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Latin America Healthcare System Overview

A comparative analysis of fiscal space in healthcare

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ABBREVIATIONS

CSS	Social Security Fund (Panama)
CCSS	Caja Costarricense de Seguro Social (Costa Rica)
DRG	Diagnosis Related Group
ECLAC	Economic Commission for Latin America and the Caribbean
EMP	Prepay Private Insurance (Argentina)
EPS	Healthcare Provider Enterprises (Peru)
EsSalud	Seguro Social de Salud (Peru)
EU	European Union
GDP	Gross Domestic Product
GNI	Gross National Income
FFAA	Armed Forces (Peru)
FONASA	Fondo Nacional de Salud (Chile)
IADB	Inter-American Development Bank
IESS	Ecuadorian Social Security Institute (Ecuador)
INS	National Insurance Institute (Costa Rica)
IMF	International Monetary Fund
ISAPRE	Instituciones de Salud Provisional (Chile)
LA	Latin America
NCD	Non-Communicable Disease
NGO	Non-Governmental Organization
NHS	National Health System (UK)
MIES	Ministry of Economic and Social Inclusion (Ecuador)
MINSA	Ministerio de Salud de la Republica de Panama (Panama)
MSP	Ministry of Public Health, Ecuador
OECD	Organization for Economic Co-Operation and Development
OOP	Out of Pocket
OS	Obras Sociales (Argentina)
PAHO	Pan American Health Organization
PAMI	Comprehensive Medical Assistance Program (Argentina)
PED	Price Elasticity of Demand

PNP	National Police (Peru)
PPP	Purchasing Power Parity
THE	Total Health Expenditure
SDG	Sustainable Development Goal
SHI	Statutory Health Insurance
SIS	Integral Health Insurance (Peru)
SNIS	Integrated National Health System (Uruguay)
SNS	National Health System (Spain)
SPSS	Social Protection System in Health (Mexico)
SS	Social Security (Mexico)
SSB	Sugar-sweetened beverages
SSC	Seguro Social Campesino (Ecuador)
SUS	Sistema Único de Saúde (Brazil)
VAT	Value-Added Tax
UHC	Universal Health Coverage
UK	United Kingdom
UNICEF	United Nations Children's Fund
USD	United States Dollar
WEF	World Economic Forum
WHO	World Health Organization

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EXECUTIVE SUMMARY

Rationale

Universal Health Coverage (UHC) is an ambition for health systems to reach where everyone can access healthcare services regardless of their ability to pay and while avoiding the incurrence of catastrophic costs. UHC was set out as one of the targets in the 2015 Sustainable Development Goals (SDGs), and as a step towards achieving "the enjoyment of the highest attainable standard of health" which is, according to the 1948 WHO constitution, a basic right for every individual regardless of socioeconomic, religious, political or racial status. The principles of UHC feature strongly in Latin America, where significant progress has been made over the past 15 years to broaden and deepen the process of healthcare reform.

Many countries, including those in Latin America, are experiencing rising healthcare costs driven by technological advances, resource inefficiencies, income growth, the epidemiological transition from infectious to chronic diseases in lower income countries and the disproportionate rise of labour costs compared to productivity growth. Conversely, current trends in population aging may contribute to a declining revenue for healthcare: while aging may not be a driver for higher healthcare related costs by itself, the declining proportion of active workforce may result in less income generated for health, social security and other public services. Consequently, a country's ability to raise sufficient funds for UHC in light of rising costs is a major challenge.

Considering these challenges, the need for existing sources to be used efficiently and for novel funding sources to be identified and leveraged, governments can turn to the concept of fiscal space, namely to create the capacity in their (national) budgets that can be used for specific purposes without compromising their financial stability and sustainability. Fiscal space is closely linked to UHC, considering the need for new sources of health financing together with the efficient use of available resources by eliminating unnecessary and unproductive expenditures.

The creation of fiscal space is country- and context-specific, but fiscal space can be generated without attempting to increase the budget surplus of a country with several mechanisms available to improve spending ability. More often than not, fiscal space and UHC are political, rather than technical, issues and securing political will is key in achieving progress in these areas.

Objectives

In this study we set out to fulfil three objectives: first, to study the need to broaden the fiscal space in healthcare financing for the Latin American region and have selected 10 countries for this purpose (Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Panama, Peru and Uruguay). Whether countries in the region possess, can leverage, or can enhance fiscal space to increase health spending depends on various aspects of a country's health system and their economic circumstances. Second, to identify existing and potential taxes to support the enhancement of fiscal space without endangering fiscal sustainability. Within the report's analysis and comparison of fiscal space for healthcare in the ten Latin American countries, there is particular focus on the use of indirect taxes (specifically VAT and harmful products from a public health perspective and, in particular, taxes on alcohol and tobacco) as a mechanism to generate further financial resources for healthcare. And, third, to provide benchmark conclusions that could support country-specific public policies, whether there is potential to increase the fiscal space, and how potential additional resources could be used.

Methods

We used primary and secondary data sources to (a) analyse specific aspects of each country's current health system; (b)

conduct an assessment of their macroeconomic performance over time using a set of indicators enabling us to assess the overall fiscal, monetary and overall economic health in order to gauge the extent to which the fiscal space actually existed for additional investment(s) in healthcare; (c) conducted a survey of stakeholders in the region in order to understand how they perceive different scenarios relating to the funding of healthcare services, ranging from raising additional taxes to fund healthcare services, to shifting resources from other human services to fund health, to improving the efficiency of existing resources instead of levying additional taxes; (d) we conducted a series of simulation exercises to show that is it feasible to raise additional revenue via modest increases in indirect taxes (VAT, alcohol and tobacco) and, through that, create the fiscal space in the study countries; and (e) we employed three scenarios to highlight how this fiscal space could be used to strengthen and expand healthcare finance, organization and delivery of services.

The scenarios considered (a) investing the totality of fiscal space to increasing the funding of public healthcare services; (a) investing in health in a way that is proportional to its weight among other human services such as education and social security; and (c) focusing on improvements in efficiency whilst using fiscal space resources to improve quality of services.

Healthcare system challenges

Key health indicators, such as infant mortality and life expectancy are improving across the countries in the region. In line with global trends, the Latin American region is affected by the burden of NCDs as the leading cause of death, with the proportion of deaths due to NCDs increasing in all Latin American countries between 2000 and 2015. NCDs, therefore, pose the highest burden on the healthcare system and the resources available.

The region faces several challenges in the financing, organization and delivery of its healthcare systems; this includes ineffective delivery of care and slow uptake of policies to improve performance and efficiency. Total health expenditure as a percentage of GDP ranges from 5% to just over 9%, but for most countries in the region, publicly funded health expenditure stands at well below 6% of GDP. Health spending is coupled with high out-of-pocket expenditure across the region: at a low of 16% of current health expenditure (Uruguay) and a high of 43% (Ecuador). While several countries rely heavily on general taxation to finance healthcare, large informal economies contribute to difficulties in tax collection and financing healthcare (and other public services) to an adequate level via taxation.

Despite the above trend, total health expenditure as a proportion of GDP has increased in the majority of Latin American countries (particularly in Argentina, Chile, Colombia, Costa Rica, Ecuador, Panama, and Peru) over the past 15 years, while out-of-pocket expenditure on health increased in 5 countries (Colombia, Ecuador, Panama, Peru and Uruguay), but decreased in the remaining countries (Argentina, Brazil, Chile, Costa Rica, Mexico) over the same period. Private health expenditure increased in all countries besides Argentina, Costa Rica, Mexico, and Uruguay during the same period.

As a percentage of GDP, public spending on health is higher than public spending on social security in all countries. When compared to education spending, public spending on health is generally lower in all countries, apart from Chile (equal spending), and Panama and Uruguay (higher health spending).

Official data demonstrates that universal health coverage remains an elusive goal for the region as a whole to date, with the majority of countries ranking in poor to moderate attainment of universal coverage across delivery, costs, and coverage.

Macroeconomic performance and fiscal space

In order to determine whether the fiscal space exists to expand health spending, it is essential to assess macroeconomic performance. This is because the fiscal

space to increase healthcare expenditure is determined by a country's wider economic context. Countries facing adverse fiscal and other macroeconomic conditions may resist future increases in real health spending because these could undermine fiscal stability; by contrast, strong economic growth (which is a major driver of fiscal space) and sound macroeconomic fundamentals form the basis for an increase in fiscal space and, ultimately, health expenditure.

Positive GDP growth may signal the potential to generate additional government revenue to spend on health services. All study countries displayed positive GDP growth trend between 2007 and 2017. While positive growth is expected to continue in the short-term, a weak growth outlook remains for the region in the medium-term, which, in turn, may influence discussion on fiscal space.

Other macroeconomic performance indicators highlight sources of potential instability. For example, all countries except Peru have generated fiscal deficits in recent years; continued fiscal deficits, in turn, may fuel increases in debt levels, although in most countries the pursuit of fiscal discipline, and, therefore, deficit reduction, is a stated objective. Besides Argentina, Panama, Peru, and Uruguay, debt increased from 2006 to 2016 in all other countries, with particularly significant increases in the latter 5-year period. The debt situation and its servicing in Argentina remains a challenge.

A fall in inflation will likely be beneficial for the creation of fiscal space. Between 2006 and 2016, inflation declined in six countries except for Brazil, Chile, Colombia, Peru, and Uruguay.

In terms of external balance, all study countries also experience current account deficits. Persistent trade and current account deficits could be detrimental, and may result in limited fiscal space for health.

The consequences of these trends for fiscal space may materialize as an increasing proportion of existing tax revenue is likely to be directed towards financing debt interest payments, potentially through an increase in government taxation and reduction in government expenditure, unless GDP growth remains strong. Debt sustainability becomes an adjacent issue, together with the existing high cost of raising funds to service it in some countries. However, while increasing levels of debt across the study countries are observed, sovereign debt credit ratings are positive for the majority of them (Chile, Colombia, Mexico, Panama, Peru, and Uruguay). Affordable debt financing in these countries may positively impact their fiscal space for health.

Overall, macroeconomic performance is not positive in its entirety for all study countries and a variety of macroeconomic instabilities remain in the region, including fiscal deficits, deteriorating external balances and debt servicing in some cases. However, these can be balanced out by positive growth levels, recovering commodity prices, and low inflation. Therefore, and in general terms, a debate on fiscal space is in a positive territory considering macroeconomic performance in the Latin American region.

Observed fiscal gap in public healthcare spending

While all healthcare systems in Latin America subscribe to the principle of universal health coverage, in practice, only partial coverage is offered, with a significant proportion of the demand for healthcare services being met through out-of-pocket spending. The benchmark level of public expenditure on health as a proportion of GDP for middle/upper middle income countries has been advised by WHO/PAHO to be 6%. The difference between that level of expenditure and actual spending constitutes the fiscal gap in public healthcare spending.

Currently, the average observed fiscal gap across the ten study countries between public spending on health (as % of GDP) and the benchmark health spend of 6% of GDP stands at 1.9% GDP (ranging from 1.1 to 2.9% of GDP). The majority of countries currently spend considerably below the 6% WHO/PAHO benchmark, with only Costa Rica and Uruguay meeting and slightly exceeding that benchmark. In monetary

terms, Brazil, Mexico, and Peru have the largest fiscal gaps to close in terms of additional resources required for their healthcare systems (US$70.6 billion, US$63.8 billion and US$12.4 billion, respectively).

Perception of financing and efficiency mechanisms by policymakers

Forming policy and deciding on equity-efficiency trade-offs by implementing policy interventions involves political discourse and multidimensional stakeholder influence. In order to gauge stakeholder perceptions and preferences about specific foci on health policy reform, a survey was conducted and considered values and opinions of several key sector stakeholders (payers, academia, providers, government and industry) on healthcare financing and health reform direction(s).

The objective of the survey was to inform the debate on fiscal space, the modalities through which this could be leveraged and focused on obtaining opinion and perspective on three key areas. First, in terms of the necessity and political feasibility of key mechanisms for sustainable healthcare financing, stakeholders strongly agree on the necessity of implementing efficiency measures and lifestyle interventions as a means of improving the 'productivity' of available resources devoted to health and agree that generating additional revenue is important but that tight control on spending should also be observed (cost containment). Stakeholders also commented on the political feasibility of the above options and confirmed their agreement on all of them.

Second, stakeholders were asked to comment on the revenue-raising capacity and political feasibility of a range of revenue generation mechanisms. They agreed that taxes on harmful products, particularly on alcohol and tobacco (known as 'sin' taxes), if earmarked, have considerable revenue-raising capacity and are politically feasible. In a comparable vein, they favoured earmarked taxes on luxury goods and income tax more than increases in VAT and were completely negative on the proposal of re-allocating resources from social security, education or other publicly funded services to health.

And, third, we gauged stakeholder interest in a series of options relating to improvements in efficiency and the political feasibility of a number of mechanisms that could promote efficiency. In that context, stakeholders remained neutral about the potential of the following measures concerning their ability to improve efficiency: privatization of health services, restrictive purchasing of new technologies, the ability of people to opt-out of national health systems, the introduction of private (top-up) health insurance for expensive technologies and the introduction of health savings accounts. In terms of political feasibility, however, stakeholders agreed that the above options were implementable.

Overall, there seems to be agreement on the necessity of additional funding options to increase the level of investment in healthcare, in combination with measures to improve the efficiency of resources that are already deployed. In parallel, private funding options at healthcare system level were met with some scepticism, perhaps with the exception of top-ups for specific types of coverage (expensive technologies) and, where possible, health savings accounts.

Based on the results of the stakeholder survey, we selected indirect taxes (VAT and 'harmful products') to study the extent to which they could create additional fiscal space and the magnitude of such space. Although stakeholders expressed concerns about the use of VAT as a vehicle to raise additional resources to fund health services, it was included in the analysis, first, because of its revenue-raising capacity, which is equal to or higher than that of income tax and, second, because of the assumption that any additional resources raised would be explicitly earmarked, wholly or partly, to fund health services, therefore, becoming hypothecated. The selection of taxes on harmful products as a vehicle to raise additional resources for health was based on the principle of hypothecation, i.e. all additional revenue would be earmarked for the purposes of health.

Taxes on alcohol and tobacco are not the only taxes related to behaviour: taxing sugar and fat or levying environmental taxes also present valid policy options. However, lack of readily available and comparable data and information have meant that we have focused only on alcohol and tobacco. Still, it needs to be recognised that sugar, fat and environmental taxes, raise important public health implications similar to those raised by taxes on alcohol and tobacco.

Fiscal space for health: The role of modest increases in VAT

The ability to increase VAT rates in order to raise additional revenue for health, and the corresponding increment in expected tax revenue, are multi-factorial and depend on (a) current levels of VAT, which vary considerably across Latin American countries, (b) local consumption patterns and how consumption is taxed, which ultimately relate to the VAT base, (c) the price elasticity of demand (PED), which shapes the response of demand when prices change and (d) the likely impact tax increases will have on certain locally produced goods, where a country may have a comparative advantage and whether any form of industrial policy is reversed by tax increases.

Political feasibility is critical in that context and highlights the need to identify specific use as a justification for raising additional resources through taxation, also considering the regressive nature of indirect taxes, in general, and VAT in particular. Earmarking the additional resources for specific purposes (e.g. improving quality of health services) would be critical and increase the degree of acceptability amongst the population.

Standard VAT rates varied significantly in the region, ranging between 7% (Panama) to 22% (Uruguay). Countries implementing low VAT rates may have the capacity to implement an increase of up to 3 percentage points, whereas countries implementing high VAT rates may be in a position to raise VAT by one percentage point. It is likely that a 3% increase in the standard VAT rate might be feasible in Costa Rica, Ecuador, and Panama, where current standard VAT rates are below 15%; a 2% rise could be feasible in Mexico, Brazil and Peru, although, unavoidably, there may be some resistance, given that standard VAT stands at 16, 17 and 18%, respectively. A maximum of 1% standard VAT rate increase could be feasible in Argentina (21%), Chile (19%), and Colombia (19%), given their already high current rates. It is uncertain whether a 1% standard VAT rate increase is possible in Uruguay (22% standard rate) given the political direction is to decrease VAT. This 1% increase in VAT is considerably lower, and would need to be introduced more slowly than that which is feasible in Brazil, Costa Rica, Ecuador, Mexico, and Panama given their standard rates are considerably lower.

We modelled the financial impact of a 1% increase in the standard and non-standard VAT rates in order to showcase what impact this will have on additional revenue generation. The extent of additional revenue generation is dependent on demand elasticity and the VAT base.

The analysis suggests that a one percentage point rise in VAT will result in additional revenue ranging between 0.12% of GDP (Mexico) and 0.63% of GDP (Uruguay). In monetary terms the maximum achievable increase in VAT revenue across all scenarios, varies from US$214 million in Panama to US$11,805 million in Brazil. These figures represent a significant level of new resources, which, if earmarked for the purposes of improving health services could make a difference in the study countries.

Fiscal space for health: The role of modest increases in alcohol and tobacco taxes

Sin tax increases, particularly modest increases in alcohol and tobacco tax rates, can contribute to additional revenue generation. Having explored a 5 percentage point increase in tobacco and alcohol tax rates, we found that resources ranging between 0.03 and 0.16% of GDP can be raised. Overall, the ability of tax increases on alcohol and tobacco to generate significant tax revenue, was found to be small both in absolute terms as well as

relative to key countries in the OECD region.

Brazil and Uruguay had the highest increase in revenue, with most of the increase coming from alcohol taxes. By contrast, taxes on alcoholic beverages would be least effective in raising additional revenue in Chile. Argentina, Chile and Mexico also had a high increase in revenue, with the most revenue resulting from tobacco taxes. Tobacco taxes were least effective in raising additional revenue in Colombia, Costa Rica, and Panama.

Simulation scenarios and the fiscal gap

Having ascertained that one percentage point of VAT increase and five percentage point increases in alcohol and tobacco products can deliver significant additional resources, both in absolute monetary terms and as a proportion of GDP, we focused on the magnitude of increases required to fill the funding gap in healthcare, i.e. what tax increases would be required to reach the benchmark spending level on health as a percent of GDP from the current levels of health expenditure. This was undertaken in order to highlight the level of effort required and how this differed by country.

Three scenarios were used to outline how the fiscal gains from increased indirect taxation could be allocated. The first, assumes that all fiscal benefits will be earmarked for the purposes of increasing the funding of healthcare services; the second, assumes that healthcare is prioritised, but the proceedings from increased indirect taxation are distributed on a weighted basis in accordance with other governmental priorities; and, the third, assumes that healthcare benefits are benefiting from the increased resources from tax revenue but the key focus is placed on improving efficiency in the healthcare system.

If all additional tax revenue is allocated to health only, the remaining fiscal gap would be filled to varying degrees. Mexico and Peru would require a significant increase in VAT (16.1 and 10.1 percentage points, respectively) and harmful product tax (80 and 55 percentage point rise, respectively) to cover their overall funding gaps. In contrast, Uruguay and Costa Rica would require a 0.7 and 2.3 percentage point increase in VAT and 3.3 and 11.3 percentage point increase in harmful product tax, respectively, to do the same. To fill the funding gap, the VAT increases necessary are significantly lower than potential harmful product tax increases. Therefore, countries could look to VAT first to consider addressing funding gaps they have.

If revenue generated is allocated in a weighted fashion, VAT and harmful product tax increases required to close the remaining fiscal gap are significantly higher than under the previous scenario. Mexico and Peru still require a significant increase in VAT and harmful product tax (in percentage point terms) to fill their fiscal gaps. As with the previous scenario, VAT increases required (in percentage points) are significantly lower than the tax increases on alcohol and tobacco required to cover the fiscal gap across all countries.

With regards to the third scenario, it is generally acknowledged that allocating additional funding to healthcare without the implementation of reforms to improve efficient use of resources is not a wise strategy and may perpetuate wasteful use of resources. Consequently, raising additional revenue through taxation, should be combined with efforts to improve (a) the governance of healthcare systems (e.g. reduce unnecessary administrative processes), (b) reduce inefficiencies in clinical care (e.g. reduce the rate of avoidable clinical adverse incidents) and (c) reduce the degree of operational waste. Several potential reforms aimed at improving efficiency in current health systems are possible, including improved access to primary care, value-led approaches to pharmaceutical care, promotion of cost-effective products, including generics, and streamlining hospital financing mechanisms with focus on prospective payments.

Allocation of the generated revenue to these reforms would require carefully designed approaches based on evidence to ensure the aim is achieved. To that end, financing and implementing robust data collection systems may allow

decisionmakers to make informed budget allocations and streamline inefficiencies.

The suitability and feasibility of applying harmful product tax increases are dependent on country context. In countries producing these products (e.g. wine in Argentina and Chile, or tobacco in Colombia), increased taxation on these goods might not be politically feasible or economically desirable. The political feasibility of these taxes might increase if there is a public declaration (and subsequent action) to earmark the revenue for the purposes of funding health services.

Summary of key results

The region faces several challenges in the financing, organization and delivery of its healthcare systems; this includes inefficient delivery of care and slow uptake of policies to improve performance and efficiency. Total health expenditure as a percentage of GDP ranges between 5% and 9%, but for most countries in the region, publicly funded health expenditure is well below 6%, the remainder being out-of-pocket expenditure, which ranges from 16% of total health expenditure (Uruguay) to 43% (Ecuador).

Despite the above trend, total health expenditure as a proportion of GDP has increased in the majority of Latin American countries (particularly in Argentina, Chile, Colombia, Costa Rica, Ecuador, Panama, and Peru) over the past 15 years, while out-of-pocket expenditure on health increased in Colombia, Ecuador, Panama, Peru and Uruguay but decreased in Argentina, Brazil, Chile, Costa Rica, Mexico over the same period. Private health expenditure increased in all countries besides Argentina, Costa Rica, Mexico, and Uruguay during the same period.

While several countries rely heavily on general taxation to finance healthcare, large informal economies contribute to difficulties in tax collection and financing healthcare (and other public services) to an adequate level via taxation. In line with global trends, the Latin American region is affected by the burden of NCDs as the leading causes of death, with the proportion of deaths due to NCDs increasing in all Latin American countries between 2000 and 2015. NCDs, therefore, pose the highest burden on the healthcare system and the resources available. Despite the above challenges, key health indicators, such as infant mortality and life expectancy are improving across the region.

Underfunding of healthcare systems across the region remains a key concern. The average observed fiscal gap across the ten study countries between public spend on health (as % of GDP) and the benchmark health spend of 6% of GDP stands at 1.9% GDP (ranging from 1.1 to 2.9% of GDP). The majority of countries currently spend considerably below the 6% WHO/PAHO benchmark, with only Costa Rica and Uruguay meeting and slightly exceeding that benchmark. In monetary terms, Brazil, Mexico, and Peru have the largest fiscal gaps to close in terms of additional resources required for their healthcare systems (US$70.6, US$63.8 and US$12.4 billion, respectively).

Although macroeconomic performance cannot be characterised as overarchingly and sustainably positive in its entirety for all Latin American countries and a variety of macroeconomic instabilities remain in the region, the outlook remains positive and these instabilities can be balanced out by positive growth levels, recovering commodity prices, and low inflation. On balance, macroeconomic performance seems to provide some support to the arguments around the existence of modest to moderate fiscal space, which could be leveraged to improve the range, performance and quality of healthcare services provided and contribute towards the achievement of universal health coverage.

Forming policy and deciding on equity-efficiency trade-offs by implementing policy interventions involves political discourse and multidimensional stakeholder influence. Based on survey results, there seemed to be agreement on the necessity and political feasibility of additional funding options to increase the level of investment in healthcare, in combination with measures to improve the efficiency of resources that are already deployed. In parallel, private funding options at

healthcare system level were met with some scepticism, perhaps with the exception of top-ups for specific types of coverage (expensive technologies) and, where possible, health savings accounts.

Driven partly by survey results suggesting that indirect and 'sin' tax increases have a greater degree of political acceptance and feasibility compared with other types of taxation, we have explored the use of indirect taxation – particularly VAT and taxes on alcohol and tobacco (products that can be characterised as 'harmful' and justifying the levying of the so-called 'sin' taxes), as a vehicle to generate fiscal space and generate additional resources to be used for the funding of healthcare services. Despite their regressive nature, modest increases in these taxes could generate significant resources that, if earmarked, can contribute to UHC.

The financial impact of a 1 percentage point increase in the standard and non-standard VAT rates was explored in order to showcase what impact this will have on additional revenue generation. The extent of additional revenue generation is dependent on demand elasticity – how demand will respond to changes in prices – and the VAT base. The analysis that a 1% rise in VAT would result in additional revenue ranging between 0.12% of GDP (Mexico) and 0.63% of GDP (Uruguay). In monetary terms the maximum achievable increase in VAT revenue across all scenarios assuming there is no price elasticity effect, varies from US$214 million in Panama to US$11,805 million in Brazil. These figures represent a significant level of new resources, which, if available for the purposes of improving health services could make a significant difference in the study countries if targeted appropriately.

In the case of taxes on harmful products, having explored a 5 percentage point increase in tobacco and alcohol tax rates, we found that resources equivalent to 0.03% and 0.16% of GDP can be raised. Overall, the ability of tax increases on alcohol and tobacco to generate significant tax revenue, was found to be small both in absolute terms as well as relative to the comparator countries. Brazil and Uruguay had the highest increase in revenue, with most of the increase coming from alcohol taxes. By contrast, taxes on alcoholic beverages would be least effective in raising additional revenue in Chile. Argentina, Chile and Mexico also had a high increase in revenue, with the most revenue resulting from tobacco taxes. Tobacco taxes were least effective in raising additional revenue in Colombia, Costa Rica, and Panama.

The suitability and feasibility of applying tax increases on tobacco and alcohol products are very often contestable and dependent on country context: where countries are producers of such goods (e.g. wine in Argentina, Chile or Brazil, or tobacco in Colombia) increases in taxation of these goods might not be politically feasible or economically desirable. It may also artificially raise product prices for local goods and reduce local consumption, threatening the viability of local industry. However, the political feasibility of raising indirect taxes might increase if the taxation proceedings are earmarked for the purpose of being used to improve the quality of health services.

Simulation analysis was conducted in order to determine what resources would be required to cover the fiscal gap in healthcare across Latin American countries. The three scenarios that were explored in this context were (a) that all fiscal benefits should be earmarked for the purposes of increasing the funding of healthcare services; (b) that healthcare should prioritised, but the proceedings from increased indirect taxation ought to be distributed on a weighted basis in accordance with other governmental priorities; and (c) that while there are fiscal benefits from increased indirect taxation, the key focus is placed on improving efficiency in the healthcare system.

If all additional tax revenue is allocated to health only, the remaining fiscal gap would be filled to varying degrees. Mexico and Peru would require a significant increase in VAT (16.1 and 10.1 percentage points, respectively) and harmful product tax (80 and 55 percentage point rise, respectively) to cover their overall funding gaps. By contrast, Uruguay and Costa Rica would require 0.7 and 2.3 percentage point

increase in VAT and 3.3 and 11.3 percentage point increase in harmful product tax, respectively to do the same. To fill the funding gap, the VAT increases necessary are significantly lower than potential harmful product tax increases. Therefore, countries could look to VAT first to consider addressing funding gaps they have.

If revenue generated is allocated in health in a way that addresses need in other areas of human services (e.g. education, pensions & social security, and defence), VAT and harmful product tax increases required to close the remaining fiscal gap are significantly higher than under the previous scenario. Mexico and Peru still require a significant increase in VAT and harmful product tax (percentage points) to fill their fiscal gaps.

The purpose of the modelling and simulation exercise pursued in the context of this report were not to advocate in favour of tax increases. Rather, it was to showcase that indirect taxes can be used effectively to raise additional revenue to invest in health. This can be done in varying degrees in the study countries, as their dependence on and exposure to indirect taxes (both VAT and taxes on alcohol and tobacco) differs quite fundamentally. Equally, national governments need to reflect very carefully on expected revenue and the impact that additional tax rises will have on consumption.

Policy implications

Decisionmakers faced with increased pressure to accelerate towards the goal of UHC need to very actively consider the possibility of raising additional resources to fund health services, whilst at the same time working towards improving the efficiency with which existing sources are deployed. The concept of fiscal space, therefore, is far from theoretical and can provide significant opportunities to expand on the level of resources available. Still, there are several dimensions that need to be taken into account in order to ensure that appropriate decisions are taken.

First, any discussion on fiscal space needs to be based on good macroeconomic performance that does not jeopardize the sustainability of public finances. In circumstances where there are persistent macroeconomic imbalances (e.g. fiscal deficits, high debt levels, deteriorating external balances and loss of competitiveness), the fiscal space to increase meaningfully public spending on health may not be there and, even if there was, the temptation would be to use any additional resources to cover deficits rather than invest these in public health.

Second, it takes political courage to propose and promote increases in taxation and this needs to be judged against political feasibility, which may vary depending on country context. While tax rises is never desirable, they can become more palatable if use of the additional resources has been identified ex ante and communicated to the electorate. Earmarking is, therefore, critical.

Third, although a 1 percentage point rise in VAT and a 5 percentage point rise in tobacco and alcohol would have different impact on resources raised, the fiscal figures found as part of the modelling exercise represent a significant level of new resources, which, if available for the purposes of improving health services could make a substantial difference in the study countries if targeted appropriately.

Fourth, decisionmakers must have a sense not only of what is desirable but also what is feasible. From a political feasibility perspective, it may not be possible to raise standard VAT rates in some countries because they are already considered to be high; this is the case in Uruguay (where the VAT rate stands at 22%), Argentina (21%), Chile (19%) and Colombia (19%). In these countries, any potential increase in increasing revenue from VAT may come from either increasing the non-standard VAT rates or the overall VAT base. The former may be feasible in all the above countries, perhaps with the exception of Argentina. Nevertheless, all other countries present opportunities to raise the basic rate of VAT by at least one percentage point, as basic rates range between 7% (Panama) and 18% (Peru). In this report, we have assumed a one percentage rise in VAT in

order to gauge the yield that such an increase would deliver across countries.

Fifth, raising taxes on alcohol and tobacco is often contestable and it has been the case that these two products have already attracted significant attention. While the fiscal gains from increased alcohol and tobacco taxes are expected to be moderate at best, focus on these 'sin' taxes carry two interconnected policy and political messages: first, that higher taxes for these products are a signal to deter people from consuming or consuming in excess because of the health implications and, second, those who engage in their consumption run the risk of developing disease over the longer term and ultimately they contribute to funding care and treatment caused by their behaviour.

Sixth, while we have modelled the effect of taxes on alcohol and tobacco, clearly they are not the only taxes related to behaviour: taxing sugar and fat or levying environmental taxes also present valid policy options. Taxing sugar and fat is one way of raising additional resources, but the public health dimension is also very important, as increased levels of sugar and saturated fat in processed food are major predictors of obesity and, ultimately, poor health. There are obvious trade-offs between raising the rate of taxation on foods that have a high saturated fat content and beverages versus working with the food industry or regulating sugar and fat content in order to mitigate their harmful effects on human health. Environmental taxes are also important, but their imposition in the Latin American context needs to be balanced against the range of options that can be made available to encourage change in consumer behaviour.

Seventh, the explicit assumption made is that indirect taxes represent a desirable option to raise additional resources compared with direct taxes. It is, nevertheless, well known that indirect taxes are inherently regressive and tax more heavily the lower socioeconomic groups. Apart from having a higher impact on consumption amongst those groups, indirect taxes may be seen as 'stealth' taxes, particularly if there is no clear plan for their use. Consequently, hypothecation would be required so that the proceeds are earmarked for specific purposes, of which, improvements in healthcare is the most worthwhile causes.

Eighth, it is assumed that competent authorities are (a) neutral to the selection of tax modality; (b) interested in closing the funding gap that exists in healthcare; and (c) willing or able to raise taxes across settings and products. However, taxes are not only a fiscal tool used to raise resources, but also a means of industrial policy and, consequently, tax rates should be calibrated and tailored to the type of product and the need they are required to fulfil.

Ninth, as detailed information on price elasticities of demand is not widely available, the modelling results may need to be interpreted with some caution. Before proceeding with tax rises in specific products, decisionmakers will have to account for the appropriate elasticities in order to estimate potential impact on consumption and on fiscal yield.

Tenth, it has been implicitly assumed that governments would undertake modest increases in indirect taxation in order to cover part of their funding gap for healthcare. Yet, decisions of this kind should be taken after very careful consideration and based on a needs assessment exercise, particularly around what services should be targeted, where the highest needs are and who the likely beneficiaries are going to be. If additional sources of revenue are delivered by taxing more the less well-off, then there is a legitimate argument for the benefits to accrue proportionately more to weaker socio-economic groups and improve their access to services and care.

Eleventh, as decisions to reduce the fiscal gap in healthcare are likely to be long-term in nature, over the short-term three types of activity can take place: (a) needs assessment exercises can reveal what the most pressing areas of need are in a healthcare system and provide estimates of funding these; (b) priorities can be set that can be fulfilled during a specific timeframe and budget; and (c) a series of pilots can take place that would test the potential of

new interventions; pilots would require additional resources, therefore, smaller scale increases in indirect taxes could be implemented to raise these on the assumption that they remain earmarked. Peru and Paraguay have had some experience in that context.

Finally, it would be unwise not to implement reforms to improve efficient use of resources and could perpetuate wasteful use of resources. Consequently, raising additional revenue through taxation, should be combined with efforts to (a) improve the governance of healthcare systems; (b) reduce inefficiencies in clinical care (e.g. reduce the rate of avoidable clinical adverse incidents); (c) reduce the degree of operational waste. Several potential reforms aimed at improving efficiency in current health systems are possible, including improved access to primary care, value-led approaches to pharmaceutical care, promotion of cost-effective products, improvements in quality of products and services, and streamlining hospital financing mechanisms with focus on prospective payments, among others; and (d) finance and implement robust data collection systems, which would allow decisionmakers to make informed budget allocations and streamline inefficiencies.

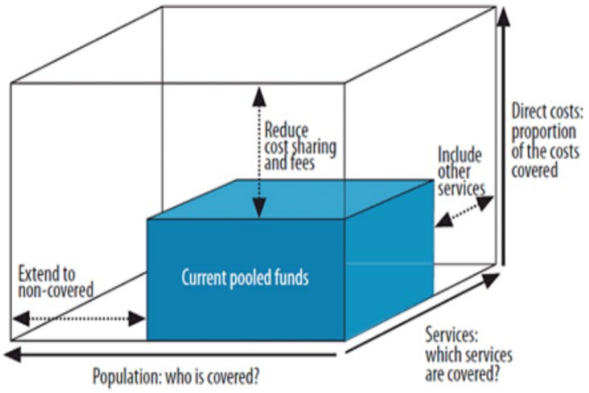
Higher spending does not always improve health, but making the right investments at the right time can.

World Health Organization, 2017

INTRODUCTION

Universal Health Coverage (UHC) is an ambition for health systems to establish a system where everyone can access healthcare services regardless of their ability to pay and while avoiding the incurrence of catastrophic costs. UHC was set out as one of the targets in the 2015 Sustainable Development Goals (SDGs), and as a step towards achieving "the enjoyment of the highest attainable standard of health" which is, according to the 1948 WHO constitution, a basic right for every individual regardless of socioeconomic, religious, political or racial status.

Figure 1: WHO universal health coverage cube



Source: *WHO, 2010*

However, within the goal of achieving UHC, there are concerns about how financial risk protection and access to high-quality healthcare can be achieved for everyone. Figure 1 showcases the WHO UHC 'cube', demonstrating the difference between a country's current coverage position, represented by the smaller blue cube, and the policy aim of UHC, shown by the larger transparent cube (Roberts et al. 2015). To achieve universal coverage, all three factors including services, costs, and population segments should be covered.

Therefore, the gaps identified along the three dimensions of (1) the population covered, (2) the services covered, and (3) the proportion of costs covered, highlight some of the required areas of health system reform.

Achieving UHC thus comes with serious health financing challenges to expand current pooled funds to cover these three dimensions, including issues relating to raising sufficient funds, ensuring protection from financial risks, minimizing inequity, improving efficiency while ensuring accountability and transparency.

In addition, there is a need to ensure the efficient utilization of available funds: the 2010 World Health Report estimated 20 to 40% of health sector resource utilization to be wasteful (WHO, 2010), and recommended efficiency gains as a means to achieve the most within a health system with a restrictive budget (WHO, 2018a).

