

## Chapter 7

# Expanding Health Taxation to Other Unhealthy Behaviours and Harmful Activities

Andreia Costa Santos\*, Thiago Hérick de Sá†, Michael Oliver Hinsch‡, Ernesto Sanchez Triana‡, and Jeremy A Lauer§

The use of taxation to improve public health has been successful in tackling tobacco and alcohol, with positive and direct effect on health outcomes. However, the taxation of other unhealthy behaviours and activities negatively affecting health (e.g. the increased use of cars) has not yet been explored for the promotion of public health and societal well-being, in particular for reducing premature mortality from non-communicable diseases (NCDs), which account for 70% of global deaths. Taxation can be expanded to unhealthy behaviours and activities affecting individuals' health and well-being, in the pursuit of public health goals. For unhealthy behaviours and some other activities, taxation might be defined at local levels of government, as a way to tackle local health problems. Local governments should be actively collaborating with other levels of government (e.g. federal level), to identify taxation-based solutions for health problems that directly affect

\* University of London, UK.

† World Health Organization, Switzerland.

‡ The World Bank, USA.

§ University of Strathclyde, UK (formerly World Health Organization, Switzerland).

their jurisdiction. We use the examples of air pollution, land use, gambling and farming practices to illustrate the challenges facing local authorities, and opportunities to deal with them through taxation and health promotion, particularly in tackling NCDs.

## 7.1. Introduction

Unhealthy behaviours are major factors behind the rise in non-communicable diseases (NCDs), an annual killer of 40 million people of all ages accounting for 70% of all global deaths, in 2016.<sup>1-3</sup> Pushed by increased industrialisation and urbanisation, the consumption of highly processed food and beverages, harmful use of tobacco and alcohol and physical inactivity have led to detrimental consequences to the health of individuals around the world, with an increasing shift of the burden of NCDs from high-income countries (HICs) to low- and middle-income countries (LMICs).<sup>4-6</sup>

The economic development brought by industrialisation and urbanisation has contributed to harmful living conditions and unhealthy behaviours, exacerbating the risk of diseases. Living conditions and unhealthy behaviours in urban areas are characterised by heavy traffic, physical inactivity, air pollution, housing insecurity and poverty. These conditions lead to premature death, disability and reduced productivity from NCDs, with the urban poor experiencing worse health outcomes compared to their rural counterparts.<sup>7-9</sup> The situation tends to deteriorate as the world's population in urban areas increases. Currently, more than 55% of the world's inhabitants live in urban centres, and by 2050 the proportion is expected to grow to 68%, with Asia and Africa seeing a rise of almost 90%.<sup>10</sup>

Outside urban centres, the prevalence of NCDs is rapidly increasing, driven by physical inactivity and poor diet.<sup>9,11</sup> Obesity, for example, is growing faster in rural areas than in cities, although important differences between countries' income levels are observed: rural populations in HICs, mainly women, are more obese than those in cities because of the indirect effect of their lower-income and education levels, and the direct effects of limited availability and higher price of healthy foods, and less leisure and sports facilities; in LMICs, the mechanisation of labour and increased use

of cars reduce physical activity, in addition to an increased spending on low-quality, fat-rich food.<sup>12</sup>

While the use of taxation to improve public health has been successful in tackling unhealthy foods, tobacco and alcohol, with a positive and direct effect on health outcomes,<sup>6,13</sup> the taxation of unhealthy behaviours and activities negatively affecting health (e.g. replacing subsidies with taxation for the increased use of cars and their production and disposal) has not yet been explored for the promotion of public health and societal well-being, in particular for reducing premature mortality from NCDs, one of the United Nation's Sustainable Development Goals.<sup>14</sup>

Taxation of unhealthy products usually occurs at the highest level of government (e.g. federal level), where revenues from taxes have been used to lessen budget deficits, and to promote health, safety, energy and environmental programmes.<sup>15–17</sup> This top-down approach may not be the most effective way to tackle the growing burden of NCDs when dealing with specific unhealthy behaviours and activities negatively affecting health and that may be prone to taxation. Important differences in the drivers of NCDs in urban and rural, HICs and LMICs require a cooperative approach at all governmental levels, with an important role for local governments in defining priorities.<sup>18</sup> For example, heavy traffic and low levels of walking and cycling, as a means of transportation and physical activity, might be an issue more prominent in urban centres than rural localities, thus, defining taxation instruments for vehicles in urban centres might be more effective than at state or federal levels; while the increased gambling leading to alcoholism, drug addiction, mental health conditions and physical inactivity, might be more severe among rural and peri-urban residents than in urban settings. Hence, the revenue generated by taxation designed and applied at the local level could help local authorities to target their populations with awareness campaigns, to provide tailored treatments for those affected and to reach out and engage with the most disadvantaged.<sup>19–23</sup> This approach does not eliminate the role of other levels of government in taxation and regulations, rather, it empowers local governments to contribute to the efforts of combating NCDs.

Taxation at local levels for local problems can strengthen the role of local governments in combating NCDs, empower local authorities to make critical decisions for people in their jurisdiction, and help generate the necessary financial resources to deal with the health issues at hand.<sup>24</sup> Local administration may also increase the transparency, accountability and engagement of citizens when a tax is implemented.<sup>25,26</sup>

This chapter argues that taxation could be expanded to harmful products, activities and health-related behaviours negatively affecting individuals' health and well-being. It also argues that, for unhealthy behaviours and some activities, taxation can be defined and applied at local governmental levels as an efficient way to tackle local health problems. Local governments should also be actively collaborating at other levels of government to define health policies for health problems directly affecting their jurisdictions. We use the examples of air pollution, land use, problem gambling and farming practices to illustrate the challenges facing local authorities, and opportunities to deal with them through taxation and health promotion, in particular in combating NCDs.<sup>a</sup>

### 7.1.1. Local governments creating and promoting public goods that support health – The role of local taxes for health

Typically, the creation and provision of public goods occur at the highest governmental level (e.g. federal level), where revenues generated by taxation are allocated to different activities such as national defence, flood control systems and the control of water pollution. This direct provision of a public good by the highest level of government can help to overcome the free-rider

<sup>a</sup> Societal well-being, including the promotion and protection of health, can only be achieved when the negative effects of products and behaviours to the society – or *negative externalities*, in economic terms – are eliminated or reduced. Thus, from the perspective of public health, it is not unreasonable to promote ways to correct, reduce or even eliminate the consumption of products that cause harm to health, and to encourage better lifestyles to prevent diseases. Externalities occur when economic transactions carried out by corporations or individuals impose costs or benefits to a third party that is not part of the price. A solution is to impose a tax equivalent to the magnitude of these external costs.<sup>27,28</sup>

problem which leads to market failure.<sup>b</sup> Health – and the promotion of public health – however, requires a whole-system approach, where cooperation between various levels of government is key to achieve the national and international targets for the control of NCDs.

The concept of public goods considers the production of ‘goods’ that are in the interest of the society, such as the control of climate change and prevention of diseases, but that also demonstrate public good attributes (non-exclusion and non-rivalry). These attributes mean that there is often a lack of incentive to produce these goods. Thus, the central issue of concern within the concept of public goods becomes one of ensuring collective action at all levels of government.<sup>c,30,31</sup>

Collective action by all levels of government requires guaranteeing a degree of independence for a lower authority in relation to a higher body or for a local authority in relation to the central government, involving the sharing of powers between several levels of authority – *the principle of subsidiarity*.<sup>d,32</sup> Thus, local governments can be empowered to act in the production and provision of public health as a public good.

In addition, local governments can produce and provide public goods that are efficiently tailored to local needs and act on policies to address such needs. In particular, urban governments yield *agglomeration* gains, that is, they have advantages in terms of transport and infrastructure, in the concentration of highly qualified workers, in encouraging and facilitating knowledge spillovers for a diverse and productive market and in creating

<sup>b</sup> A public good refers to a good that can be accessed and consumed by anyone, without directly paying for it (non-excludable), and once consumed, its availability is not reduced by the use of others (non-rivalrous).<sup>28</sup> Free-riding is a type of market failure that occurs when people can benefit from a good or service without paying for it.<sup>29</sup>

<sup>c</sup> Dees (2017)<sup>30</sup> and Horne (2019)<sup>31</sup> suggest further examination on the concept of public goods to include public health. Horne (2019) stressed the fact that public goods are not the only goods that the market may fail to provide efficiently, providing a way to broaden the account of the public good of public health, without abandoning the public goods’ distinctive characteristics.

<sup>d</sup> The principle of subsidiarity serves to regulate the exercise of the central government’s non-exclusive powers. It rules out central government intervention when an issue can be dealt with effectively by other levels of government, e.g. regional or local level (European Union, 2021).

public goods.<sup>e,34,35,37</sup> Taxation is the mechanism that allows local governments to efficiently take advantage of local preferences and agglomerative effects, although the challenges of slums, overcrowding and a large presence of the informal sector in LMICs may reduce the benefits of agglomeration leading to free-rider problems and difficulties in financing adequate public services, due to local governments diminished ability to tax, monitor and regulate this sector.<sup>38</sup> Nonetheless, taxation can be effectively used as an instrument for accountability and responsiveness by governments in LMICs, and new systems have been explored to improve taxation in these lower-income settings.<sup>25,39</sup> At the same time, taxation can also be used to improve slums conditions and prevent overcrowding, for example, through land-use taxes.

Taxes on activities causing air pollution – from traffic caused by cars to industrial emissions – for example, have been sources of revenue for many local governments, generating a considerable amount of income.<sup>40</sup> The resulting revenues are rarely allocated to fund public health spending, though the health benefits generated by the taxes are well documented.<sup>41–44</sup> In London, for example, a congestion charge system was introduced in 2003 with the objective of reducing traffic, improving bus service, making journey times more predictable for drivers and increasing efficiency in the delivery of goods and services throughout the city. Traffic volumes in central London are now almost a quarter lower than a decade ago, with all London buses expected to have green technologies and zero emissions by 2037.<sup>45</sup> In 2017–2018 alone, about USD 297 million in net income (revenue minus costs) was generated.<sup>46</sup> The revenue generated by the congestion charges was mostly earmarked for re-investment in transport, principally on buses,

<sup>e</sup> The assumption of the efficiency of local governments in producing local public services, based on local preferences, is anchored on the original 1956's work of Charles Tiebout, *A Pure Theory of Local Expenditure*.<sup>33</sup> Although Tiebout's work provided the basis for the new economic geography and agglomeration economics,<sup>34,35</sup> agglomeration was not the focus of his work, even though the issue permeates all his discussions.

