessibility of NCD treatment. Draft texts of the TPP had included measures on reference-based drug pricing, although these provisions did not make the final text (Lexchin and Gleeson 2016). Reference-based pricing has been used by some governments as a cost-containment mechanism for drug expenditures (Lee *et al.* 2012a; Bach 2016).

The inclusion of an expansive set of investor rights alongside an ISDS mechanism in an investment chapter is also critical to understanding the potential health impacts of such agreements, given their capacity to empower private actors to challenge public policy measures, including those regulating HHCs. Government procurement provisions may also be included which specify the instances and

conditions when foreign companies are permitted access to the domestic procurement contract bidding process; as well as change stipulations on performance requirements included within these contracts, such as limitations on requirements on domestic content, local labour or even environmental standards.

Underlying and immediate causes

Health impacts through HHCs and access to medicines. In contemporary trade and investment agreements, considerable attention is paid to progressing convergence and equivalence of regulation among varying countries (Bhala 2014). For example, while requiring adherence to minimum international standards, the Sanitary and Phytosanitary Standards and Technical Barriers to Trade Agreements of the World Trade Organization also require that standards are not more trade restrictive than necessary and that any policies that create stricter requirements than the relevant international standards must justify their necessity with scientific evidence. Thow *et al.* (2017), for example, explored trade concerns raised in the committee on Technical Barriers to Trade regarding front-of-pack interpretive nutrition labelling policy, which has been empirically linked to healthier food choices (Campos *et al.* 2011; Hersey *et al.* 2013; Volkova and Mhurchu 2015). They noted that members had queried such policies in Thailand, Chile, Peru, Indonesia and Ecuador regarding the justification of the specific labelling measures proposed, the scientific evidence for the effectiveness of such measures, and the consistency of the measures with international standards. All countries proceeded with legislation to implement these nutrition labelling policies (with the expectation of Thailand which modified their measure from interpretive labelling to a warning that children should consume less), suggesting that converging regulation may introduce greater administrative and scientific requirements in HHC policy development, but may not necessarily deter those states committed to such policy change.

While sanitary and phytosanitary standards and technical barriers to trade chapters are designed to address non-tariff barriers by harmonizing standards, regulatory coherence provisions qualitatively raise the bar on the type of demands placed on domestic policy-makers (Bhala 2014). As regulatory coherence chapters are new, and are not yet included in any agreement in force at the time of writing, the implications of such a chapter remain largely hypothetical; although a recent analysis suggests that they will likely increase the difficulty of protecting national policy-making from vested interests (Thow *et al.* 2015). While increased transparency and reporting requirements present opportunities for improved governance, increased corporate participation in shaping the rules that regulate its industry presents a threat to the development of effective policies for HHCs (Chan 2013).

However, the greatest transformation to domestic policy space is arguably related to the addition of investment chapters, particularly so when they offer an investor–state dispute settlement mechanism. The inclusion of an ISDS mechanism in an investment chapter creates an opportunity for private foreign investors to initiate litigation against governments for domestic regulations that are perceived to violate investor rights. The likelihood of pursuing an ISDS claim will be mediated by the level of comprehensiveness and ambiguity in the investor rights language, in addition to factors external to the text that influence investor decision-making, including the likely size of an award, chances of success, costs of the process, and risks to reputation with states or consumers. While the use of ISDS only emerged in 1987, for the first 10 years there were no more than ten cases annually. This began to rise in the early 2000s, with 70 new claims in

2015 alone (United Nations Conference on Trade and Development 2015). It has been suggested that ISDS may affect a government's willingness to regulate in the public interest (Van Harten and Scott 2015). While evidence for regulatory chill is widespread for fields other than health, for example for environmental regulation (Brown 2013), evidence for this phenomenon is just starting to accumulate in health research (Neumayer 2001; Tienhaara 2011; Van Harten and Scott 2015). A concrete example of regulatory chill was the official statement from the government of New Zealand that it would not pursue tobacco plain packaging legislation until a decision was made in the investor-state litigation against Australia for the same policy (3 News 2015).

Finally, the inclusion of regulatory provisions that seek to intervene in therapeutic- or value-based drug pricing have the capacity to influence drug plan costs, which may mediate individual's access to NCD prevention or treatment. Implementing therapeutic reference-based drug pricing has been estimated to save the Canadian province of British Columbia up to CA\$44 million annually (Canadian Health Services Research foundation 2005). Review of reference-based pricing in Australia, Denmark, Germany, Netherlands, New Zealand, Norway and Sweden also suggest short term savings (Ioannides-Demos *et al.* 2002).

Health impacts through the SDH. The first pathway that links domestic policy space to health through the SDH focuses on changes to government procurement principles outlined in trade treaties. Government procurement has been an important tool for economic development by creating demand for locally produced goods and services, often under conditions that promote equity, social justice and environmental sustainability (Kaye Nijaki and Worrel 2012). For example, construction of a new government-funded hospital may be built with the intention of improving access to health services; however, the actual construction project could also potentially have indirect health impacts through the income generated for domestic companies and employment opportunities for local labourers; but that is only possible if local inputs and labour are used in the construction.