In addition, many health systems are dependent on out-of-pocket (OOP) payments, which act as a barrier to access healthcare services by creating a link between access to healthcare and financial status. In 2016, health expenditure in OECD countries was growing in line with average economic growth, but with countries facing excessive levels of public debt, particularly after the 2008 financial crisis, several governments have responded with policies attempting to reduce public healthcare spending (Jack, 2013) and increasing OOP payments (Mladovsky et al., 2012).

On the other hand, low and middle-income countries, typically underspend on healthcare (Hopkins, 2010) and face a greater challenge in achieving UHC with regressive health financing systems and high proportions of OOP in several nations in the Latin America and Asia-Pacific regions (Asante et al., 2016). On average, 50% of healthcare funding in low and 30% in middle income countries comes from OOP, compared to 14% in high income countries (Mills, 2014). The challenge in many middle-income countries is more intense as they are transitioning epidemiologically from communicable to non-communicable diseases (NCDs).

Rising healthcare costs and the concept of fiscal space

Many countries are experiencing rising healthcare costs driven by technological advances, resource inefficiencies, income growth, the epidemiological transition from infectious to chronic diseases in lower income countries (Sorenson, 2013; Mercer, 2014) and the disproportionate rise of labour costs compared to productivity growth (Hartwig, 2008). Conversely, current trends, such as population aging, may contribute to a declining revenue for healthcare: while aging may not be a driver for higher healthcare related costs by itself, the declining proportion of active workforce may result in less income generated for the health and social security (pension) systems (Staudinger et al., 2016; Rechel et al., 2009).

Consequently, a country's ability to raise sufficient funds for UHC in light of rising costs is a major challenge. Healthcare financing mechanisms and funding sources, which are equitable and compatible with UHC, are necessary to sustain these rising costs. It is important, especially for middle-income countries, to identify alternative and novel revenue streams, as well as affordable, effective, cost-effective and feasible interventions to include in their benefit packages, to strengthen their healthcare systems to achieve UHC, whilst at the same time ensuring that available resources are spent efficiently.

Considering these challenges and the need for novel funding sources, governments can turn to the concept of *fiscal space*, namely to create the capacity in their (national) budgets that can be used for specific purposes without compromising their financial stability and sustainability (Box 1). Fiscal space is closely linked to UHC, considering the need for new sources of health financing together with the efficient use of available resources by eliminating unnecessary and unproductive expenditures (Doherty et al., 2018).

Fiscal space (Box 1)

Capacity in a government's budget that can be used as a source of funds for a specific purpose without compromising its financial stability or position

(Heller, 2005)

The space between current levels of expenditure and maximum spending abilities

(IMF and World Bank, 2006)

Enhancing the fiscal space through indirect and earmarked taxation without endangering fiscal sustainability

The creation of fiscal space is country- and context-specific, but fiscal space can be generated without attempting to increase the budget surplus of a country (PAHO, 2015), with several mechanisms available to improve spending ability. More often than not, fiscal space and UHC are political rather than technical issues (Clements, 2012; Gupta et al., 2013; PAHO, 2015) and securing political will is key in achieving progress in these areas.

Direct taxation and social health insurance, are not always an immediate solution or politically feasible means to create additional revenue. Although they are desirable from an equity standpoint, there is limited potential to raise additional revenue to cover a meaningful proportion of the fiscal gap from direct taxes (e.g. personal income tax) due to the high level of informal economy which leads to tax evasion and avoidance, and non-monetised transactions in the region. Consequently, a greater reliance is placed on indirect taxes to generate an increase in potentially available resources.

The changing of *indirect taxation* structures has been evaluated across Latin American and Caribbean countries by PAHO, concluding that they present a major potential as a source for the creation of fiscal space in a majority of countries in this region. In particular, PAHO reported that value added tax (VAT) would mostly likely have a greater importance in the creation of fiscal space across the taxation sources reviewed.

Special taxes on sugar, alcohol and tobacco with a target of changing unhealthy behaviour and generating additional revenue earmarked for healthcare have been popular in several countries. Conversely, they have also been argued to have reduced revenue predictability and to cause reactions from industry and other stakeholder interests while their impact on health is still unclear (Briggs et al., 2017; Caro, 2017; Cornelsen, 2015; Wright et al., 2017).

Nevertheless, in a stakeholder preferences survey, Tordrup et al. (2013) found that raising taxes on "harmful" products would be favourable overall, so long as they remain earmarked and are used alongside other policies, such as earmarked health taxation and privatization of parts of the healthcare system, to provide enhanced resource options in most settings.

Report aims and objectives

Over the last decade, Latin American countries have made significant gains in economic and social development. A 2014 Pan American Health Organization (PAHO) strategy set out the goal to provide universal access to and coverage of comprehensive healthcare, with a benchmark 6% of GDP to be spent on healthcare services to support the provision of universal healthcare (PAHO, 2014). Despite these, health systems in the region remain underfunded, characterized by limited resources and delivering fragmented service and coverage. In addition, across the region, significant improvements in reducing vaccine preventable diseases and maternal mortality rates are met with an increased

RESEARCH QUESTIONS

1. **What are the key organizational and financial factors in each healthcare system?**
2. **What is the macroeconomic performance of the study countries?**
3. **How are key financing mechanisms perceived by policymakers in terms of political feasibility and necessity?**
4. **How large is the fiscal space in healthcare spending in the countries?**
5. **How can increases in indirect taxes generate fiscal space for health?**

prevalence of non-communicable diseases (NCDs) and diseases associated with an ageing population. This increasing disease burden has led many Latin American countries to face continuing challenges in securing adequate funding for their health systems.

In light of funding limitations for health across the region, this study aims to analyse whether there is scope to increase public spending on healthcare without compromising the economic and/or financial stability across ten Latin American countries: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Panama, Peru and Uruguay.

The focus of the study will be on identifying sources of finance, in particular, indirect taxation and, specifically, leveraging and earmarking revenue from VAT and taxes on specific products perceived to be harmful in (known as 'sin taxes'). The rationale for selecting *indirect* taxation stems from the limited potential of *direct* taxation to contribute to the creation of fiscal space, which is particularly salient across the geographic scope of the countries, perhaps with the exception of one or two cases. For example, the informal economy comprises 35.5% of GDP on average across the ten study countries and varies from as much as 60% of GDP in Panama to 18.5% of GDP in Chile (Schneider & Williams, 2013). Therefore, if direct tax rates were to be increased, this could lead to significant tax evasion or avoidance. Furthermore, in 2016 indirect and direct tax comprised 9.4% and 12.4% of GDP on average across the ten study countries (OECD, 2018; World Bank, 2018c). This, alongside the reported high levels of informal economy in the region, highlights the higher potential for indirect tax to contribute more significantly to increasing available resources in health compared with direct tax, despite the former being perceived to be regressive in nature.

The specific objectives of this study are the following:

Objective 1: Study the need to broaden the fiscal space in healthcare financing for the Latin American region

Whether countries in the region can leverage or enhance fiscal space to increase health spending depends on various aspects of a country's health, and general economic, system. The study analyses specific aspects of each country's current health system (and other relevant economic indicators) and conducts a (fiscal) gap analysis to determine whether increases in healthcare spending can be accommodated.

Objective 2: Identify existing and potential earmarked or other taxes to support the enhancement of fiscal space without endangering fiscal sustainability

Within the report's analysis and comparison of fiscal space for healthcare in the ten Latin American countries, there is a particular focus on the use of earmarked taxes

(coming from VAT and taxation of products that are considered harmful from a public health perspective[1]) as a mechanism to generate further financial resources for healthcare. The imposition of taxes on harmful products through carefully designed programmes is noted to be a cost-effective way to improve health outcomes and may also be able to generate financial resources for the healthcare system if earmarked for this purpose. In addition, it may provide an answer to PAHO's call to create unique strategies to increase access to healthcare and fiscal space (PAHO, 2014; 2015b). The effectiveness of taxation on harmful products is evaluated to provide a robust discussion on whether it is a potential avenue for contributing to an enhanced fiscal space. In addition, general VAT on all goods and either an increase of existing tax on harmful goods or the introduction of such a tax are modelled and evaluated in their ability to generate new resources for healthcare systems.

Objective 3: Provide benchmark conclusions that could support country-specific public policies

Whether there is potential to increase the fiscal space, and how potential additional resources could be used, within the 10 study countries will be discussed in a series of recommendations. A number of feasibility scenarios will be employed to assess the feasibility of the identified fiscal space (or parts of it) being used to strengthen healthcare finance, organization and delivery of services. The scenarios will consider (a) the prioritization of health against other areas of public finance, (b) allocating the totality of fiscal space to public healthcare services, and (c) improving efficiency in healthcare, and using fiscal space resources to improve quality of services. The report provides conclusions and recommendations for the study countries and the region based on this analysis.

[1] Excise taxes on goods considered detrimental for the health of the population include tobacco products, alcohol, or certain foods or drinks (e.g. those high in sugar content) (WHO, 2004).

Conceptual framework

The conceptual framework used in this report is made up of five key analytical components, which work together to allow for country-specific conclusions and recommendations to follow. Figure 2 details the methods and report outputs across each of the five components.

Figure 2: Conceptual framework

Conceptual framework and analytical aims	**RQ1** Mapping financial and organisational aspects of healthcare systems +	**RQ2** Evaluating macroeconomic performance +	**RQ3** Understanding necessity and political feasibility of key financing mechanisms +	**RQ4** Calculating available fiscal gap in each country, contextualized in macroeconomic trends +	**RQ5** Simulating and assessing the potential yield from increases in VAT and harmful products taxes =	**Benchmarked conclusions and recommendations** for country-specific public policies (Chapter 9)
Methods used	Literature review	Data collection of key variables & indicators	Survey of key sector stakeholders	Data collection & analysis of variables and indicators	Simulation modelling & feasibility assessment	
Findings	Chapter 3	Chapter 4	Chapter 5	Chapter 6	Chapters 7 & 8	

Note: *RQ = research question.*

Chapter 2 outlines the research methodology used for both the primary and secondary data collection, and the subsequent modelling and analysis conducted as part of this study. The remainder of the report is structured along the key research questions in the conceptual framework. Chapter 3 presents an overview of the health systems in the countries included in the study, including a brief description of their health systems' organization and financing structures, key trends and challenges for the region, and a brief analysis of their attainment of UHC principles. This is followed by the results and findings of the study, through the analysis of macroeconomic indicators and trends (Chapter 4), a discussion on the findings of the survey on the necessity and political feasibility of financing mechanisms (Chapter 5), calculations of the existing fiscal gap (Chapter 6) and the potential fiscal yield (Chapter 7), and an assessment of the feasibility of increases in indirect taxes across three scenarios (Chapter 8). Chapter 9 provides conclusions and recommendations based on the findings discussed in preceding sections.

METHODS

In order to address the aims and objectives set out in the previous section we conducted primary and secondary data collection. The resulting data was used to conduct simulations on the impact of modest-to-moderate increases in indirect taxation (both VAT and taxes on harmful products) on raising additional resources for healthcare. This section outlines the methods used for the primary and secondary data collection, and the analysis performed.

Study countries

Our study focused on 10 Latin American countries (Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Panama, Peru, and Uruguay), which represent just under 80% of the total Latin American population.

Whilst the key criterion for inclusion as a study country was geographical, the ten countries vary in terms of their macroeconomic setting and their current investment in health. Most of the countries are classified as upper middle income, except Argentina, Chile and Uruguay which are high-income countries. GDP per capita ranges from US$5,195 (constant 2010 US$) in Ecuador to US$15,019 in Chile.

In order to have a degree of comparability for our results and benchmark with other settings we included France, the United Kingdom (UK) and Spain as 'comparator' countries. The three comparator countries have well-developed healthcare systems, subscribe to universal health coverage principles, fund healthcare mainly through general taxation and social insurance contributions, spend between 9.2% to 11.1% of GDP on health and are macroeconomically stable.

There is also additional contribution from private insurance (albeit modest) and out of pocket payments. In addition, there is evidence of the use of taxation on harmful goods in the form of taxes on alcohol, tobacco and sugar in all three countries.

Secondary data collection

Variables

We performed a trend analysis in order to capture elements of the study countries' performance in terms of key areas of economic activity, including the macroeconomic performance, fiscal status, healthcare expenditure and key health indicators, and expenditure on and significance of other human services, such as pensions/social security, education and defence. Data was sourced for each of the ten study countries, plus the three EU comparators (the UK, France and Spain) for a collection of 80 indicators (see Appendix 1) thought to be relevant to the issues under investigation which are grouped into five thematic areas (see box below).

In order to ensure comparability across countries, data reported by key international organizations (the World Bank, the Organization for Economic Co-Operation and Development (OECD), the International Monetary Fund (IMF), the Inter-American Development Bank (IADB), the World Health Organization (WHO), the Pan-American Health Organization (PAHO) and UNICEF were used. Where available data was collected for each indicator and each country with yearly time points from 1997 up to (and including) 2017, where possible. Part of the data we sought to identify related to the identification of (a) indirect tax rates (including taxes on harmful goods) in the study countries and (b) receipts/revenues from indirect taxes in local currency and US$. Data reported by international organizations contributed to the latter, but in order to identify individual country and product tax rates, we explored grey literature, accessed study country government websites and contacted experts on the subject. VAT was the indirect tax we benchmarked against, while taxes on tobacco (cigarettes, cigars, and loose tobacco), alcohol (beer, wine and spirits), and sugar were identified as the most relevant harmful product taxes in this context.

Thematic areas for data collection

- Demographics and disease prevalence
- Macroeconomic environment and policies, including macroeconomic performance, fiscal balance[2], tax revenue from various sources (direct and indirect)
- Health system variables, including financing, insurance and performance indicators
- Health indicators, including life expectancy and key causes of mortality
- Expenditure on and importance of other human services (pensions/social security, education, defence)

[2] From a fiscal standpoint, subsidies to producers of goods and services are included in the general outlays.

Indicator data was subsequently used to conduct trend analysis as well as calculate the fiscal gap and assist in the simulation analysis that informed the modelling exercise seeking to identify the extent of generating additional sources from increases in indirect taxation to fund healthcare services. These are explored in the sections below.

Literature review

A comprehensive literature review was conducted to build a framework for researching indirect taxes and, specifically, VAT and taxes on harmful goods in the study countries. The overall aim was to identify how such taxes affect consumption, revenue and health and provide a further understanding of the fiscal space for healthcare expenditure.

An extensive search using available databases, such as PubMed and Proquest, was carried out. Multiple preliminary searches were conducted to optimise results. The key terms used in the finalised search strategy include 'healthcare financing', 'sin taxes', 'earmarked taxation', 'alcohol taxation', 'tobacco taxation', 'sugar taxation'. All terms were searched by each country and by including "AND Latin America". A combination of these keywords were used with the addition of "and/or" terms. The protocol and endpoints for the comprehensive literature review are described in Appendix 2.

Primary data collection

In order to determine preferences of healthcare stakeholders, an international survey seeking broad stakeholder opinions was carried out. Among others, the survey canvassed stakeholders' level of agreement or disagreement with a series of statements underpinning policy options for ensuring the financial sustainability of health systems, with a focus on the role of VAT and taxes on harmful goods. The survey explored healthcare financing options and their desirability and feasibility, for example: (a) increasing the revenue base for health services by increasing taxes on personal income, corporate income or consumption; (b) leveraging the potential of taxes on harmful goods, supplemented with other sources of finance, as a method of increasing tax revenue and earmarking it for the purposes of health service provision; (c) reducing the cost of services provided by restricting the scope of coverage or restricting the uptake of new and expensive technologies; (d) implementing market-based mechanisms, including an increased role for private insurance, increased user charges or privatisation of parts of the system itself; (e) re-allocation from other areas of public spending; or (f) implementation of preventive services or support for individuals to lead more healthy lifestyles.

Analysis

Trend analysis

A trend analysis was conducted to answer the first research question: What are the key organizational and financial factors in each healthcare system? Using the data captured on multiple indicators we performed a trend analysis across four areas of interest: (a) Basic macroeconomic indicators; (b) Healthcare financing; (c) Healthcare spending; and (d) Taxation and fiscal priorities (including the importance of education, pensions and social security, and defence, in addition to health). For each of the ten study countries and the three EU comparators we looked at three key time points for a number of indicators.

Survey analysis

The survey conducted as part of the primary data collection was analysed to provide insights into the second research question: How are key financing mechanisms perceived by policymakers in terms of political feasibility and necessity?

Fiscal gap in healthcare analysis

Analysis on the fiscal gap in healthcare for each country was conducted to address the third research question: How large is the fiscal space in healthcare spending in the study countries? In order to analyse any gaps in healthcare funding the fiscal gap in healthcare spending was calculated, by comparing *current* public health expenditure in each of the study countries against the 2014 PAHO strategy goal of 6% of GDP. Where the target of 6% on GDP was achieved in any of the study countries, we looked to a more ambitious benchmark target of the average public health expenditure (% GDP) in the three comparator countries (France, UK and Spain).

In order to calculate the fiscal gap in healthcare spending as the distance between current and acceptable levels of public health expenditure based on the above assumptions, we have used three different indicators: (a) the shortfall in public healthcare financing as a percent of GDP, (b) the shortfall in public healthcare financing in monetary terms, and (c) the cost of increasing public healthcare financing to fill this fiscal gap.

Shortfall in public healthcare financing

Using publicly available data we calculated the difference between the public health spend (% GDP) and the PAHO benchmark goal of 6% GDP for Argentina, Brazil, Chile, Colombia, Ecuador, Panama, Peru, and Mexico. We also calculated the average comparator country (France, Spain, and the UK) public spend on healthcare which was then represented as a proportion of GDP. The difference between this value and the equivalent value for Costa Rica and Ecuador, countries with public health spend already exceeding the PAHO 6% benchmark, was then calculated. The resulting fiscal gap was initially calculated

in percent GDP units before being transformed to US$ (in current PPP) using information on the value of GDP for the years in question for each of the study countries.

Cost of increasing public healthcare financing

Using publicly available data on GDP for each country we calculated the additional funding required to increase public healthcare financing to fill the fiscal gap. These additional simulated resources were represented in US$ (in current PPP).

Impact of increases in indirect taxes and taxes on harmful goods: simulation analysis

Simulations of increases in indirect taxes (VAT and harmful goods) were run to address the fourth research question: How can increases in existing or implementation of new VAT or taxes on harmful goods fill the fiscal space?

Modelling the Effect of Changes in VAT

We analysed the impact of indirect tax changes on the expected fiscal revenue in the study and comparator countries.

Our model focused on indirect taxes due to the limited potential for the ten study countries to raise additional revenue to cover a meaningful proportion of the fiscal gap from direct taxes (e.g. personal income tax) as a result of the high level of informal economy and non-monetised transactions in the region. For example, the informal economy comprises 35.5% of GDP on average across the ten study countries and ranges from as much as 60% of GDP in Panama to 18.5% of GDP in Chile (Schneider and Williams, 2013). Therefore, if direct tax rates were to be increased, this could lead to significant tax evasion or avoidance. Furthermore, in 2016 indirect and direct tax comprised 9.4% and 12.4% of GDP on average across the ten study countries (OECD, 2018; World Bank, 2018c). This, alongside the reported high levels of informal economy in the region, helps justify the choice of indirect taxes to contribute more meaningfully to raising additional resources to be used to fund healthcare services.

We modelled five distinct VAT scenarios for study and comparator countries, to assess across the scenarios, the impact of increasing VAT rates on additional resources raised. We calculated the fiscal yield of a–one percentage point increase in the standard VAT rate (scenarios 1 to 4), and a one percentage point increase in the standard and non-standard VAT rate(s) (scenario 5). The five scenarios included in this simulation exercise incorporated distinct weightings to alter the contribution to revenue of standard and non-standard VAT rated goods and services (see Table 1). It also included price elasticity of demand (PED) to account for (a) zero impact on consumption and (b) non-zero impact on consumption resulting from the

goods/services price increase due to increased VAT rates.

Our model uses a combination of inputs from publicly available information, and estimates based on publicly available information. Table 1 below shows inputs to the model and the associated sources for the inputs included in our analysis. A detailed account of the scenarios pursued, the choice of price elasticity of demand and the assumptions underpinning our model are provided in Appendix 3.

Table 1: Scenario Inputs for VAT Modelling

	Price elasticity of demand[1]		Standard VAT		Non-standard VAT	
	Zero impact	*Some impact[2]*	*Rate increase /(decrease)[3]*	*Receipt weighting[4,5]*	*Rate increase /(decrease)[3]*	*Receipt weighting[4,5]*
SCENARIO 1	0	Study countries: -0.09 to -0.58 Comparator countries: -0.10 to -0.74	+ 1% point	99%	unchanged	1%
SCENARIO 2	0		+ 1% point	80%	unchanged	20%
SCENARIO 3	0		+ 1% point	75%	unchanged	25%
SCENARIO 4	0		+ 1% point	60%	-	40%
SCENARIO 5	0		+ 1% point	60%	one percentage point	40%

Notes:

[1] The impact on demand of increasing or decreasing VAT rates

[2] We used PEDs identified in our research to form a separate PED range for each of the country groupings. The same PED range was used for all the countries in a grouping. The range presented is made up of PED lower bound and PED upper bound.

[3] Percentage point adjustment to the current VAT rate (for either standard or non-standard rates)

[4] Weighting of the total VAT revenue attributable to standard or non-standard VAT rates

[5] If non-standard VAT rate is 0% or there is only one VAT rate for a country, then weighting is 100% for standard VAT rate in all scenarios

***Sources**: Authors' compilations from different sources including Huang et al., 2015; Almendarez-Hernández, 2013; Selvanathan and Selvanathan, 1994; Bouamra-Mechemache et al., 2008*

Modelling the Effect of Changes in Taxes on Harmful Goods

The harmful goods tax modelling was undertaken to assess how increases in these taxes could affect the fiscal yield in the countries of interest. The taxes examined in this model were those on alcohol and tobacco. We excluded sugar and 'fat' taxes because a paucity of data made their simulation infeasible, and unlike alcohol and tobacco which are universally accepted as harmful goods, countries vary in their acceptance of other goods as harmful. The tax fluctuations on harmful products that are modelled relate to the consumption taxes directly on the products and exclude VAT, which was included in the indirect tax simulation discussed in the previous section.

To arrive at macro-level effects of changes in tax policy, macro-data modelling was undertaken. We used the most recent tax revenue data from the OECD for the given taxed goods and modelled the increase in revenue if the established excise taxes were to increase by five percentage points, which constituted a modest increase in taxation. Tax data was further separated for alcohol products (beer, wine and spirits) and tobacco products (cigarettes, cigars and loose tobacco) due to the different levels of taxation among these products. We used tax data pertaining to a standard packet of cigarettes, standard bottle of wine, beer and spirits respectively.

Similar to the VAT modelling, the model on harmful goods assumed two scenarios; the first assumed a perfectly inelastic demand (i.e. a price elasticity of demand (PED) equal to zero), while the second, assumed non-zero PED and used the PEDs in Table 2. Scenario 1 modelled tax revenues according to a 5-percentage point increase in product-specific tax, respectively, with a PED of 0; Scenario 2 increased tax identically, but with a country-specific PED applied. Appendix 4 discusses the process followed in the macro-data modelling, the relevant calculations, the assumptions made and the limitations.

Table 2: Scenario inputs relating to harmful product tax modelling

	Scenario 1	Scenario 2				
	Price elasticity of demand (inelastic demand)	*Price Elasticity of Demand for Beer[1]*	*Price Elasticity of Demand for Wine[1]*	*Price Elasticity of Demand for Spirits[1]*	*Price Elasticity of Demand for Tobacco (Mostly Cigarettes)[2]*	*Price Elasticity of Demand for Sugar[3]*
ARGENTINA	0	-0.29	-0.46	-0.54	-0.15	-1.37
BRAZIL	0	-0.29	-0.46	-0.54	-0.27	-1.25
CHILE	0	-0.29	-0.46	-0.54	-0.22	-1.37
COLOMBIA	0	-0.29	-0.46	-0.54	-0.78	-1.25
COSTA RICA	0	-0.29	-0.46	-0.54	-0.27	-1.25
ECUADOR	0	-0.29	-0.46	-0.54	-0.87	-1.25
MEXICO	0	-0.29	-0.46	-0.54	-0.14	-1.25
PANAMA	0	-0.29	-0.46	-0.54	-0.34	-1.37
PERU	0	-0.29	-0.46	-0.54	-0.7	-1.25
URUGUAY	0	-0.29	-0.46	-0.54	-0.34	-1.37
FRANCE[4]	0	-0.29	-0.46	-0.54	-0.56	-0.9
SPAIN[4]	0	-0.29	-0.46	-0.54	-0.56	-0.9
UK[4]	0	-0.29	-0.46	-0.54	-0.56	-0.9

Notes: *[1] The same PED will be used for all countries (UK PED data). This is due to limited robust information from the other countries*

[2] Costa Rica had no recorded PED for tobacco, so Brazilian PED was used, as it is the closest in terms of GDP per capita

[3] PEDs used for the region are based on either Chilean or Ecuadorian data found, allocated based on which one they are closer to in GDP per capita

[4] All data for the comparator countries are obtained from UK data as it was the most robust and plentiful in the literature

Sources*: Beer, wine and spirits (Nelson, 2013); Tobacco PED (Argentina, Brazil, Chile, Mexico and Uruguay (Maldonado et al., 2016); Peru (Gonzalez-Rozada & Ramos-Carbajales, 2016); UK (Reed & Langely, 2013); Sugar PED (Chile (Guerrero-López et al., 2017; Ecuador (Paraje, 2016); UK (Andreyeva, Long & Brownell, 2010))*

WHAT ARE THE KEY ORGANIZATIONAL AND FINANCIAL FACTORS IN LATIN AMERICAN HEALTHCARE SYSTEMS?

Key challenges

In general, the region faces challenges such as large informal economies, unequal access and distribution of health services, and high out-of-pocket (OOP) expenditure. The large, informal economies make it difficult to finance healthcare via taxation. Many of the countries in the region (for example Colombia and Peru) struggle to fund their health system leading to quality issues and access problems.

There tends to be a focus on indirect taxation within the region, in contrast to the European comparators that are primarily focused on direct taxation, due to a higher proportion of informal economy (the informal economy accounts for over a third of the value of GDP in the study countries, in contrast to just over ten per cent in the European comparator countries). There are large socioeconomic inequities and regional disparities between the rural areas and cities within many of the countries.

Investment in health varies significantly in the study countries. Uruguay spends the highest proportion of its GDP on health (9.2%) while Peru spends only 5.2%. Public spend on health tends to be lower than the 6% recommended by WHO for UHC systems, although over the last decade the proportion of public money spent on health has increased.

High OOP payments, specifically for medicines, are a characteristic of many of the study countries. In 2015 OOP accounted for almost a third of total spend on health across the ten countries, with specific figures ranging from 16.2% in Uruguay to 43.7% in Ecuador (World Bank, 2018d; World Bank, 2018e). The equivalent figure in the three EU comparator countries ranges from 6.8% in France to 24.2% in Spain.

Health expenditure

Table 3 provides an overview of total health expenditure, public and private health expenditure, out-of-pocket expenditure, and the percentage of total health expenditure spent on drugs, while Figure 3 presents data on total health expenditure as a proportion of GDP over a ten-year period between (2005-2015).

Table 3: Health Expenditure in Latin America, France, Spain and the UK, 2015

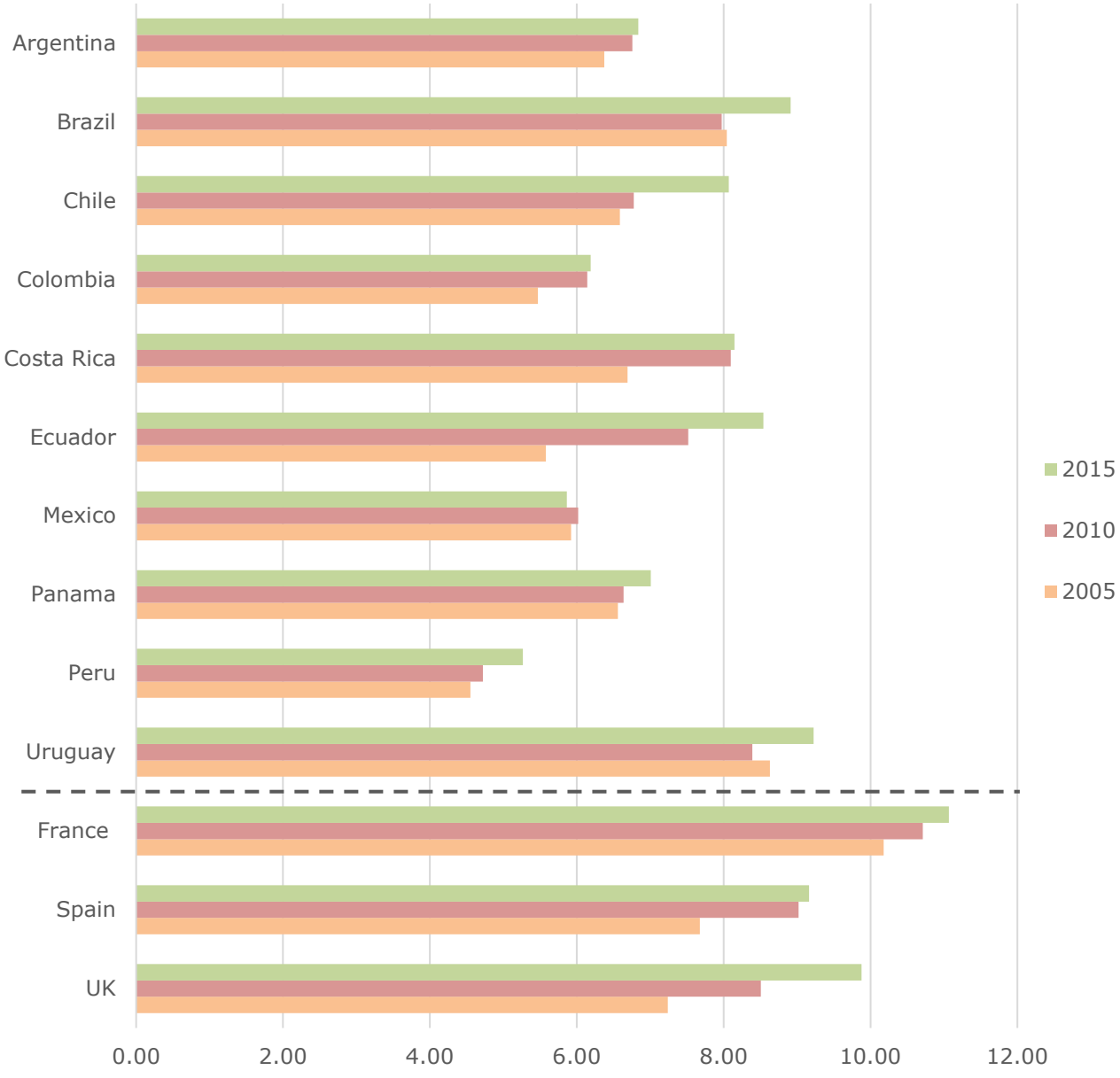
	Health expenditure *% GDP (2015)*	Health expenditure per capita, PPP *current international $ (2015)*	Public health expenditure *% current health expenditure (2015)*	Private health expenditure *% current health expenditure (2015)*	Out-of-pocket expenditure *% current health expenditure (2015)*	External health expenditure *% current health expenditure (2015)*	Drug expenditure *% THE (2016)*
ARGENTINA	6.84	1,389.8	71.42	10.38	17.63	0.58	23.5
BRAZIL	8.91	1,391.5	42.75	28.22	28.29	0.73	13.9
CHILE	8.07	1,903.1	60.78	6.98	32.24	0.00	17.0
COLOMBIA	6.19	852.8	66.78	10.92	18.29	4.01	13.9
COSTA RICA	8.15	1,286.5	75.97	2.53	21.49	0.01	16.9
ECUADOR	8.54	980.2	49.67	6.23	43.71	0.40	16.3
MEXICO	5.86	1,008.7	52.17	6.46	41.37	N/A	15.2
PANAMA	7.01	1,542.8	61.58	6.84	30.52	1.06	16.4
PERU	5.27	671.0	61.70	6.91	30.92	0.48	14.5
URUGUAY	9.22	1,747.8	69.82	13.90	16.19	0.09	N/A
FRANCE	11.07	4,542.3	78.92	14.28	6.80	0.00	13.9
SPAIN	9.17	3,182.5	71.03	4.74	24.23	0.00	27.1
UK	9.88	4,144.6	80.35	4.84	14.79	0.01	20.9

Note: *Private health (% current health expenditure) was calculated by subtracting out-of-pocket expenditure (% current health expenditure) from private health expenditure (% current health expenditure) data per the World Bank.*

Sources: *All data from World Bank except drug expenditure (% THE). Drug expenditure (% THE) taken from: Argentina (BMI, 2018a), Brazil (BMI, 2018b), Chile (BMI, 2018c), Colombia (BMI, 2018d), Costa Rica (BMI, 2018e), Ecuador (BMI, 2018f), Mexico (BMI, 2018g), Panama (BMI, 2018h), Peru (BMI, 2018i), France (BMI, 2018j), Spain (BMI, 2018k), and UK (BMI, 2018l).*

Total health expenditure as a proportion of GDP has consistently increased in multiple Latin American countries (Argentina, Chile, Colombia, Costa Rica, Ecuador, Panama, and Peru), comparable to the trends observed in the comparator countries. There was a slight increase in expenditure in Mexico between 2005 and 2010, but the health expenditure declined in 2015. Despite Uruguay experiencing a decrease in health spend in 2010, it experienced a large increase in total health spend as a proportion of GDP and increased expenditure in 2015, with the greatest expenditure in the Latin America countries.

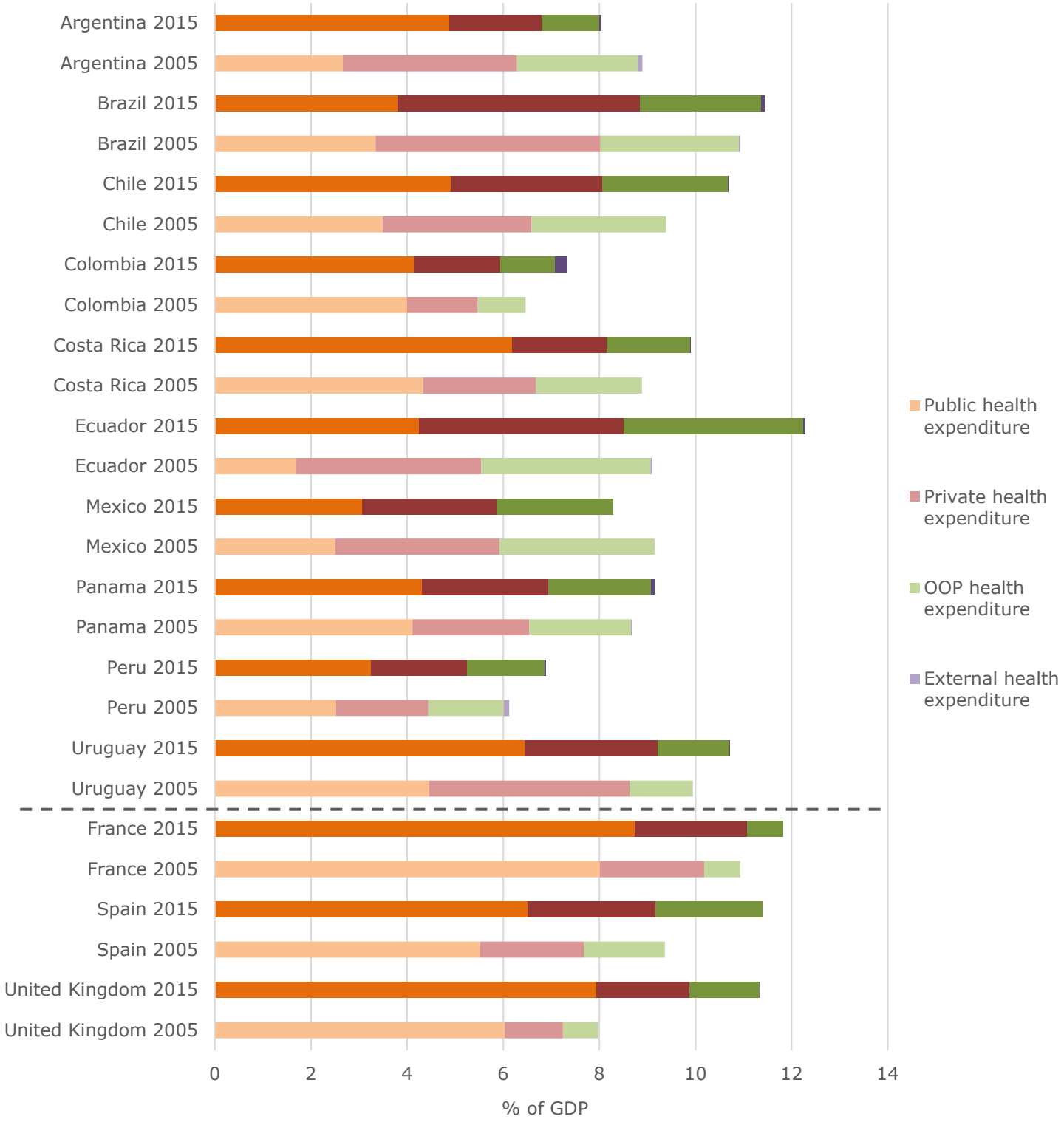
Figure 3: Total Health Expenditure (% GDP)



***Source**: LSE, based on World Bank, 2018d data.*

Figure 4 presents a breakdown of health expenditure as a percentage of GDP across public, private, out of pocket (OOP), and external expenditure.