Agglomerative efficiency can be questioned as an efficient allocative mechanism for the production of public goods due to the presence of *sorting* (residents moving from one local authority to another in order to obtain better services) – see Ref.<sup>36</sup> *Postcode lottery* is another potential disadvantage of policy determination independent of local governmental level, as individuals may have access to social services in one local government but not in another leading to the presence of sorting.

in order to alleviate the pressure on the underground network, with some limited investments in promoting health through walking and cycling.<sup>47</sup>

Reducing traffic and increasing space for walking and cycling can generate health benefits. Improving physical activity leads to long-term health benefits and the prevention of over 20 common health conditions, including mental health conditions and diabetes. Physical inactivity is estimated to cost the United Kingdom National Health Service (NHS) more than USD 1.9 billion per year, in 2018 prices.<sup>48</sup>

Congestion charges by themselves are a limited mechanism for reducing air pollution and promoting health, although are effective in reducing traffic. In 2008, Transport for London introduced the low emission zone (LEZ) to encourage polluting diesel vehicles driving in London to become cleaner.<sup>49</sup> The LEZ was expected to have a significant impact on health outcomes, although recent studies have shown only limited effects on improving air quality and health outcomes in children, despite some evidence of a reduction in the prevalence of rhinitis.<sup>50,51</sup>

In 2019, an ultra-low emission zone (ULEZ) was introduced, with charges being applied to all vehicles entering central London (in addition to the congestion charges) that do not conform to the emissions standards defined by legislation.<sup>52,53</sup> However, more ambitious schemes with wider coverage of ULEZs and plans for a reduction in the use of vehicles are needed to yield significant reductions in levels of air pollution and positive changes in population health.<sup>50</sup> Though the marketing strategy for the new ULEZ is heavily focused on the health benefits for the NHS, the funds generated are essentially earmarked for making the fleet 'clean and green' rather than for policies to reduce the use of cars. That said, Transport for London states that plans are being put in place for further reductions in traffic, aiming to have four out of every five trips through the city of London made by public transport, walking or cycling by 2040.<sup>52–54</sup> Earmarking an expanded ULEZ as a contribution to the NHS, as well as for increasing the walking and cycling infrastructure, bike-sharing and the use of free public transport could generate the much-needed support among the general public, effectively

reduce the use of cars and generate meaningful health benefits. Recent polls have shown signs of an increased willingness from the public to pay more tax when health is the main area of spending.<sup>55</sup>

Taxes targeting harmful health-related behaviours and unhealthy activities can be designated as health taxes, and the revenue can be earmarked for public health gains through investment in solutions for health and well-being, such as increasing spaces for walking and cycling, and green spaces. Unquestionably, intensive policy coordination and investments are needed for local governments to operate efficiently, and this is a particular challenge in LMICs where a reliable tax system can be difficult to implement.<sup>54</sup> Even with such challenges, local governments can be empowered to find solutions to plan, finance and manage sustainable and strategic fiscal interventions that lead to better public health outcomes. As we will see in subsequent sections, local governments can catalyse sustainable development through the use of health taxes that promote health in an efficient, cost-effective and equitable manner. We will explore a few examples, from non-traditional areas of taxation for health, but that directly or indirectly produces substantial effects on health and should be more actively looked at, as opportunities to create additional revenue to improve health.

## **7.2. Sectoral interventions in local governments for better health**

### **7.2.1. Air pollution and taxes for health**

Air pollution affects populations in all parts of the world. The World Health Organization (WHO) estimates that worldwide, 7 million people die every year from exposure to fine particles: 4.2 million from ambient (outdoor) air pollution and 3.8 from household air pollution.<sup>f,55,56</sup> Recent studies have also suggested that short- and long-term exposure to air pollution might

<sup>f</sup> Household air pollution also contributes to ambient air pollution, but the number of deaths due to this intersection is difficult to be assessed, thus some double counting is assumed.

increase the risk of complications related to COVID-19, including deaths, although more evidence is needed to support the causal link.<sup>57–61</sup>

Carbon taxes have been used to support the reduction in levels of air pollution and restrict the use of fossil fuels, such as petroleum, coal and natural gas, by targeting fossil fuels according to how much carbon dioxide is emitted when the fuel is burned.<sup>62</sup> However, carbon does not have a direct and well-defined scope for taxation, with the source of emissions not always clearly identified and measured, making it vulnerable to lobbying, or garnering weak public and political support.<sup>63</sup> Until now, carbon taxes have been implemented only in a small number of countries or regions, covering less than 20% of global emissions, although it is important to note that the number of carbon-pricing initiatives almost doubled in the past 5 years, with many initiatives coming from upper-middle-income countries.<sup>64,65</sup>

A gateway tax focusing on air pollution has been advocated as an initial step to tackle the issue of climate change and the low coverage of carbon taxes.<sup>63</sup> The carbon tax is important for decarbonisation, but it is not sufficient to address human health.<sup>8</sup> Taxes targeting air pollution have been defended as more effective due to a straightforward link to emissions sources and clearer regulatory scope.<sup>64,67</sup> A lump-sum tax encompassing carbon emissions and air pollution could gain support from the public if the benefits are concentrated in specific areas, especially one with health as the focus. Research has shown that fiscal policies are more likely to be successful if their costs are diffused but the benefits are concentrated<sup>43</sup>; carbon taxes on the other hand tend to have diffused benefits and concentrated costs.<sup>h,51,52</sup> By concentrating the benefits of fiscal policies on health, policymakers gain a broader spectrum for policies that

<sup>8</sup> The short-lived climate pollutants black carbon, methane, tropospheric ozone, hydrofluorocarbons, and other fine particulate matter (PM) are the most important contributors to the man-made global greenhouse effect after carbon dioxide. These short-lived climate pollutants remain in the atmosphere for a much shorter period of time than carbon dioxide, but they are much harmful to the atmosphere. Certain short-lived climate pollutants are also dangerous air pollutants that have harmful effects for people, ecosystems and agricultural productivity.<sup>68</sup>

<sup>h</sup> Studies show that, although a significant reduction in the amount of CO<sub>2</sub> emissions can be observed since carbon taxes have been introduced, it is difficult to assign the effect to the tax since other effects are more important or the tax is too low in order to clearly assign variations in the emissions to the tax. Transaction cost and bounded rationality of actors may play a

benefit health, including tackling climate change and air pollution, but also providing potential leverage to invest in other areas such as universal health coverage. This approach could be more acceptable to the public, especially in areas with low levels of political trust and awareness of climate change.<sup>68,69</sup>

Concomitantly, replacing subsidies with taxes on health-related behaviours and unhealthy activities will maximise the efforts to reduce the effects of climate change, particularly on health. Subsidies maintain consumer prices artificially low, leading to higher consumption of subsidised goods, which in turn results in higher consumption and pollution. Examples of harmful subsidies include those for fossil fuels that increase air pollution and congestion and discourage energy efficiency; and agricultural subsidies that can lead to the overuse of pesticides and fertilisers.<sup>71–74</sup> According to the International Monetary Fund (IMF), fossil fuel subsidies were estimated at USD 5.2 trillion or 6.5% of GDP in 2017. Efficient prices would have avoided 46% of the deaths caused by fossil fuel-related air pollution in 2015.<sup>73</sup> Mexico, for example, has successfully phased out subsidies to gasoline and diesel. During the period of 2008 and 2017, subsidies were reduced a few cents every month, in addition to the implementation of low-emission zones at cities levels. An economy-wide assessment found that elimination of all energy subsidies would be associated with a 1.5% higher GDP growth over the long-term because resources that were being used to pay for subsidies could be used instead to increase government expenditure, potentially including the expansion of public healthcare.<sup>75</sup>

Local governments have an important role to play in delivering reductions in carbon emission, and a gateway price at the local level, as well as the implementation of supporting interventions to cut or reduce subsidies (e.g. implementation of zero-emission zones in cities), could be effective ways to strategically counteract industry efforts to overturn policy action for air quality. This is because local governments are close to the exposure sources that directly affect their populations, potentially increasing public engagement

---

non-negligible role and can lead to a lower reaction than what has been anticipated by pre-tax evaluations models have predicted.<sup>72</sup>

and support for carbon or air pollution taxes. Local governments can also define green transport policies (e.g. forestalling or limiting increases in road capacity, supporting car-sharing, or taxing the use of cars or highly polluting vehicles), enforce energy-efficient construction, adopt low-cost circular economy waste policies, restrict the volumes of waste going to landfill or incineration, support and encourage (through subsidies or grants) renewable energy and closely enforce carbon policies for industries in their jurisdictions.

### 7.2.2. Air pollution from traffic emissions

Transport systems are core to the development of any city. High-speed trains, subway systems and vehicle technologies are in constant development to attend to the needs of growing urban and peri-urban populations. As transportation transforms, so too does the health of individuals. Transport choices, technologies and policies determine the exposure to certain environmental pollutants, the frequency and severity of traffic-related accidents and injuries, the level and types of physical activity and the exposure to noise, with associated disruption of sleep and hearing.<sup>76–78</sup>

Adverse health effects associated with exposure to traffic-related pollutants are well documented, with adverse cardiorespiratory effects including the exacerbation of asthma, the incidence of new cases of asthma, reduced lung function, myocardial infarction, the progression of atherosclerosis and cardiovascular mortality being identified as the main outcomes of exposure to traffic emissions.<sup>79</sup> Children living near roads with heavy-duty vehicle traffic have twice the risk of respiratory problems as those living near less congested streets.<sup>80</sup>

Urban transport policies should be more and more turned into strategies promoting zero-emission transportation, with walking and cycling at the core. Increased walking and cycling in urban areas and reduced use of private cars generate positive effects on many health outcomes, including the reduction of type 2 diabetes, dementia, cerebrovascular disease, breast cancer, colorectal cancer, depression and ischaemic heart disease.<sup>81</sup> Although congestion charges and taxes on fuels have achieved considerable success,

especially in increasing revenues, these interventions have shown the limited effect on emissions and health benefits, mainly because the revenue generated by fiscal policies have not been used to promote aggressive policies to reduce the use of cars and encourage the use of public transport, walking and cycling. Marketing congestion charges and fuel taxes as health taxes and allocating these corresponding resources for activities that directly benefit health, including spending on construction and maintenance of safe and comfortable infrastructure, car-free zones, tax-reduction and subsidies for bicycles, as well as a review of taxation structure that benefit cheap transport fares could enhance the acceptability of such taxes to the general public and make them more sustainable in the long term.<sup>55</sup>

Implementing air pollution or traffic-related taxes might be a challenge, especially if lobbying and private-sector interests are dominant. Nevertheless, if the tax is specifically designed to promote health and in addition earmarked for health as a progressive redistributive mechanism, it might be acceptable. In Delhi, for example, pollution is perceived as a serious concern for public health by segments of the population, and a source of organised and growing complaints by physicians, echoed by the media, in spite of the constant and powerful vested interest of the automotive sector.<sup>82–84</sup> Annual mean levels of air pollution in Delhi often exceed 20 times WHO's guideline value of 5 µg/m<sup>3</sup> annual mean.<sup>85,86</sup> The public appeal of significant health problems could be a first step towards the introduction of health taxes targeting air pollution, a framing that is potentially more acceptable than if marketed as a congestion charge or a tax on fuel. Even for those working in the informal sector – a sector corresponding to more than 50% of the active workforce in India<sup>87</sup> – the health tax approach can be appealing since air-pollution-related diseases can have a direct and detrimental impact on the income generated by this segment of the workforce.