The second pathway focuses on how government budgets may be redirected to cover the costs associated with ISDS. The rise in ISDS claims creates increased costs through potential financial awards to investors and the costs associated with litigation. To date, states, and consequently tax-payers, have been ordered to pay over US\$10 billion in legal fees and financial compensation (Van Harten and Malysheuski 2016). Even when investors fail to win their claim, states must still contend with the costs of litigation, which has been estimated at US\$8 million per case (Gaukrodger and Gordon 2012), producing significant opportunity costs of ISDS litigation in terms of foregone revenue for health spending. The redirection of government funds to costs associated with ISDS, or budgetary allowances deferred to the implementation of new standards and administrative demands of regulatory harmonization, is very likely reallocated from another budget area. Such a diversion of funds is relevant to assessments of the health impacts of these agreements if spending is diverted from the provision of health and social services or any other redistributive or welfare spending that affects the SDH. However, further empirical evidence for such opportunity costs associated with ISDS and regulatory harmonization is needed.

Discussion

Examining contemporary trade and investment agreements reveals multiple tensions between the goals and effects of trade and

investment liberalization and the protection and promotion of population health (Friel *et al.* 2015). Our conceptual framework was developed with the intention to inform researchers and policy-makers of key provisions within such agreements, and provide a high-level analysis and overview of the various ways in which they may influence NCD outcomes. Future health assessments of trade and investment agreements can use this framework to identify a broad range of possible causal pathways for detailed inquiry in localized contexts. In addition, the realist review used to assist in the development and validation of the conceptual framework underscores the need for robust evidence, particularly as related to the SDH, and in matters outside FDI flows and tariff rates. Finally, this framework was designed in an attempt encourage upstream approaches to NCD prevention by demonstrating how individually located behavioural risk factors actually occur within environments that are conditioned and constrained by macroeconomic policies, such as trade and investment, and that addressing these upstream policies may be a productive way to more equitably address rising NCD rates than lifestyle interventions.

The evidence reviewed for the facilitation of trade in goods pathway supports the proposition that the reduction of tariffs results in a higher volume of cheaper imports flowing across borders, increasing their availability and affordability in the consumer environment. This may present a challenge to health when the effects apply disproportionately to HHCs. The development of more robust evidence in the future should contrast applied tariffs before and after the agreement, address whether currently applied tariff rates are less than the bound rates in the agreement, and associate those modifications with changes in absolute volumes and retail price of imported HHCs. In addition, future research could contrast the effects on healthy and unhealthy food products to draw comparisons of access to healthy and unhealthy diets facilitated by trade in goods.

The reduction of trade barriers also has the potential to undermine tariff revenues needed for the provision of public services, reshape domestic economies and thus impact the quality and quantity of employment, and influence economic growth performance. While the relationship between tariff reductions, lost government revenue and reduced capacity to provide health and social services seems viable, our review did not return any empirical investigations of these relationships making this an important area for future research. The complexity of the evidence for trade and economic growth makes it crucial to assess the potential economic impacts based on a variety of econometric models and data sources for each participating country. Such an economic assessment should include heterodox econometric models and data sources (such as the United Nation's Global Policy modelling database) to avoid the pro-free trade bias inherent to mainstream econometric models rooted in the flawed neoclassical assumptions of perfect competition, perfect fungibility of resources, full employment, and static inequality.

In relation to the facilitation of the services and investment pathway, the evidence reviewed supports the proposition in the framework that trade and investment provisions could influence FDI into the production, processing, retailing and marketing and advertising of HHCs, as well as the market for pharmaceuticals, vaccines, medical devices, and health technologies. This, in turn, influences the availability, accessibility, affordability and acceptability of these products, including life-saving drugs. However, a better understanding of the impact of services and investment commitments on investment inflows for all HHCs, and connections between FDI and specific trade and investment liberalization commitments, is needed. In addition, more robust evidence should be generated by reviewing commitments in the agreement relative to existing domestic

commitments and exploring causal relationships with FDI inflows in varying areas of production, processing, retailing, marketing and advertising.

There was a dearth of research in understanding the influence of services liberalization from trade and investment agreements on national provision of health services and health insurance and subsequent effects for out-of-pocket expenditures on these services. The evidence reviewed appears to indicate that privatization of health services is associated with rising costs and is not consistently associated with increases in quality. More robust evidence is needed regarding the impacts of guaranteeing and enforcing existing levels of service liberalization, as well as new liberalization, on access to and affordability of health services specifically, and on the SDH more generally.