Figure 4: Breakdown of Health Expenditure (% GDP) 2005 - 2015



***Source**: LSE, based on (World Bank, 2018e, 2018f, 2018g, 2018h) data.*

Between 2005 and 2015, public health expenditure as a proportion of GDP increased in all countries. Ecuador experienced the largest increase in public health expenditure. Nonetheless, only Uruguay and Costa Rica achieved the PAHO recommendation of spending 6% of GDP on public health expenditure for a universal healthcare system. During the same period, private health expenditure increased in all countries besides Argentina, Costa Rica, Mexico, and Uruguay. Argentina, Costa Rica, and Uruguay were among the top four study countries which experienced the largest increases in public health expenditure during this 10-year period. This indicates a negative relationship between public and private health expenditure as a proportion of GDP.

Out-of-pocket health expenditure increased in Colombia, Ecuador, Panama, Peru and Uruguay, along with the comparator countries between 2005 and 2015. Over this 10-year period, Argentina experienced the largest decrease in out-of-pocket health expenditure, followed by Mexico, Costa Rica, Brazil, and Chile.

External health expenditure accounts for the smallest proportion of GDP across all countries. Between 2005 and 2015, external health expenditure increased for all countries besides Argentina, Costa Rica, and Peru. Nonetheless, external health expenditure remains negligible across all countries as a proportion of GDP during this 10-year period.

Health systems in the study countries

This section provides an overview of the main features of the health systems in each of the study countries. Table 4 provides a detailed overview of these characteristics.

Table 4: Health Systems in Study Countries

	Healthcare providers	Financing mechanisms	Beneficiaries & coverage
ARGENTINA	Public	Government funding through general taxation and federal budget (non-contributory)	Beneficiaries: free for all, but primarily covers uninsured poor, informal workers and unemployed
	Obras Sociales (OS)	Employer/employee contributions (3% and 5% of payroll, respectively)	Beneficiaries: social health insurance for independent workers and formal sector employees Population coverage: 42%
	Prepay Private Insurance (EMP)	Voluntary contributions for supplementary coverage	Population coverage: 8%
	Comprehensive Medical Assistance Program (PAMI)	Employer/employee contributory coverage (affiliated with OS)	Beneficiaries: pensioners and retirees Population coverage: 11%
BRAZIL	Sistema Único de Saúde (SUS)	Federal, State and Municipal bodies' contributions	Beneficiaries: Available to all Brazilians without user fees, co-payments or financial contributions
	Private health insurance	Monthly fees for voluntary-based healthcare plans, insurance premiums and OOP payments	Beneficiaries: Urban workers Population coverage: 77.5%
CHILE	Fondo Nacional de Salud (FONASA)	Mandatory contributions (7% of monthly income or pension); Federal funding	Beneficiaries: Indigenous people (Group A, receives free coverage), Very low income (Group B), Lower-middle income (Group C), and Higher-middle income (Group D)
	Instituciones de Salud Provisional (ISAPRE)	Mandatory contributions (7% of monthly income from FONASA in addition to premiums established by each ISAPRE)	Beneficiaries: Voluntary affiliates; Independent workers with no social security benefits
COLOMBIA	Contributory Health Insurance Scheme (Régimen Contributivo)	Earmarked payroll taxes (12.5% of workers' income)	Beneficiaries: Workers with the capacity to pay
	Subsidized Health Insurance Scheme (Régimen Subsidiado)	Government funding	Beneficiaries: Poor residents who lack the capacity to pay
	Private insurance	-	Population coverage: c.1m who can afford private insurance

COSTA RICA	Caja Costarricense de Seguro Social (CCSS)	Employer/employee/retiree contributions (90% of funding; independent workers contribute depending on their salary); Government contribution (0.5%); Non-contributory system and no co-payments for the poor	Beneficiaries: Offers complete universal coverage (formal sector workers, independent workers, the poor)
	National Insurance Institute (INS)	Private insurance owned by the government (cost between US$60-130 per month per person depending on plan, age, gender, etc.)	Beneficiaries: voluntary registration Employers: employers must assume the cost of the Seguro Obligatorio por Riesgos del Trabajo
ECUADOR	Ministry of Public Health (MSP)	State budget; Extra budgetary reserves; Contingency and emergency funds; International and national schemes and arrangements	Beneficiaries: services offered to the entire population Population coverage: c.51%
	Ministry of Economic and Social Inclusion (MIES)	-	Beneficiaries: uninsured population
	Ecuadorian Social Security Institute (IESS) (including the Seguro Social Campesino (SSC))	Employee/employer contributions; Government contributions	*IESS:* Beneficiaries: workers in the formal sector of the economy, primarily urban employees and rural farmers); Population coverage: 20% *SSC:* Beneficiaries: the rural poor, overlapping with the Ministry of Health rural services; Population coverage: 0.9 million people
	Armed Forces Social Security Institute (ISSFA)	Employee/employer/retiree contributions; Government contributions	Beneficiaries: Members of the armed forces and their families Population coverage: 5% (together with ISSPOL)
	National Police Social Security Institute (ISSPOL)	Employer contributions; Government contributions	Beneficiaries: Members of the police and their families Population coverage: 5% (together with ISSFA)
	Private services	Prepaid medical insurance premiums	Beneficiaries: upper middle class and the rich Population coverage: 3%
MEXICO*	Social Security (SS)	Employee/employer payroll contributions; Federal government contributions; Fixed annual fee from independent workers	Beneficiaries: Formal sector workers and their dependents; Independent workers

	Social Protection System in Health (SPSS)	Co-financed through federal and state level general government revenues; Non-indigent beneficiaries are meant to (but rarely) pay contributions through premiums	Beneficiaries: Open to anyone not covered by SS schemes (where enrolment is required)
PANAMA	Social Security Fund (CSS)	Salaried employees and employers' contributions	Beneficiaries: Salaried employees and dependents Population coverage: 84.4%
	MINSA	General revenues	Beneficiaries: Theoretically covers those not covered by CSS; Available to all Panamanians Population coverage: 47%
	Private health insurance	OOP payments or private health insurance premiums	Beneficiaries: Individual households or employers who provide private insurance Population coverage: 6%
PERU*	Seguro Social de Salud (EsSalud)	Mandatory employer and retiree contributions; Ministry of Health contributions; Voluntary for independent workers financed by their contributions	Beneficiaries: Salaried formal sector employees, retirees and their families (Does not include self-employed or informal workers) Population coverage: 30%
	Integral Health Insurance (SIS)	Ministry of Health and DIRESA budgets and contributions; Premiums paid by business owners, partially subsidised by the national government	Beneficiaries: Fully subsidised SIS for Peruvians who do not have health insurance due to poverty; Partially subsidised as a voluntary plan for independent workers and dependents, and for business owners and their employees Population coverage: 60%
	Armed Forces (FFAA)	-	Population coverage: 10% (joint with PNP and private sector)
	National Police (PNP)	-	Population coverage: 10% (joint with FFAA and private sector)
	Private health insurance	-	Population coverage: 10% (joint with PNP and FFAA)
URUGUAY	Fondo Nacional de Salud (FONASA)	Taxes, contributions to social security and service tariffs	Population coverage: 73%

	Private health insurance	OOP expenses	Beneficiaries: those who have voluntary or private providers
FRANCE	Statutory health insurance (SHI)	Employee/employer payroll contributions (50%); National earmarked income tax (35%); Taxes levied on tobacco and alcohol, the pharmaceutical industry and voluntary health insurance companies (13%); State subsidies (2%)	Beneficiaries: Employees and dependents; Voluntary opting-in for those with low income and unemployed Population coverage: 99.9%
	Private voluntary health insurance	Mainly through not-for-profit, employment based mutual associations or provident institutions	Population coverage: over 90%
SPAIN	Spanish national health system (SNS)	General taxation	Beneficiaries: Universal coverage for Spanish citizens
	Private voluntary insurance	OOP expenditure (primarily co-payments for prescription drugs)	Population coverage: c.13%
UK	National Health System (NHS)	General taxation; Private medical insurance and OOP payments	Beneficiaries: universal coverage
	Private voluntary health insurance	Premiums based on the scope of coverage	Beneficiaries: Purchased on an individual basis or through employer-based private medical insurance Population coverage: 11%

***Notes**: * For brevity, only the main health insurance systems were described.*

- = No information found

***Sources**: Argentina (Knaul et al., 2012; World Bank, 2014; PAMI, 2018); Brazil (World Bank, 2014a); Chile (Knaul et al., 2012; World Bank, 2014b); Colombia (Knaul et al., 2012; World Bank, 2014c); Costa Rica (Del Rocío Sáenz et al., 2011; PAHO, 2017g; INS, n.d.); Ecuador (Durán et al., 2017; De Paepe et al., 2012; Lucio et al., 2011; PAHO, 2008, 2017e); Mexico (World Bank, 2014d); Panama (PAHO, 2017d); Peru (Knaul et al., 2012; Ministry of Health Peru, 2018; OECD, 2017a; World Bank, 2014e, 2018c); Uruguay (PAHO, 2007, 2017c); France (Chevreul et al., 2015; Durand-Zaleski, 2008); Spain (Garcia et al., 2010); UK (Cylus et al., 2015).*

Argentina

Argentina's health system has several broad coverage regimes which are separate from each other as well as internally fragmented (Knaul et al., 2012). There is a public system which is free for all, Obras Sociales (OS) providing coverage in a mandatory contributory social health insurance scheme, supplementary private insurance scheme (EMP) and the Comprehensive Medical Assistance Program (PAMI) (World Bank, 2014). The public sector is non-contributory and covers the uninsured, but Argentines with contributory insurance also utilise public facilities at times.

Employees and their employers make mandatory payroll contributions for OS (5% and 3% of wages, respectively), despite beneficiaries primarily utilising private facilities. PAMI comprises of contributory health coverage for retirees and pensioners and their families affiliated with OS. Services are free of charge at public facilities and some private facilities (World Bank, 2014).

Public health coverage is financed through general taxation, mainly through the federal budget. OS, excluding PAMI, is funded by mandatory employee and employer contributions, while there are also fixed voluntary monthly payments for independent workers which varies based on income. PAMI is financed through employee and employer contributions. Private insurance is funded through prepaid premiums of beneficiaries and/or their employers (World Bank, 2014).

Brazil

The Sistema Único da Saúde (SUS) is the national public health insurance system in Brazil. All three levels of government (Federal, State, and Municipal) are legislated to minimum financial contributions for health from their tax revenues and social contributions (World Bank, 2014a). The Federal, State and Municipal governments are required to contribute 6-7%, 12% and 15% of gross tax revenues, respectively.

Brazil's health system is highly decentralised, resulting in a complex financial flow from higher to lower levels of government and from all levels of government directly to public and private health facilities (World Bank, 2014a). Primary, secondary and tertiary medical care are all funded by federal transfers. Services under the public SUS system are available to all Brazilians without user fees co-payments or financial contributions, except for the People's Pharmacy Program where co-payments are necessary.

The private supply of health services is permitted with or without the intermediation of health plans or health insurance companies. There also may or may not be a contractual relationship with SUS, which purchases the services of private providers. In 2008, of the 49.2 million people that were covered by least one healthcare plan, 77.5% were covered

by insurance plans of private companies and 22.5% to insurance plans for public servants (Knaul et al., 2012).

Chile

The Chilean health system is separated into two principal agents, a single non-profit public insurer and for-profit called Fondo Nacional de Salud (FONASA) and non-profit private health insurance institutions known as Instituciones de Salud Provisional (ISAPRE). FONASA is required by law to buy the majority of its services from public providers, who are then required to sell the majority of their services to FONASA. However, FONASA beneficiaries are able to receive care from the private sector, with high incurring co-payments. ISAPRE beneficiaries can receive care in the private or public sector, by making co-payments proportional to the total cost of care up to certain coverage ceilings.

All dependent workers, retirees and independent workers receiving social security benefits are required to register for mandatory health insurance, contributing 7% of their monthly income or pension (to a maximum of US$140) (World Bank, 2014b). They can choose to be covered by FONASA or ISAPRE, however, those who choose ISAPREs have to make the same 7% payroll contribution for FONASA plus an additional premium established by each ISAPRE (World Bank, 2014b). Independent workers with no social security benefits may voluntarily affiliate with any of the ISAPREs. The right to free coverage is financed by FONASA through FONASA Group A for unemployed people and indigents.

Mandatory insurance covers 91% of the total population. Seventy-six percent of the population is covered by FONASA; 17% is covered by ISAPRE; 7% belongs to other insurance schemes provided by other institutions such as the armed forces and universities (World Bank, 2014b).

Colombia

All Colombian citizens have access to a basic health service package and the right to choose private or public insurance provider. People with the capacity to pay (CTP) are affiliated to the Contributory Health Insurance Scheme (Régimen Contributivo), and are registered with one of 40 Health Promoting Entities (Entidades Promotoras de Salud, EPS) (Knaul et al., 2012). This is mainly financed through earmarked payroll taxes pooled by the federal government (World Bank, 2014c). Those with EPS have to pay 12.5% of the worker's income each month. The beneficiary and dependents then receive an integral health service package known as the Compulsory Health Plan (Plan Obligatorio de Salud). In this plan, the contribution depends on the individual's CTP and not on the level of risk they are insured for. Beneficiaries can purchase additional health insurance in the form of a complementary package, a drug prepayment package or a health insurance policy.

Those who lack the CTP are covered by the Subsidized Health Insurance Scheme (Régimen Subsidiado), and may register freely with any of the EPS that operate under the subsidized scheme. The cost of the basic benefits package is covered by the government. EPSs receive capitation payments from municipalities which are financed by funds pooled at the municipal level consisting of revenues from general and earmarked taxes, and cross-subsidies from the national solidarity fund. Approximately 49% of these costs were financed by transfers from the central government treasury, 24% by the solidarity fund financed mostly through a solidarity payroll tax contribution (1.5% of payroll), and the rest mainly by territorial (departmental and municipal) health sources (Knaul et al., 2012).

Costa Rica

In Costa Rica, the Caja Costarricense de Seguro Social (CCSS) is the regulator of the public health system and aims to offer complete universal coverage, expanding both financially and geographically (Del Rocío Sáenz et al., 2011). Health coverage is through prepaid mechanisms and 90% of the population is insured. For the poor, there is a non-contributory system of protection in health and there are no co-payments in the public health insurance system (including the cost of prescriptions, which are free to all patients). The health system is organised into three service networks, each led by a tertiary level hospital.

Finances for CCSS come from employers, workers and the State. Ninety percent of contributions are from insured beneficiaries and employer/employee contributions; 22.9% comes from the insured's salary, 14.2% is provided by the employer, 8.25% is provided by the employee and 0.5% is provided by the State. Voluntary insured and independent workers' contributions depend on the income. Those making more than US$885 contribute 13.5% of the salary and those making less contribute 10.5%, with 0.25% from the State. There are no co-payments (PAHO, 2017g). Private insurance is available through the National Insurance Institute (INS), which is a government owned insurance company.

Ecuador

The main institutes of healthcare services are the Ministry of Public Health and the Ecuadorian Social Security Institute (IESS) (Duran et al., 2017). The public health expenditure is less than 50% of national healthcare costs (PAHO, 2012). The majority of payments in the private sector are out-of-pocket, while some correspond to voluntary prepaid insurance schemes, covering 5% of the population.

IESS covers workers in the formal sector of the economy, focused mostly on urban employees and rural farmers. IESS insures approximately 20% of the population. The poor are served by the Ministry of Health (MoH) and the formally employed by the IESS, while the upper middle class and the rich use private services (De Paepe, 2012).

The rural social security system (SSC, a component of the IECSS) aims at the rural poor and overlaps with MoH rural services, although the SSC only enrols families through legally recognized peasant organizations. Urban IESS affiliates contribute a small part of their insurance premium to finance the SSC.

Mexico

The public sector of healthcare in Mexico is separated into a Social Security (SS) sector and Social Protection System in Health (SPSS) sector (World Bank, 2014d). The SS provides health insurance and pensions for formal-sector workers and their dependents. Within SS there are two main schemes: the ISSSTE covers the majority of government employees while the Mexican Institute for Social Security (IMSS) covers the remainder of SS beneficiaries. SPSS is a voluntary government-subsidised regime open to anyone not covered by SS schemes (World Bank, 2014d).

The SS is funded through employee and employer payroll contributions and federal government contributions. The size of each party's contribution is based on the level of the employee's earnings. Independent workers have a fixed annual fee for individual sickness and maternity insurance where additional payments apply for family members. SPSS is co-financed through federal and state level general government revenues. Non-indigent beneficiaries are supposed to pay contributions through premiums, but rarely do, whereas no contributions are required from most beneficiaries. There are no point-of-service fees for beneficiaries in public or approved private facilities. As of 2012, 45% of the population was covered by SPSS, 47% by SS and 8% were uninsured (World Bank, 2014d).

Panama

MINSA and CSS are the regulators of the health system (PAHO, 2017d). MINSA has the responsibility of determining, regulating and implementing Government health policy and the essential public health policies.

CSS is financed by contributions from employees where they pay a percent of their wage, which entitles them and dependents to coverage; employers also contribute a percentage. The reach of CSS is extensive considering the unemployment rate is quite low (PAHO, 2017d). About 70% of the public health budget goes to CSS and 30% to MINSA.

Peru

The Peruvian health system consists of multiple private and public funders, insurers and providers. The main insurers are EsSalud and the Integral Health Insurance (SIS). SIS is a Ministry of Health decentralised agency funded by fiscal resources provided by the Ministry of Economics and Finance. EsSalud is part of the social security system which covers formal sector workers. They contribute a proportion of their salary to health

insurance and the pension system (World Bank, 2014e). Under social security health insurance, contributions can be split between EsSalud and healthcare provider enterprises (EPS). EPS usually offers health plans covering primarily low complexity care. Independent workers may enrol and pay premiums for themselves and dependents. There are co-payments, which can be significant for complex care.

SIS fully subsidises the poor population, but with a more restrictive benefit package than EsSalud. SIS includes mostly preventive and curative care at MOH health facilities giving priority to reproductive health and early childhood development (Knaul et al., 2012). Under SIS, there is also a partially subsidised/semi-contributive regime including a voluntary plan for independent workers and dependents in addition to a voluntary plan where business owners can enrol employees and pay their premiums which are partially subsided by the national government (World Bank, 2014e). Both of these voluntary plans require beneficiaries to have no other insurance coverage.

Private health insurance is low. Individuals may split their payroll contribution between EsSalud and private health insurers for supplementary coverage (World Bank, 2014e). The uninsured (e.g. unemployed, rural workers or informal sector workers), must pay for services OOP at MOH and Regional Health Authorities facilities (World Bank, 2014e).

Uruguay

Uruguay has a mixed health system where public health expenditure exceeds 50%, but is under 60% of national healthcare costs (PAHO, 2012). Public financing is largely comprised of taxes, contributions to social security and tariffs for services (PAHO, 2007). The General Budget for Expenses and Investment assigns resources to national level public agencies. Municipal taxes contribute marginal costs to finance the provision of health services to the population, and care coverage for their employees. Certain public agencies finance health coverage of their employees through fees charged for their services. Private financing is largely comprised of OOP expenses by those who have voluntary or private providers (PAHO, 2007).

France

The French healthcare system is a combination of universal coverage and a public-private mix of hospital and ambulatory care. Statutory Health Insurance (SHI) is composed of various schemes (Chevreul et al., 2015): the general scheme, the agricultural scheme and a self-employed scheme. Each of these schemes is made up of a national health insurance fund and local structures. All residents are automatically enrolled with an insurance fund based on their occupational status: working people have no choice which scheme they are enrolled in and may not opt out, except in certain cases, while unemployed people are automatically enrolled in the general scheme.

Private voluntary health insurance provides complementary care, such as for co-payments and better coverage for medical goods and services that are poorly covered by SHI (Chevreul et al., 2015). Voluntary health insurance has ensured equity in access and financing healthcare, offering publicly financed complementary universal health coverage to those on lower incomes.

SHI is funded by employer and employee payroll taxes; a national earmarked income tax; taxes levied on tobacco and alcohol, the pharmaceutical industry and voluntary health insurance companies; and state subsidies. Voluntary health insurance is financed by not-for-profit, employment based mutual associations or provident institutions (Chevreul et al., 2015).

Spain

The Spanish National Health System (SNS) is almost universal in coverage (99.5%) and offers a comprehensive benefits package. The main funding source for the SNS is through public funds, primarily general taxation, with a residual amount generated by patients with other types of coverage. General taxation includes employer and employee contributions to the work injuries and professional diseases mutuality schemes, and the mutual funds for catering civil servants.

Voluntary health insurance in Spain is supplementary and covers c.13% of the population. This system provides coverage for the same goods and services offered by the public sector, but is purchased for faster access, greater consumer choice and improved resources/amenities. Private financing is largely from OOP household expenditure in the form of co-payments for prescription drugs.

United Kingdom

Legal residents of the United Kingdom may use the services of the National Health Service (NHS), which provides universal coverage. Healthcare in the UK is mainly devolved: Scotland, Wales and Northern Ireland make their own decisions about how health services are organised. Each country in the UK has their own performance framework for the healthcare system (Cylus et al., 2015). NHS services are mainly funded through general taxation with a small amount from National Insurance contributions, together with contributions from OOP payments and private medical insurance.

Private medical insurance or voluntary health insurance can be purchased by individuals or by employers for employees. Private insurance finances services not offered by the NHS or to access NHS services more quickly. The primary source of funding for private insurance is OOP payments and the general cost of private insurance. There were c.4 million people with private medical insurance in 2011, 18% purchased as individuals and 82% as employer-funded private medical insurance (Cylus et al., 2015).

HEALTH SYSTEM PRIORITIES

ARGENTINA Argentina has set out a series of priorities, including universal health coverage, developing an agency for health technology assessment, and establishing a quality accreditation system.

(PAHO, 2017f)

BRAZIL Priorities for health are set out in the Brazilian Plano National de Saude 2016 – 2019, including expanding access to health services and medicines, improving the regulatory framework and system management, and achieving sustainable financing.

(Brazilian Ministry of Health, 2016)

CHILE The Chilean National Strategy for Health outlines key priorities across the following objectives: communicable and non-communicable diseases, risk factors and lifecycles, social determinants of health, environmental factors, strengthening of the health sector, and access to quality healthcare.

(Government of Chile, 2011)

COLOMBIA The Colombian Ministry of Health has set key reform priorities across three key areas: achieving greater equity in health, improving the living and health conditions of the population, and zero tolerance for avoidable morbidity, mortality and disability.

Colombian Ministry of Health, 2013)

COSTA RICA Restoring the financial sustainability of health insurance (CCSS) is one of the key objectives of Costa Rica's State of the Nation Sustainable Human Development Plan.

(Aguilar, R. et al., 2015)

ECUADOR Ecuador's health system is focusing on prevention, expanded coverage and universal insurance, strengthened management, and reductions in maternal and child mortality.

(Republic of Ecuador, 2017)

MEXICO The Government of Mexico has set out key priorities for health: a focus on health protection and disease prevention, access to quality health services and closing social and geographical health gaps, the generation and effective use of health resources and the creation of a Universal Health System.

(Government of Mexico, 2013)

PANAMA The Panamanian Government aims to strengthen leadership and management, improve the efficiency, and guarantee access to services.

(PAHO, 2017d)

PERU The Peruvian health sector is focused on health promotion and disease prevention, citizen participation, closing gaps in access to health and social security, providing universal access to primary care, infrastructure improvement and system modernization, and increased public spending.

(Peruvian Ministry of Health et al., 2014)

URUGUAY Uruguay is aiming to improve population health, reduce the burden of premature and avoidable morbidity and mortality, and improve the quality of healthcare.

(PAHO, 2017c)

Universal healthcare coverage

UHC is achieved by ensuring coverage of services, all population segments, and costs. To contextualize the discussion presented in this report, the study countries have been assessed for their achievement of these issues. Table 5 presents data for all study countries across the following indicators for UHC:

- For *services*, the WHO / World Bank UHC service coverage index[3] was used;
- For *costs*, OOP spending rates and catastrophic cost rates (OOP exceeding 10% of income);
- For *population coverage*, the most recent available rates of insurance coverage.

Table 5: Coverage, Service, and Cost Indicators

	Services	Costs	Costs	Coverage
	UHC service coverage	*Out-of-pocket expenditure (% current health expenditure, 2016)*	*Incidence of catastrophic expenditure (%)[4]*	*% population covered*
ARGENTINA	76	15.8	16.9	-
BRAZIL	77	43.6	25.6	100%**
CHILE	70	20.2	33.1	87.5%
COLOMBIA	76	20.2	16.9	96%
COSTA RICA	75	22.1	10.1	86%
ECUADOR	75	40.5	15.2	-
MEXICO	76	40.4	7.1	75%
PANAMA	75	27.4	1.4	84%
PERU	78	28.3	8.3	100%**
URUGUAY	79	17.4	13.9	73%

***Note**: * Coverage may not reflect true % population covered given that not all population covered can access healthcare due to barriers relating to geographical access among others.*

***Sources**: Services (WHO & WB, 2017); Costs (World Bank, 2018c; WHO & WB, 2017); Coverage (Chile: PAHO, 2017a; Colombia: GNHE, 2015a; Costa Rica: GHNE, 2015b; Panama: PAHO, 2017d; Peru: PAHO, 2017b; Uruguay, PAHO, 2017c)*

[3] An indicator made up of tracer indicators of coverage of essential services. In the usage of the indicator by the WHO/WB, a rating of 77+ is considered excellent, followed by segments of 70-76, 62-69, 46-61, and below 45.
[4] Incidence of catastrophic expenditure (%), at 10% of household total consumption or income. SDG-UHC indicator 3.8.2, latest year.

To assess the proximity of countries in achieving UHC the data identified for services, costs, and coverage were assessed through the following benchmarks[5]. For *services*, the WHO / World Bank UHC service coverage index was evaluated as good for 77+, and average under 77 (see footnote 3 for the categorization used by the WHO). For *costs*, OOP spending rates were assessed as high over 40% of total health expenditure, as medium for rates between 20% to 40%, and low for rates under 20%. Catastrophic cost rates (10% of income) were rated as good under 5%, average under 10%, and poor over 10%. For *population coverage*, the most recent available rates of insurance coverage were benchmarked as good over 90%, average for rates between 80 to 90%, and low for rates under 80%. See Table 6 for results.

Table 6: Achievement of UHC Dimensions

	Services	Costs *Out-of-pocket expenditure*	Costs *Catastrophic expenditure*	Coverage
ARGENTINA	—	✓	x	n/a
BRAZIL	✓	x	x	✓
CHILE	—	—	x	—
COLOMBIA	—	—	x	✓
COSTA RICA	—	—	x	—
ECUADOR	—	x	x	n/a
MEXICO	—	x	—	x
PANAMA	—	—	✓	—
PERU	✓	—	—	✓
URUGUAY	✓	✓	x	x

***Legend**: ✓ = good; — = average; x = poor; n/a = no data.*

***Source:** LSE estimates, based on publicly available data.*

Health indicators

Whilst all ten countries of interest are from the Latin American region, given the region's vast geography and population sizes, there is unsurprisingly variation in the demographic and disease prevalence indicators within each of those countries. This section explores the general health and demographic trends in the region,

[5] Benchmarks were set by authors based on data of comparator countries.

before analysing the following indicators in depth: cause of death by non-communicable and communicable diseases, infant mortality, life expectancy at birth (years), and inverse old age dependency ratio.

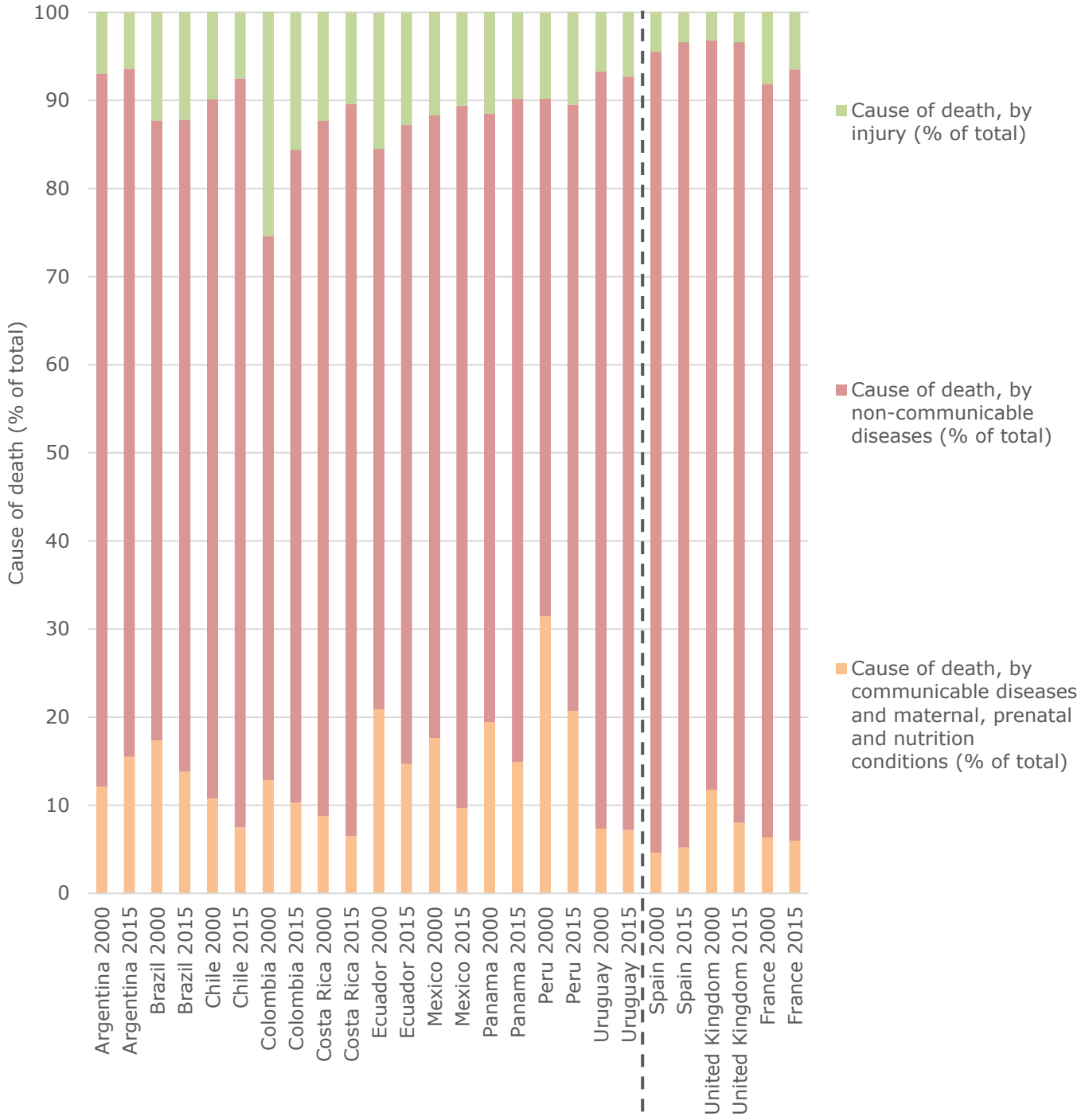
Population growth has slowed between 2000 and 2015 in all countries, although countries such as Panama and Ecuador still have high levels of growth (1.66 and 1.51 respectively) in comparison to the European comparators which average 0.38 (see Appendix 5). Across the ten study countries, significant gains have been made in infant mortality, neonatal mortality and maternal mortality. Average infant mortality fell from 20.72 to 11.92 (deaths per 1000 live births), neonatal mortality from 12.5 to 7.7 (deaths per 1000 live births) and maternal mortality from 72.5 to 48.6 (deaths per 100,000 live births). Whilst gains in the EU comparator countries have been minimal in comparison, their mortality levels were already significantly lower (see Appendix 5).

Cause of death by non-communicable and communicable diseases

Alongside the demographic transition process, the epidemiological transition process has ensured that the leading causes of death in the ten study countries are a mix of non-communicable diseases (NCDs) such as ischemic heart disease, cerebrovascular diseases and Alzheimer's with risk factors of high blood pressure, poor diets, high body mass index, and alcohol and drug use. Nonetheless, reliance on tobacco tends to be smaller in the study countries than the European comparators. An average of 18.79 % of men, and 10.09% of women smoke across the study countries, in contrast to 31.13% men and 26.07% of women in the EU comparators. Although some countries, such as Argentina and Chile still experience high levels of smoking (see Appendix 5).

Between 2000 and 2015 the proportion of deaths due to NCDs increased in all European comparators and in all countries of interest, other than Argentina and Uruguay where the proportion of deaths due to non-communicable diseases declined by 2.7 and 0.4 percentage points respectively (see Appendix 5). The increasingly acute role that non-communicable diseases play in causes of death, leads to pressure on health systems to adopt policies and practices to address the growing prevalence of chronic, non-communicable diseases such as cardiovascular disease.

Figure 5: Causes of death by non-communicable and communicable diseases (% of total)

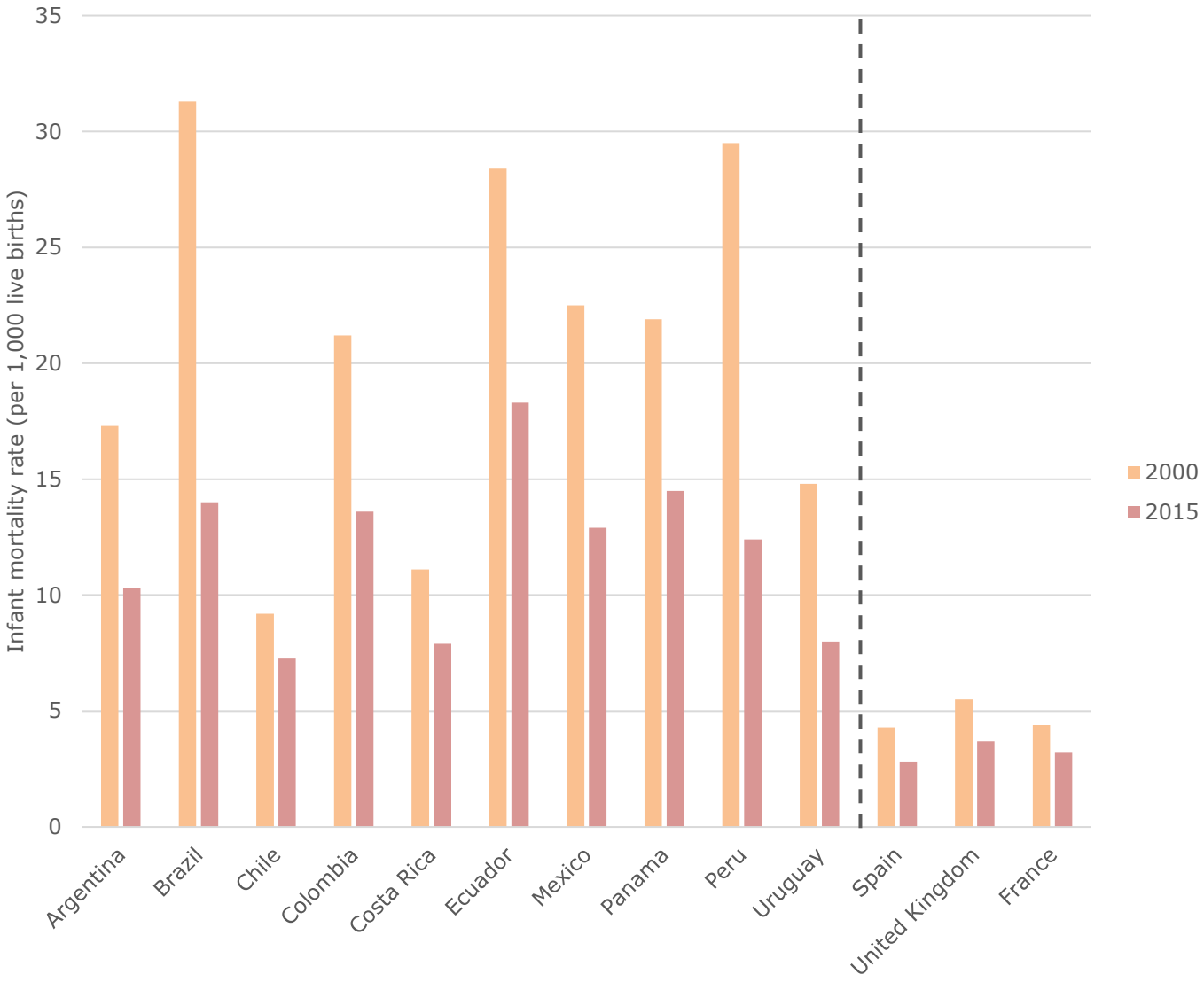


***Source**: LSE, based on data from World Bank (2018c).*

Infant mortality

The infant mortality rate has decreased across all countries between 2000 and 2015. The decline in infant mortality is significantly more marked in the study countries compared to the comparators. This is because the comparators' infant mortality rates were already at much lower levels in 2000. Of the study countries, Brazil, Peru, and Ecuador which had infant mortality rates close to or above 30 per 1,000 live births in 2000, experienced the most significant improvements in their infant mortality rates. Since infant mortality rate is a key indicator of the overall health of a country, Figure 6 indicates that the study countries have experienced a significant improvement in the health of their populations.