### 7.2.3. Air pollution from industrial activities

The pollution associated with industrial activities includes mainly emissions from oil combustion, coal burning in power plants, emissions from different

types of industries (e.g. petrochemical, metallurgic, etc.) and harbour-related activities.<sup>88</sup> Industrial activities pollute the air, soil and water. Toxic gases released into the air and combined with those from automobiles on the road are the main contributors to ambient air pollution.<sup>88</sup> Pollution from industrial activities is also a major contributor to water and soil pollution worldwide through the legal or illegal dumping of contaminated water, gases, chemicals, heavy metals and radioactive materials into oceans, rivers and landfills, damaging marine life, the productivity of crops and the environment as a whole.<sup>89</sup>

Air pollution from industrial activities is still an important environmental issue even in cities in HICs. In Europe, for example, the release of pollutants to air, water and soil by industries has decreased significantly particularly during the last decade thanks to regulations such as the Clean Air Strategies.<sup>90,91</sup> However, the industrial pollution of water, soil and air is still causing USD 75–242 billion in damages to health and the environment.<sup>92</sup>

Industries have brought rapid economic growth to cities and countries, but some of these developments have been accompanied by the generation of toxins harmful to human health and the environment. China is the largest global consumer of coal and is still commissioning new coal-fired stations to supply power to its industries.<sup>93</sup> The city of Chongqing, located in the southwest of China, is an example of a highly urbanised megacity, with rapid urbanisation and industrialisation, and high levels of air pollution from urban industries. Coal combustion in the industry is the dominant primary source of PM<sub>2.5</sub> in Chongqing.<sup>94,95</sup> The costs of damages associated with industrial-air-pollution-related activities in Chongqing are considerable, with the effect on public health alone estimated at almost USD 3.6 billion.<sup>96</sup>

India is another country that experienced rapid growth in industrial production, but without a parallel growth in regulation and law enforcement to monitor and lessen levels of air pollution. The Central Pollution Control Board (CPCB) in India has identified 17 categories of polluting industries, with 77% of them contributing to water pollution, 15% to air pollution and 8% to both water and air pollution.<sup>97</sup> An important source of pollution in

India comes from the (mostly) informal production of bricks in small-scale kilns. In a 2017 research with brick producers in Delhi, the CPCB found that 74% of them are still using the traditional and highly polluting fixed-chimney Bulls trench kiln (FCBTK), in which bricks are just lined up and fired, although the Environment Pollution Prevention and Control Authority had ordered that all kilns in the Delhi National Capital Region (NCR) should shift to the cleaner zigzag kiln before 2018.<sup>98</sup>

Environmental regulations on air pollution in China have promoted important reductions in infant mortality.<sup>99</sup> Carbon taxes are not explicitly used in China. Instead, the country adopted, since 2017, an emissions trading system with a cap on the amount of emissions and trade through auctions or free exchange. The caps of greenhouse gas emissions vary from 30 to 350 metric tons of carbon dioxide equivalent per year, and the price for carbon from USD1.40 to USD13.00 per ton of carbon dioxide (implicitly, a carbon tax).<sup>100</sup> Together with the enforcement of regulations, China seems to be making important progress to achieve the 2016 Paris Agreement.<sup>99</sup> On the other hand, India and Nepal are still struggling with ill-regulated industries. Carbon taxes are in place in India but lobbying from the coal industry has put pressure on the government to waive the tax to help finance pollution-curbing equipment. The government of India has already pushed back a deadline to cut emission levels, with over half of the coal industry already missing the 2019 deadline to cut emissions of sulphur oxides, a carcinogen toxin.<sup>101</sup> Nepal does not apply a carbon tax, and regulations are in place to try and limit emissions, although the enforcement of laws is an issue.<sup>102</sup>

#### **7.2.4. Other harmful lifestyles and activities that could form the object of health taxes**

##### ***Land use***

The level of walking and cycling and outdoor recreational activity are strongly affected by accessibility to local facilities, including green spaces.<sup>103</sup> The way land is taxed and used can facilitate or obstruct the creation of spaces

for a healthy population, and is a key determinant of social inclusion, and consequently, of health equity. Community design influences household car ownership and use of cars in households, public spaces and the availability of recreational areas and accessible infrastructure for older people and persons with disabilities.<sup>104,105</sup>

Land use has been increasingly recognised for its value in enhancing the health of populations. Activities such as walking, climbing, biking, horse riding and golf are among the activities that provide physical and mental health benefits. They also generate substantial economic activity and income. It also supports the greenspace within towns and cities where a large proportion of outdoor recreation takes place.<sup>106</sup> Planning decisions influencing land use directly can affect the amount of land used for interventions that promote health.<sup>107</sup> For example, taxation of land, especially those used for market speculation, can generate the needed resource to encourage compact developments in cities, focused on walking and cycling and public transit improvements. Land use taxation can also be an advantage for LMICs as it does not require costly administrative structures and can be administrated by modern computer-assisted mass appraisal (CAMA) systems, at the lowest level of government.<sup>39</sup>

It is also fundamental to take into consideration socio-economic and demographic differences and people's needs when planning for taxation, transport systems and land use.

The poorest groups in any given country tend to be less mobile and to have poor access to both private and public transport services, with important consequences to their population health.<sup>108,109</sup> In LMICs, the poor rely on walking or cycling over long distances and under unsafe conditions to access basic services such as health and educational facilities or to reach their workplaces. Consequently, they are more exposed to traffic-related air pollution, road injuries and deaths – 93% of the global deaths related to road traffic occur in LMICs, especially among children and young adults (5–29 years old), even though these countries have only 60% of the world's vehicles.<sup>110</sup> Public transportation systems in LMICs range from non-existent

to poor, unreliable and expensive. In middle-income countries such as Brazil, India and China, economic growth has boosted high rates of individual car use, not only as a response to the perceived lack of efficient public transport systems for mobility, especially amongst the poor and middle-class but also because of economic status and lack of climate legislation.<sup>108,111–113</sup> High levels of car use result in declining physical activity, increasing levels of air pollution, noise and traffic-related injuries and fatalities.<sup>114,115</sup>

In HICs, the poorest, usually those on short-term or zero-hour contracts, or even jobseekers from disadvantageous socio-economic backgrounds, cannot always predict or plan their travel patterns, diminishing access to their workplaces and employment opportunities. Transport-related uncertainty can make owning a car a necessity for many on lower incomes, even when affording a car is an issue in itself.<sup>116,117</sup> In population-dense urban or peri-urban areas where public transport is physically present, overcrowding, high costs and lack of accessibility for those with disabilities are common barriers cited by individuals for the use of public transport, as well as concerns over safety and security, particularly after nightfall.<sup>118,119</sup> Wheelchair users in Toronto, for example, have access to only 75% of the jobs that are accessible to individuals who are not in a wheelchair, whilst their counterparts in Montreal have access to only 46% of the jobs accessible to others.<sup>118</sup> In Scotland, those in the lowest income quintile spend around 40% of their income on commuting costs compared to about 15% and 16% of those in the fourth and fifth quintile.<sup>120</sup> In low-density areas, such as suburban and rural areas, housing developments and long distances between households make public transport costs prohibitive, with individuals relying on private motorised transport, with its consequent deleterious effects on physical activity and traffic emissions.<sup>121</sup>

Government taxation policies and plans to integrate transport and land use should be attentive to social needs when supporting mobility and population health. Policy planning should focus on compact cities that provide inclusive and safe infrastructure for all individuals, limit car parking, support the modal shift from private motor vehicles to walking, cycling and low emission public transport to workplace and work opportunities. It

has been estimated that compact cities that match transportation to their population needs can result in overall health gains of 420 to 826 disabilities-adjusted life-years (DALYs) per 100,000 population.<sup>122</sup>

As being close to their communities and aware of their needs, local governments can be more effective than other governmental jurisdictions in regulating land use. Local governments can better define restrictions to and limit parking spaces, design effective and customised transport services, take into account the needs of their own populations, including supporting the elderly, people with disabilities and those on low incomes. They can also effectively identify and tax speculation on land and exempt areas for the construction of safe walking and cycling infrastructure. In low population-density areas, local governments can encourage households to limit car ownership to one car, can promote credible rural and inter-urban public transport networks that enable intermodal links to local walking, cycling, taxi and other transport options. Local governments should be allowed to take part in multi-jurisdictional decisions on fiscal expenditure, especially to focus resources on the building of infrastructure needed for social mobility and housing.<sup>123</sup> Limiting or restricting the role of local governments in defining land use is ineffective and costly and is especially costly to the poor.<sup>124,125</sup>

### ***Farming practices***

Globally, agriculture has rapidly grown to meet the demands of a fast-growing urban population. To yield the required high levels of production, traditional farming has evolved to large-scale single-crop production that is highly mechanised and dependent on fossil fuels, pesticides, antibiotics and synthetic fertilisers, all with significant implications for human health and the environment.<sup>126–128</sup> Monocrop farming is highly dependent on the use of pesticides and fertilisers, and while crop rotation and natural manure or compost revives the soil and control pests and insects, monocropping exhausts natural nutrients and disturbs ecosystems.<sup>129</sup> Pesticides impact

the ground- and surface-water quality, affecting both urban and rural communities, while synthetic fertilisers reduce soil health and are moreover produced through intensive use of fossil fuels, making agriculture one of the main contributors to ambient air pollution.<sup>129</sup>

The use of pesticides and other chemicals, such as lead, mercury, chromium, arsenic and volatile organic compounds, also results in mortality, morbidity, disabilities and impairment to the cognitive development of individuals, especially children. Studies showed that children exposed to lead developed lifetime intellectual disabilities, with one in three children worldwide presenting elevated blood lead levels.<sup>130</sup>

The routine use of antibiotics in animals contributes to antibiotic resistance, reducing the effectiveness of the drugs for human use.<sup>131</sup> Besides, the growing number of farm animals and the associated reduction in genetic diversity have been linked with the emergence of diseases that pose a significant threat to both animal and human health.<sup>131,132</sup>

To break the vicious circle of environmental degradation and costs to human health, it is necessary to promote activities that encourage individuals to shift behaviours to healthy eating, through education and public health campaigns. From the supply side, a repurposing of public investments and subsidies for food and farming should be devised to incentivise the production of a range of healthy and sustainable foods, rather than focusing on foods such as cereals. Variation in production is an expensive undertaking but redirecting money from subsidies for sugar and other crops to promote research on and development of clean technologies, for example, concomitantly with a business model that prioritises environmental and social outcomes, can be a starting point for improved food security and sustainable farming practices. A taxation system that encourages farmers to invest in more diversified food production is also desirable.<sup>133,134</sup>