The health impacts of international trade and investment agreements on HHCs, access to medicines and the SDH through the domestic policy space and governance pathways have the least empirical support, with scholarship in this area only recently emerging. Hence, the causal connections proposed are largely theoretically derived and deductively generated. They should be tested in future empirical investigations. Trade and investment provisions that influence the policy-making process, set international standards and restrict policy-space, whether just perceived or in actual fact, may alter a state's propensity for regulating HHCs and the efficacy of those regulations. Although it is reasonable to presume that diverting government procurement contracts from local developers to foreign developers will influence opportunities for local development, empirical evidence is still required to demonstrate the magnitude of these impacts and make direct connections to government procurement agreements. Evidence for the opportunity costs of fees associated with ISDS is also needed.

This article has developed a conceptual framework for the pathways through which trade and investment provisions impact the business, regulatory and consumer environments, as described above. Changes to these environments were of interest in relation to their ability to condition and constrain individual health behaviours relevant to NCDs, specifically consumption of tobacco, alcohol and ultra-processed foods and beverages. Whether a specific trade and investment provision, within a specific domestic environment, will result in increased or decreased consumption must be addressed based on a case-by-case basis. Pathways between trade and investment provisions and access to medicines, income, employment and health and social services were also introduced as additional points of consideration in future empirical investigations as potential mediators of the impact of trade and investment liberalization on either HHC consumption, or access to resources to mediate the health impacts of elevated consumption.

Limitations

Assessing the health impacts of international trade and investment agreements is a complex process. Changes along the pathways are interconnected, context-dependent and occur over extended periods of time, all of which makes establishing and measuring causality highly problematic. Moreover, as the provisions moved further away from traditional tariff rules to 'behind-the-border' measures impacting on services, investment, domestic policy space and governance, the volume and strength of evidence began to decline. Areas requiring more robust evidence have been indicated above.

The evidence in our realist review does not reflect the entire body of available evidence on the concepts included in the framework, particularly in relation to the expansive body of literature on

the impacts of trade on the economy and employment. In addition, while the intent of the review was to explore the impacts of trade and investment liberalization, a considerable portion of the reviewed evidence was from studies of liberalization in general, not demonstrably undertaken as a result of specific trade and investment commitments. As more robust evidence is generated for the relationship between trade and NCDs across a broader range of pathways, conclusions regarding specific effects of trade and investment agreements will become more viable.

The reviewed evidence was also heavily weighted towards the negative externalities of trade and investment agreements rather than the positive externalities, due in considerable part to the focus on WHO identified NCD risk factors in this framework. Considerable evidence also originated from studies of NAFTA and the Central America Free Trade Agreement, and relatedly, much of the evidence of changes to the food environment and dietary outcomes from trade and investment liberalization was restricted to Latin America and the Pacific Island Countries. As this body of literature develops, a more balanced and global approach should be taken, which should also include rigorous investigations of effects specific to vulnerable populations and impacts across socioeconomic classes.

This framework captures many but not all factors. One important area for future research is the role of actors and complex power-structure relationships among them, such as the ways in which corporate global production chains are developed and sustained or inequalities in decision-making power within consumer environments. The content of this framework was also limited by focusing on the WHO 4×4×4 framing, emphasizing behavioural risk factors including tobacco, alcohol and unhealthy dietary product consumption. Moreover, while select SDH were incorporated, fuller treatment of these expansive topics and a wider range of determinants is needed. Important environmental concepts were omitted entirely, such as the impact of trade on NCDs through air pollution or climate change. As employment and environment are increasingly incorporated in new sections of trade and investment agreements, labour and environment agreements may be added to the framework.

We see the utility of this framework as providing guidance to researchers on which areas of trade and investment agreements to study if they are interested in empirically examining the relationships between trade and investment policy and health outcomes. Future work should consider addressing the structural limitations of this framework through the inclusion of components such as health opportunities, physical activity, population-specific effects, actor interests, environmental factors and a more diverse range of SDH, including greater attention to employment. Although as this framework is expanded it will be important to be mindful of the tipping point where increased comprehensiveness and complexity slips from enhancing utility to impeding utility.

Conclusion

Effort is needed from researchers engaged in trade and investment and health research to discuss realist evaluation methods for developing quality evidence and directing attention to areas where evidence is currently absent or inadequate. Future investigations of the health impacts of trade and investment agreements must account for specificity and complexity not yet included in this framework. Thus, when conducting prospective analyses of a new agreement it is important to account for the current trade and investment landscape within a state. Each new agreement should be explored for the changes it makes to existing domestic law (already reflecting prior

international trade and investment commitments), focusing on the new commitments it introduces. Moreover, future investigations may consider the inclusion of corporate and consumer agency within the structural determinants outlined in the framework for a more complete understanding of the dynamics between actors and institutions that together co-create the health outcomes from trade and investment agreements. Developing a better understanding of the complex economic implications of trade and investment agreements for the SDH, including employment and working conditions, individual income and social status, and access to health and social services, should be a priority area for future research.

Additional efforts to continue compiling evidence for the pathways and refining the framework itself as new evidence emerges will support future work in this area. It is the hope that the development of this conceptual framework will encourage capacity and inclination among a greater number of researchers to undertake health assessments of trade and investment agreements to generate an extensive and robust evidence-base to guide future policy actions in this area.

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