Figure 6: Infant mortality rate (per 1,000 live births)



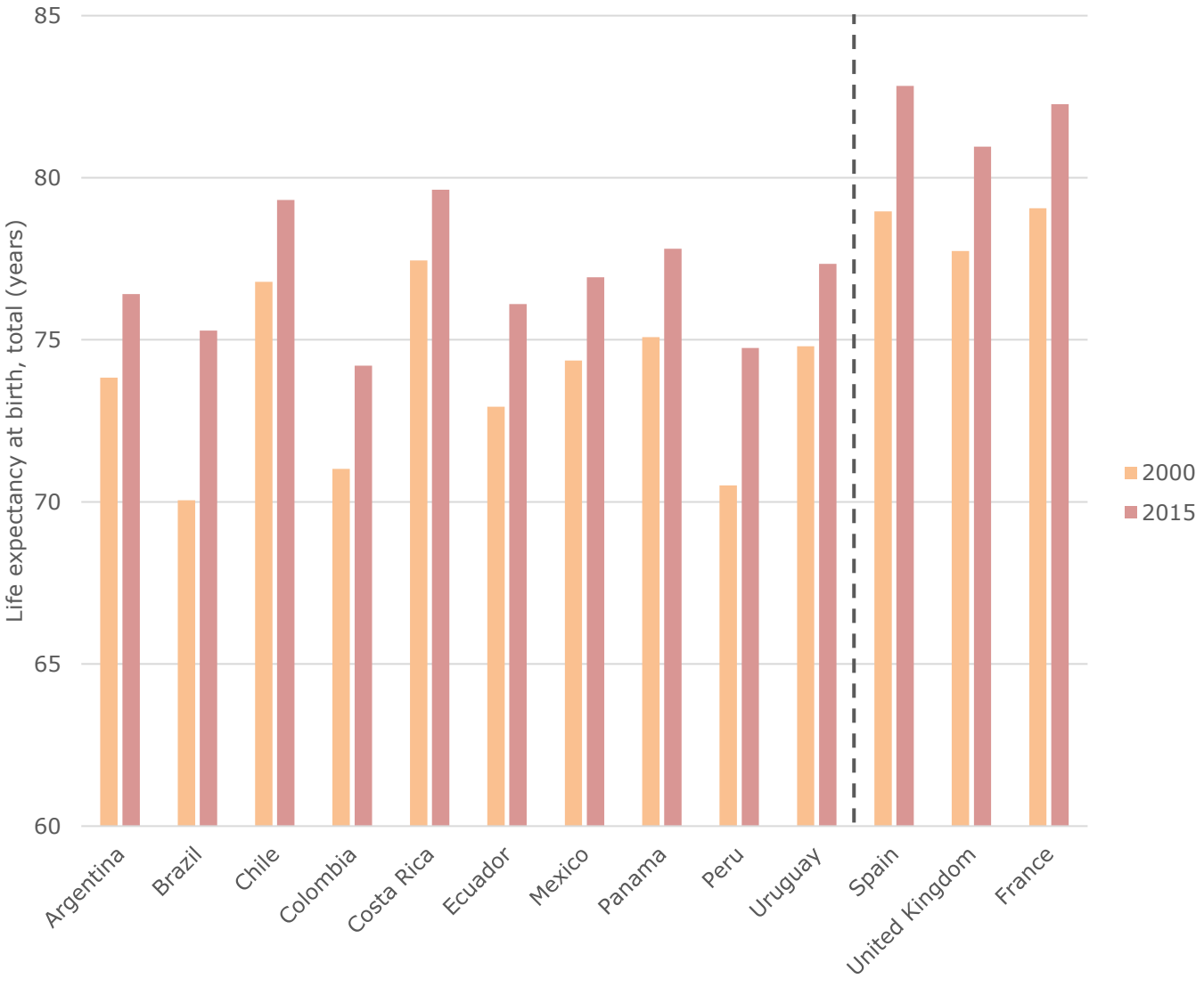
***Source**: LSE, based on World Bank (2018c) data.*

Life expectancy at birth (years)

Total life expectancy at birth (years) increased across all countries between 2000 and 2015 (see Figure 7). Of the countries, Brazil and Peru which had the lowest life expectancy levels in 2000, experienced the greatest improvement in life expectancy over this 15-year period.

Declining infant mortality rates may have contributed to the higher life expectancies. Improvements in life expectancy at birth, indicate an aging demographic across the study and comparator countries, which given the higher propensity for ill health in later life, suggest an increase in required health expenditure.

Figure 7: Life expectancy at birth, total (years)



***Source**: LSE based on World Bank (2018c) data.*

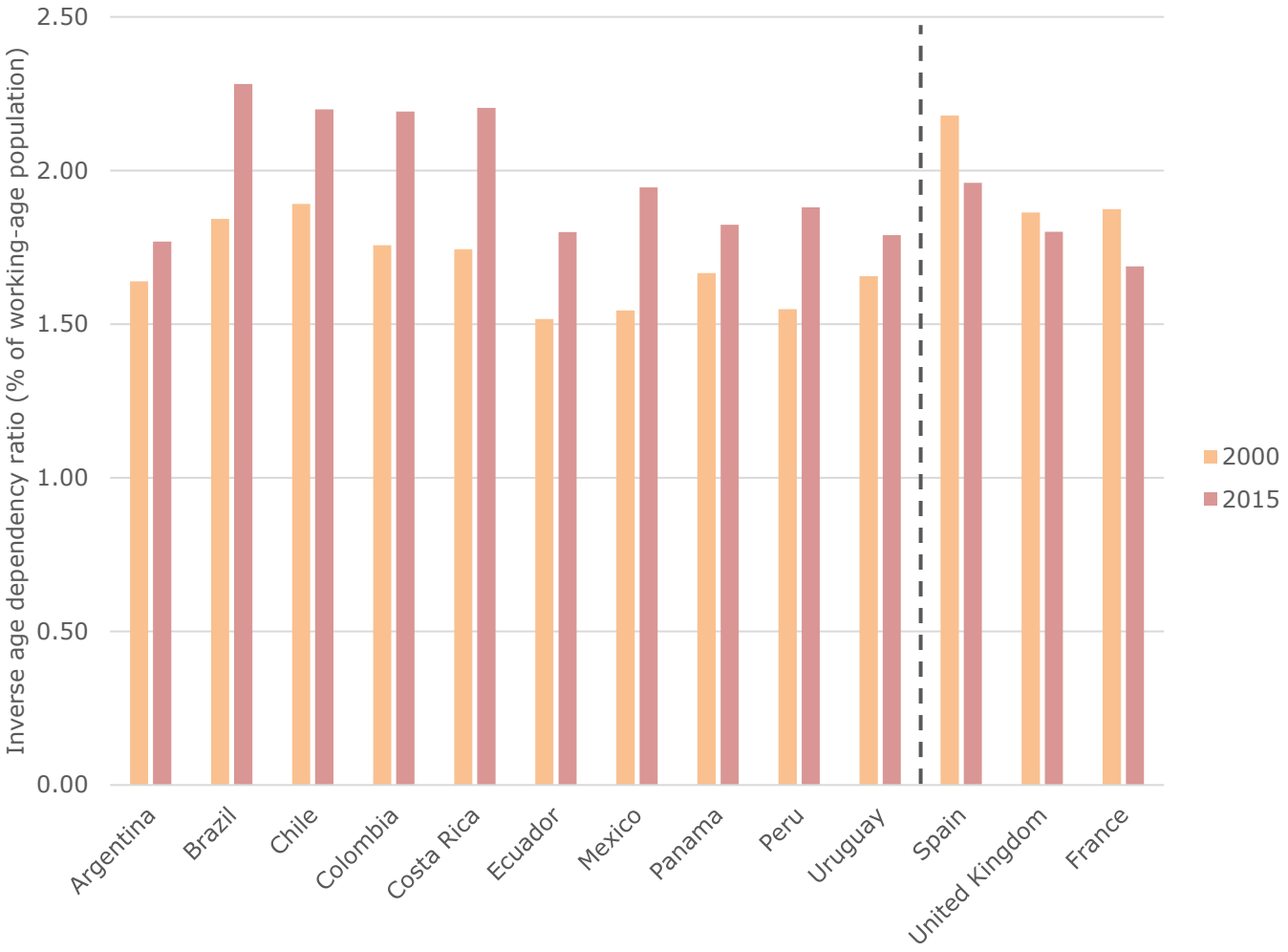
Both female and male life expectancy at birth (years) improved across all countries between 2000 and 2015 (see Appendix 5). During this fifteen year period, the increase in life expectancy at birth, female (years) was particularly marked for Brazil and Peru. The greatest improvement in life expectancy at birth, male (years) for the region was experienced by Colombia along with Brazil and Peru. These three countries achieved life expectancy at birth, male (years) exceeding 70 years in 2015. Costa Rica maintained the highest life expectancy at birth for both males and females (years) during this 15-year period. Although life expectancy at birth (years) for both males and females increased between 2000 and 2015, the enhancement in female life expectancy significantly outperformed the improvement in male life expectancy during this period. This reflects the significant gains these countries have achieved in maternal mortality during this same period. Nonetheless, female life expectancy is still far below the European benchmarks.

Life expectancy at birth across the region sits at an average of 79.82 years and 73.74 years for females and males respectively, in contrast to 84.67 years and 79.5 years in the EU comparator countries. Healthy life expectancy at birth in the ten countries of interest is 70.27 years and 65.9 years for females and males respectively, in contrast to the EU comparator averages of 74.23 years and 71.4 years (see Appendix 5).

Inverse old age dependency ratio (% of working-age population)

The inverse old age dependency ratio (% of working-age population) is the number of independent workers which have to provide for old age dependents. In all countries of interest, the inverse old age dependency ratio increased between 2000 and 2015 (Figure 8). This indicates that there is surplus labour and there are now more working age members of the population, compared to those over the age of 65 than there were at the turn of the century. This reflects Latin America's demographic transition process, whereby the population's life expectancy is improving, and is gradually aging. As the population ages, we will see a transition from an increase in working age members of the population, until slowly over time the number of old age dependents exceeds the number of working age individuals. This can be seen for the European comparators which are further along their demographic transition process. Between 2000 and 2015, the European comparators experienced a decrease in the inverse dependency ratio. The aging population experienced by the study countries will lead to pressure on pensions in future years. Given they currently have a greater number of working age individuals to old age dependents, there may be the potential to raise government tax revenue to address their future increases in health expenditure.

Figure 8: Inverse dependency ratio (% of working-age population)



***Source**: Based on Authors' calculation. All data from World Bank, 2018c.*

Other priorities

Evidence indicates that budget prioritisation towards health, through health sector advocacy, offers significant fiscal space expansion for health (WHO, 2018d). As part of our fiscal space analyses we assess each country's political economy to understand the prioritisation of health compared with other public services such as education, pensions, social care and military forces within the context of its governmental budget. Through examining the share of government expenditure apportioned to health, we can understand its priority within the budget. Although not examined here, budget prioritisation of health depends also on regulatory constraints such as legal mandates which state health budget allocations, and a country's values in relation to health (WHO, 2018e).

Table 7: Government spending as a proportion of GDP

	Health spend *% GDP*	Military spend *% GDP*	Education spend *% GDP*	Social pension spend *% GDP*
ARGENTINA	4.88	0.81	5.88	0.50
BRAZIL	3.81	1.35	5.95	0.50
CHILE	4.91	1.92	4.90	2.90
COLOMBIA	4.13	3.08	4.48	0.10
COSTA RICA	6.19	0	7.06	N/A
ECUADOR	4.24	2.51	5.00	0.30
MEXICO	3.06	0.56	5.33	2.30
PANAMA	4.32	0	3.19	0.20
PERU	3.25	1.30	3.81	0.10
URUGUAY	6.44	1.88	4.36	0.50
FRANCE	8.73	2.33	5.52	13.80
SPAIN	6.51	1.13	4.28	11.40
UK	7.94	1.81	5.63	6.10

***Sources**: Health spend (World Bank, 2018b); Military spend (World Bank, 2017a); Pension spend (Argentina, Brazil, Colombia, Ecuador Panama, Peru, Uruguay (World Bank, 2018a); Chile, Mexico, France, Spain and UK (OECD, 2015); Education Spend (World Bank, 2018c) (Argentina, 2015; Brazil, 2014; Chile, 2015; Colombia, 2016; Costa Rica, 2016; Ecuador, 2015; Mexico, 2014; Panama 2011; Peru 2016; Uruguay, 2011; France, 2014; Spain, 2014; UK, 2015)*

SUMMARY

Healthcare system challenges

Key health indicators, such as infant mortality and life expectancy are improving across the countries in the region. In line with global trends, the Latin American region is affected by the burden of NCDs as the leading cause of death, with the proportion of deaths due to NCDs increasing in all Latin American countries between 2000 and 2015. NCDs, therefore, pose the highest burden on the healthcare system and the resources available.

The region faces several challenges in the financing, organization and delivery of its healthcare systems; this includes ineffective delivery of care and slow uptake of policies to improve performance and efficiency. Total health expenditure as a percentage of GDP ranges from 5% to just over 9%, but for most countries in the region, publicly funded health expenditure stands at well below 6% of GDP. Health spending is coupled with high out-of-pocket expenditure across the region: at a low of 16% of current health expenditure (Uruguay) and a high of 43% (Ecuador). While several countries rely heavily on general taxation to finance healthcare, large informal economies contribute to difficulties in tax collection and financing healthcare (and other public services) to an adequate level via taxation.

Despite the above trend, total health expenditure as a proportion of GDP has increased in the majority of Latin American countries (particularly in Argentina, Chile, Colombia, Costa Rica, Ecuador, Panama, and Peru) over the past 15 years, while out-of-pocket expenditure on health increased in 5 countries (Colombia, Ecuador, Panama, Peru and Uruguay), but decreased in the remaining countries (Argentina, Brazil, Chile, Costa Rica, Mexico) over the same period. Private health expenditure increased in all countries besides Argentina, Costa Rica, Mexico, and Uruguay during the same period.

As a percentage of GDP, public spending on health is higher than public spending on social security in all countries. When compared to education spending, public spending on health is generally lower in all countries, apart from Chile (equal spending), and Panama and Uruguay (higher health spending).

Official data demonstrates that universal health coverage remains an elusive goal for the region as a whole to date, with the majority of countries ranking in poor to moderate attainment of universal coverage across delivery, costs, and coverage.

MACROECONOMIC PERFORMANCE IN LATIN AMERICAN COUNTRIES

Macroeconomic environment and policies

Fiscal space is defined as "the availability of budgetary room that allows a government to provide resources for a given desired purpose without any prejudice to the sustainability of a government's financial position" (Heller, 2006). Any assessment of fiscal space typically entails an examination of whether and how a government could feasibly increase its expenditure in the short-to-medium term, and do so in a way that is consistent with a country's macroeconomic fundamentals.

In order to determine whether the fiscal space exists to expand health spending, it is essential to assess macroeconomic performance within the context of the study and comparator countries. This is because the fiscal space to increase healthcare systems expenditure is determined by a country's wider economic context (Box 2). Countries facing adverse fiscal and other macroeconomic conditions may resist future increases in real health spending because these could undermine fiscal stability, whereas for a country with strong economic growth (which is a major driver of fiscal space) it is, in principle, feasible to increase health expenditure. Indeed, one of the five central components of the "fiscal space for health" framework is a favourable macroeconomic environment[6] (Tandon and Cashin, 2010).

Assessing fiscal space (Box 2)

Fiscal space is the space between current levels of expenditure and maximum spending abilities.

The financial stability of a country, in turn influencing fiscal space, is reviewed through the following indicators:

- GDP growth
- fiscal deficit
- sovereign debt
- inflation
- current account balance
- sovereign debt credit ratings

This section assesses the macroeconomic performance of the ten study and the three comparator countries. We focus on six key measures which reflect the health of their economies, and, in turn, comment on whether fiscal space actually exists: (a) GDP growth; (b) fiscal deficit (c) sovereign

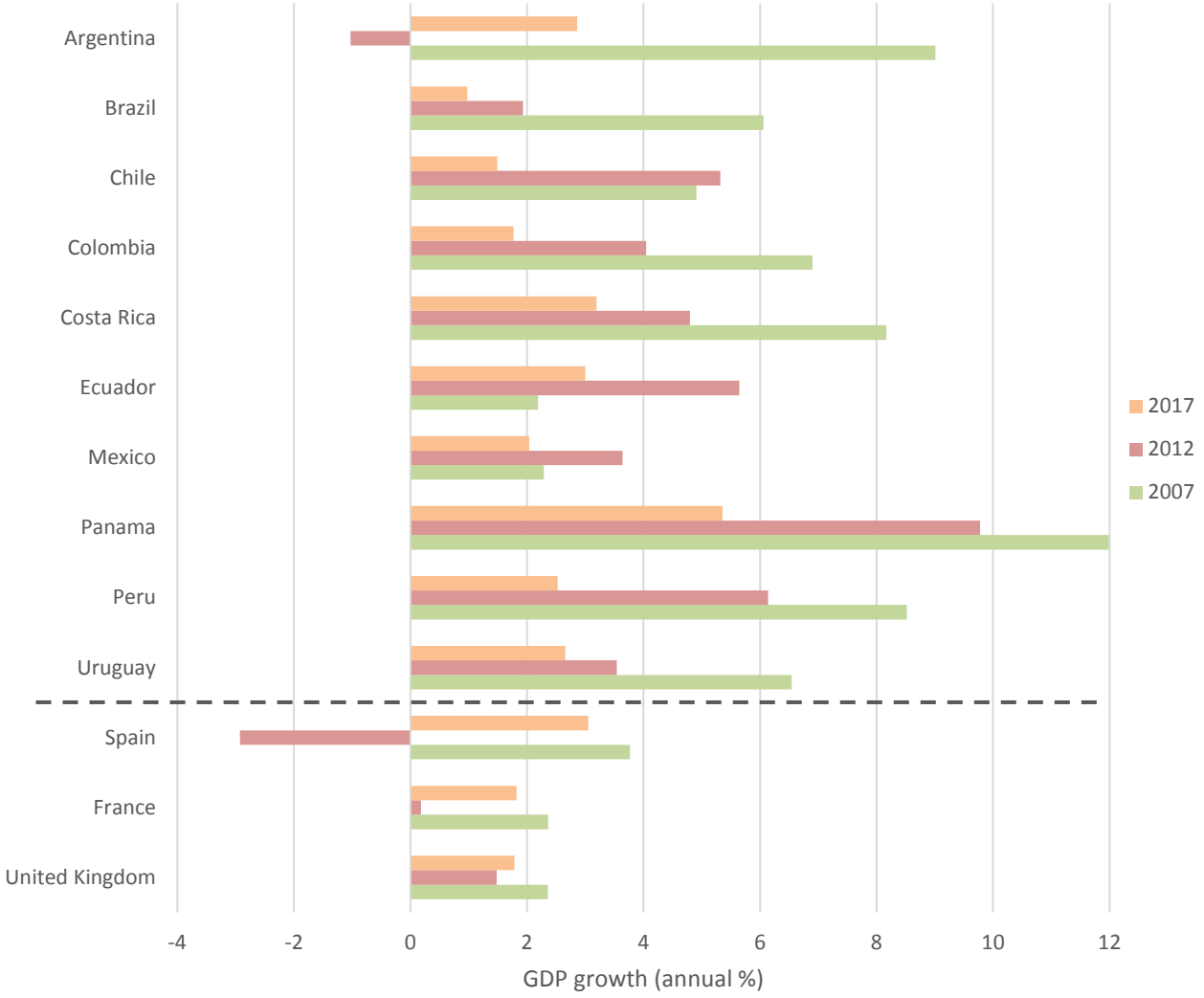
[6] The other four components are the re-prioritization of health, the increase in health sector-specific resources, the health sector-specific grants and foreign aid, and the increase in the efficiency of health expenditures.

debt; (d) inflation; (e) current account balance; and (f) sovereign debt credit ratings. We selected a timeframe of ten years to evaluate the countries' performance across these indicators as fiscal space analysis requires a sufficiently long framework, since it necessitates consideration of current and future revenue and expenditure streams (WHO, 2018b).

GDP

GDP growth is a key determinant of a country's economic health, since it measures how fast an economy is growing. GDP growth of 2 to 3% is considered advantageous, and it is against this growth rate that we benchmark the countries' performance in Table 10.

Figure 9: GDP growth (% annual, constant local currency)



***Source**: LSE based on World Bank (2018c) data.*

From 2007 to 2017, Latin American countries generally experienced significantly higher growth than the comparator countries (see Figure 9). GDP growth rates declined across all countries from 2007 to 2017, but nonetheless all Latin American countries experienced a positive GDP growth trend during this ten-year period, except for Argentina, which had negative growth in 2012.

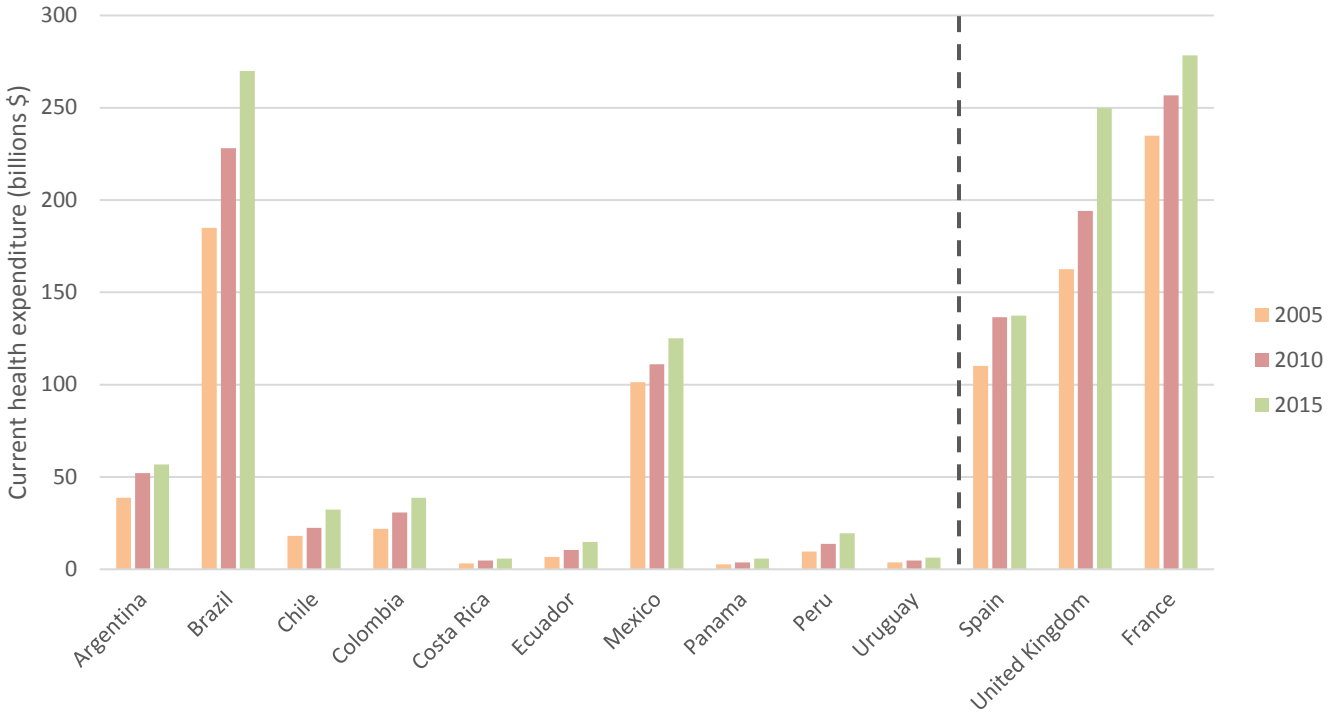
Following a two-year contraction from 2015 to 2016 (OECD, CAF & ECLAC, 2018), Latin America experienced modest economic recovery (International Monetary Fund, 2018b) with growth of 1.3% in 2017 (OECD, CAF and ECLAC, 2018). A significant factor underlying this growth is the end of recessions in some of the key economies in the region, including Argentina and Brazil (International Monetary Fund, 2018b)[7]. Of the study countries, Argentina, Costa Rica, Ecuador, Mexico, Panama, Peru, and Uruguay all achieved at least the benchmark growth rate of 2-3% in 2017. Costa Rica and Panama registered growth rates of 3.2% and 5.4% respectively.

The region's growth is anticipated to continue in the short-term with expected growth of 2% in 2018, and 2.8% in 2019 (International Monetary Fund, 2018a). Besides domestic conditions improving in some major economies, the region's stronger growth in the short term is due to factors related to external conditions including: (1) increased global trade and demand which benefits the region's exports; (2) beneficial global financial conditions e.g. high global equity prices, and low long-term interest rates resulting in easier financing for Latin America; and (3) partial recovery in commodity prices since early 2016 (International Monetary Fund, 2018b)[8].

The trend of positive growth will beneficially impact Latin America's fiscal space for health since evidence indicates that one of the main ways of increasing fiscal space for health in middle-income countries is macroeconomic growth (WHO, 2018a). Indeed, current health expenditure from 2005 to 2015 tracked GDP (in PPPs) very closely, especially in the study countries (Figure 10 and Figure 11). Positive economic growth will also improve the study countries' debt situation. First, it generates more revenue which can lower their fiscal deficit, and second, their economies can more easily cope with the debt since it can lower their debt-to-GDP ratios.

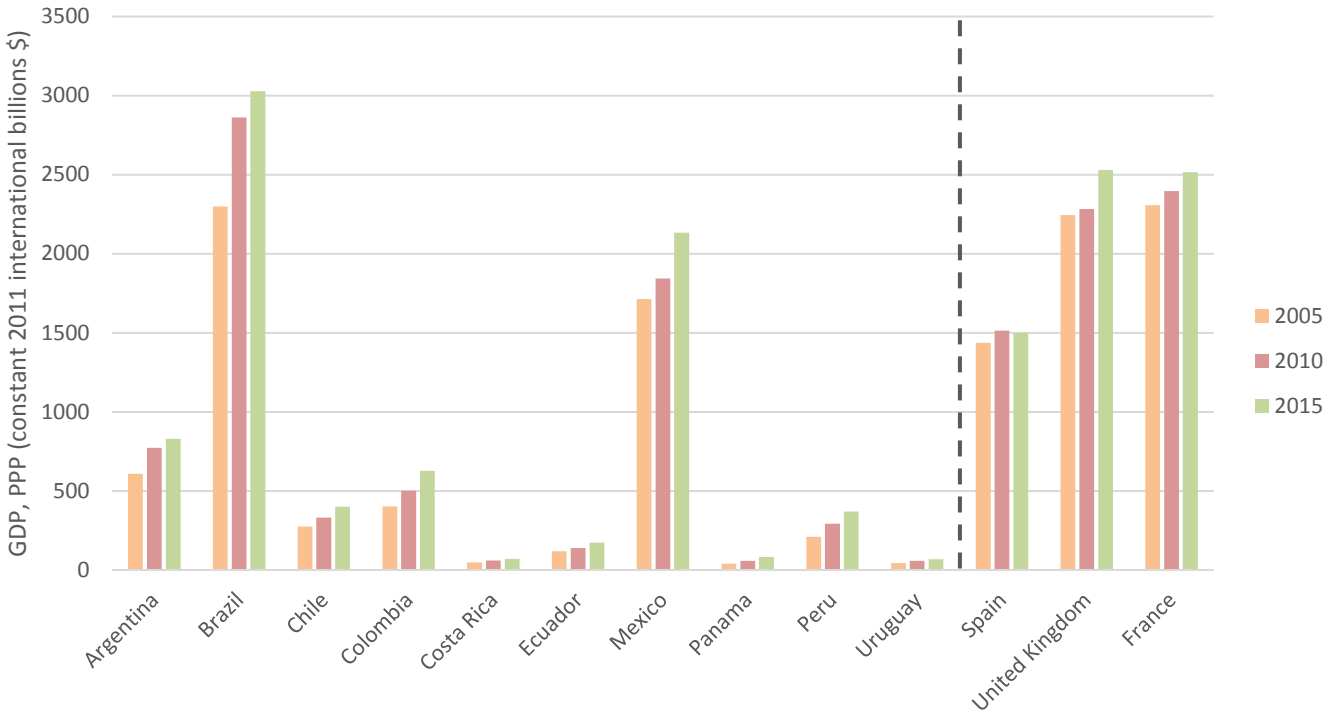
[7] If Venezuela, which still faces an economic crisis is excluded, the region's average growth estimate for 2017 increases to 1.9% (International Monetary Fund, 2018b)
[8] Global commodity prices decreased sharply at the end of the commodity super-cycle, for example energy and metal prices halved between 2011/2 and early 2016, leading to a substantial shock for Latin American commodity exporters (International Monetary Fund, 2018b).

Figure 10: Current health expenditure



***Source**: LSE, calculated using data from World Bank (2018d, 2018i).*

Figure 11: GDP (in $PPP), 2005-2015



***Source**: LSE based on World Bank (2018i) data.*

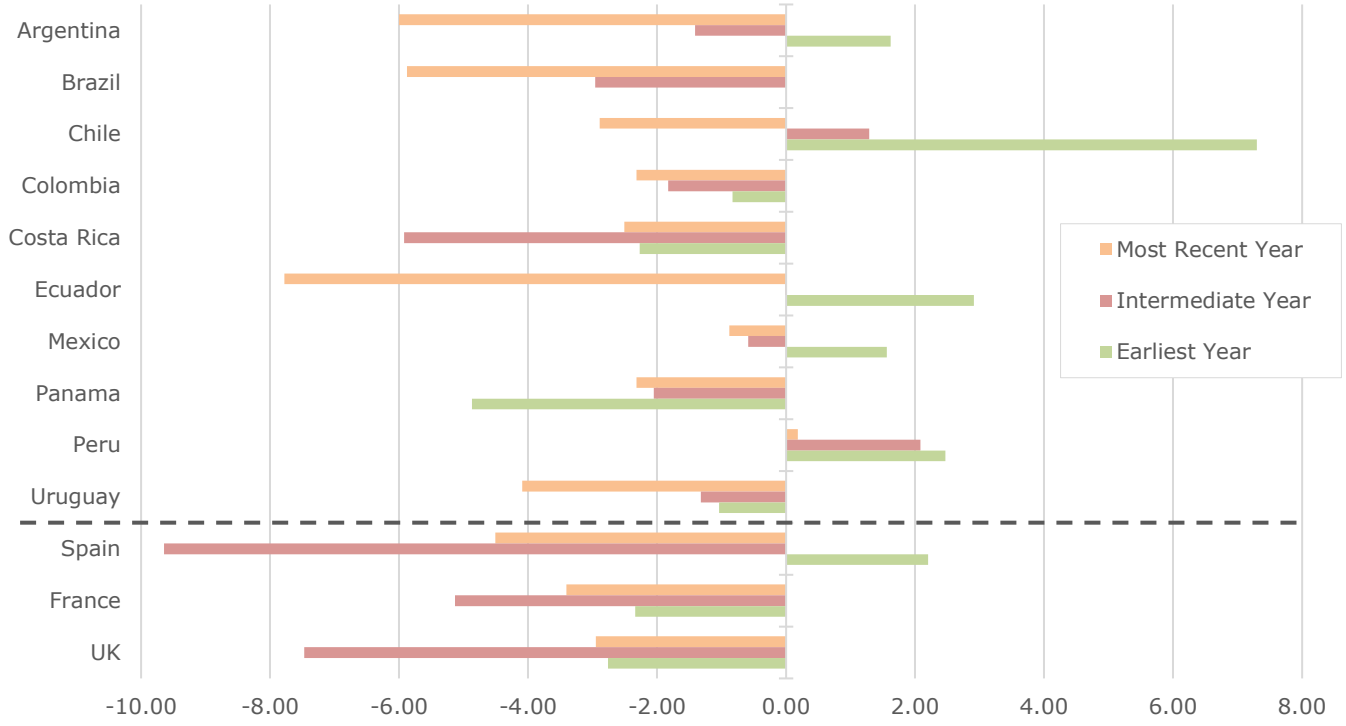
Despite the enhanced short-term regional outlook, substantial risks persist and a weak growth outlook remains for the region in the medium-term, with potential growth returning to its low long-run average (IMF, 2018b). The risks facing the region stem from economic and policy uncertainty due to: risks of changes in main economic partners (IMF, 2018b); the adoption globally of more protectionist policies, such as increasing tariff and nontariff barriers which could reduce world trade (IMF, 2018a); contracting global financial conditions (see section on sovereign debt credit rating); the upcoming domestic elections given rising populism; spillover effects from Venezuela's humanitarian crisis, which has increased emigration to and is placing pressure on the social services of Brazil, Colombia, Argentina, Ecuador, Chile, and Peru; and corruption scandals (IMF, 2018b).

In all countries, GDP, (in constant 2011 international $PPP billion) and all cause total health spending (billion $), increased between 2005 and 2015. During this 15-year period, health spending increased as a percentage of GDP across all countries. Health expenditure growth surpassing GDP growth, highlights the increasing demands that health is placing on these economies.

Fiscal balance

All countries, except Peru which experienced a considerably smaller fiscal surplus in 2016 compared to 2006 and 2011, have faced a fiscal deficit in recent years (Figure 12). France, UK, Colombia, Costa Rica and Uruguay have experienced a deficit at each measured interval during the last ten years. In Argentina, Brazil, and Uruguay, the most recent deficit has grown considerably since the intermediate year.

Figure 12: Fiscal balance (% GDP)



***Sources**: OECD (2018a) for UK, France, Spain, Mexico, Brazil and Costa Rica; Inter-American Development Bank (2018) for all other countries. Data Points: Brazil - 2014 and 2011; Costa Rica and Mexico - 2015, 2010 and 2005; all other countries - 2016, 2011 and 2006.*

The fiscal situation in most countries has deteriorated, owing to a combination of factors (IMF, 2018b): first, fiscal expansionary policies adopted following the crisis were not relaxed following the recovery. Second, the end of the commodity super-cycles resulted in a sharp decrease in commodity revenues in oil, gas, agricultural and metal producing countries, and a worsening of the region's fiscal balances. Third, the situation was compounded by the economic activity slowdown which followed, and the persistent public expenditure growth. Both of which decreased the region's fiscal buffers.