Tax structures that encourage a more diversified production and consumption of fruits and vegetables, reduce the creation of animals for meat consumption and are environmentally friendly can form a foundation

for healthier economies. The Organisation for Economic Co-operation and Development (OECD) has studied the effectiveness of a range of taxes in agriculture – from the taxation of pesticides and fertilisers to environmental taxes, such as carbon and pollution taxes and resource taxes (water pollution) and have concluded that evidence has demonstrated the limited effectiveness of these taxes in promoting sustainable agriculture.<sup>135</sup> This limited effectiveness could be related to the fact that the costs of taxation are compensated by the widespread use of subsidies and incentives. The focus on public health should be the explicit aim of fiscal policy in agriculture, and robust evidence from health taxes from other sectors, such as the levy on sugary drinks, have proved that it is possible to promote sustainable changes in production and consumption behaviours.<sup>136,137</sup>

Innovative projects in local governments can ripple and spread, benefiting not only individuals' health and well-being but also contributing to relieve other societal pressures such as food crises and poverty. Urban and peri-urban farms are relevant examples. In Havana, about 30% of the urban land is dedicated to growing food that is consumed by the local population. In other Cuban regions, up to 80% of all food produced is consumed in the corresponding city or regional perimeter.<sup>138</sup> In Sao Paulo, large municipal allotments produce organic fruits and vegetables that are supplied to the schools of the region.<sup>139</sup> Other urban farms, such as those in Dallas, Texas, produce fruit and vegetables in abandoned areas that are donated to the community.<sup>140</sup> Many other examples of city farms exist, from New York to The Hague and Shanghai, including household urban agriculture projects in Paris, Lusaka, Kampala and Yaounde.<sup>141–145</sup> City farms, either directly or indirectly, help to secure the provision of public goods: such as clean air (by reducing the need for food transportation), to re-using and decreasing the waste of water and, in some cases, using *hydroponic* technologies, permitting the growing of plants in a watery solution of mineral nutrients instead of using soil. More importantly, such projects help cut the pressure on rural lands for deforestation, protect biodiversity and wildness and reduce greenhouse gas emissions.<sup>146</sup>

### **Gambling**

Gambling is defined as betting money on an outcome of uncertain results to win money and includes activities of casinos, lotteries, as well as horse and dog races, among others. For most individuals, gambling is a form of entertainment, as many people can gamble without experiencing any harm. However, a minority of gamblers present gambling illnesses, such as drug and alcohol addiction and mental health conditions leading to crime and bankruptcy.<sup>147</sup> Gambling is a popular activity in both urban and rural areas, but it is in rural settings where its most harmful effects have been observed.<sup>148</sup> Gambling has been increasingly recognised as a public health issue, leading to substantial costs to the health system, individuals and societies. In the United States, for example, 2.6% of the population (or 10 million people) are estimated to have an addiction problem because of gambling, with the age group of 16-24 years old being the most susceptible. Gambling costs USD 6 billion annually in public services to the US economy, including costs of health, welfare, employment, housing and criminal justice services.<sup>149</sup>

The gradual liberalisation of gambling and the advent of the internet have helped the widespread expansion of the gambling industry, with exponential growth in the number of electronic gaming machines, large casinos, lotteries and online gambling sites in the last 15 years. Advertising plays a key role. In the United Kingdom, the number of gambling advertisements aired on TV has risen substantially: in 2006, approximately 152,000 advertisements were placed against 1.39 million in 2012; only in 2017, the gambling industry spent almost USD 2 billion on advertising and marketing in the country.<sup>150</sup> Laptops and desktop computers are the most commonly used devices for online gambling, being employed by 50% of online gamblers in the United Kingdom and 55% in the United States, although mobile phones are growing in use, with 39% and 29% of gamblers using them in the United Kingdom and United States, respectively.<sup>149,151</sup>

Gambling is an influential industry worldwide, with an estimated USD 565 billion global market, expected to increase at an annual rate of 5.9% through 2022.<sup>152</sup> The United States, Japan and Italy are the top three

revenue generators in the legalised gambling industry, corresponding to about 32% of the global gambling revenues generated worldwide.<sup>153</sup> Even in countries where gambling is legally restricted, such as in Brazil, the industry is estimated to generate USD 13 billion, with about 60% coming from illegal gambling, mainly from the so-called 'animal game' (*jogo do bicho*).<sup>154</sup> Gambling is also an important source of revenue for countries. In the United Kingdom alone, the betting and gaming tax receipts reached USD 3.8 billion in the fiscal year of 2018/2019.<sup>155</sup>

On the other hand, the costs attributable to gambling are also substantial. Australians are estimated to spend the most on gambling per head per year worldwide (USD 1,288 per capita), followed by residents in Singapore and Ireland, who spend, on average, USD 1,174 and USD 588, in 2017 figures.<sup>156</sup> Citizens in the United States collectively spent USD 117 billion, while in China and Japan, the losses were, respectively, USD 62 billion and USD 24 billion in 2016 prices, with 1–4% of this population left with problems of debt and bankruptcy, divorce, lost productivity, crime (such as theft and fraud) and depression or suicide.<sup>147,157</sup>

Political, religious and community groups have been advocating for tighter regulation of the gambling sector, pressuring for policies to protect the most vulnerable, including the restriction of advertisements in different media, restrictions on the use of credit and debit cards for online games and increases in the price of health insurance for gamblers.<sup>158</sup> There is also a movement to try and shift the focus on individual responsibility only and to look at the responsibility of the industry in shaping addiction by influencing policies, research and framing of public debate.<sup>159,160</sup> Stronger legislations and policies, including tax increases, are being advocated in many countries, as studies have demonstrated that costs of gambling are likely to considerably outweigh the benefits in terms of tax revenues and that the harms of gambling to society should be more systematically addressed.<sup>161–163</sup>

The gaming industry is one of the sectors that cause the most harm to individuals, and yet public sector spending to help individuals and their families affected by the direct consequences of addiction, including a growing

number of children, has been minimal.<sup>164</sup> The current revenue generated by the sector, even if entirely spent on health promotion and healthcare, would not match the costs of gambling-related to addiction. In the United States, for example, the societal costs of gambling are estimated to be about USD 129 billion,<sup>i</sup> namely 1.6 times more than the revenue of USD 79 billion generated by gambling in 2018, with the public sector paying the bulk of costs related to this harmful activity.<sup>156,157,165</sup>

A gambling-levy for health, in addition to the existing levels of taxation, and clearly earmarked for healthcare, research and education appears not only desirable but potentially necessary to tackle the health issues of gambling from a societal perspective. However, this approach alone is not enough to promote the public health interest. Existing taxation on gambling is highly regressive, and gambling tax reform should also be taken into consideration within the framework of a comprehensive response that considers all forms of gambling products in the context of relevant cultural differences.<sup>166–168</sup>

### 7.3. Challenges and opportunities with the implementation of health taxes

Revenue generated from the taxation of sources of air pollution, land use, farming practices and gambling and influenced by unhealthy behaviours and activities have provided substantial financial resources for many governments. However, the revenues generated from these activities are not earmarked for improving health as a primary outcome, even though the health benefits of pricing and taxing these harmful practices are well documented.<sup>127</sup> On the other hand, when taking into account the economic burden associated with healthcare and the loss of productivity, welfare and lives from NCDs associated with unhealthy behaviours and environmental risk factors, the unbalanced accounting of benefits and costs has left citizens

<sup>i</sup> It includes the annual USD 6 billion to the US economy, including costs of health, welfare, employment, housing and criminal justice services,<sup>151</sup> and the USD 117 billion to US citizens with losses related to gambling,<sup>158,159</sup> in 2018 prices.

to pick up the negative public health and economic costs of industrial and commercial activities. Increasing taxation and re-calibrating fiscal policies to embed health as the main objective of the production and promotion of public goods can result in healthier urban (and rural) populations, gain public support and make taxes more sustainable in the long term.

The non-exclusion and non-rival nature of public health as a public good provides a strong case for collective action at all levels of government, with the particular and growing importance of local governments in providing public goods at the point of use, paid for out of taxation that can be generated and administered at this level, as discussed in Section 7.2. The local government's provision of public goods may help to prevent the under-provision and under-consumption of public goods. Local government provision of public goods can also be more efficient due to agglomeration effects.

Good governance is also highly correlated to the success of the introduction of new taxes, with countries exhibiting high levels of trust in politicians, perceived low levels of corruption, extensive public dialogue and mechanisms for social deliberation having stronger fiscal policies and better health outcomes.<sup>169</sup> In contrast, where levels of corruption are perceived to be high or there are problems with lack of political credibility or poor quality of public debate and engagement, taxes tend to be both unpopular and unsuccessful.<sup>169</sup> Moreover, in countries, and in particular, cities with large informal sectors and weak tax systems, as is the case in many urban centres in LMICs, the implementation of health taxes may be difficult.<sup>170</sup>

### 7.3.1. Scope of a tax and cities' taxing authority

In the environmental taxation literature, it is frequently stated that the appropriate authority for levying a tax depends on the scope of the damage being addressed, with the implication being that the level of political jurisdiction defines the scope of the tax (e.g. city, state or national).<sup>171</sup> For example, for some issues like waste disposal linked to soil contamination, as the impacts are generally realised at the level of the municipality, a local

tax might be more efficiently managed. On the other hand, greenhouse emissions might involve sub-national and national jurisdictions as well as other countries, and thus this issue should normally be dealt with through a national or even international instrument.<sup>171,172</sup> In line with this assessment, we argue that in the context of health taxes, taxation at the local level could be introduced or expanded when considering the issues addressed in this chapter. In addition, local governments might have a greater role in multi-jurisdictional decisions on fiscal expenditure, as a way to maximise public health benefits and governmental collaboration at all levels.

Local governments provide many of our most basic public goods and services and also deal with externalities caused by harmful lifestyles and activities, such as air pollution, land use, gambling and farming practices. Traditionally, though, local governments have limited power to tax or borrow funds to support their activities as laws for taxation are typically defined at the level of state and federal governments.<sup>173</sup> Concerns about fiscal mismanagement and the multiplication of the administrative costs of taxation are justifications for this highly verticalised system in most countries. In many countries, however, a vertical system promotes imbalances at the subnational level in terms of the lack of subsidiarity in legal and regulatory responsibilities and the uneven availability of the fiscal resources required, making it difficult for local governments to act on some of their most challenging public health issues.<sup>170</sup>

Allowing local governments to participate in the definition of the scope of health taxes, regulatory policies for health and public health interventions, and even the creation and application of taxes at local levels, can create the opportunity for matching local needs with local institutional frameworks and revenue generation. The suggestion here is not to make local governments independent of state or federal laws and policies, but for them to be given *presumptive taxing authority* subject to state/federal government pre-emption. Such an approach would open the door to more local revenue innovation, improve the efficiency of revenue collection and spending, capitalise on local and regional economies of scale while ensuring that the state and the federal government can maintain their policies and interests.<sup>173</sup>

Presumptive taxing authority is particularly important for cities in LMICs that frequently suffer from the lack of infrastructure and technical capacity, with predominantly informal-sector economies. Local governments should be able to generate tax and non-tax revenues in the form of user charges and fees that promote urban health.

Thus, once the source of health harms has been identified and it has been established that altering market prices through taxation can change consumption behaviours and generate beneficial health outcomes, the scope of the health tax, using a mix of direct taxes (e.g. congestion charges) and indirect taxes (e.g. excise taxes), can be defined. In this sense, local governments have the opportunity to broaden the scope of areas traditionally considered for taxation by policymakers, but not understood as health-enhancing, as for example 'taxation for better cities'.<sup>127</sup> However, it is important to ensure that such health taxes are progressive, redistributive and benefit health and equity.

### **7.3.2. Promoting political acceptability and community trust**

Political and public acceptability are important dimensions for the adoption and implementation of a health tax. We have previously discussed that greater public distrust of politicians and perceived corruption would undermine government performance across a variety of policy domains, including taxation. However, the sensitivity of revenue policies to levels of corruption and distrust vary according to whether the mooted policy is based on market-based or non-market-based instruments. Non-market-based instruments involve non-monetary incentives to change behaviour. Market-based instruments are indirect regulatory instruments, which influence individuals' behaviour by changing their economic incentives.<sup>174</sup> While non-market-based climate policies, for example, are weakened by perceptions of institutional corruption; market-based policies are notably more sensitive than non-market ones to the influence of sizeable domestic energy-intensive and trade-exposed industries.<sup>169</sup>

The distribution of costs and benefits of a fiscal policy is also likely to influence public and political support to a tax. Other things being equal, a tax policy is expected to be more successful if its costs are diffused but its benefits are concentrated. For instance, the reduction of air pollution is costly to industry because it must pay for the installation of equipment to combat pollution and these costs are difficult to pass on to consumers. However, the benefits are diffused in both space and time, giving the industry strong incentives to lobby in opposition to such a tax. On the other hand, if the public has a strong perception of the positive impacts of environmental improvements, then the industry may bear these costs in order to gain public support.<sup>169,171</sup>

Policy-framing strategies can have important implications for the public acceptability of a health tax. A systematic literature review on the political and public acceptability of a sugar-sweetened beverages (SSBs) tax showed that the degree of public acceptability of an SSB tax in the United States, Australia, the United Kingdom and France tended to depend on the wording of the question. Public support for an SSBs tax was highest (66%) if the revenue was labelled as intended for health initiatives.<sup>175</sup> In Switzerland and in Alberta, Canada, re-labelling a carbon tax as a 'CO<sub>2</sub> levy' helped to overcome public distrust.<sup>69,176</sup>

## 7.4. Conclusion

Local governments play a key role in tackling issues of climate change, NCDs, poverty and even epidemics. Local governments provide the conditions to leverage local solutions for local problems. Building cities that are inclusive, healthy, resilient and sustainable requires intensive policy coordination at the local level. Health taxes are a cost-effective opportunity to support public health and gain public support. Local governments also offer the opportunity to derive public revenues from sources other than the traditional tobacco, alcohol and beverage taxes, by taxing harmful lifestyles and activities to promote social well-being. In this chapter we offered an

overview of some of the pressing health issues that can be addressed by public-health interventions supported by health taxes, including those at the local government level, and through the re-calibration of fiscal policies that embed health as its main objective. Globally, when we think about taxes, direct or indirect, health can be a powerful means for transforming the way public health is promoted through fiscal policies.

---



---

### Key messages

---

- Considerable health gains can be achieved when the negative health effects of products and behaviours are eliminated or reduced.
  - Taxation should be expanded to harmful lifestyles and activities affecting individuals' health and well-being as a matter of public health policy.
  - Local governments can be better placed in identifying and dealing with the health of the people in their jurisdictions, and in producing efficient local public services, based on local preferences, if the necessary human and financial resources are in place.
- 
- 

### References

1. Afshin A, et al. Health effects of dietary risks in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet*. 2019; 393(10184): 1958–1972.
2. Bollyky TJ, Templin T, Andridge C, Dieleman JL. Understanding the relationships between noncommunicable diseases, unhealthy lifestyles, and country wealth. *Health Affairs*. 2015; 34(9): 1464–1471.
3. Naghavi M, et al. Global, regional, and national age-sex specific mortality for 264 causes of death, 1980–2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet*. 2017; 390(10100): 1151–1210.
4. Bloom DE, et al. The Global Economic Burden of Noncommunicable Diseases. Working Paper Number 87, Program on the Global Demography of Aging. World Economic Forum and Harvard School of Public Health; 2012. Available at: [https://cdn1.sph.harvard.edu/wp-content/uploads/sites/1288/2013/10/PGDA\\_WP\\_87.pdf](https://cdn1.sph.harvard.edu/wp-content/uploads/sites/1288/2013/10/PGDA_WP_87.pdf) (accessed 23 December 2021).

5. World Health Organization. Global status report on noncommunicable diseases 2014. Geneva, Switzerland: WHO; 2014. Available from: [https://apps.who.int/iris/bitstream/handle/10665/148114/9789241564854\\_eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/148114/9789241564854_eng.pdf).
6. Chaloupka FJ, Powell LM, Warner KE. The use of excise taxes to reduce tobacco, alcohol, and sugary beverage consumption. *Annual Review of Public Health*. 2019; 40(1): 187–201.
7. Public Health England. Health and wellbeing in rural areas. Public Health England. Available: [http://www.local.gov.uk/sites/default/files/documents/1.39\\_Health%20in%20rural%20areas\\_WEB.pdf](http://www.local.gov.uk/sites/default/files/documents/1.39_Health%20in%20rural%20areas_WEB.pdf) (accessed 1 December 2020).
8. The Lancet Diabetes & Endocrinology. Urbanisation, inequality, and non-communicable disease risk. *The Lancet Diabetes & Endocrinology*. 2017; 5(5): 313.
9. Oyeboode O, Pape UJ, Lavery AA, Lee JT, Bhan N, Millett C. Rural, urban and migrant differences in non-communicable disease risk-factors in middle income countries: a cross-sectional study of WHO-SAGE data. *PLoS One*. 2015; 10(4): e0122747.
10. United Nations. 68% of the world population projected to live in urban areas by 2050, says UN. *United Nations: Department of Economics and Social Affairs, New York*, May 2018. Available at: <https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html> (accessed 17 July 2020).
11. Frumkin H, Haines A. Global environmental change and noncommunicable disease risks. *Annual Review of Public Health*. 2019; 40(1): 261–282.
12. Bixby H, et al. Rising rural body-mass index is the main driver of the global obesity epidemic in adults. *Nature*. 2019; 569(7755): 260–264.
13. Wright A, Smith KE, Hellowell M. Policy lessons from health taxes: a systematic review of empirical studies. *BMC Public Health*. 2017; 17(1): 583.
14. United Nations. Transforming our World: The 2030 Agenda for Sustainable Development. United Nations, 2015. Available at: <https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf> (accessed 23 December 2020).
15. Hagenaars LL, Jeurissen PPT, Klazinga NS. The taxation of unhealthy energy-dense foods (EDFs) and sugar-sweetened beverages (SSBs): an overview of patterns observed in the policy content and policy context of 13 case studies. *Health Policy*. 2017; 121(8): 887–894.
16. Beech J, Cooper E, Holmes J, McKenna H. What role do taxes and regulation play in promoting better health? The Kings Fund, Mar. 2020. Available at: <https://www.kingsfund.org.uk/publications/taxes-regulation-better-health> (accessed 30 November 2020).
17. Cheng KJG, Estrada MAG. Price elasticity of cigarette smoking demand in the Philippines after the 2012 Sin Tax Reform Act. *Preventive Medicine*. 2020; 134: 106042.
18. Lencucha R, Drope J, Chavez JJ. Whole-of-government approaches to NCDs: the case of the Philippines Interagency Committee—tobacco: Table 1. *Health Policy Plan*. 2015; 30(7): 844–852.
19. Wen L, Kenworthy J, Guo X, Marinova D. Solving traffic congestion through Street Renaissance: a perspective from dense Asian cities. *Urban Science*. 2019; 3(1): 18.

20. Millard-Ball A, Schipper L. Are we reaching peak travel? Trends in passenger transport in eight industrialized countries. *Transport Reviews*. 2011; 31(3): 357–378.
21. Metz D. Demographic determinants of daily travel demand. *Transport Policy*. 2012; 21: 20–25.
22. Skaal L, Sinclair H, Stein DJ, Myers B. Problem gambling among urban and rural gamblers in Limpopo Province, South Africa: associations with hazardous and harmful alcohol use and psychological distress. *Journal of Gambling Studies*. 2016; 32(1): 217–230.
23. Rural Services Network. [Not] everyone is a winner: gambling participation and problem gambling in rural communities. United Kingdom, Jan. 18, 2021. Available at: <https://www.rsnonline.org.uk/not-everyone-is-a-winner-gambling-participation-and-problem-gambling-in-rural-communities> (accessed 23 January 2021).
24. Whaples R. Do economists agree on anything? Yes! *The Economists' Voice*. 2006; 3(9): 1–6.
25. Quack E. Taxation and Accountability: How to Improve the State-Citizen Social Contract Through Taxation. K4D Helpdesk Report No 663. Brighton, UK: Institute of Development Studies; 2019. Available at: <https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/14752> (accessed 28 December 2020).
26. Waddington H, Sonnenfeld A, Finetti J, Gaarder M, John D, Stevenson J. Citizen engagement in public services in low- and middle-income countries: a mixed-methods systematic review of participation, inclusion, transparency and accountability (PITA) initiatives. *Campbell Systematic Reviews*. 2019; 15(1–2): 1–90.
27. Mankiw NG. Smart taxes: an open invitation to join the Pigou club. *Eastern Economical Journal*. 2009; 35(1): 14–23.
28. Parkin M, Powell M, Matthews KGP. Chapter 5: Efficiency and Equity. *Economics. Eight edition*. Essex, UK. Person Education Limited, 2012; 114–115.
29. Parkin M, Powell M, Matthews KGP. *Economics. Chapter 15: Public Choices and Public Goods*. 2014; 344–359.
30. Dees RH. Public health and normative public goods. *Public Health Ethics*. 2018; 11(1): 20–26.
31. Horne LC. Public health, public goods, and market failure. *Public Health Ethics*. 2019; 12(3): 287–292.
32. European Union. The principle of subsidiarity – fact sheets on the European Union. *European Union*. 2021. Available at: <https://www.europarl.europa.eu/factsheets/en/sheet/7/the-principle-of-subsidiarity> (accessed 1 October 2021).
33. Tiebout CM. A pure theory of local expenditures. *Journal of Political Economy*. 1956; 64(5): 416–424.
34. Krugman PR. *Development, Geography, and Economic Theory*. Cambridge, MA: MIT Press; 1995.
35. Glaeser EL. Are cities dying? *Journal of Economic Perspectives*. 1998; 12(2): 139–160.
36. Schleicher D. The city as a law and economic subject. George Mason Law & Economics Research Paper No. 09-47, *University of Illinois Law Review*. 2009; 2010(5): 1507–1564. Available at: [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1471555](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1471555) (accessed 14 January 2020).