Most of the countries in the region ended 2017 with primary deficits above their debt-stabilising levels, and, accordingly, public debt continues to increase (IMF, 2018b). Consequently, most countries in the region have started or intend to undertake fiscal consolidation over the next few years. Fiscal adjustment is essential given low commodity prices are anticipated to persist for a long time and the countries need to develop fiscal buffers and achieve sustainability (IMF, 2018b). In some countries, the fiscal adjustment required is small. However, for most countries primary balances are significantly below the levels to reach debt stabilisation, such as in Brazil,

and Argentina (IMF, 2018b). Countries which experienced a more significant increase in debt ratios after the end of the commodity super-cycle, have plans for greater fiscal consolidation (IMF, 2018b). Some countries have responded to the deteriorating fiscal situation by undertaking fiscal adjustment through increasing non-commodity revenues such as Argentina, Mexico and Chile, or through public investment reductions. The region's cyclically adjusted primary balance is anticipated to recover by 1.4% of GDP between 2016-2020, and it is nearly halfway to achieving this target (IMF, 2018b).

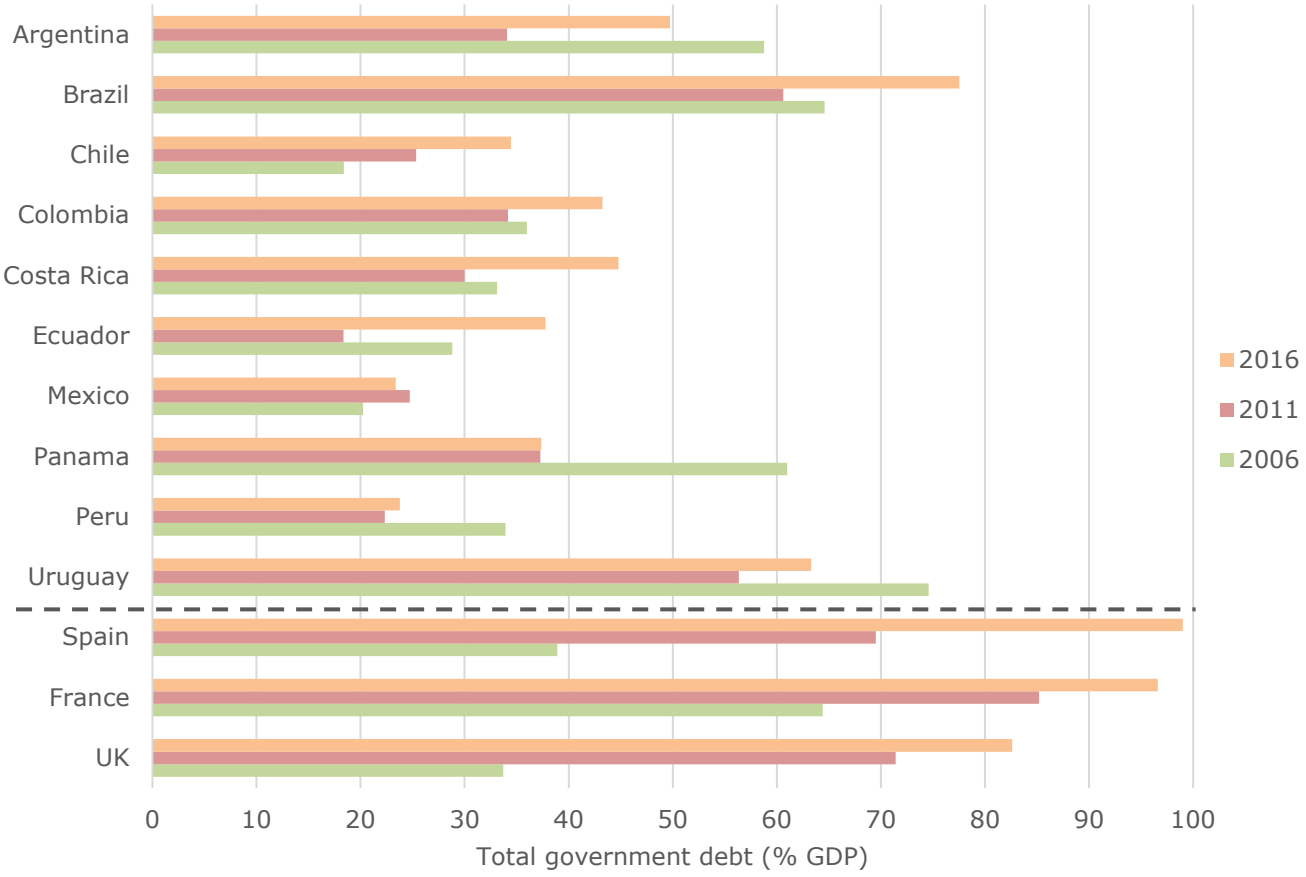
Debt levels

In all countries besides Argentina, Panama, Peru, and Uruguay, debt levels have increased from 2006 to 2016. During this ten-year period, the Latin American countries experienced lower debt levels than their comparators, which saw debt increase significantly as a proportion of GDP. Between 2002 and 2007, many Latin American countries could reduce their public debt owing to strong growth and advantageous external conditions (IMF, 2018b). This may explain the fall in debt levels from 2006 to 2011 experienced by all Latin American countries apart from Chile and Mexico (Figure 13). However, from 2011 to 2016 debt increased in all countries besides Mexico. Government debt is the accumulation of government borrowing to cover fiscal deficits, and the region's debt situation worsened with debt ratios rising significantly in several countries, because the primary deficit exceeded the debt stabilising levels. Debt ratios in the region now exceed the average for other emerging economies (International Monetary Fund, 2018b). We assess the study countries' debt-to-GDP ratios against the suggested benchmark for developing countries of 40% (Chowdhury & Islam, 2012). In 2016, half of the countries including Chile, Ecuador, Mexico, Panama, and Peru achieved debt-to-GDP ratios below the benchmark level. Mexico and Peru achieved especially advantageous debt-to-GDP levels of 23.4% and 23.8% respectively. Nonetheless, Argentina, Brazil, Colombia, Costa Rica, and Uruguay achieved debt-to-GDP ratios which exceeded the benchmark level.

Public debt has risen in many Latin American countries due to a range of factors, including: slower growth; expansionary policies; sharp decrease in fiscal revenues, resulting from the end of the commodity super-cycle[9]; and the upward trend in current spending which started during the commodity price boom, and continued in several countries even after the bust (IMF, 2018b).

[9] The end of the commodity super-cycle saw lower global commodity prices negatively impacting the commodity-exporting countries which produce gas, oil, metal, and agricultural products (International Monetary Fund, 2018b).

Figure 13: Total government debt (% of GDP)



***Sources**: Inter-American Development Bank (2018) for Argentina, Brazil, Chile, Columbia, Costa Rica, Ecuador, Mexico, Panama, Peru, and Uruguay; Trading Economics (2018c) for UK, Spain and France.*

Latin American countries' increasing levels of debt can have a detrimental impact on their fiscal space for expanding their healthcare system funding: first, an increasing proportion of existing tax revenue of a highly-leveraged economy will be directed towards financing debt interest payments (see section on sovereign debt credit rating), at the opportunity cost of funding public services such as healthcare; second, a country with high levels of debt, will be unable to increase spending or reduce taxes without a detrimental impact on debt sustainability (WHO, 2018b). Contrarily, high levels of government debt will necessitate an increase in government taxation and reduction in government expenditure. This is because a country with high debt levels will need to undertake fiscal adjustment[10] to improve its debt ratio, and through reduced debt financing, this could have a positive long-term impact on fiscal space for health.

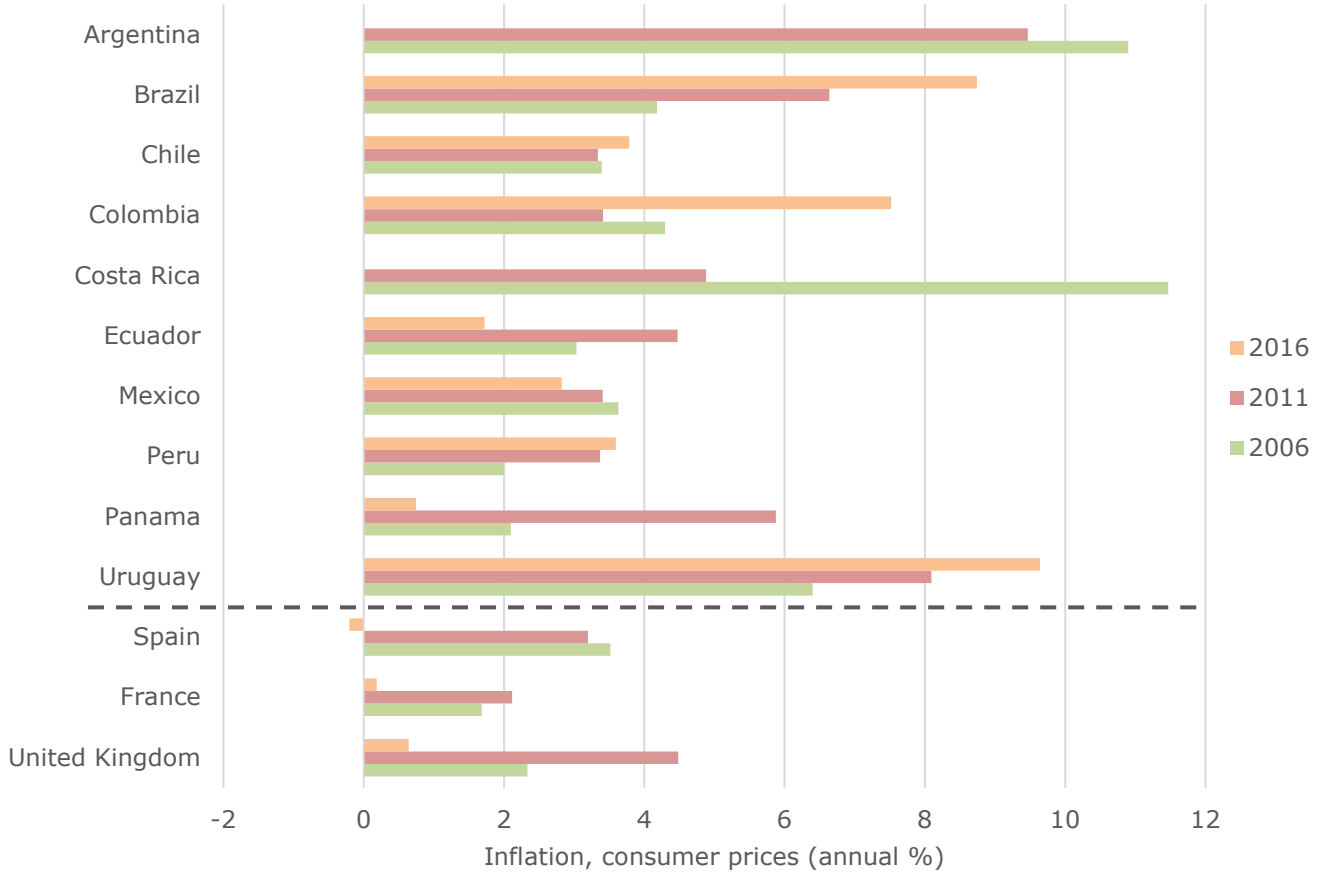
[10] Fiscal adjustment is a decrease in the primary budget deficit, because of a rise in tax revenues and/or decrease in government spending.

Inflation

Amongst other factors, lower inflation encourages (1) firm investment, which can promote higher long-term macroeconomic growth, and (2) enhanced competitiveness, reducing the current account deficit and propagating economic growth. On the other hand, if inflation decreases to a very low level, it can increase real interest rates, and consequently real debt payment value. The consequence could be to preclude countries from improving their fiscal space for health without compromising their debt sustainability, considering already high debt levels, and the existing high cost of raising finance in some countries (see sovereign debt credit rating and debt sections for further information).

Between 2006 and 2016, inflation declined in all countries besides Brazil, Chile, Colombia, Peru, and Uruguay. Inflation has continued to fall in most Latin American countries, and for most of the inflation-targeting countries, inflation has returned to within the official target range (IMF, 2018b). In countries where inflation is above the target range, it is anticipated inflation will moderate in 2018-19 (IMF, 2018b). The recent fall in inflation in several Latin American countries has allowed for monetary policy easing; specifically, with inflation nearing the target range and expectations remaining stable, most inflation-targeting central banks have reduced their policy rates (IMF, 2018b). Although monetary policy is less procyclical in economies with more well anchored inflation expectations, episodes of exchange rate volatility and substantial currency depreciations have resulted in Latin America's central banks undertaking procyclical monetary policy tightening, despite stable inflation expectations (IMF, 2018b).

Figure 14: Inflation (annual %)



***Source**: LSE, based on World Bank (2018c) data.*

We assessed the study countries' inflation rate against a benchmark of 2 to 2.5%. Of the study countries, Colombia, Brazil, and Uruguay experienced high inflation levels in 2016 of 7.5%, 8.7%, and 9.6% respectively. Except for Costa Rica, Ecuador, and Panama that already have achieved low inflation, a fall in inflation will likely be beneficial for the study countries' fiscal space.

Current account balance

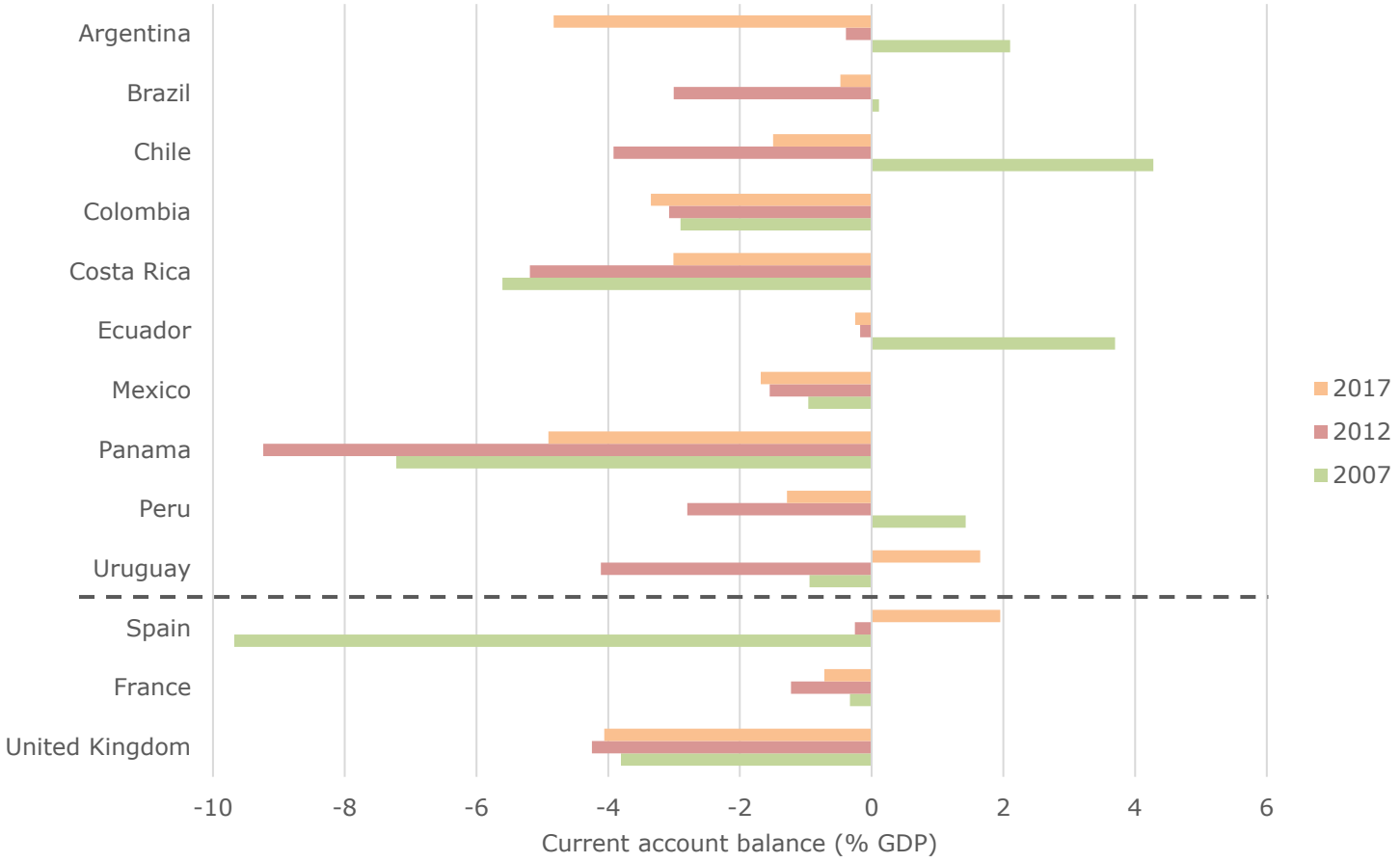
The overarching trend for the study and comparator countries is one of current account deficits. The UK, France, Panama, Mexico, Costa Rica, and Colombia have had a current account deficit at each measured interval over the last ten years. Although, Argentina, Brazil, Chile, Ecuador, and Peru experienced a current account surplus in 2007, all countries had a current account deficit in 2012, and in 2015 Latin America's current account deficit reached its apex (Werner, 2017).

In most Latin American countries, current account deficits have decreased during the last couple of years, and external adjustment which followed the end of the commodity super-cycle is nearly complete (IMF, 2018b). In some countries such as

Peru and Chile, which are commodity (metal) exporters and net oil importers, the rebound in commodity prices has led to improvements in net commodity terms of trade to their boom levels (IMF, 2018b). Nonetheless, only Uruguay and Spain had a current account surplus in 2017, and looking forward, current account deficits are expected to expand once again, as growth in investment and domestic consumption hastens (IMF, 2018b). At current levels between -2% and -4% of GDP, current account deficits are not critically high, but further deterioration will pose constraints on fiscal space and will require correction intervention.

Overall, persistent trade and current account deficits could be detrimental to Latin American economies because they have the capacity to negatively affect growth, employment, and result in currency depreciations. They are indicators of failing competitiveness, and the indirect effects of the above would be to limit fiscal space for health (as well as other human services), given macroeconomic growth is considered a major driver of fiscal space.

Figure 15: Current account balance (% GDP)



Source: *LSE, based on World Bank (2018c) data.*

Sovereign debt credit rating

The different credit rating agencies utilise a cut-off point to determine whether a country's sovereign debt is credit worthy. Above or equal to this level, a country's sovereign debt is considered investable, and below this level it is not worth investing in. In the study countries, there is a general trend of fiscal solvency, as reflected by the credit ratings (see Table 8).

Table 8: Credit-worthiness of study and comparator countries

	Credit-worthiness
ARGENTINA	×
BRAZIL	×
CHILE	✓
COLOMBIA	✓
COSTA RICA	×
ECUADOR	×
MEXICO	✓
PANAMA	✓
PERU	✓
URUGUAY	✓
FRANCE	✓
SPAIN	✓
UK	✓

***Note**: × = Not credit worthy (junk bonds), ✓ = credit worthy*

***Source**: Adapted from Trading Economics (2018b).*

Based on information from credit rating agencies, sovereign debt is below credit-worthiness in four study countries: Argentina, Brazil, Costa Rica, and Ecuador. One interpretation is that this represents a heightened risk of not being able to meet financial obligations in totality and on time. Low credit ratings also implies difficulty in attracting international capital to fund debt given the substantial costs of raising funds in international markets. The knock-on effect of such high lending rates, are significant (and in some cases prohibitive) costs of national debt servicing, and the opportunity cost of human services investment such as health. Consequently, these countries will have to rely on domestic capital to fund their sovereign debt.

On the other hand, the credit rating agencies consider Chile, Colombia, Mexico, Panama, Peru, and Uruguay, along with the comparator countries, investable. Consequently, the interest rates they face will be lower, and they will be able to raise finance at a reduced cost compared to countries with a lower credit rating. Given the increasing levels of debt across the study countries, cheaper debt financing in these countries will positively impact their fiscal space for health, since they will face a lower amount of government revenue expended on debt interest payments.

Looking forward, and taking into account broader environmental and external, challenges, contracting global financial conditions which cause the region to face medium-term growth risks, may also adversely impact debt financing. The risks surrounding global financial conditions include US monetary policy tightening which may significantly affect the region's

long-term interest rates, and overall financing conditions. Most countries in the region will face substantial spillover effects from US interest rates on their domestic interest rates, for example short-term interest rates in Mexico and Peru, and long-term interest rates in Brazil and Colombia (IMF, 2018b). The countries most at risk of adverse global financial conditions are Chile, Mexico, Brazil, Peru, and Colombia since they are the most financially integrated economies in the region. Overall the region's capital flows are extremely receptive to worldwide shocks, and tighter financial conditions have the potential to adversely impact capital flows to the region. Nevertheless, this will be partly offset by the improved conditions for commodity exporters due to partial recovery of commodity prices (IMF, 2018b).

Assessment of macroeconomic environment and policies

We assessed the countries' achievement of a favourable macroeconomic environment for fiscal space. We focused on their performance across the five following areas: GDP growth, fiscal balance, debt, inflation, and current account balance. Table 9 presents data across these indicators for all study countries.

Table 9: Macroeconomic Indicators[1]

	GDP growth	Fiscal balance	Debt	Inflation	Current account balance
	% (2017)	*% GDP*	*% GDP (2016)*	*% (2016)*	*% GDP (2017)*
ARGENTINA	2.86	-6.00	49.73	N/A	-4.83
BRAZIL	0.98	-5.88	77.55	8.74	-0.47
CHILE	1.49	-2.89	34.46	3.79	-1.50
COLOMBIA	1.77	-2.32	43.25	7.52	-3.35
COSTA RICA	3.19	-2.51	44.79	0.00	-3.01
ECUADOR	3.00	-7.78	37.76	1.72	-0.25
MEXICO	2.04	-0.88	23.39	2.82	-1.68
PANAMA	5.36	-2.32	37.36	0.75	-4.91
PERU	2.53	2.08	23.78	3.60	-1.29
URUGUAY	2.66	-4.09	63.3	9.64	1.65

Note: *[1]Macroeconomic data from other authorities may differ. For example, the Central Bank of Costa Rica reported 0.6% inflation for 2016.*

Sources: *GDP growth (World Bank, 2018c), fiscal balance for Brazil, Costa Rica, and Mexico (OECD, 2018a) and for all other countries (Inter-American Development Bank, 2018), debt (Inter-American Development Bank, 2018), inflation (World Bank, 2018c), and current account balance (World Bank, 2018c).*

To assess the countries' achievement of a favourable macroeconomic environment for fiscal space, the following measures were applied (Table 10):

- For *GDP growth*, a benchmark of 2 to 3% growth was utilised and evaluated as good over 2%, low-to-average between 1 to 2% and poor under 1%.
- For *fiscal balance*, we evaluated as good a surplus, average 0 to 3% deficit, and poor over 3% deficit.
- For *debt*, the debt-to-GDP ratio of 40% for developing countries was used, and evaluated as good below 30%, average between 30 to 40% and poor over 40%.
- For *inflation*, the benchmark of 2 to 2.5% was utilised, and assessed as good between 2 and 2.5%, average 2% above 2.5%, and poor more than 2% above 2.5%.
- For *current account balance,* we evaluated as good a surplus, average 0 to 3% deficit, and poor over 3% deficit.

Table 10: Achievement of favourable macroeconomic environment for fiscal space

	GDP growth	Fiscal balance	Debt	Inflation	Current account balance
ARGENTINA	✓	x	x	n/a	x
BRAZIL	x	x	x	x	—
CHILE	—	—	—	—	—
COLOMBIA	—	—	x	x	x
COSTA RICA	✓	—	x	—	x
ECUADOR	✓	x	-	—	—
MEXICO	✓	—	✓	—	—
PANAMA	✓	—	—	—	x
PERU	✓	✓	✓	—	—
URUGUAY	✓	x	x	x	✓

Legend: ✓ = *good;* — = *average;* x = *poor; n/a = no data.*

Source: *LSE assessment.*

In 2017, all study countries besides Brazil, Chile, and Colombia experienced good GDP growth. This is advantageous for generating fiscal space for health, and must be maintained. If GDP growth declines, the fiscal balance which is already average to poor across the study countries, will further deteriorate as their fiscal deficits increase. Subsequently there will be upwards pressure on debt levels, which given the

sovereign debt credit rating of Argentina, Brazil, Costa Rica, and Ecuador, will lead to significant associated debt servicing costs. Acting as a counterbalance to their good GDP growth, is the countries' average to poor performance in relation to inflation and the current account balance, which could reduce their growth and thereby limit their ability to increase fiscal space for health.

SUMMARY

Macroeconomic performance and fiscal space

In order to determine whether the fiscal space exists to expand health spending, it is essential to assess macroeconomic performance. This is because the fiscal space to increase healthcare expenditure is determined by a country's wider economic context. Countries facing adverse fiscal and other macroeconomic conditions may resist future increases in real health spending because these could undermine fiscal stability; by contrast, strong economic growth (which is a major driver of fiscal space) and sound macroeconomic fundamentals form the basis for an increase in fiscal space and, ultimately, health expenditure.

Positive GDP growth may signal the potential to generate additional government revenue to spend on health services. All study countries displayed positive GDP growth trend between 2007 and 2017. While positive growth is expected to continue in the short-term, a weak growth outlook remains for the region in the medium-term, which, in turn, may influence discussion on fiscal space.

Other macroeconomic performance indicators highlight sources of potential instability. For example, all countries, except Peru, have generated fiscal deficits in recent years; continued fiscal deficits, in turn, may fuel increases in debt levels, although in most countries the pursuit of fiscal discipline, and, therefore, deficit reduction, is a stated objective. Besides Argentina, Panama, Peru, and Uruguay, debt increased from 2006 to 2016 in all other countries, with particularly significant increases in the latter 5-year period. The debt situation and its servicing in Argentina remains a challenge.

A fall in inflation will likely be beneficial for the creation of fiscal space. Between 2006 and 2016, inflation declined in 6 countries except for Brazil, Chile, Colombia, Peru, and Uruguay.

In terms of external balance, all study countries also experience current account deficits. Persistent trade and current account deficits could be detrimental, and may result in limited fiscal space for health.

The consequences of these trends for fiscal space may materialize as an increasing proportion of existing tax revenue is likely to be directed towards financing debt interest payments, potentially through an increase in government taxation and reduction in government expenditure, unless GDP growth remains strong. Debt sustainability becomes an adjacent issue, together with the existing high cost of raising funds to service it in some countries. However, while increasing levels of debt across the study countries are observed, sovereign debt credit ratings are positive for the majority of them (Chile, Colombia, Mexico, Panama, Peru, and Uruguay). Affordable debt financing in these countries may positively impact their fiscal space for health.

Overall, macroeconomic performance is not positive in its entirety for all study countries and a variety of macroeconomic instabilities remain in the region, including fiscal deficits, deteriorating external balances and debt servicing in some cases. However, these can be balanced out by positive growth levels, recovering commodity prices, and low inflation. Therefore, and in general terms, a debate on fiscal space is in a positive territory considering macroeconomic performance in the Latin American region.

HOW ARE KEY FINANCING MECHANISMS PERCEIVED BY POLICYMAKERS IN TERMS OF POLITICAL FEASIBILITY AND NECESSITY?

Forming policy and deciding on equity-efficiency trade-offs by implementing policy interventions is a complex process that involves political discourse and multidimensional stakeholder influence. In order to elicit stakeholder preferences and the degree of agreement or disagreement on different healthcare financing options, we conducted a web-based survey. The survey considered values and opinions of several key sector stakeholders (payers, providers, governmental organisations, academia and private sector/industry) on healthcare financing, ranked on a Likert scale from 1 (strongly agree) to 7 (strongly disagree). Likert type scales are used in order to draw the individual preferences of each respondent as they are most commonly used to measure attitudes and degree of agreement to statements (Sullivan & Artino, 2013).

The proposed alternatives included generating additional revenue for the health system by increasing taxation on income, corporate profits or consumption, "sin" taxes on harmful products, fund reallocation and user charges; containing costs by restricting the free package of healthcare and means tested free healthcare eligibility; implementing healthcare efficiency measures by privatizing parts of healthcare, reinforced role of private insurers and health saving accounts; and life style interventions including free mandatory screening programmes, healthy eating and living encouragement as well as products showing the amount of sugar contained in a very visible way. The survey results hope to analyze and discuss healthcare stakeholder preferences for potential policy interventions that can help achieve healthcare financing sustainability. Considering the key role of political will in achieving UHC, wider stakeholder preferences can provide insights into what is viable.

In total, 1176 individuals were invited to participate and answer this questionnaire and the group included individuals in senior and decision-making positions across several key, related to health, sectors, including: government, healthcare providers, academia, think tanks, industry, advisory, patient groups, international organizations, not-for profit organizations. Participation was sought from the 10 Latin American countries and the 3 EU

comparator countries. A total of 673 responses were received. The LSE network was used to compile the list of target individuals. Prior to the launch of the survey online, a pilot was run and was tested by a team of healthcare financing experts and feedback was incorporated. The survey was electronically sent to the stakeholders in mid-May 2018 and was open for four months, until mid-September 2018, with reminders being sent 3, 7, 11 and 15 weeks following the initial invitation.

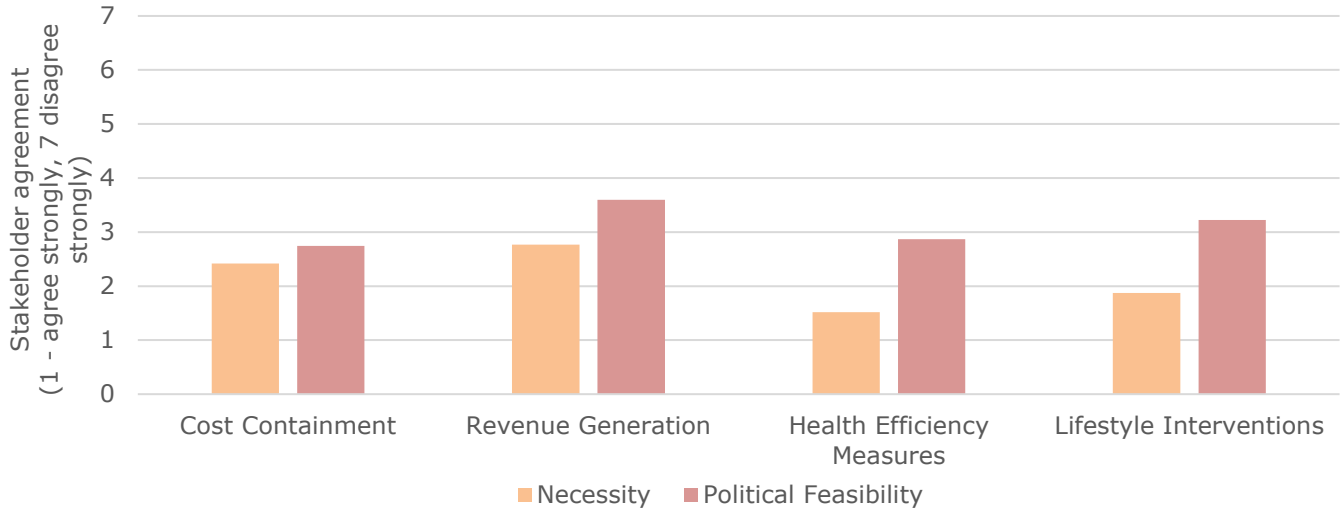
Table 11 summarises the key respondent characteristics regarding affiliation, country, gender and age group. In the following sections, we present and briefly discuss the key results of the survey, notably stakeholder preferences on (a) the necessity and political feasibility of financing mechanisms, (b) revenue generation mechanisms in terms of revenue-raising capacity and political feasibility, and (c) health efficiency mechanisms (in terms of their ability to increase efficiency and the associated political feasibility).

Political feasibility of financing mechanisms

Figure 16 shows the perceived necessity and political feasibility of four financing mechanisms: cost containment, generation of additional revenue, improved efficiency in healthcare provision, and lifestyle interventions to curb healthcare costs.

A general sense of agreement on the necessity and political feasibility of the options is observed. The necessity of all four options is considered relatively high, with respondents' ratings ranging between strong agreement and agreement. Respondents rated the political feasibility of implementing the options generally positively, with revenue generation rated least feasible.

Figure 16: Necessity and political feasibility of mechanisms for sustainable financing



***Source**: LSE based on survey data.*

Table 11: Respondent characteristics: survey on healthcare financing preferences

Variable	Total respondents	Percentage
Affiliation (n=673)		
Academia	88	13%
Government decision-making	222	33%
Provider	40	6%
Private sector/Industry	209	31%
Other (health professionals, think-tanks, NGO)	114	17%
Country (n=673)		
Latin America	458	68%
Argentina	*66*	*14%[1]*
Brazil	*117*	*26%*
Chile	*31*	*7%*
Colombia	*47*	*10%*
Costa Rica	*13*	*3%*
Ecuador	*19*	*4%*
Mexico	*101*	*22%*
Panama	*14*	*3%*
Peru	*27*	*6%*
Uruguay	*23*	*5%*
Comparator countries (France, Spain, UK)	215	32%
Gender (n=673)		
Male	384	57%
Female	289	43%
Age group (n=673)		
<30 years	54	8%
30-44 years	229	34%
45-60 years	343	51%
>65 years	47	7%

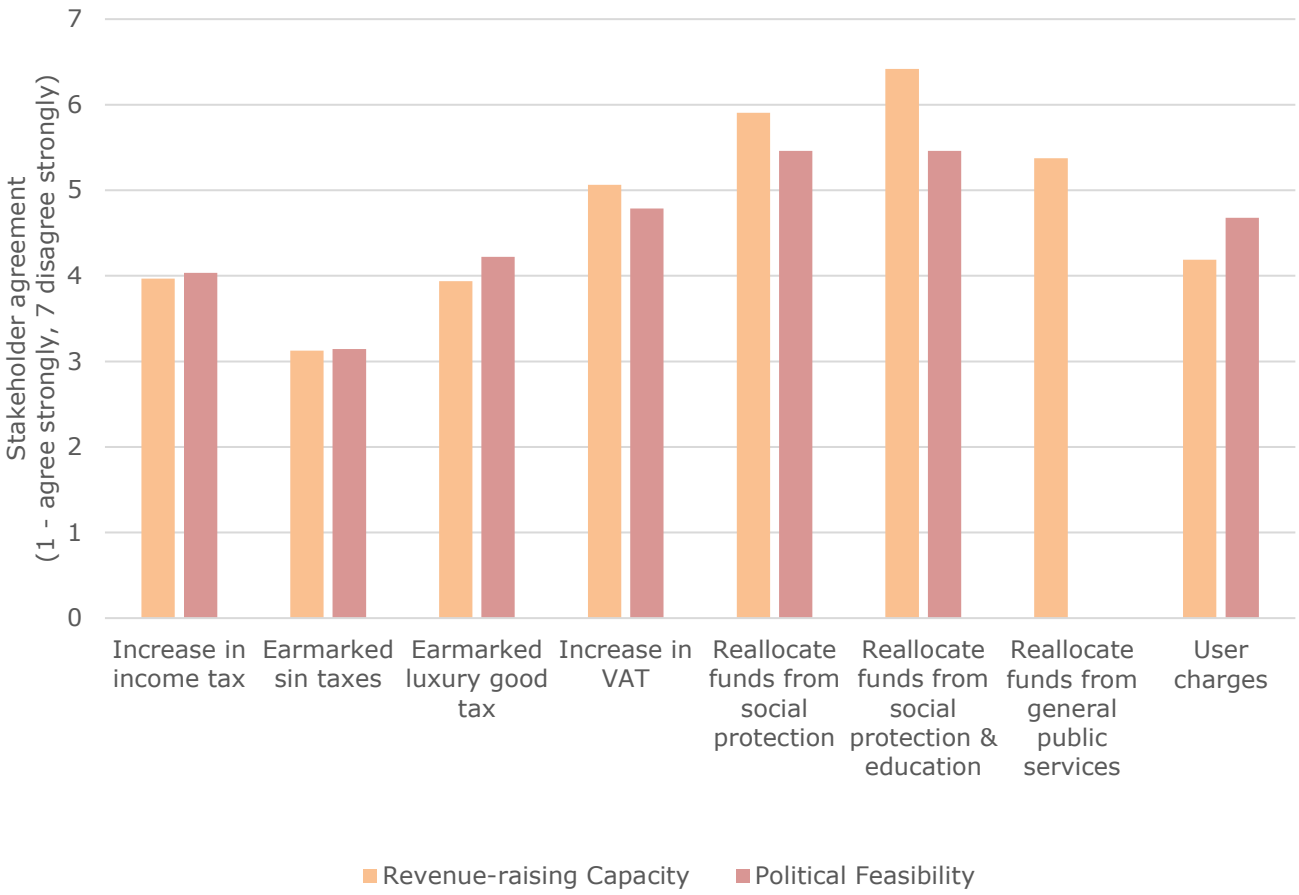
Note: *[1] All country-level percentages reflect country weight amongst Latin American respondents (n=458).*

Source: *LSE survey.*

Key mechanisms for revenue generation

Figure 17 shows the perceived strength of the revenue raising capacity of various revenue generating mechanisms. Harmful product taxes earmarked for healthcare provision were considered the most appropriate mechanism for securing additional resources for sustainable funding and were rated highest for political feasibility. Earmarked luxury good taxes and income tax increases were also considered good revenue generating mechanisms and politically feasible, though the applicability of income tax in the Latin American region is limited due to a large informal economy and tax evasion. A reduction in or reallocation from other areas of public spending were considered the weakest forms of revenue generation, and the least politically feasible.

Figure 17: Revenue-raising capacity and political feasibility of revenue generation mechanisms



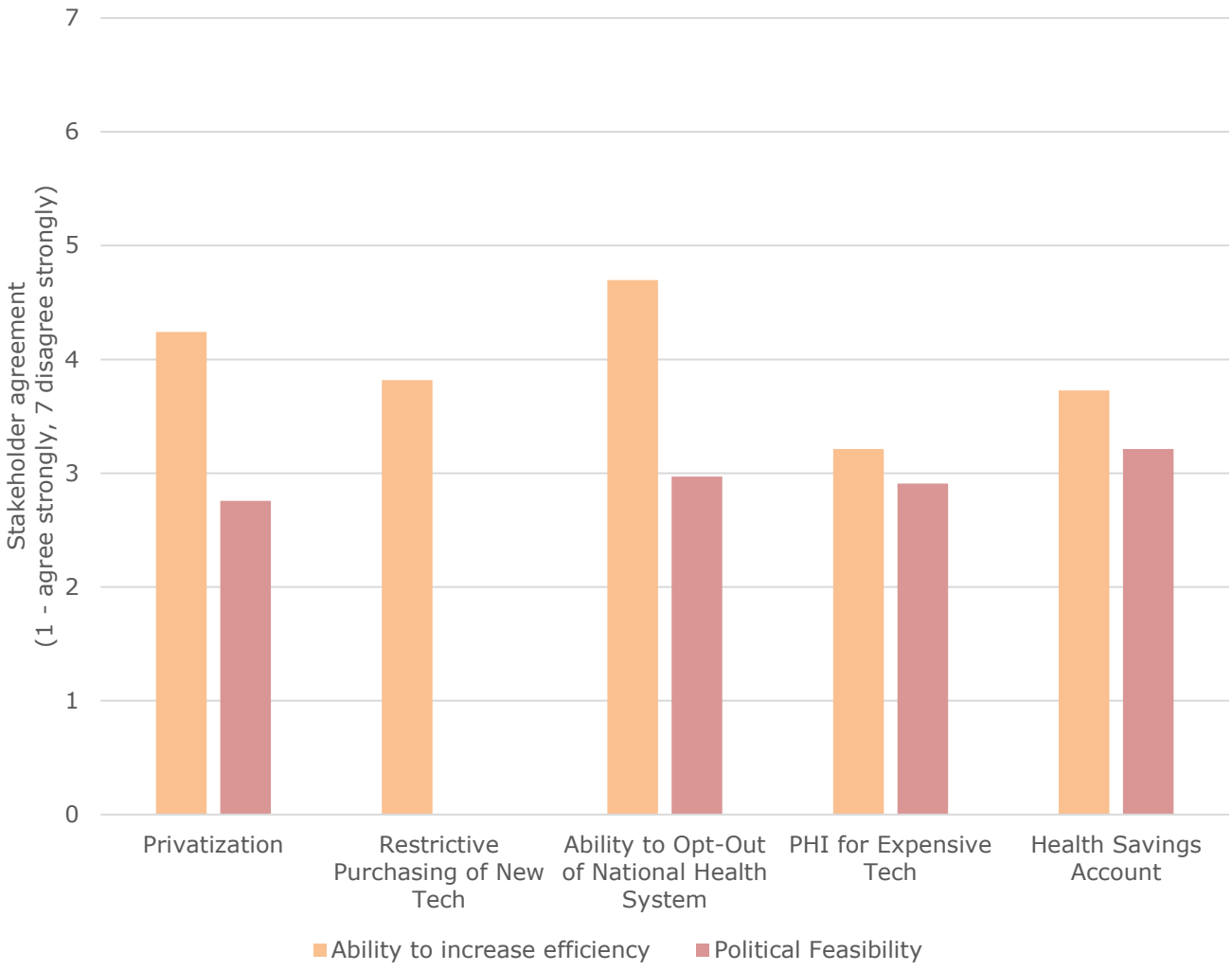
***Note**: No data on the political feasibility of reduced spending on general public services was collected. Data on the political feasibility for social protection, and social protection and education, was derived from a single question.*

***Source**: LSE based on survey data.*

Key mechanisms for health efficiency

Figure 18 shows the perceived use of strategies for improving healthcare system efficiency together with their political feasibility. All options are rated as average in their ability to increase system efficiency, together with relative positive responses to the political feasibility of implementing these techniques.

Figure 18: Improved efficiency and political feasibility of health efficiency mechanisms



***Note**: No data on the political feasibility of restrictive purchasing was collected.*

***Source**: LSE based on survey data.*

SUMMARY

Perception of financing and efficiency mechanisms by policymakers

Forming policy and deciding on equity-efficiency trade-offs by implementing policy interventions involves political discourse and multidimensional stakeholder influence. In order to gauge stakeholder perceptions and preferences about specific foci on health policy reform, a survey was conducted and considered values and opinions of several key sector stakeholders (payers, academia, providers, government and industry) on healthcare financing and health reform direction(s).

The objective of the survey was to inform the debate on fiscal space, the modalities through which this could be leveraged and focused on obtaining opinion and perspective on three key areas. First, in terms of the necessity and political feasibility of key mechanisms for sustainable healthcare financing, stakeholders strongly agree on the necessity of implementing efficiency measures and lifestyle interventions as a means of improving the 'productivity' of available resources devoted to health and agree that generating additional revenue is important but that tight control on spending should also be observed (cost containment). Stakeholders also commented on the political feasibility of the above options and confirmed their agreement on all of them.

Second, stakeholders were asked to comment on the revenue-raising capacity and political feasibility of a range of revenue generation mechanisms. They agreed that taxes on harmful products, particularly on alcohol and tobacco (known as 'sin' taxes), if earmarked, have considerable revenue-raising capacity and are politically feasible. In a comparable vein, they favoured earmarked taxes on luxury goods and income tax more than increases in VAT and were completely negative on the proposal of re-allocating resources from social security, education or other publicly funded services to health.

And, third, we gauged stakeholder interest in a series of options relating to improvements in efficiency and the political feasibility of a number of mechanisms that could promote efficiency. In that context, stakeholders remained neutral about the potential of the following measures concerning their ability to improve efficiency: privatization of health services, restrictive purchasing of new technologies, the ability of people to opt-out of national health systems, the introduction of private (top-up) health insurance for expensive technologies and the introduction of health savings accounts. In terms of political feasibility, however, stakeholders agreed that the above options were implementable.

Overall, there seems to be agreement on the necessity of additional funding options to increase the level of investment in healthcare, in combination with measures to improve the efficiency of resources that are already deployed. In parallel, private funding options at healthcare system level were met with some scepticism, perhaps with the exception of top-ups for specific types of coverage (expensive technologies) and, where possible, health savings accounts.

Based on the results of the stakeholder survey, we selected indirect taxes (VAT and 'harmful products') to study the extent to which they could create additional fiscal space and the magnitude of such space. Although stakeholders expressed concerns about the use of VAT as a vehicle to raise additional resources to fund health services, it was included in the analysis, first, because of its revenue-raising capacity, which is equal to or higher than that of income tax and, second, because of the assumption that any additional resources raised would be explicitly earmarked, wholly or partly, to fund health services, therefore, becoming hypothecated. The selection of taxes on harmful products as a vehicle to raise additional resources for health was based on the principle of hypothecation, i.e. all additional revenue would be earmarked for the purposes of health.

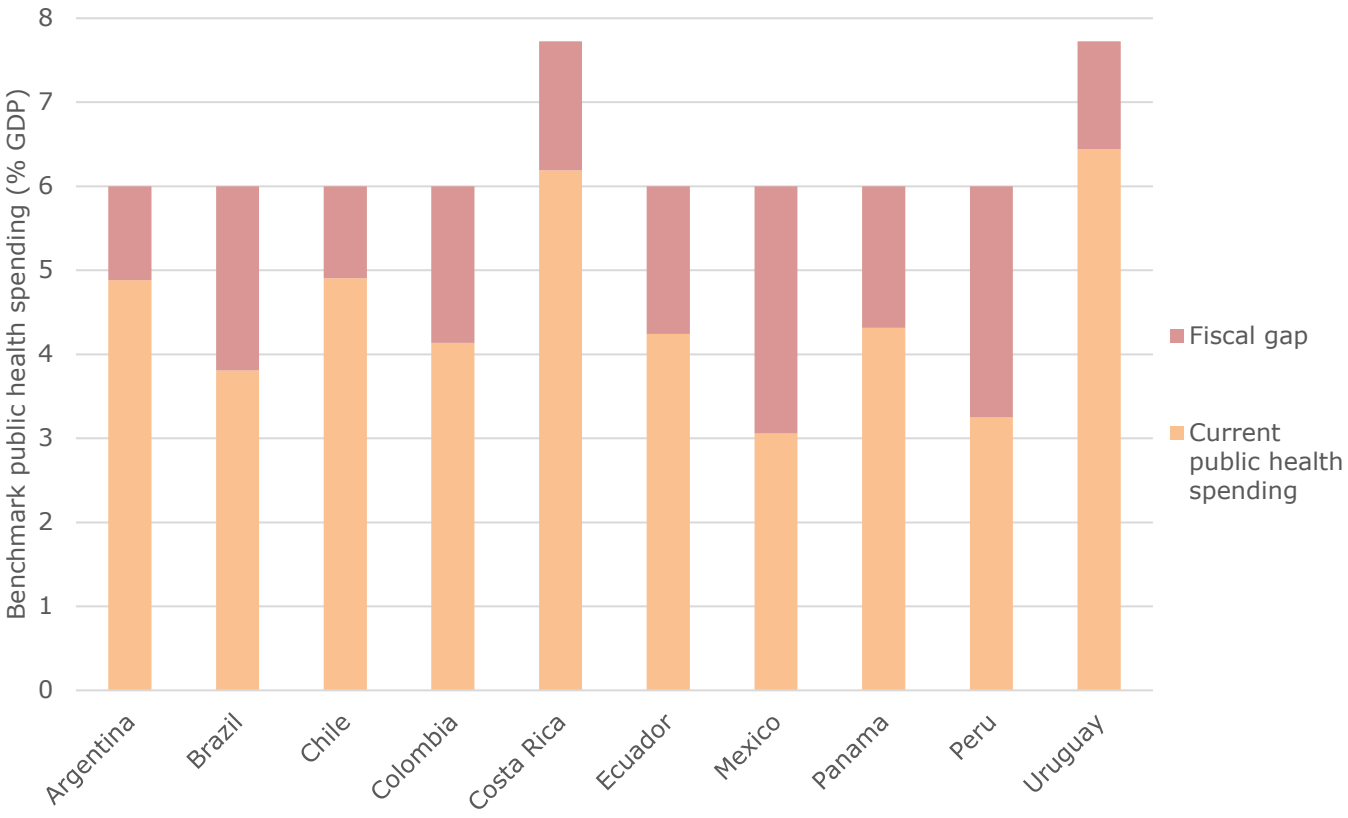
Taxes on alcohol and tobacco, are not the only taxes related to behaviour: taxing sugar and fat or levying environmental taxes also present valid policy options. However, lack of readily available and comparable data and information have meant that we have focused only on alcohol and tobacco. Still, it needs to be recognised that sugar, fat, and environmental taxes, are associated with important public health implications similar to those raised by taxes on alcohol and tobacco.

HOW LARGE IS THE FISCAL GAP IN HEALTHCARE SPENDING IN THE COUNTRIES?

Shortfall in public healthcare financing

The fiscal gap between the public spend on health (% GDP) in Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Panama and Peru, and the 2014 PAHO benchmark of 6% of GDP, varied from 1.1% GDP in Chile to 2.9% GDP in Mexico. The average gap across the eight countries was 1.9% GDP. The average public spend on health across the three comparator countries was found to be 7.7% GDP. The gap between this value and that contributed by Costa Rica and Uruguay, varied from 1.3% GDP in Uruguay to 1.5% GDP in Costa Rica. Figure 19 shows this fiscal gap across the 10 study countries, as a % of GDP.

Figure 19: Fiscal gap based on public health spend as % of GDP

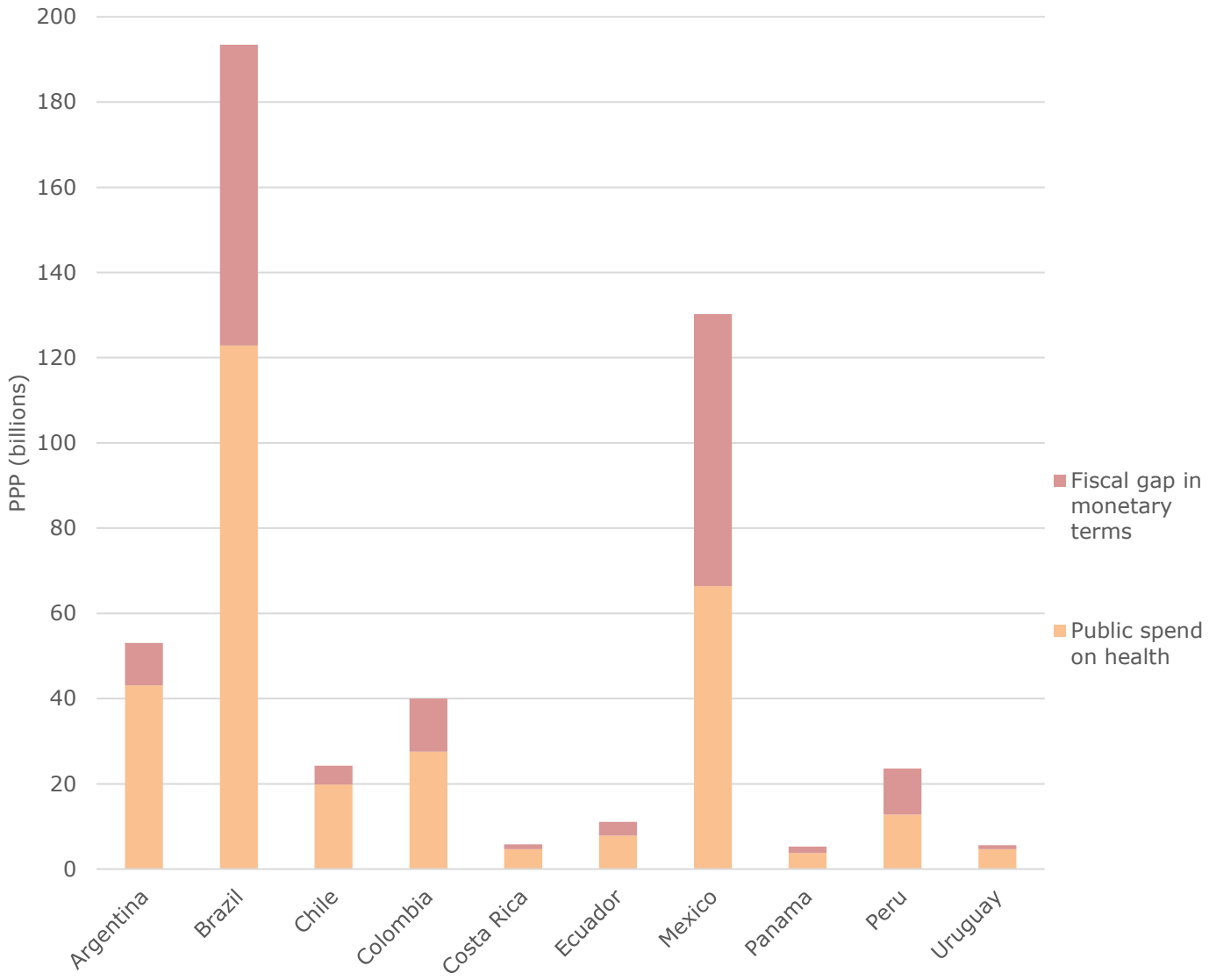


***Note**: Figure shows the gap between current (most recently available) public spend on health (as a % GDP) in contrast to the 6% benchmark spend for Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Panama and Peru, and in contrast to the average comparator country spend of 7.7% for Costa Rica and Uruguay.*

***Source**: LSE calculations based on World Bank data (2015).*

In monetary terms Brazil is the highest spender in the region in terms of public expenditure on health ($123 billion, in US$ PPP) but also has the highest fiscal gap to reach the PAHO benchmark on public health spend ($71 billion in US$, PPP). Uruguay has the lowest gap to fill (US$0.93 billion) due to its high current public health spend relative to its GDP. Figure 20 outlines country level public spending on health and the fiscal gap in monetary terms.

Figure 20: Fiscal gap based on public spend on health in monetary terms (US$ PPP)

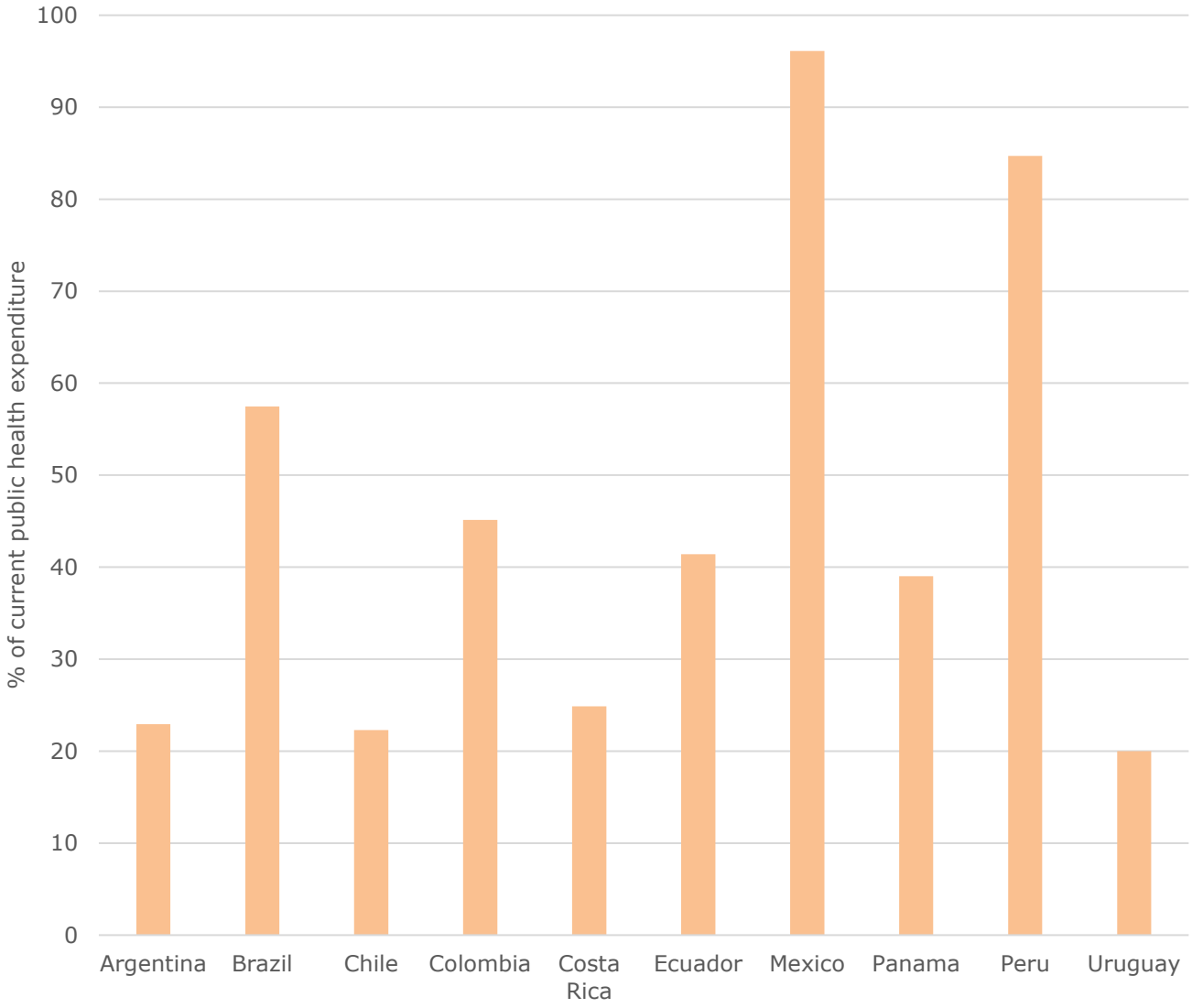


***Note**: Figure shows the gap between current (most recently available) public spend on health, PPP (billions) in contrast to the PAHO benchmark spend for Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Panama and Peru, and in contrast to the average comparator country spend for Costa Rica and Uruguay.*

***Source**: LSE calculations based on World Bank data (2015).*

Mexico has the largest fiscal gap as a percentage of current public spend on health (Figure 21) (96%), followed by Peru (84.7%). Uruguay has the smallest fiscal gap as a percentage of current public health spend (20%). All other countries have a fiscal gap (as % current public health spend) within the range of 22.3 to 57.5%.

Figure 21: Fiscal gap as a percentage of current public spend on health



***Source**: LSE based on World Bank data.*

Cost of increasing public healthcare financing to fill the fiscal gap

The cost of increasing public healthcare financing reflects the size of the GDP of the country in question. Table 12 highlights the resources required for such additional spend for each country. Brazil followed by Mexico face the highest cost (in monetary terms US$, billion) of increasing public healthcare financing, despite Brazil not facing the highest cost of increasing public healthcare financing (as % GDP). This is because Brazil has the highest GDP of all ten countries. Furthermore, Uruguay followed by Costa Rica face the lowest cost of increasing public healthcare finance (US$, billion), although they do not face the lowest cost of increasing public healthcare financing (as % GDP). Partly because of their size they have the lowest aggregate GDP of the ten countries.

Table 12: Cost of increasing public healthcare financing

	Cost of increasing public healthcare financing *% GDP*	Cost of increasing public healthcare financing *US$, billions*
ARGENTINA	1.1	9.89
BRAZIL	2.2	70.62
CHILE	1.1	4.43
COLOMBIA	1.9	12.44
COSTA RICA	1.5	1.16
ECUADOR	1.8	3.25
MEXICO	2.9	63.82
PANAMA	1.7	1.48
PERU	2.8	10.82
URUGUAY	1.3	0.93

***Source**: LSE calculations using World Bank data.*

SUMMARY

Observed fiscal gap in public healthcare spending

While all healthcare systems in Latin America subscribe to the principle of universal health coverage, in practice, only partial coverage is offered, with a significant proportion of the demand for healthcare services being met through out-of-pocket spending. The benchmark level of public expenditure on health as a proportion of GDP for middle/upper middle income countries has been advised by WHO/PAHO to be 6%. The difference between that level of expenditure and actual spending constitutes the fiscal gap in public healthcare spending.

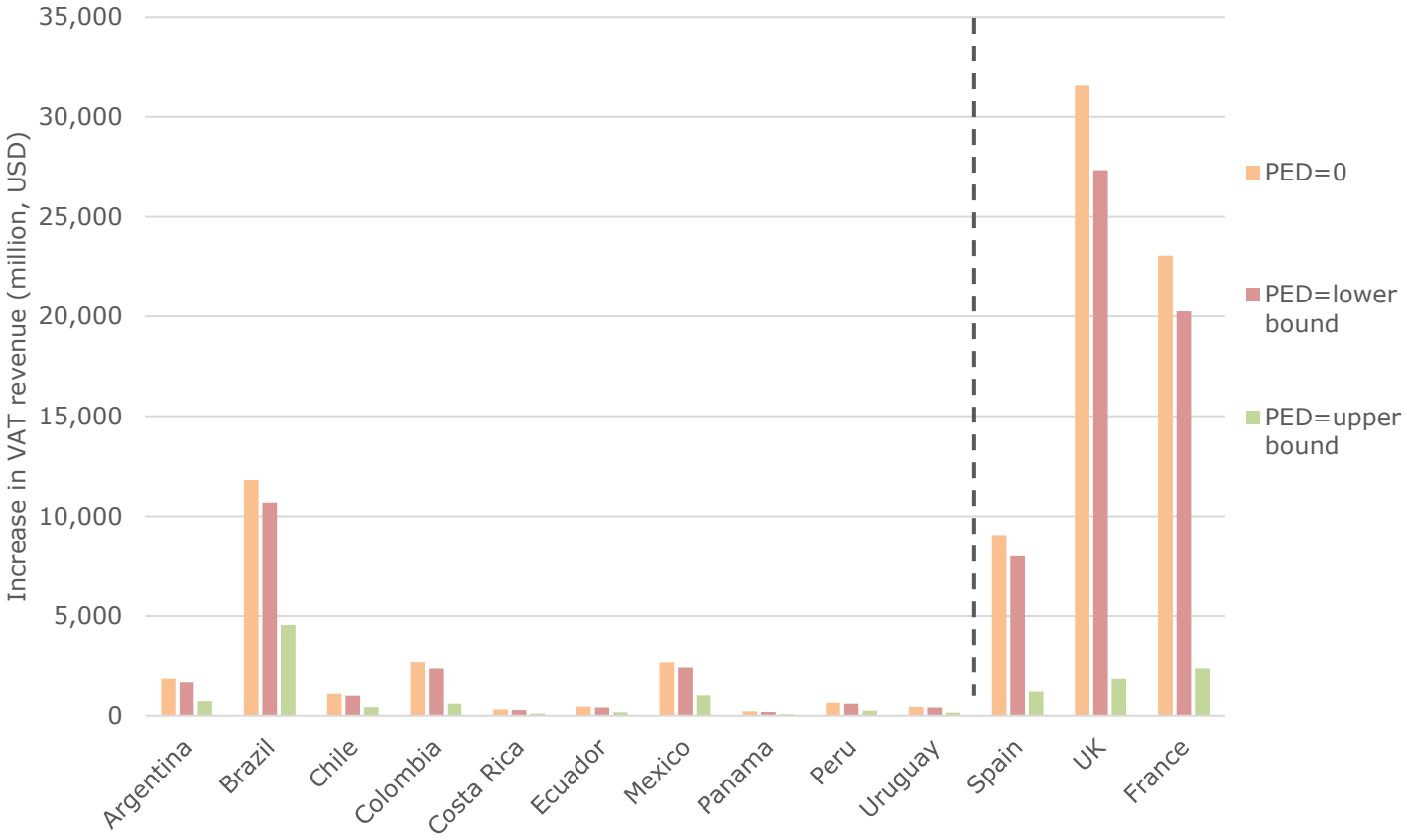
Currently, the average observed fiscal gap across the ten study countries between public spending on health (as % of GDP) and the benchmark health spend of 6% of GDP stands at 1.9% GDP (ranging from 1.1 – 2.9% of GDP). The majority of countries currently spend considerably below the 6% WHO/PAHO benchmark, with only Costa Rica and Uruguay meeting and slightly exceeding that benchmark. In monetary terms, Brazil, Mexico, and Peru have the largest fiscal gaps to close in terms of additional resources required for their healthcare systems (US$70.6 billion, US$63.8 billion and US$12.4 billion, respectively).

HOW CAN INCREASES IN INDIRECT TAXES GENERATE FISCAL SPACE FOR HEALTH?

Value-Added Tax

Table 13 lists the standard (current and simulation) and non-standard VAT rates, along with the percentage point increase in each of the five scenarios that were outlined in the methods section. Table 13, Figure 22, and Figure 23 provide the range of fiscal yields generated, and maximum achievable increase in VAT revenue in million (USD), and as a % of GDP respectively, for all countries and all scenarios when VAT rates are increased by one percentage point, when PED is equal to: (1) zero; (2) the lower bound; and (3) the upper bound. PED rates are country-specific.

Figure 22: Maximum achievable increase in VAT revenue (US$ million)



Note: *In this figure, we show that maximum VAT revenue increase (in US$ million)) that is achievable: under scenario 1 for Brazil, Panama, and UK (PED=upper bound); and under scenario 5 for Argentina, Colombia, Costa Rica, Uruguay, Spain, UK (PED=0 and PED=lower bound) and France. Chile, Ecuador, Mexico, and Peru achieve the same VAT revenue increase for PED=0, PED=lower bound, and PED=upper bound across all scenarios.*

Source*: LSE calculations.*

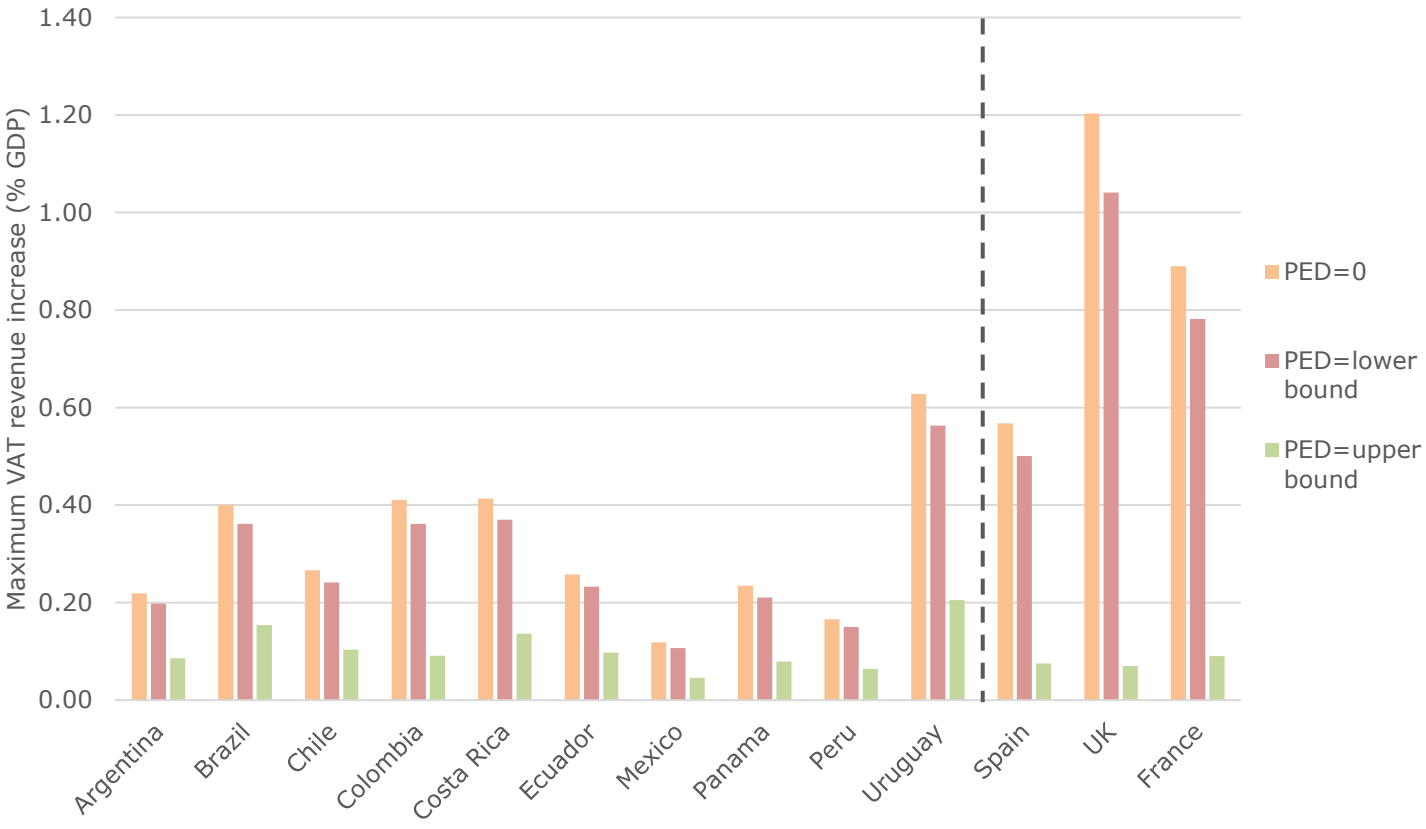
Table 13: Standard and non-standard VAT rates in Latin American countries

	Current standard rate	Rate increase	Simulation rate standard	Current non-standard rate	Non-standard Rate increase	Rate increase	Simulation rate non-standard
	%	*Scenarios 1-5*	**%**	*%*	*Scenarios 1 – 4*	*Scenario 5*	*%*
ARGENTINA	21	+1% point	**22**	18.75[1]	Unchanged	+1% point	**19.75**
BRAZIL	17	+1% point	**18**	18.5	Unchanged	+1% point	**19.5**
CHILE	19	+1% point	**20**	0[4]	Unchanged	+1% point	**1**
COLOMBIA	19	+1% point	**20**	2.5[2]	Unchanged	+1% point	**3.5**
COSTA RICA	13	+1% point	**14**	5[3]	Unchanged	+1% point	**6**
ECUADOR	14	+1% point	**15**	0[4]	Unchanged	+1% point	**1**
MEXICO	16	+1% point	**17**	0[4]	Unchanged	+1% point	**1**
PANAMA	7	+1% point	**8**	12.5[5]	Unchanged	+1% point	**13.5**
PERU	18	+1% point	**19**	N/A	Unchanged	+1% point	**N/A**
URUGUAY	22	+1% point	**23**	5[6]	Unchanged	+1% point	**6**
FRANCE	20	+1% point	**21**	2.5[2]	Unchanged	+1% point	**3.5**
SPAIN	20	+1% point	**21**	3.83[7]	Unchanged	+1% point	**4.83**
UK	21	+1% point	**22**	4.67[8]	Unchanged	+1% point	**5.67**

Notes:
[1] Calculated as an average of 27% and 10.5%
[2] Calculated as an average of 5% and 0%
[3] Calculated as an average of 10%, 5%, and 0%
[4] Single non-standard rate of 0%
[5] Calculated as an average of 15% and 10%
[6] Calculated as an average of 10% and 0%
[7] Calculated as an average of 10%, 5.5%, 2.1%, and 0%
[8] Calculated as an average of 10%, 4%, and 0%

***Sources**: Current VAT rates (Trading Economics (2018a); VAT receipts (million, USD): OECD (2018)*

Figure 23: Maximum achievable increase in VAT revenue (% GDP)



Note: *In this figure, we show that maximum VAT revenue increase (as a % of GDP) that is achievable: under scenario 1 for Brazil, Panama, and UK (PED=upper bound); and under scenario 5 for Argentina, Colombia, Costa Rica, Uruguay, Spain, UK (PED=0 and PED=lower bound) and France. Chile, Ecuador, Mexico, and Peru achieve the same VAT revenue increase for PED=0, PED=lower bound, and PED=upper bound across all scenarios.*

Source*: LSE calculations.*

Fiscal impact assuming PED=0. If we assume no impact on consumption (PED=0), the increase in yield for the ten study countries across all five scenarios ranges from US$113 million in Uruguay to US$11,805 million in Brazil. Additionally, Figures 22 and 23 show the *maximum* achievable increase in VAT revenue across all scenarios when PED=0, varies from US$214 million in Panama to US$11,805 million in Brazil (Figure 22), and from 0.12% of GDP in Mexico to 0.63% of GDP in Uruguay (Figure 23). Such significant variation in additional tax revenue is unsurprising, given the differences in (1) factors which impact VAT base such as population size, and income, (2) current VAT rates, and (3) weightings used across the five scenarios. Nonetheless, in scenario 1 alone, there is substantial variation in the increase in additional revenue which ranges from US$187 million in Uruguay to US$11,805 million in Brazil.