37. Johnson P, et al. Securing the future: funding health and social care to the 2030s – summary. May 2018. Available at: <https://www.ifs.org.uk/uploads/publications/comms/R143%20executive%20summary.pdf> (accessed 20 April 2020).
38. Moretti E. Cities and growth. The International Growth Centre (IGC) directed by the London School of Economics and The University of Oxford, 11 April 2014. Available at: <https://assets.publishing.service.gov.uk/media/57a089d140f0b649740002a0/IGC-EvidencePaperCities.pdf> (accessed 14 July 2020).
39. Kalkuhl M, Fernandez Milan B, Schwerhoff G, Jakob M, Hahnen M, Creutzig F. Can land taxes foster sustainable development? An assessment of fiscal, distributional and implementation issues. *Land Use Policy*. 2018; 78: 338–352.
40. European Automobile Manufacturers Association (ACEA). €428 billion in taxes generated by motor vehicles in EU-15, new figures show. Press Release. 24 April 2019. Available at: <https://www.acea.be/press-releases/article/428-billion-in-taxes-generated-by-motor-vehicles-in-eu-15-new-figures-show> (accessed 19 December 2020).
41. Wang L, et al. Air quality strategies on public health and health equity in Europe — a systematic review. *IJERPH*. 2016; 13(12): 1196.
42. Shaw C, Hales S, Edwards R, Howden-Chapman P. Health co-benefits of policies to mitigate climate change in the transport sector: systematic review. *Journal of Transport & Health*. 2017; 5: S107–S108.
43. Burns J, et al. Interventions to reduce ambient air pollution and their effects on health: An abridged Cochrane systematic review. *Environment International*. 2020; 135: 105400.
44. Yang T, Liu W. Health effects of energy intensive sectors and the potential health co-benefits of a low carbon industrial transition in China. *IJERPH*. 2019; 16(17): 3022.
45. Transport for London. Mayor's Transport Strategy. Mayor of London, March 2018. Available at: <https://www.london.gov.uk/sites/default/files/mayors-transport-strategy-2018.pdf> (accessed 17 April 2020).
46. Transport for London. Annual Report and Statement of Accounts. Mayor of London, 25 July 2018. Available at: <http://content.tfl.gov.uk/tfl-annual-report-and-statement-of-accounts-2017-18.pdf> (accessed 17 April 2020).
47. BBC London. Congestion charge – where has the money gone? 1 July 2008. Available at: [http://www.bbc.co.uk/london/content/articles/2006/11/21/congestion\\_update\\_feature.shtml](http://www.bbc.co.uk/london/content/articles/2006/11/21/congestion_update_feature.shtml) (accessed 16 April 2020).
48. Scarborough H. Intergenerational equity and the social discount rate: intergenerational equity and social discount rate. *Australian Journal of Agricultural and Resource Economics*. 2011; 55(2): 145–158.
49. Transport for London. Changes to the LEZ. Transport for London, Mayor of London, 2019. Available at: <https://tfl.gov.uk/modes/driving/low-emission-zone/changes-to-the-lez?intcmp=52426> (accessed 14 December 2020).
50. Mudway IS, et al. Impact of London's low emission zone on air quality and children's respiratory health: a sequential annual cross-sectional study. *The Lancet Public Health*. 2019; 4(1): e28–e40.
51. Gehrsitz M. The effect of low emission zones on air pollution and infant health. *Journal of Environmental Economics and Management*. 2017; 83: 121–144.

52. Transport For London. Ultra low emission zone. Transport for London, Mayor of London; 2020. Available at: <https://tfl.gov.uk/modes/driving/ultra-low-emission-zone> (accessed 13 November 2020).
53. Mayor of London. World's first ultra low emission zone to save NHS billions by 2050. Mayor of London, 26 February 2020. Available at: <https://www.london.gov.uk/press-releases/mayoral/ulez-to-save-billions-for-nhs#:~:text=The%20ULEZ%20has%20already%20led,per%20cent%20in%20the%20zone.&text=almost%20300%2C000%20Londoners%20saved%20from,disease%2C%20lung%20cancer%20and%20dementia> (accessed 13 November 2020).
54. Tanzi V, Zee HH. *Tax Policy for Developing Countries*. Washington, DC: IMF; 2001.
55. World Health Organization (WHO). Ambient (outdoor) air pollution. WHO: Website, Geneva, Switzerland, 2 May 2018. Available at: [https://www.who.int/news-room/fact-sheets/detail/ambient-\(outdoor\)-air-quality-and-health](https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health) (accessed 3 June 2019).
56. World Health Organization (WHO). Household air pollution and health. *Newsroom, Fact sheets*, 8 May 2018. Available at: <https://www.who.int/news-room/fact-sheets/detail/household-air-pollution-and-health> (accessed 30 May 2020).
57. Comunian S, Dongo D, Milani C, Palestini P. Air pollution and COVID-19: the role of particulate matter in the spread and increase of COVID-19's morbidity and mortality. *IJERPH*. 2020; 17(12): 4487.
58. Copat C, et al. The role of air pollution (PM and NO<sub>2</sub>) in COVID-19 spread and lethality: a systematic review. *Environmental Research*. 2020; 191: 110129.
59. Wu X, Nethery RC, Sabath BM, Braun D, Dominici F. Exposure to air pollution and COVID-19 mortality in the United States: a nationwide cross-sectional study, preprint, April 2020. Available at: <http://medrxiv.org/lookup/doi/10.1101/2020.04.05.20054502> (accessed 26 August 2020).
60. Hutter H-P, et al. Air pollution is associated with COVID-19 incidence and mortality in Vienna, Austria. *IJERPH*. 2020; 17(24): 9275.
61. Pope CA, Cropper M, Coggins J, Cohen A. Health benefits of air pollution abatement policy: role of the shape of the concentration-response function. *Journal of the Air & Waste Management Association*. 2015; 65(5): 516-522.
62. Zimmer A, Koch N. Fuel consumption dynamics in Europe: tax reform implications for air pollution and carbon emissions. *Transportation Research Part A: Policy and Practice*. 2017; 106: 22-50.
63. Harman O, Berland O. The gateway to carbon pricing? Air pollution policy. *World Economic Forum, Environment and Natural Resource Security*, Davos 2020, 14 January 2020. Available at: <https://www.weforum.org/agenda/2020/01/a-gateway-tax-for-heating-mitigate-climate-change/> (accessed 3 July 2020).
64. Funke F, Mattauch L. Why is carbon pricing in some countries more successful than in others? *Our World in Data, University of Oxford*, 10 August 2018. Available at: <https://ourworldindata.org/carbon-pricing-popular> (accessed 3 July 2020).
65. The World Bank. What's carbon pricing? Carbon Pricing Dashboard. The World Bank, Washington, DC, 2019. Available at: <https://carbonpricingdashboard.worldbank.org/what-carbon-pricing> (accessed 13 November 2020).

66. Climate and Clean Air Coalition. Short-Lived Climate Pollutants (SLCPs). UN Environment Programme, 2017. Available at: <https://www.ccacoalition.org/en/content/short-lived-climate-pollutants-slcps> (accessed 3 September 2020).
67. Rosenbloom D, Markard J, Geels FW, Fuenfschilling L. Opinion: why carbon pricing is not sufficient to mitigate climate change—and how “sustainability transition policy” can help. *Proceedings of the National Academy of Sciences of the United States America*. 2020; 117(16): 8664–8668.
68. Olson M. *The Logic of Collective Action: Public Goods and the Theory of Groups*, 21. printing. Cambridge, MA: Harvard University Press; 2003.
69. Klenert D, et al. Making carbon pricing work for citizens. *Nature Climate Change*. 2018; 8(8): 669–677.
70. Millock K, Nauges C. Ex post evaluation of an earmarked tax on air pollution. *Land Economics*. 2006; 82(1): 68–84.
71. Smith KR, Sagar A. Fossil fuel subsidies and health. *The Lancet Global Health*. 2015; 3(11): e674.
72. Coady D, Parry I, Sears L, Shang B. How large are global fossil fuel subsidies? *World Development*. 2017; 91: 11–27.
73. Coady D. *Global Fossil Fuel Subsidies Remain Large: An Update Based on Country-Level Estimates*. International Monetary Fund; 2019. Available at: <https://elibrary.imf.org/view/IMF001/25712-9781484393178/25712-9781484393178/25712-9781484393178.xml> (accessed 21 October 2021).
74. Inchauste G, Victor DG, (eds). *The Political Economy of Energy Subsidy Reform*. Washington, DC: World Bank Group; 2017.
75. World Bank. *United Mexican States Reducing Fuel Subsidies : Public Policy Options*. Washington, DC: World Bank; 2013. Available at: <https://openknowledge.worldbank.org/handle/10986/21755> (accessed 19 October 2021).
76. Zuurbier M, et al. Commuters' exposure to particulate matter air pollution is affected by mode of transport, fuel type, and route. *Environmental Health Perspectives*. 2010; 118(6): 783–789.
77. Sahlqvist S, Song Y, Ogilvie D. Is active travel associated with greater physical activity? The contribution of commuting and non-commuting active travel to total physical activity in adults. *Preventive Medicine*. 2012; 55(3): 206–211.
78. Jiang B, et al. Transport and public health in China: the road to a healthy future. *The Lancet*. 2017; 390(10104): 1781–1791.
79. Health Effects Institute. *Traffic-Related Air Pollution: A Critical Review of the Literature on Emissions, Exposure, and Health Effects*. HEI Special Report 17, Boston: Health Effects Institute. Available at: <https://www.healtheffects.org/publication/traffic-related-air-pollution-critical-review-literature-emissions-exposure-and-health>. (accessed 14 May 2020).
80. World Health Organization (WHO). Air pollution and climate change. *Data and Statistics*. Available at: <https://www.euro.who.int/en/health-topics/environment-and-health/Transport-and-health/data-and-statistics/air-pollution-and-climate-change2> (accessed 3 March 2020).