Fiscal impact assuming PED=lower bound. The significant variation in yield increase is sustained for the lower and upper bound PEDs. If we assume PED is equal to the lower bound, the increase in yield across all scenarios ranges from US$103 million in Uruguay to US$10,680 million in Brazil. Additionally, Figure 22 and Figure 23 show the maximum achievable increase in VAT revenue when PED=lower bound, which varies from US$192 million in Panama to US$10,680 million in Brazil (Figure 22), and from 0.11% of GDP in Mexico to 0.56% of GDP in Uruguay (Figure 23).

Fiscal impact assuming PED=upper bound. If we assume PED equals the upper bound, the additional revenue increase ranges from US$43 million in Costa Rica to US$4,555 million in Brazil. Additionally, Figures 22 and 23 show the maximum achievable increase in VAT revenue when PED=lower bound, varies from US$72 million in Panama to US$4,555 million in Brazil (Figure 22), and from 0.05% of GDP in Mexico to 0.21% of GDP in Uruguay (Figure 23).

Across all PEDs, Brazil generates the highest increase in additional tax revenue from VAT, and either Uruguay or Costa Rica generate the lowest increase in this type of revenue. While Brazil has a high VAT base, Costa Rica has a low VAT base, and Uruguay has a low VAT base combined with a low percentage change in VAT base. Additionally, Brazil and Panama achieve the highest and lowest maximum achievable VAT revenue increase in US$ million, respectively, whereas, Uruguay and Mexico achieve the highest and lowest maximum achievable VAT revenue increase as a proportion of GDP respectively.

There are some clear trends from the results presented in Table 13, Figure 22, and Figure 23. First, the more inelastic demand is, the greater the increase in revenue across all scenarios. Figure 22 and Figure 23 show that there is a significant differential between the maximum achievable increase in VAT revenue across the different PEDs, and the increase in VAT revenue is maximised when PED=0. This is in line with economic theory, given the more inelastic demand is the smaller the change in quantity demanded for a given change in price. Second, the revenue increase is maximised under scenario 5 when both standard and non-standard rates are increased, followed by scenario 1 in which the standard VAT rate is most heavily weighted. Third, the revenue increase is minimised under scenario 4, and PED equals the upper bound.

SUMMARY

Fiscal space for health: The role of modest increases in VAT

The ability to increase VAT rates in order to raise additional revenue for health, and the corresponding increment in expected tax revenue, are multi-factorial and depend on (a) current levels of VAT, which vary considerably across Latin American countries, (b) local consumption patterns and how consumption is taxed, which ultimately relate to the VAT base, (c) the price elasticity of demand (PED), which shapes the response of demand when prices change and (d) the likely impact tax increases will have on certain locally produced goods, where a country may have a comparative advantage and whether any form of industrial policy is reversed by tax increases.

Political feasibility is critical in that context and highlights the need to identify specific use as a justification for raising additional resources through taxation, also considering the regressive nature of indirect taxes, in general, and VAT in particular. Earmarking the additional resources for specific purposes (e.g. improving quality of health services) would be critical and increase the degree of acceptability amongst the population.

Standard VAT rates varied significantly in the region and ranged between 7% (Panama) to 22% (Uruguay). Countries implementing low VAT rates may have the capacity to implement an increase of up to 3 percentage points, whereas countries implementing high VAT rates may be in a position to raise VAT by one percentage point. It is likely that a 3% increase in the standard VAT rate might be feasible in Costa Rica, Ecuador, and Panama, where current standard VAT rates are below 15%; a 2% rise could be feasible in Mexico, Brazil and Peru, although, unavoidably, there may be some resistance, given that standard VAT stands at 16, 17 and 18%, respectively. A maximum of 1% standard VAT rate increase could be feasible in Argentina (21%), Chile (19%), and Colombia (19%), given their already high current rates. It is uncertain whether a 1% standard VAT rate increase is possible in Uruguay (22% standard rate) given the political direction is to decrease VAT. This 1% increase in VAT is considerably lower, and would need to be introduced more slowly than that which is feasible in Brazil, Costa Rica, Ecuador, Mexico, and Panama given their standard rates are considerably lower.

We modelled the financial impact of a 1% increase in the standard and non-standard VAT rates in order to showcase what impact this will have on additional revenue generation. The extent of additional revenue generation is dependent on demand elasticity and the VAT base.

The analysis suggests that a one percentage point rise in VAT will result in additional revenue ranging between 0.12% of GDP (Mexico) and 0.63% of GDP (Uruguay). In monetary terms the maximum achievable increase in VAT revenue across all scenarios, varies from US$214 million in Panama to US$11,805 million in Brazil. These figures represent a significant level of new resources, which, if earmarked for the purposes of improving health services could make a difference in the study countries.

Table 14: Increase in revenue due to the simulated VAT rate (million, US$)

	Scenario 1			Scenario 2			Scenario 3			Scenario 4			Scenario 5		
PED rate	*Zero*	*Lower bound*	*Upper bound*	*Zero*	*Lower bound*	*Upper bound*	*Zero*	*Lower bound*	*Upper bound*	*Zero*	*Lower bound*	*Upper bound*	*Zero*	*Lower bound*	*Upper bound*
ARGENTINA	1,734	1,571	681	1,401	1,269	550	1,314	1,190	516	1,051	952	412	1,836	1,662	718
BRAZIL	11,805	10,680	4,555	9,539	8,630	3,681	8,943	8,091	3,451	7,154	6,473	2,761	11,537	10,440	4,464
CHILE	1,094	991	426	1,094	991	426	1,094	991	426	1,094	991	426	1,094	991	426
COLOMBIA	727	658	283	587	532	229	551	498	214	441	399	172	2,673	2,350	591
COSTA RICA	190	172	71	154	139	58	144	130	54	115	104	43	315	282	104
ECUADOR	454	410	172	454	410	172	454	410	172	454	410	172	454	410	172
MEXICO	2,651	2,398	1,017	2,651	2,398	1,017	2,651	2,398	1,017	2,651	2,398	1,017	2,651	2,398	1,017
PANAMA	214	192	72	173	155	58	162	146	55	130	117	44	178	160	62
PERU	654	591	253	654	591	253	654	591	253	654	591	253	654	591	253
URUGUAY	187	170	74	151	137	60	142	128	56	113	103	45	446	400	146
FRANCE	8,225	7,362	1,834	6,647	5,949	1,482	6,231	5,577	1,390	4,985	4,462	1,112	31,572	27,327	155
SPAIN	8,494	7,602	1,894	6,864	6,143	1,531	6,435	5,759	1,435	5,148	4,608	1,148	23,054	20,256	2,347
UK	3,736	3,344	840	3,019	2,702	678	2,830	2,533	636	2,264	2,027	509	9,056	7,994	1,198

***Note**: Tables 23-25 in the Appendices provide a more detailed results breakdown of revenue raised from VAT (million, US$) calculated using simulation VAT rate, and increase in revenue due to the simulation VAT rate (million, US$) when PED=0, PED=lower bound, and PED=upper bound.*

***Source**: LSE calculations.*

Taxes on harmful products

Data and rates on harmful product taxes specific to each country and product type are shown in Table 15. The increase that is assumed here is a 5 percentage point rise in the relevant levels of taxation, which is modest by international standards. As shown, there is significant variability in the rates and the type of product. Rates are influenced by fiscal needs, but are also affected by industrial policy considerations.

Table 15: Current levels of excise taxes on alcohol and tobacco products

	Excise Tax on Beer	Excise Tax on Wine	Excise Tax on Spirits	Excise Tax on Sugar	Excise Tax on Cigarettes	Excise Tax on Cigars	Excise Tax on Loose Tobacco
	%	%	%	%	%	%	%
ARGENTINA	11.0	0.0	23.0	7.0	70.0	25.0	20.0
BRAZIL	20.0	28.0	20.0	0.0	45.0	45.0	24.4
CHILE	15.0	21.5	27.0	14.0	30.0	52.6	59.7
COLOMBIA	16.0	36.0	35.0	0.0	25.7	25.7	25.7
COSTA RICA	10.0	11.0	10.0	0.0	100.0	95.0	100.0
ECUADOR	22.5	76.0	75.0	10.0	61.5	61.5	61.5
MEXICO	26.5	27.5	53.0	3.1	17.3	30.4	30.4
PANAMA	10.0	10.0	10.0	0.0	100.0	100.0	100.0
PERU	30.0	0.0	0.0	25.0	21.0	21.0	21.0
URUGUAY	5.0	0.0	63.0	0.0	47.5	47.5	33.0
FRANCE	~ 9.8	~ 17.0	~ 36.7	~ 2.4	49.7	26.9	44.5
SPAIN	~ 9.2	0.0	~ 21.2	~ 2.2	51.0	15.8	41.5
UK	~ 30.2	~ 57.4	~ 57.3	~ 5.4	16.5*	16.5*	~ 67.7*

Notes: *~ denotes the percentage was calculated from a fixed monetary tax to show all taxes in the same way*
** This is the tax as % of retail selling price and does not take into account the excise duty levied in sterling on a per unit basis*

Sources*: Argentina (PWC, 2018a); Brazil (Alcohol (Alcohol and Tobacco Tax and Trade Bureau, 2014); Cigarettes (Iglesias, 2016); Sugar (Fitch Solutions, 2018)); Chile (Alcohol (OECD, 2018b); Tobacco (Anon, 2016); Sugar (Fitch Solutions, 2018)); Colombia; Costa Rica (Alcohol and tobacco (Alcohol and Tobacco Tax and Trade Bureau, 2012)); Ecuador (Alcohol (United States Trade Representative, 2010); Tobacco and sugar (AUXADI, 2016)); Mexico (OECD, 2018b); Panama (PWC, 2018c); Peru (Alcohol (Post, 2017); Tobacco (Nordea Trade, 2018); Sugar (Jenner, 2018)); Uruguay (Alcohol (WHO, 2004); Tobacco (WHO, 2017)); France (Alcohol (OECD, 2018b); Sugar (McPartland, 2017); Tobacco (European Commission, 2018)); Spain (Alcohol (OECD, 2018b); (Sugar (Baquero, 2017); (Tobacco (European Commission, 2018)); UK (Alcohol (Anderson, 2014); Tobacco (OECD, 2018b); Sugar (HM Revenue & Customs, 2018)).*

Table 16: Simulation tax rates for harmful goods (5-percentage point increase)

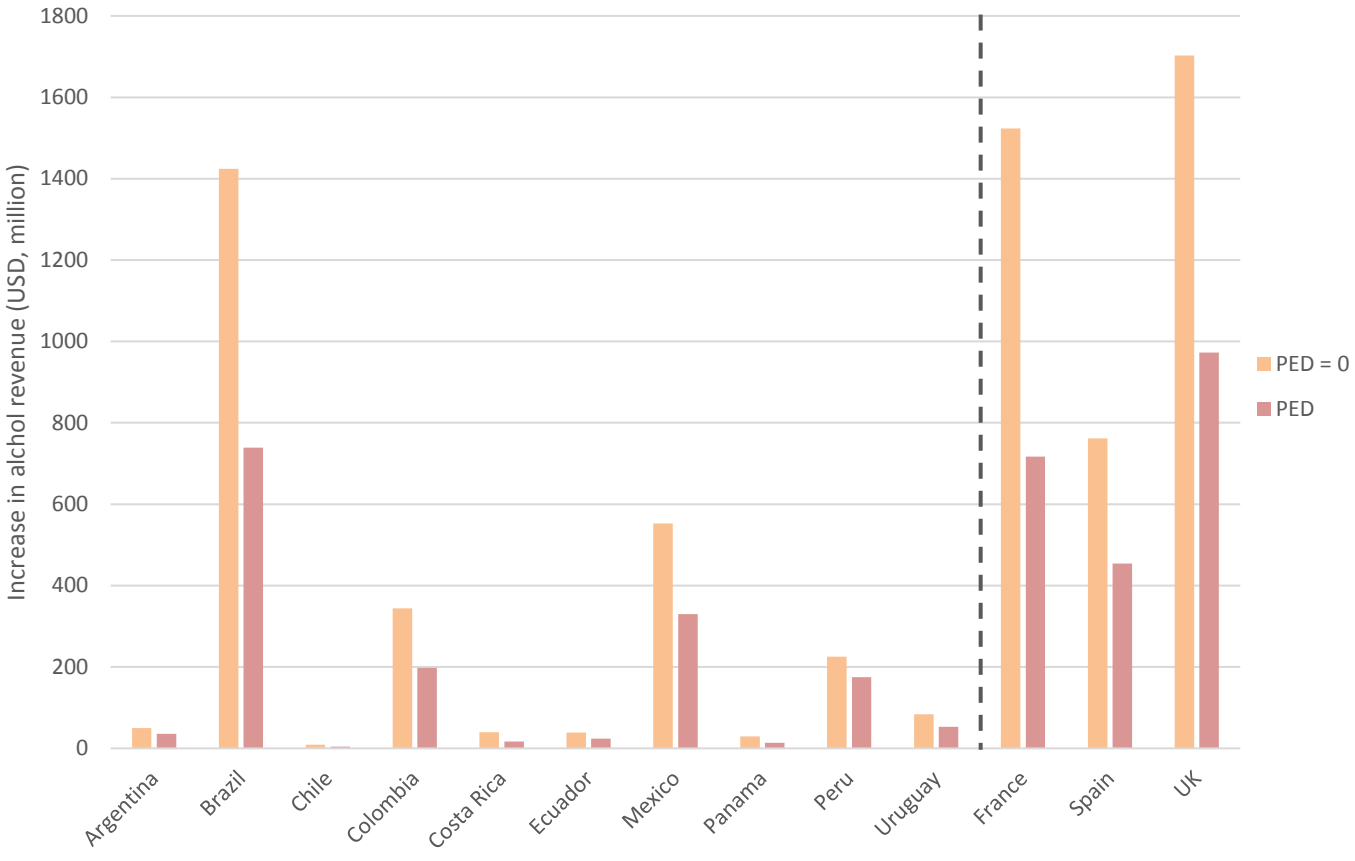
	New beer tax rate	New wine tax rate	New spirits tax rate	New cigarette tax rate	New cigar tax rate	New loose tobacco tax rate
	%	%	%	%	%	%
ARGENTINA	16.0	5.0	28.0	75.0	30.0	25.0
BRAZIL	25.0	33.0	25.0	50.0	50.0	29.4
CHILE	20.0	26.5	32.0	35.0	57.6	64.7
COLOMBIA	21.0	41.0	40.0	30.7	30.7	30.7
COSTA RICA	15.0	16.0	15.0	105.0	100.0	105.0
ECUADOR	27.5	81.0	80.0	66.5	66.5	66.5
MEXICO	31.5	32.5	58.0	22.3	35.4	35.4
PANAMA	15.0	15.0	15.0	105.0	105.0	105.0
PERU	35.0	5.0	5.0	26.0	26.0	26.0
URUGUAY	10.0	5.0	68.0	52.5	52.5	38.0
FRANCE	14.8	22.0	41.7	55.8	31.9	49.5
SPAIN	14.2	5.0	26.2	56.0	20.8	46.5
UK	35.2	62.4	62.3	21.5	21.5	72.7

***Source**: LSE calculations based on existing data sources for the products shown on the table.*

Table 16 indicates the simulation values for all tax rates modelled for each product type in each of the two scenarios envisaged for these goods. The analysis was conducted for alcohol and tobacco products; sugar taxes were excluded from the analysis due to the lack of readily available comparable data.

Simulated additional revenue from alcohol. Figure 24 shows the increase in overall revenue from alcohol with an increase in the relevant excise tax by 5 percentage points with and without country-specific PED applied. Without applying PED, among the Latin American countries, Brazil had the greatest increase in revenue (US$1,424.60 million), the greatest increase being in spirits and beer. The comparator countries observed lower revenue increases with Spain at the lowest of (US$761.50 million) and the UK at the highest (US$1,702.90). When alcohol-specific PED was applied, Brazil maintained the greatest increase in revenue, similar to the increase observed in France (US$717.30). Brazil had the highest increase in beer and spirits revenue, but Uruguay had the highest increase in revenue due to increasing wine taxes.

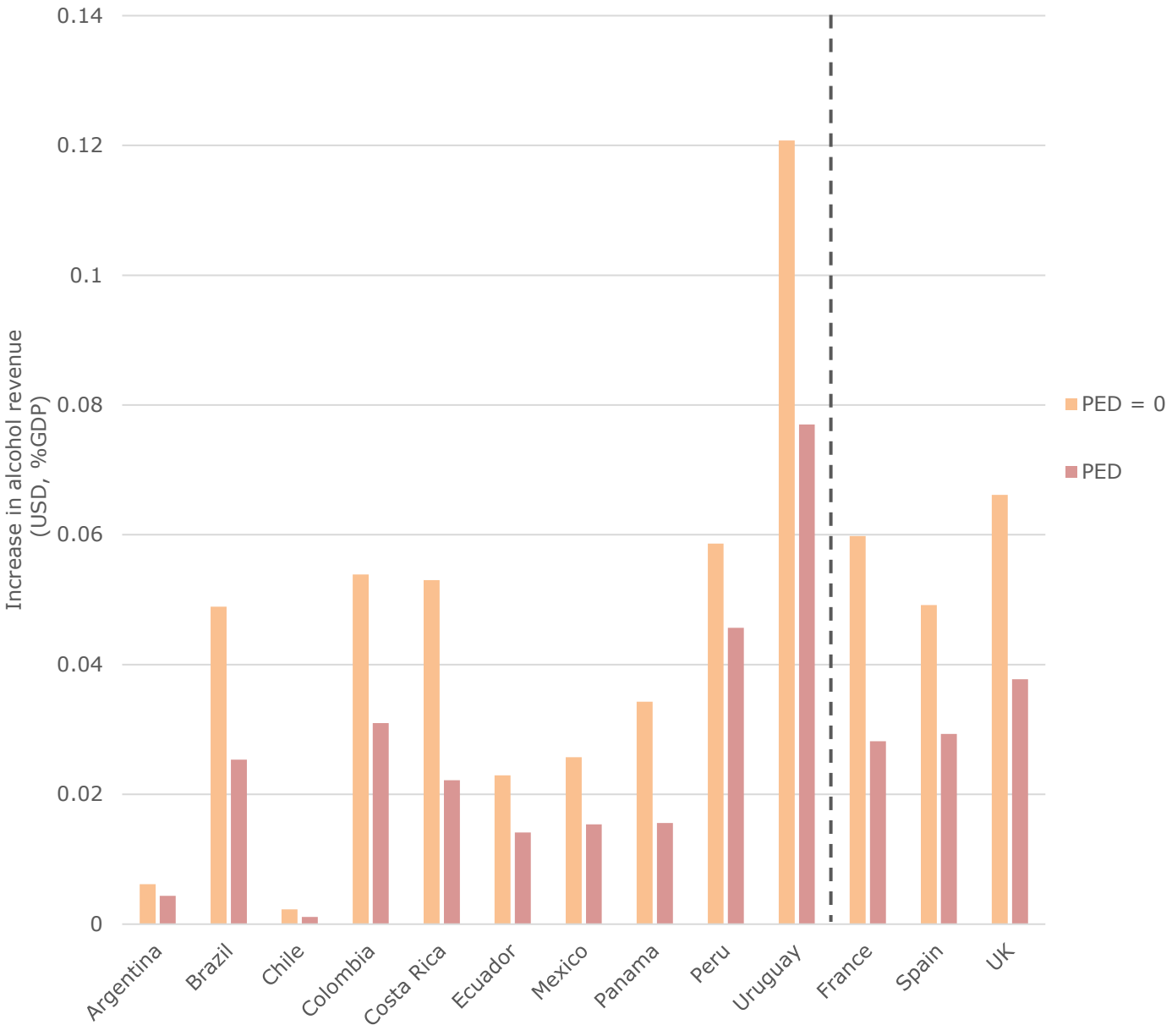
Figure 24: Increase in tax revenue: 5-percentage point increase in alcohol tax (US$, million)



Source: *LSE calculations.*

Figure 25 shows the increase in alcohol revenue as a proportion of GDP with and without the application of PED. When no PED was applied, Uruguay had the highest increase in alcohol revenue across all countries, with a 5 percentage point increase in tax, as a proportion of GDP. This was also observed when PED was applied. Chile was observed to have the lowest impact on GDP when increasing alcohol taxes by 5 percentage points with or without PED.

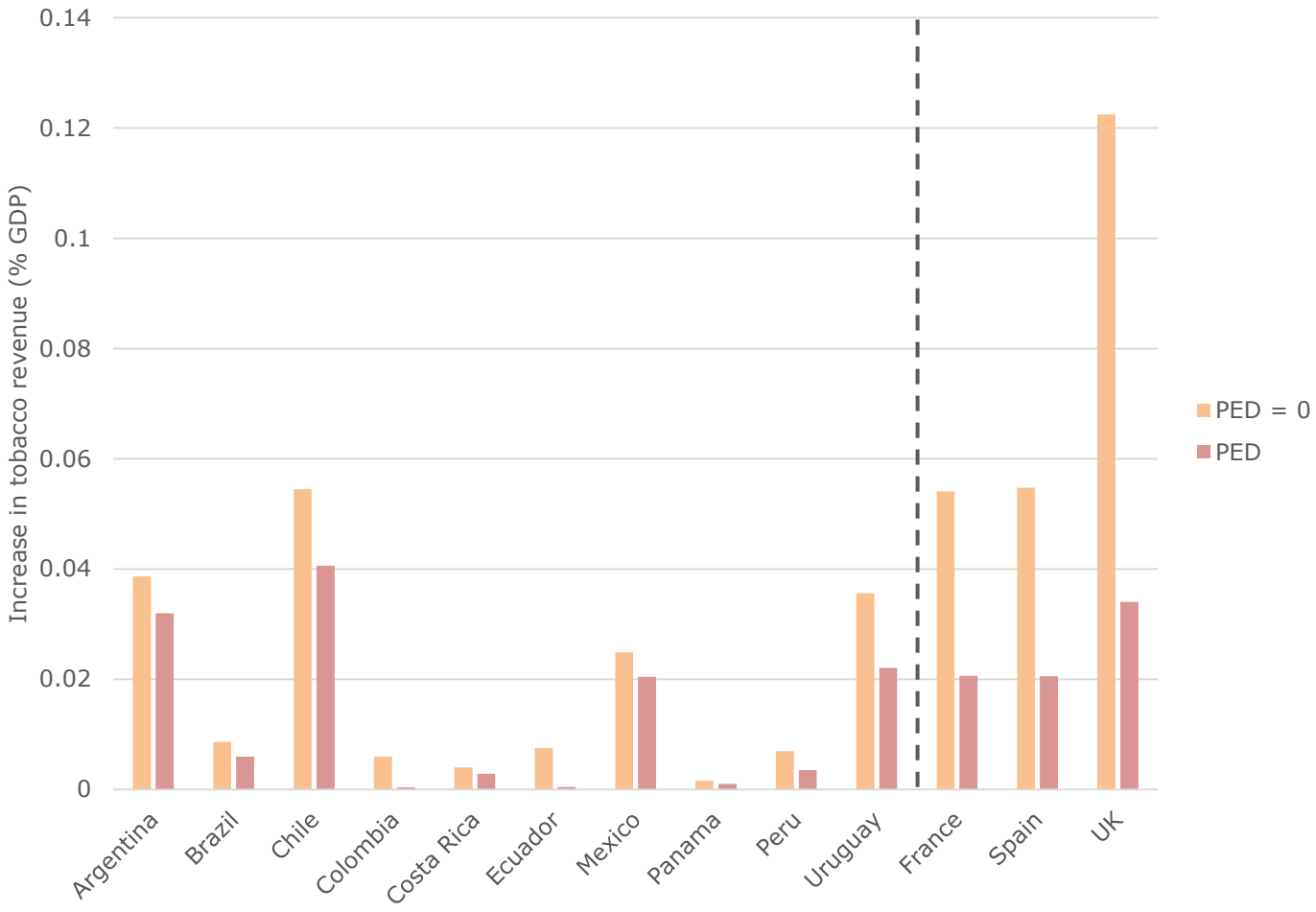
Figure 25: Increase in tax revenue: 5-percentage point increase in alcohol tax (as % GDP)



Source: *LSE calculations.*

Simulated additional revenue from tobacco. Figure 26 shows the increases in tobacco revenue following a 5 percentage point increase in the relevant excise taxes. In Mexico, revenue would increase by US$534.02 million, accounting for the greatest increase in revenue in Latin America assuming PED remaining unaffected. Argentina's revenue was the greatest for cigars and loose tobacco, but Mexico's cigarette revenue was the highest across Latin American countries. Panama observed the lowest increase in revenue of US$1.33 million for tobacco taxes assuming PED remaining constant. When the PED effect was accounted for, Mexico had the greatest increase in overall tobacco revenue (US$438.90 million), predominantly through an increase in cigarette revenue. Argentina had the highest increase in revenue due to cigar and loose tobacco tax increases. Tobacco tax increases were far greater in the UK compared to the Latin American countries (US$875.84 million).

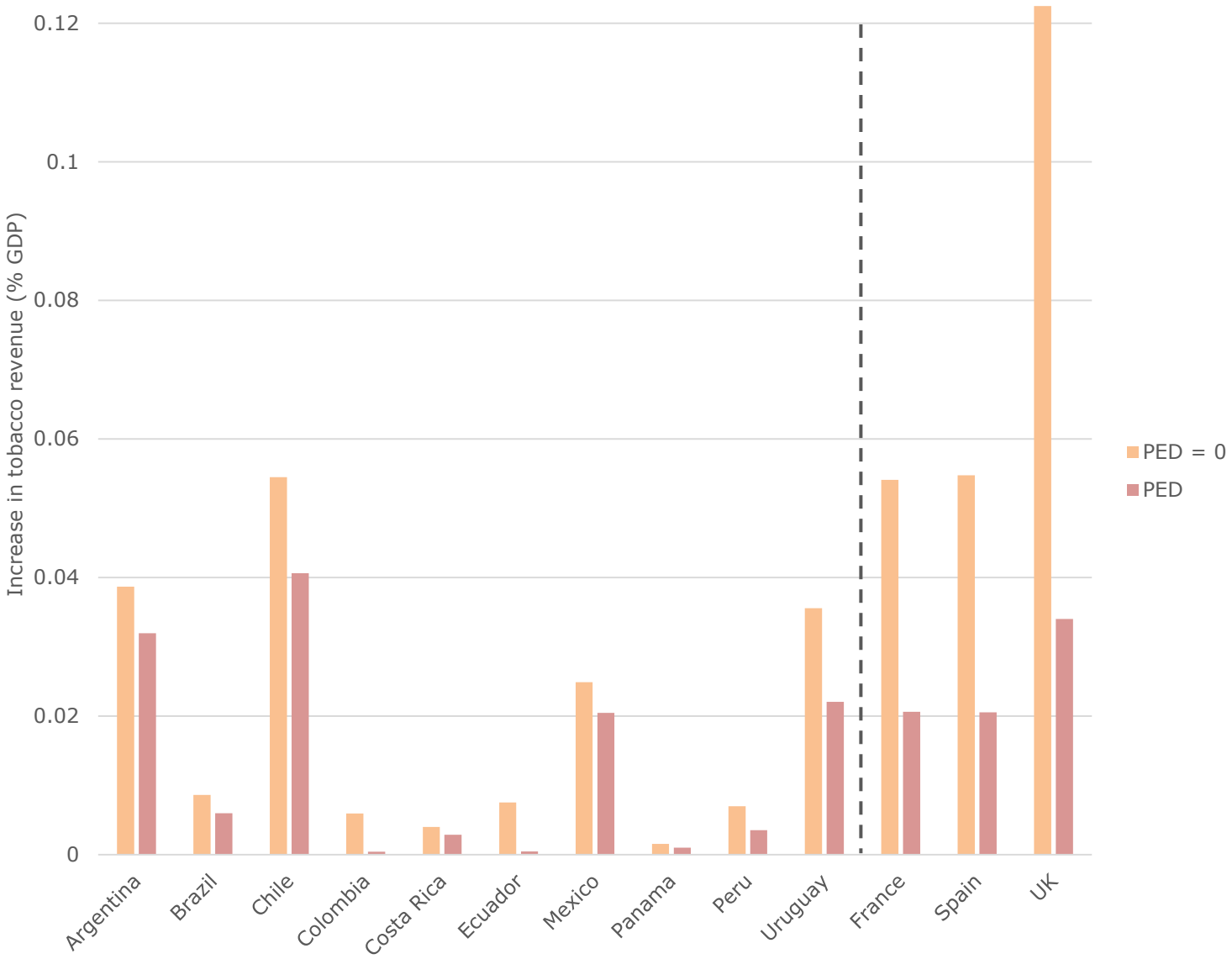
Figure 26: Increase in tax revenue: 5-percentage point increase in tobacco tax (US$, million)



Source: *LSE calculations.*

In Figure 27, the increase in tobacco revenue is shown as a proportion of GDP. Unlike alcohol tax increases, the highest increase in tobacco taxes as a proportion of GDP was observed in the UK. However, the increase observed in Chile without PED is similar to the increases observed in France and Spain. When the effect of PED was applied, the increase as a proportion of GDP was greatest in Chile among all countries. There was little impact on the increase of tobacco taxes in countries such as Panama, Colombia and Costa Rica, especially after taking into account the PED effect.

Figure 27: Increase in tax revenue: 5-percentage point increase in tobacco tax (% GDP)



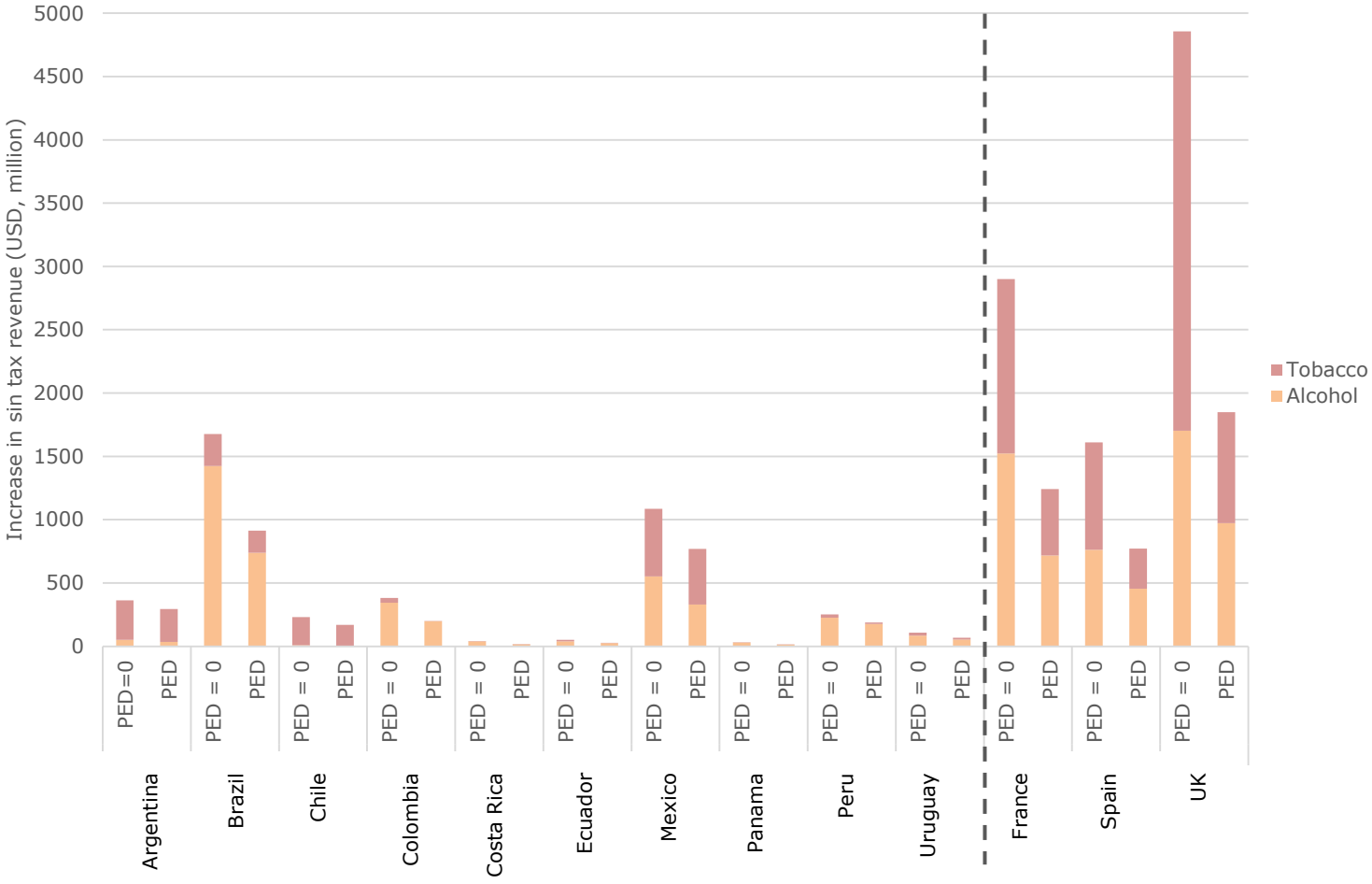
Source: *LSE calculations.*

Fiscal space for health: The role of modest increases in alcohol and tobacco taxes

The overall increases in both alcohol and tobacco revenue after a 5 percentage point increase in tax are shown in Figure 28. In itself, a 5 percentage point increase can be perceived to be modest to moderate, consequently, the fiscal impact in aggregate terms is, strictly speaking, small across countries. Indeed, the impact of these tax increases in the study countries was found to be small compared to the comparator countries; this indicates in part that taxation levels are lower in the study countries than they are in the comparator countries.

Brazil had the highest increase in revenue, with most of the increase in revenue coming from alcohol taxes. When accounting for the PED effect, Mexico also had a high increase in revenue, with the most revenue resulting from tobacco taxes. Both of these countries have a similar increase in revenue, with PED, as Spain.

Figure 28: Increase in revenue: 5-percentage point increase in alcohol and tobacco tax (USD, million)

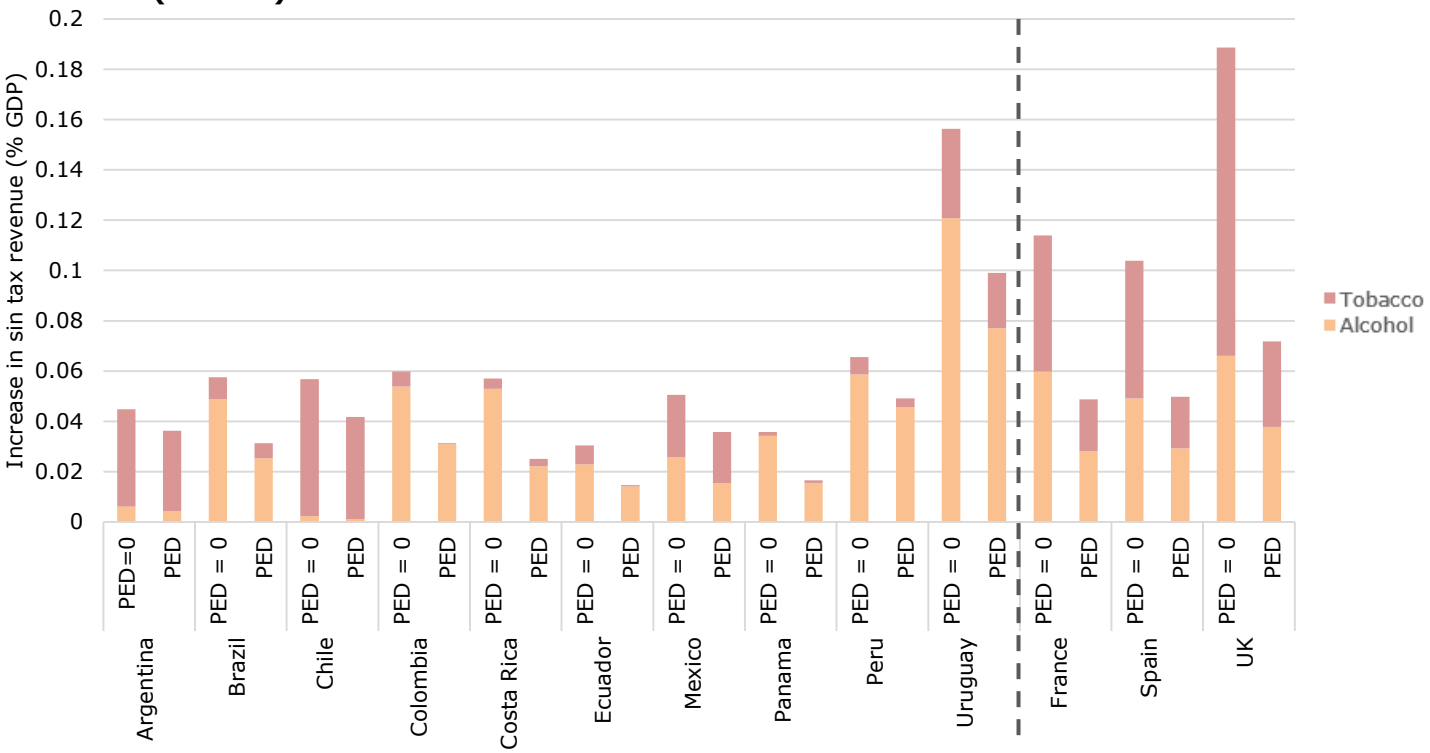


Source: *LSE calculations.*

The increase in alcohol and tobacco revenue as a proportion of GDP is shown in Figure 29. Argentina, Chile, and the UK have the highest increases in GDP due to modest increases in tobacco taxes, whereas Brazil, Colombia, Costa Rica, Peru, Uruguay and France have the greatest increases in tax revenue due to the modest increase in alcohol taxes.