81. Jarrett J, et al. Effect of increasing active travel in urban England and Wales on costs to the National Health Service. *The Lancet*. 2012; 379(9832): 2198–2205.
82. Irfan U. How Delhi became the most polluted city on Earth. Vox. 25 November 2017. Available at: <https://www.vox.com/energy-and-environment/2017/11/22/16666808/india-air-pollution-new-delhi> (accessed 14 November 2020).
83. Irfan U. Why India's air pollution is so horrendous. Vox. 31 October 2018. Available at: <https://www.vox.com/2018/5/8/17316978/india-pollution-levels-air-delhi-health> (accessed 30 March 2020).
84. Bernard S, Kazmin A. Dirty air: how India became the most polluted country on earth. The Financial Times. 11 December 2018. Available at: <https://ig.ft.com/india-pollution/> (accessed 30 March 2020).
85. World Health Organization. *WHO Global Air Quality Guidelines: Particulate Matter (PM<sub>2.5</sub> and PM<sub>10</sub>), Ozone, Nitrogen Dioxide, Sulfur Dioxide and Carbon Monoxide*. Geneva: World Health Organization; 2021. Available at: <https://apps.who.int/iris/handle/10665/345329> (accessed 21 October 2021).
86. IQAir. 2019 World's Air Quality Report, 2019. Available at: <https://www.iqair.com/world-most-polluted-cities?continent=&country=&state=&page=1&perPage=50&cities=> (accessed 24 August 2020).
87. India Wage Report. Wage policies for decent work, and inclusive growth, 'India Wage Report: Wage policies for decent work and inclusive growth'. 2018. Available at: [https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---sro-new-delhi/documents/publication/wcms\\_638305.pdf](https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---sro-new-delhi/documents/publication/wcms_638305.pdf) (accessed 22 June 2020).
88. Karagulian F, et al. Contributions to cities' ambient particulate matter (PM): a systematic review of local source contributions at global level. *Atmospheric Environment*. 2015; 120: 475–483.
89. Field.org.uk. How Can Factories Affect The Environment? 2018. Available at: <http://www.field.org.uk/how-can-factories-affect-the-environment/> (accessed 14 June 2020).
90. Holland M. Cost-benefit Analysis of Scenarios for Cost-Effective Emission Controls after 2020 – Version 1.02 Corresponding to IIASA TSAP Report #7. EMRC, November 2012. Available at: [https://ec.europa.eu/environment/air/pdf/TSAP\\_CBA\\_corresponding\\_to\\_IIASA7\\_v1-02%5B1%5D.pdf](https://ec.europa.eu/environment/air/pdf/TSAP_CBA_corresponding_to_IIASA7_v1-02%5B1%5D.pdf) (accessed 22 February 2019).
91. Holland M. Cost-benefit Analysis of Final Policy Scenarios for the EU Clean Air Package – Version 2 Corresponding to IIASA TSAP Report 11, Version 2a. EMRC, October 2014. Available at: <https://ec.europa.eu/environment/air/pdf/TSAP%20CBA.pdf> (accessed 22 February 2019).
92. European Environmental Agency. Costs of air pollution from European industrial facilities 2008–2012 – an updated assessment. European Environmental Agency (EEA) Technical Report, No 20/2014, 2014. Available at: <https://www.eea.europa.eu/publications/costs-of-air-pollution-2008-2012> (accessed 20 June 2020).
93. Chang S, Zhuo J, Meng S, Qin S, Yao Q. Clean coal technologies in China: current status and future perspectives. *Engineering*. 2016; 2(4): 447–459.

94. Chen Y, Xie S, Luo B, Zhai C. Particulate pollution in urban Chongqing of southwest China: historical trends of variation, chemical characteristics and source apportionment. *Science of The Total Environment*. 2017; 584–585: 523–534.
95. Power AL, et al. Monitoring impacts of urbanisation and industrialisation on air quality in the anthropocene using urban pond sediments. *Frontiers in Earth Science*. 2018; 6: 131.
96. Li L, Lei Y, Pan D, Yu C, Si C. Economic evaluation of the air pollution effect on public health in China's 74 cities. *SpringerPlus*. 2016; 5(1): 402.
97. Central Pollution Control Board. Polluting Industries. Central Pollution Control Board, 9 June 2012. Available at: [http://cpcbenvi.nic.in/cpcb\\_newsletter/Polluting%20Industries.pdf](http://cpcbenvi.nic.in/cpcb_newsletter/Polluting%20Industries.pdf) (accessed 15 January 2020).
98. Shrivastava S. 74% brick kilns in Delhi-NCR have not shifted to cleaner technology. *DownToEarth*; 2018. <https://www.downtoearth.org.in/news/environment/74-brick-kilns-in-delhi-ncr-have-not-shifted-to-cleaner-technology-61624>. (accessed 14 November 2020).
99. Tanaka S. Environmental regulations on air pollution in China and their impact on infant mortality. *Journal of Health Economics*. 2015; 42: 90–103.
100. Parenteau P, Cao M. Carbon trading in China: progress and challenges. *Environmental Law Reporter*. 2016; 46(3): 10194–10199.
101. Varadhan S. Over half of India's coal-fired power plants set to miss emission norm deadline. Reuters, 2019. Available at: <https://uk.reuters.com/article/uk-india-pollution-coal-exclusive/exclusive-over-half-of-indias-coal-fired-power-plants-set-to-miss-emission-norm-deadline-idUKKBN1XP1O2> (accessed 20 December 2019).
102. Climate Action Tracker. Climate action tracker. Country summary: Nepal, 2020. <https://climateactiontracker.org/countries/nepal/> (accessed 22 February 2021).
103. Barton H. Land use planning and health and well-being. *Land Use Policy*. 2009; 26: S115–S123.
104. Ma L, Kent J, Mulley C. Transport disadvantage, social exclusion, and subjective well-being: the role of the neighborhood environment—evidence from Sydney, Australia. *The Journal of Transport and Land Use*. 2018; 11(1): 31–47.
105. Mitra SK. Land Use, Land Value, and Transportation: Essays on Accessibility, Carless Households, and Long-distance Travel. PhD dissertation. University of California, Irvine.
106. Manchester Metropolitan University. Reconomics Plus: The Economic, Health and Social Value of Outdoor Recreation. Manchester Metropolitan University, February 2017. Available at: <https://sramedia.s3.amazonaws.com/media/documents/699fec08-3f90-4e00-ac4a-c074b353a38d.pdf> (accessed 10 September 2021).
107. Litman T. Evaluating Transportation Land Use Impacts: Considering the Impacts, Benefits and Costs of Different Land Use Development Patterns. Victoria Transport Policy Institute, 1 September 2021. Available at: <https://www.vtpi.org/landuse.pdf> (accessed 10 September 2021).

108. Lucas K, Mattioli G, Verlinghieri E, Guzman A. Transport poverty and its adverse social consequences. *Proceedings of the Institution of Civil Engineers – Transport*. 2016; 169(6): 353–365.
109. Titheridge H, Christie N, Mackett R, Oviedo Hernández D, Ye R. Transport and poverty: a review of the evidence. University College London, 2014. Available at: <https://discovery.ucl.ac.uk/id/eprint/1470392/1/transport-poverty%5B1%5D.pdf> (accessed 30 December 2020).
110. World Health Organization. Road traffic injuries. World Health Organization, 2020. Available at: <https://www.who.int/news-room/fact-sheets/detail/road-traffic-injuries> (accessed 30 December 2020).
111. Ecola L, Rohr C, Zmud J, Kuhnimhof T, Phleps P. *The Future of Driving in Developing Countries*. Santa Monica, CA: RAND Corporation; 2014.
112. Wu T, Zhao H, Ou X. Vehicle ownership analysis based on GDP per capita in China: 1963–2050. *Sustainability*. 2014; 6(8): 4877–4899.
113. Kuhnimhof T, Rohr C, Ecola L, Zmud J. Automobility in Brazil, Russia, India, and China: Quo Vadis? *Transportation Research Record*. 2014; 2451(1): 10–19.
114. Gomez LF, et al. Urban environment interventions linked to the promotion of physical activity: a mixed methods study applied to the urban context of Latin America. *Social Science & Medicine*. 2015; 131: 18–30.
115. Kopits E, Cropper M. Traffic fatalities and economic growth. *Accident Analysis & Prevention*. 2005; 37(1): 169–178.
116. DEMAND. Precarity in housing and employment: a hidden dimension of car dependency. Research Insight 14. DEMAND, 2015. Available at: <http://www.demand.ac.uk/wp-content/uploads/2015/11/demand-insight-14final.pdf> (accessed 9 January 2021).
117. Davis A, Hirsch D, Smith N, Beckhelling J, Padley M. A minimum income standard for the UK in 2012, keeping up in hard times. Joseph Rowntree Foundation, 2012. Available at: <https://www.jrf.org.uk/report/minimum-income-standard-uk-2012> (accessed 13 January 2021).
118. Grisé E, Boisjoly G, Maguire M, El-Geneidy A. Elevating access: comparing accessibility to jobs by public transport for individuals with and without a physical disability. *Transportation Research Part A: Policy and Practice*. 2019; 125: 280–293.
119. Transport For London. Understanding the travel needs of London's diverse communities – BAME. Transport for London, Mayor of London, 2012. Available at: <http://content.tfl.gov.uk/BAME.pdf> (accessed 13 January 2021).
120. Cain A, Jones PM. Does urban road pricing cause hardship to low-income car drivers?: an affordability-based approach. *Transportation Research Record*. 2008; 2067(1): 47–55.
121. Ellinas T. *Healthy Transport = Healthy Lives*. London, UK. British Medical Association, 2012. Available at: <https://thepep.unece.org/sites/default/files/2017-06/Healthy%20transport%20healthy%20lives%20British%20Medical%20Association.pdf> (accessed 3 April 2019).

122. Stevenson M, et al. Land use, transport, and population health: estimating the health benefits of compact cities. *The Lancet*. 2016; 388(10062): 2925–2935.
123. Lucas K, Stokes G, Bastiaanssen J, Burkinshaw J. Inequalities in mobility and access in the UK transport system. UK Government Office for Science, 2019. Available at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/784685/future\\_of\\_mobility\\_access.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/784685/future_of_mobility_access.pdf) (accessed 19 February 2021).
124. Cheshire P, Hilber CAL, Koster HRA. Empty homes, longer commutes: the unintended consequences of more restrictive local planning. *Journal of Public Economics*. 2018; 158: 126–151.
125. OECD. The Governance of Land Use in OECD Countries: Policy Analysis and Recommendations, OECD Regional Development Studies, OECD Publishing, Paris. Available at: <https://doi.org/10.1787/9789264268609-en> (accessed 27 February 2021).
126. Alexandratos N. *World agriculture: towards 2010. An FAO study*. Chichester, UK, John Wiley and Rome, FAO, 1995.
127. Pimpin L, Sassi F, Corbould E, Friebe R, Webber L. Fiscal and pricing policies to improve public health: a review of the evidence. *Public Health England*, 2018. Available at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/743118/Fiscal\\_and\\_Pricing\\_Policies\\_report\\_FINAL.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/743118/Fiscal_and_Pricing_Policies_report_FINAL.pdf) (accessed 25 June 2020).
128. Sugar tax and farming policy. *Perspectives in Public Health*. 2018; 138(4): 194–195.
129. Health Care Without Harm. Community health risks of industrial agriculture. *Delivering Community Benefit: Healthy food playbook*, 2018. <https://foodcommunitybenefit.noharm.org/resources/community-health-needs-assessment/community-health-risks-industrial-agriculture> (accessed 28 June 2020).
130. Rees N, Fuller R. The Toxic Truth: Children's Exposure to Lead Pollution Undermines a Generation of Future Potential. UNICEF and Pure Earth, 2020. Available at: <https://www.unicef.org/media/73246/file/The-toxic-truth-children%E2%80%99s-exposure-to-lead-pollution-2020.pdf> (accessed 24 October 2021).
131. Tomley FM, Shirley MW. Livestock infectious diseases and zoonoses. *Philosophical Transactions of the Royal Society London B, Biological Sciences*. 2009; 364(1530): 2637–2642.
132. Centers for Disease Control and Prevention (CDC). Zoonotic Diseases. U.S. Department of Health & Human Services, United States, 2021. Available at: <http://www.cdc.gov/onehealth/basics/zoonotic-diseases.html> (accessed 3 May 2022).
133. Shepon A, Henriksson PJG, Wu T. Conceptualizing a sustainable food system in an automated world: toward a “Eudaimonian” future. *Frontiers in Nutrition*. 2018; 5: 104.
134. Turner MM, Whitehead I, Millard N, Turner MM, Whitehead I, Millard N. The effects of public funding on farmers' attitudes to farm diversification. Report. Exeter, UK. University of Exeter, 2006. doi: 10.22004/AG.ECON.31746. Available at: <https://ageconsearch.umn.edu/record/31746?ln=en> (accessed 27 August 2020).
135. OECD. Taxation in Agriculture. Paris, France., OECD Publishing, 2020. Available at: <https://doi.org/10.1787/073bdf99-en> (accessed 14 November 2020).

136. Taillie LS, Rivera JA, Popkin BM, Batis C. Do high vs. low purchasers respond differently to a nonessential energy-dense food tax? Two-year evaluation of Mexico's 8% nonessential food tax. *Preventive Medicine*. 2017; 105: S37–S42.
137. Seferidi P, et al. Implications of Brexit on the effectiveness of the UK soft drinks industry levy upon CHD in England: a modelling study. *Public Health Nutrition*. 2018; 21(18): 3431–3439.
138. de la Cal P. Urban agriculture – towards a continuous productive-space system in the city. In C. Díez Medina and J. Monclús (eds) *Urban Visions*. Cham: Springer International Publishing, 2018, pp. 329–338. doi: 10.1007/978-3-319-59047-9\_32.
139. Lorencato A, Yassuda S. Regiões da capital se destacam por produção de vegetais orgânicos. *Veja* Sao Paulo. 2 March 2018. Available at: <https://vejasp.abril.com.br/cidades/parelheiros-produtores-rurais-organicos-escolas-municipais/> (accessed 21 August 2020).
140. The State Fair of Texas. Big Tex Urban Farms. Available at: <https://bigtex.com/supporting-texans/big-tex-urban-farms/> (accessed 27 April 2020).
141. Peach J. The impact of urban farming in New York City. SmartCitiesDive. Available at: <https://www.smartcitiesdive.com/ex/sustainablecitiescollective/impact-urban-farming-new-york-city/81916/> (accessed 3 May 2020).
142. Rabbani A. Urban farmers – a green thumb for the city of Den Haag, Holland. Vanguard Voyager. Available at: <https://www.vanguardvoyager.com/2018/05/26/urban-farmers-den-haag-holland/> (accessed 3 May 2020).
143. Global Site Plans. Urban farming growing in Shanghai, China. SmartCitiesDive. Available at: <https://www.smartcitiesdive.com/ex/sustainablecitiescollective/urban-farming-growing-shanghai-china/126531/> (accessed 3 May 2020).
144. Beach M. Urban agriculture increases food security for poor people in Africa. PRB. 4 April 2013. Available at: <https://www.prb.org/urban-agriculture-poor-africa/> (accessed 3 May 2020).
145. The Guardian. World's largest urban farm to open – on a Paris rooftop. The Guardian. 13 August 2019. Available at: <https://www.theguardian.com/cities/2019/aug/13/worlds-largest-urban-farm-to-open-on-a-paris-rooftop> (accessed 20 April 2020).
146. Agriculture and Economic Development Analysis Division, Food and Agriculture Organization. *Food Security: Some Macroeconomic Dimensions*. Rome: Food and Agriculture Organization of the United Nations; 1996.
147. Latvala T, Lintonen T, Konu A. Public health effects of gambling – debate on a conceptual model. *BMC Public Health*. 2019; 19(1): 1077.
148. Tolchard B. The impact of gambling on rural communities worldwide: a narrative literature review. *Journal of Rural Mental Health*. 2015; 39(2): 90–107.
149. North American Foundation for Gambling Addiction Help. Statistics Of Gambling Addiction 2016, 2016. Available at: <https://nafgah.org/statistics-gambling-addiction-2016/> (accessed 22 August 2019).
150. The Guardian. Rise in gambling ad spend fuels fears over impact on children. The Guardian. 24 November 2018. Available at: <https://www.theguardian.com/society/>

- 2018/nov/24/rise-in-gambling-ad-spend-fuels-fears-over-impact-on-children (accessed 23 June 2020).
151. Rogers RD, Wardle H, Sharp CA, Wood S, Hughes K, Davies TJ, Dymond S, Bellis MA. Gambling as a public health issue in Wales. Bangor, Wales. Bangor University, Public Health Wales, and Swansea University, 2019. Available at: <https://www.bangor.ac.uk/psychology/research/gambling/docs/Gambling-as-Public-Health-Issue-Wales.pdf> (accessed 13 June 2020).
  152. Research And Markets.com. Global Gambling Market to Reach \$565 Billion by 2022: Opportunities & Strategies Report, 2014 to 2022. Business Wire. 6 June 2019. Available at: <https://www.businesswire.com/news/home/20190606005537/en/Global-Gambling-Market-Reach-565-Billion-2022> (accessed 23 June 2020).
  153. World Casino Directory. World Casino Directory Global Gaming Summary 2019. Available at: <https://www.worldcasinodirectory.com/statistics> (accessed 24 June 2020).
  154. Medeiros G, Grant J, Tavares H. Gambling disorder due to Brazilian animal game ("Jogo do bicho"): gambling behavior and psychopathology. *Journal of Gambling Studies*. 2016; 32(1): 231–241.
  155. Clark D. United Kingdom (UK) HMRC betting and gaming tax receipts from fiscal year 2000/01 to fiscal year 2018/19. Statista. 11 September 2019. Available at: <https://www.statista.com/statistics/284338/betting-and-gaming-united-kingdom-hmrc-tax-receipts/> (accessed 25 June 2019).
  156. Lock S. Countries with the largest gambling losses per adult worldwide in 2017. Statista. 26 March 2020. Available at: <https://www.statista.com/statistics/552821/gambling-losses-per-adult-by-country-worldwide/> (accessed 24 June 2020).
  157. The Economist. The world's biggest gamblers. 9 February 2017. Available at: <https://www.economist.com/graphic-detail/2017/02/09/the-worlds-biggest-gamblers> (accessed 25 June 2020).
  158. Reith G. Scotland, and Social Research. *Research on the Social Impacts of Gambling: Final Report*. Edinburgh: Scottish Executive; 2006. Available at: <http://www.scotland.gov.uk/Publications/2006/08/17134534/0> (accessed 27 August 2020).
  159. Thomas SA, et al. The PROblem Gambling RESearch Study (PROGRESS) research protocol: a pragmatic randomised controlled trial of psychological interventions for problem gambling. *BMJ Open*. 2015; 5(11): e009385.
  160. Cassidy R, Loussouarn C, Pisac A. Fair Game: Producing gambling research. The Goldsmiths Report, 15 January 2015. Available at: [https://www.researchgate.net/publication/270887403\\_Fair\\_Game\\_Producing\\_gambling\\_research/link/54b7a6ac0cf2e68eb28037e9/download](https://www.researchgate.net/publication/270887403_Fair_Game_Producing_gambling_research/link/54b7a6ac0cf2e68eb28037e9/download) (accessed 25 June 2020).
  161. Wardle H, Reith G, Langham E, Rogers RD. Gambling and public health: we need policy action to prevent harm. *BMJ*. 2019; 365: l1807, doi: [10.1136/bmj.l1807](https://doi.org/10.1136/bmj.l1807).
  162. Browne M, Rockloff MJ. Prevalence of gambling-related harm provides evidence for the prevention paradox. *Journal of Behavioral Addictions*. 2018; 7(2): 410–422.
  163. New Zealand. Ministry of Health. *Strategy to Prevent and Minimise Gambling Harm 2016/17 to 2018/19*. Wellington, New Zealand: Ministry of Health; 2016.

164. White S. NHS chief calls for gambling tax to pay for addiction treatment. *Accountancy Daily*, 24 June 2019. Available at: <https://www.accountancydaily.co/nhs-chief-calls-gambling-tax-pay-addiction-treatment> (accessed 24 June 2020).
165. Lock S. Total revenue of the gambling market in the United States from 2004 to 2018. Statista. 29 May 2020. Available at: <https://www.statista.com/statistics/271583/casino-gaming-market-in-the-us/> (accessed 25 June 2020).
166. Gandullia L, Leporatti L. Distributional effects of gambling taxes: empirical evidence from Italy. *The Journal of Economic Inequality*. 2019; 17(4): 565–590.
167. Adams PJ, Rossen F. A tale of missed opportunities: pursuit of a public health approach to gambling in New Zealand: Gambling and public health in New Zealand. *Addiction*. 2012; 107(6): 1051–1056.
168. van Schalkwyk MCI, et al. A public health approach to gambling regulation: countering powerful influences. *The Lancet Public Health*. 2021; 6(8): e614–e619.
169. Rafaty R. Perceptions of corruption, political distrust, and the weakening of climate policy. *Global Environmental Politics*. 2018; 18(3): 106–129.
170. United Nations Human Settlements Programme (UN-HABITAT). The Challenge of Local Government Financing in Developing Countries. United Nations Human Settlements Programme (UN-HABITAT), 2015. Available at: [https://sustainabledevelopment.un.org/content/documents/1732The%20Challenge%20of%20Local%20Government%20Financing%20in%20Developing%20Countries%20\\_3.pdf](https://sustainabledevelopment.un.org/content/documents/1732The%20Challenge%20of%20Local%20Government%20Financing%20in%20Developing%20Countries%20_3.pdf) (accessed 3 May 2020).
171. Organisation for Economic Co-operation and Development (OECD). *Environmental Taxation: A Guide for Policy Makers*. OECD Publishing, 2011. Available at: <https://www.oecd.org/env/tools-evaluation/48164926.pdf> (accessed 12 June 2019).
172. Fullerton D, Leicester A, Smith S. *Environmental Taxation*. OECD Publishing, 2010. Available at: <https://www.ifs.org.uk/uploads/mirrleesreview/dimensions/ch5.pdf> (accessed 22 June 2019).
173. Scharff EA. Powerful cities? Limits on municipal taxing authority and what to do about them. *New York University Law Review*. 2016; 91(2): 292–343.
174. Görlach B. What constitutes an optimal climate policy mix? Defining the concept of optimality, including political and legal framework conditions. CECILIA2050 WP1 Deliverable 1.1. Berlin: Ecologic Institute, 2013. Available at: <https://www.ecologic.eu/14178> (accessed 22 July 2019).
175. Eykelenboom M, van Stralen MM, Olthof MR, Schoonmade LJ, Steenhuis IHM, Renders CM. Political and public acceptability of a sugar-sweetened beverages tax: a mixed-method systematic review and meta-analysis. *International Journal of Behavioral Nutrition and Physical Activity*. 2019; 16(1): 78.
176. Carattini S, Carvalho M, Fankhauser S. Overcoming public resistance to carbon taxes. *WIREs Climate Change*. 2018; 9(5): e531.