For the alcohol and tobacco products further separated by specific type, Appendix 8 indicates (a) the granular increase in revenue due to harmful product tax increase, and (b) the compiled increase.

Figure 29: Increase in revenue: 5-percentage point increase in alcohol and tobacco tax (% GDP)



Source: *LSE calculations.*

Sin tax increases, particularly modest increases in alcohol and tobacco tax rates can contribute to additional revenue generation. Having explored a 5 percentage point increase in tobacco and alcohol tax rates, we found that resources ranging between 0.03 and 0.16% of GDP can be raised. Overall, the ability of tax increases on alcohol and tobacco to generate significant tax revenue, was found to be small both in absolute terms as well as relative to key countries in the OECD region. Brazil and Uruguay had the highest increase in revenue, with most of the increase coming from alcohol taxes. By contrast, taxes on alcoholic beverages would be least effective in raising additional revenue in Chile. Argentina, Chile and Mexico also had a high increase in revenue, with the most revenue resulting from tobacco taxes. Tobacco taxes were least effective in raising additional revenue in Colombia, Costa Rica, and Panama.

SUMMARY

The potential of indirect taxes to generate fiscal space for health

The possibility of increasing VAT rates depends on their current level, the consumption patterns in relation to production, and the price elasticity of demand. Modelling shows a 3% increase in the standard VAT rate would be credible in Brazil, Costa Rica, Ecuador, Mexico, and Panama, and a 2% rise would be feasible in Peru. Slightly more significant increases are possible in these countries as standard VAT rates are at a level which can feasibly rise without significant negative repercussions. Modelling shows a 1% standard VAT rate increase is more feasible in Argentina, Chile, and Colombia, given already high current rates. It is uncertain whether a 1% standard VAT rate increase is possible in Uruguay given the political direction is to decrease VAT.

Sin tax increases, particularly modest increases in alcohol and tobacco tax rates can contribute to additional revenue generation. Having explored a 5 percentage point increase in tobacco and alcohol tax rates, we found that resources ranging between 0.03 and 0.16% of GDP can be raised. Overall, the ability of tax increases on alcohol and tobacco to generate significant tax revenue, was found to be small both in absolute terms as well as relative to key countries in the OECD region.

USING THE PROCEEDS OF INDIRECT TAX INCREASES: SIMULATION SCENARIOS

Having ascertained that one percentage point of VAT increase and five percentage point increases in alcohol and tobacco products can deliver significant additional resources, both in absolute monetary terms and as a proportion of GDP, we focused on the magnitude of increases required to fill the funding gap in healthcare, i.e. what tax increases would be required to reach the benchmark spending level on health as a percent of GDP from the current levels of health expenditure. This was undertaken in order to highlight the level of effort required and how this differed by country.

Three scenarios were used to outline how the fiscal gains from increased indirect taxation could be allocated. The first, assumes that all fiscal benefits will be earmarked for the purposes of increasing the funding of healthcare services; the second, assumes that healthcare is prioritised, but the proceedings from increased indirect taxation are distributed on a weighted basis in accordance with other governmental priorities; and, the third, assumes that healthcare benefits are benefiting from the increased resources from tax revenue but the key focus is placed on improving efficiency in the healthcare system.

The difference in maximum indirect tax revenue increase (as % GDP) assuming zero price elasticity of demand (PED) and PED being equal to the upper bound is insignificant (Figure 30). The difference in the tax revenue increase varies from 0.09% in Mexico to 0.48% in Uruguay. Given this small difference in revenue achieved, and the assumptions underpinning the calculated upper bound PED values, we model the fiscal gap assuming PED=0.

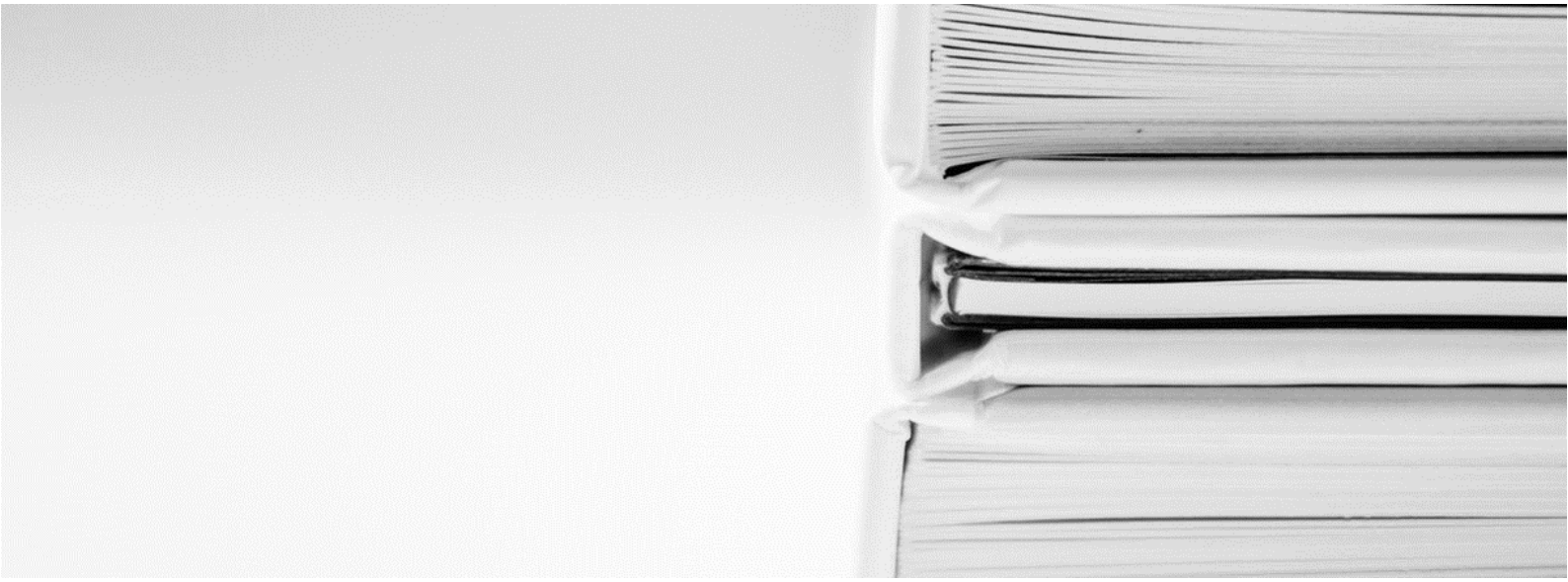
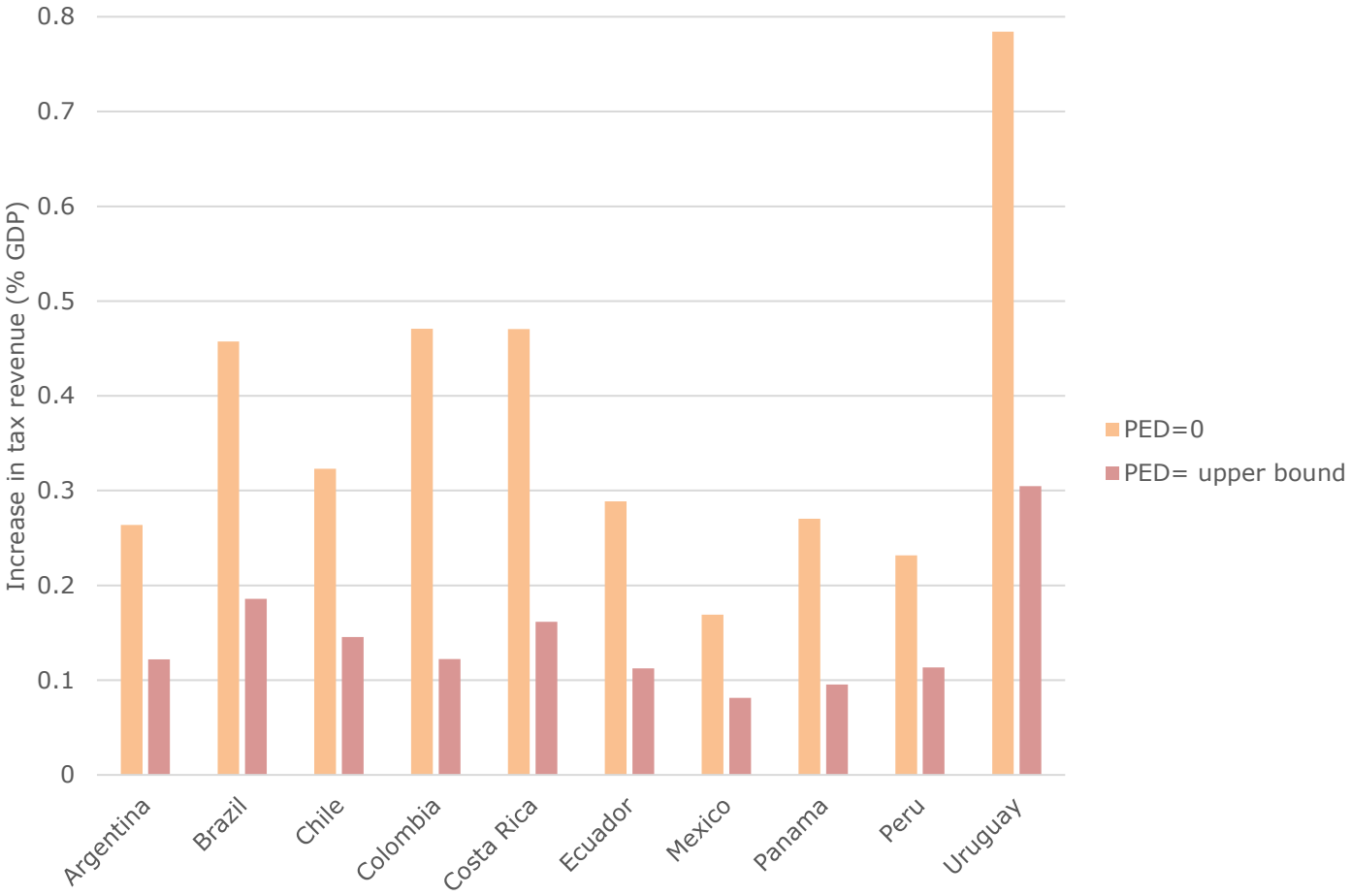


Figure 30: Difference in harmful product tax revenue increase (% GDP) when PED=0 and PED=upper bound



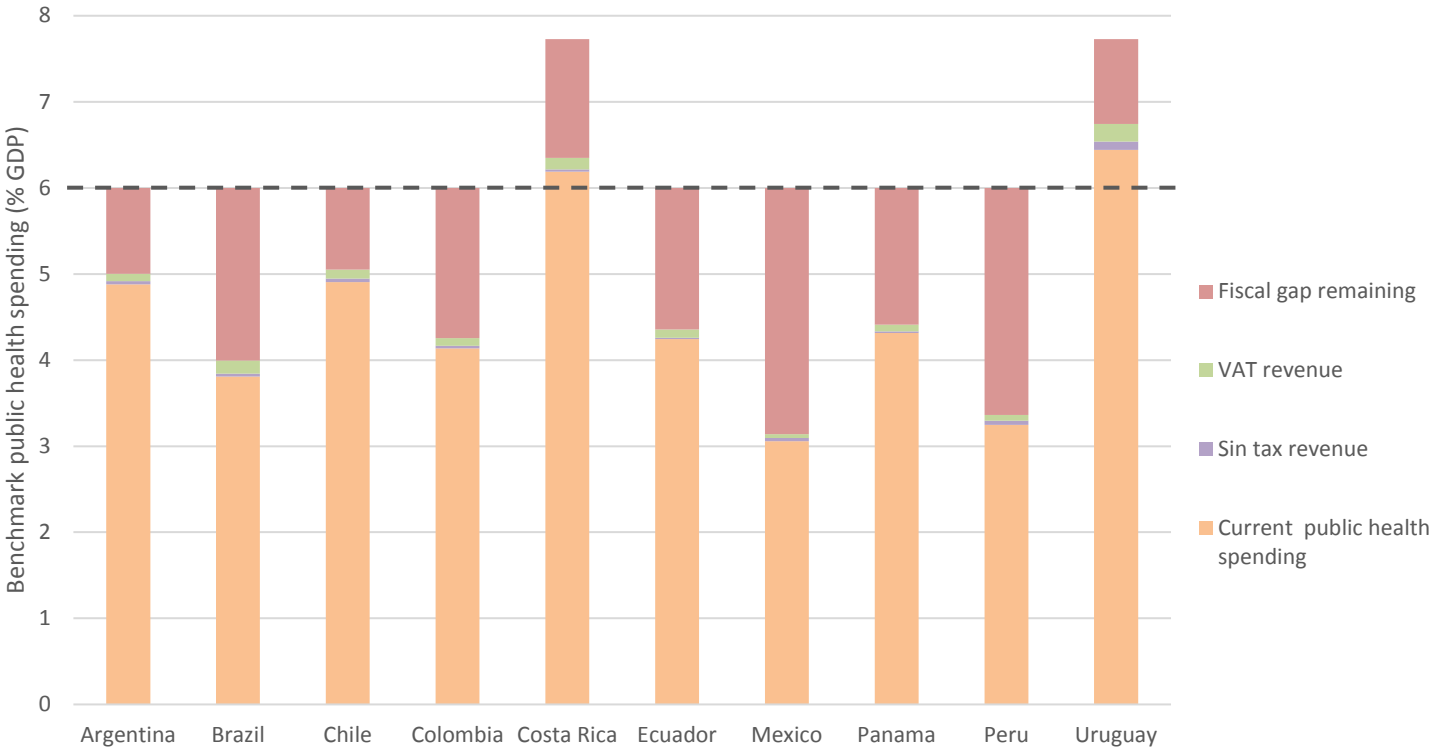
Note: *Figure shows the tax revenue increase with a five-percentage point increase in alcohol and tobacco tax, and the maximum achievable VAT revenue increase for each country.*

Source*: LSE calculations****.***

Scenario 1: Allocating additional tax revenue to health

In scenario 1 we assume a 100% allocation of all indirect tax (VAT and harmful goods) increases to funding health services. The fiscal gap (as % of GDP) which remains following the tax revenue increase varies from 0.50% (Uruguay) to 2.70% (Mexico). Mexico's fiscal gap (as % of GDP) remains significant despite the tax revenue increase, because it had the largest fiscal gap (% GDP) and it experiences the smallest VAT revenue increase (% GDP). Whereas Uruguay's remaining fiscal gap is minimal, given its existing fiscal gap was the third smallest, and it experienced the largest VAT and harmful product tax revenue increases (as % of GDP).

Figure 31: Public health spending (% GDP) after increase in VAT and harmful goods taxes against PAHO benchmark (scenario 1)



Note: *Figure uses 6% benchmark for all countries besides Costa Rica and Ecuador, given their public health spending already exceeds 6%. Costa Rica and Ecuador use a benchmark calculated as the average of the comparator countries' public health spend.*

Source: *LSE calculations.*

We calculated the concurrent VAT and harmful goods tax increases required in terms of percentage points to fill the remaining fiscal gap in each country (Table 17). We assumed proportional VAT and harmful goods tax increases by weighting each in accordance with the revenue they can generate from a one percentage point and five percentage point increase, respectively. For example, to close the remaining fiscal gap of 0.86% of GDP in Argentina, VAT and harmful product tax need to be concurrently increased by 3.4 and 17.2 percentage points, respectively.

The VAT increase required varies from 0.7 of one percentage point in Chile to 16.1 percentage points in Mexico. The harmful goods tax increase required varies from 3.3 (Uruguay) to 80.5 percentage points (Mexico). The VAT increase required (percentage points) is significantly lower than that of harmful goods tax increases to fill the fiscal gap across all countries. Mexico and Peru require a significant increase in VAT and harmful goods tax (percentage points) to fill their fiscal gaps.

Table 17: Concurrent VAT and harmful products tax increases required to close remaining fiscal gap (scenario 1)

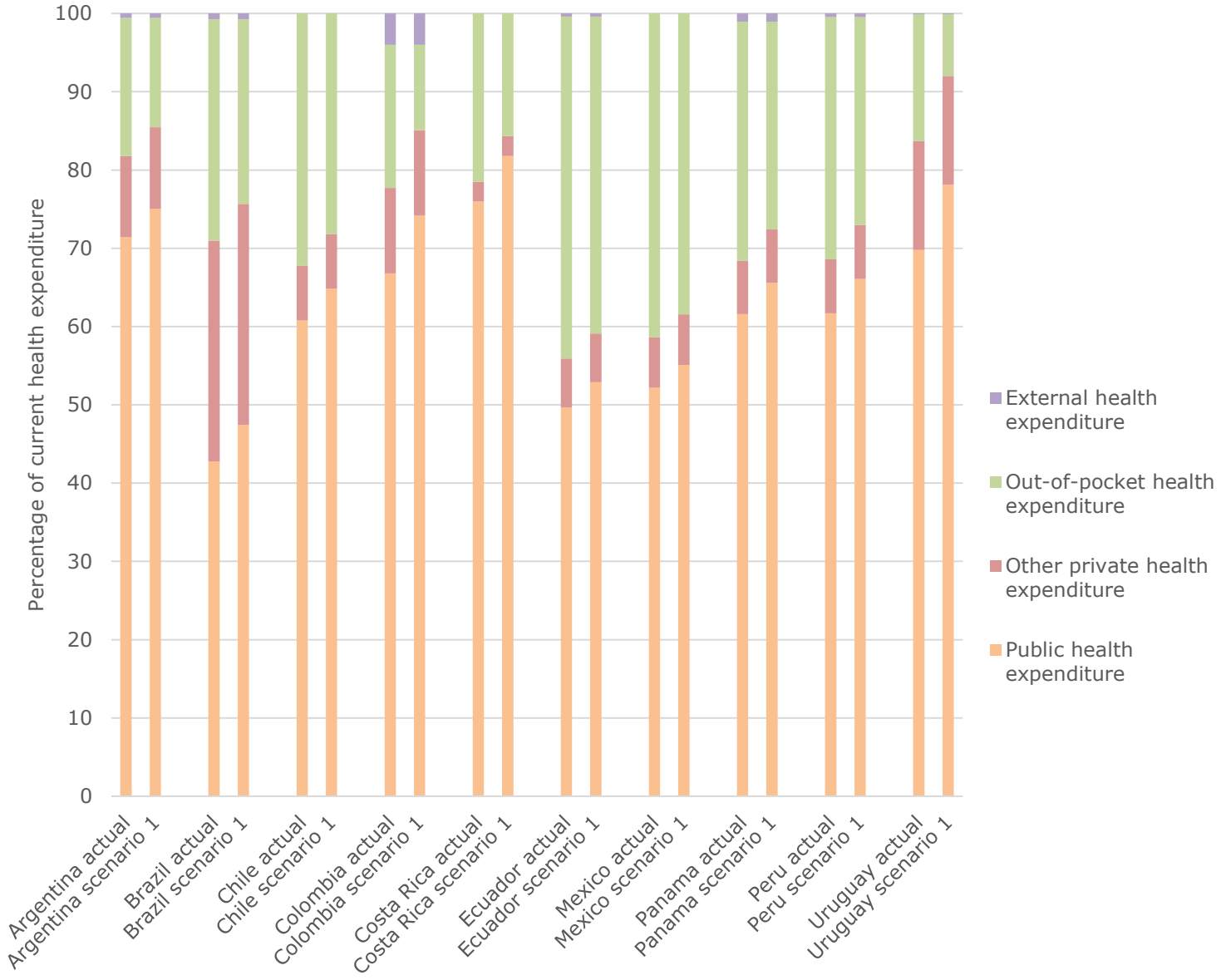
	VAT increase required *percentage points*	Harmful products tax increase required *percentage points*
ARGENTINA	3.4	17.2
BRAZIL	4.1	20.7
CHILE	2.4	11.8
COLOMBIA	3.0	15.2
COSTA RICA	2.3	11.3
ECUADOR	5.4	26.8
MEXICO	16.1	80.5
PANAMA	5.1	25.4
PERU	10.9	54.7
URUGUAY	0.7	3.3

***Source**: LSE calculations.*

The public health expenditure increment achieved in scenario 1 could enable out-of-pocket health expenditure to decrease (Figure 32). Assuming the entire public health expenditure increase is reflected in a corresponding decrease in out-of-pocket health expenditure, the decrease in out-of-pocket health expenditure varies from 2.94 (as % of current health expenditure) in Mexico to 8.29 (as % of current health expenditure) in Uruguay.

The suitability and feasibility of applying the modelled harmful products tax increases are also dependent on country context: where countries are producers of such goods (e.g. wine in Argentina, Chile or Brazil, or tobacco in Colombia) increases in taxation of these goods might not be politically feasible or economically desirable. It may also artificially raise prices for those local industries and reduce local consumption, threatening the viability of local industry. However, the political feasibility of these taxes might be increased if there is a public declaration (and subsequent action) to earmark the resulting revenue for health.

Figure 32: Health expenditure before and after public health expenditure increase (scenario 1)

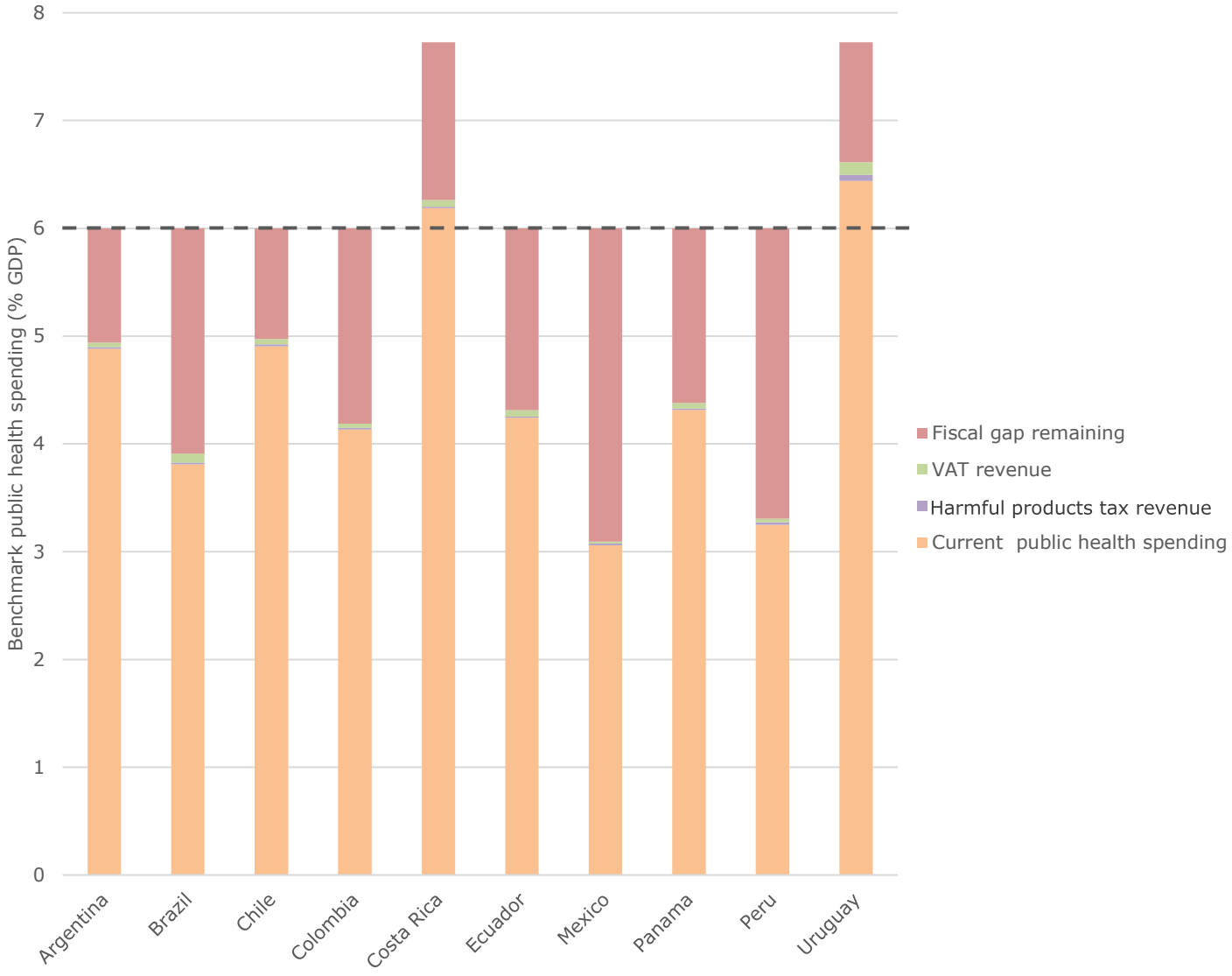


***Source**: LSE calculations.*

Scenario 2: Health as one of the priorities in human services

In scenario 2, we first allocate both the increased VAT and harmful goods tax revenue to health in line with its prioritisation compared to other public spending. We do this using a weight assigned to health which is calculated using health's share of current public spending relative to the other priorities. The fiscal gap (expressed as % of GDP) which remains following the tax revenue increase varies from 0.84% (Uruguay) to 2.87% (Mexico) of GDP (Figure 33).

Figure 33: Public health spending (% GDP) after increase in VAT and harmful goods taxes against PAHO benchmark (scenario 2 – weighted prioritisation)

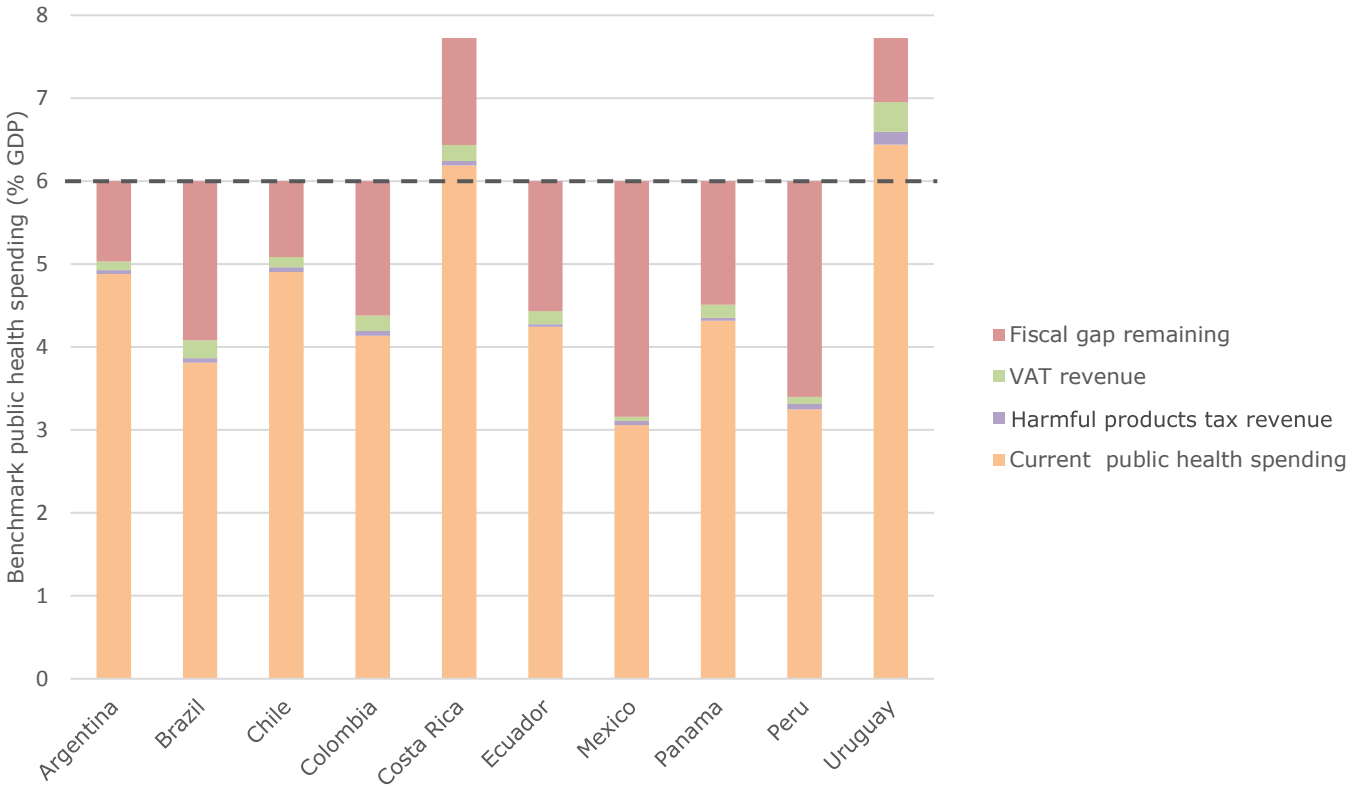


Note: *Figure uses 6% benchmark for all countries besides Costa Rica and Ecuador, given their public health spending already exceeds 6%. Costa Rica and Ecuador use a benchmark calculated as the average of the comparator countries' public health spend.*

Source: *LSE calculations.*

Second, we allocate the increased VAT revenue to health in line with its prioritisation compared to other public spending, and allocate 100% of the increased harmful product tax revenue to health. It is more realistic to assume the entire harmful product tax revenue is earmarked for health. There is a reduced fiscal gap when this tax revenue increase is earmarked for health. The fiscal gap (as % of GDP) which remains following the tax revenue increase varies from 0.77% (Uruguay) to 2.84% (Mexico) of GDP (Figure 34).

Figure 34: Public health spending (% GDP) after increase in VAT and harmful goods taxes against PAHO benchmark (scenario 2 – earmarked tax)



Note: *Figure uses 6% benchmark for all countries besides Costa Rica and Ecuador, given their public health spending already exceeds 6%. Costa Rica and Ecuador use a benchmark calculated as the average of the comparator countries' public health spend.*

Source: *LSE calculations.*

Similar to the previous scenario, we calculated the concurrent VAT and harmful product tax increases required (in terms of percentage points) to fill the remaining fiscal gap in each country under scenario 2, assuming we allocate VAT revenue to health in line with other public spending priorities, and 100% of harmful product tax revenue to health (Table 18). We assumed proportional VAT and harmful product tax increases by weighting each in accordance with the revenue they can generate from a one percentage point and five percentage point increase, respectively. For example, to close the remaining fiscal gap of 0.97 (% GDP) in Argentina, VAT and harmful product tax need to be concurrently increased by 6.82 and 34.1 percentage points respectively.

The concurrent VAT and harmful product tax increases required to close the remaining fiscal gap are significantly higher under scenario 2 than under scenario 1. This is not surprising given that the VAT increase is not 100% allocated to health in this scenario. The VAT increase required (in percentage points) varies from 1.55 in

Uruguay to 28.06 in Mexico. The harmful product tax increase required (in percentage points) varies from 7.7 in Uruguay to 140.3 in Mexico. The VAT increase required (in percentage points) is significantly lower than the harmful product tax increase required (in percentage points) to fill the fiscal gap across all countries. Mexico and Peru require a significant increase in VAT and harmful product tax (in percentage points) to fill their fiscal gaps.

Table 18: Concurrent VAT and harmful good tax increase required to close remaining fiscal gap (scenario 2)

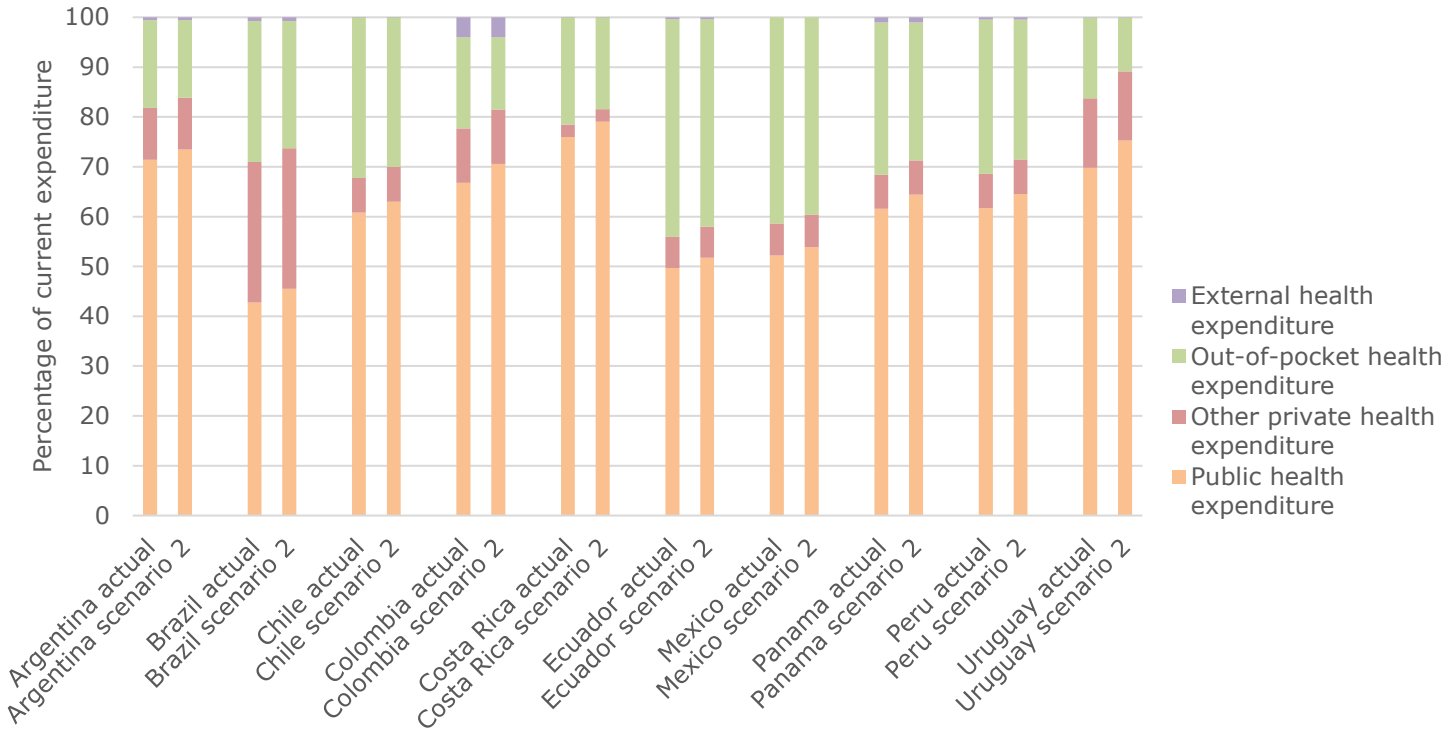
	VAT increase required *percentage points*	Harmful products tax increase required *percentage points*
ARGENTINA	6.82	34.1
BRAZIL	7.79	39.0
CHILE	5.09	25.4
COLOMBIA	6.89	34.4
COSTA RICA	5.16	25.8
ECUADOR	8.72	43.6
MEXICO	28.06	140.3
PANAMA	7.48	37.4
PERU	17.31	86.5
URUGUAY	1.55	7.7

***Source**: LSE calculations.*

The out-of-pocket expenditure reduction achievable through the public health expenditure increment, is smaller in scenario 2 compared to scenario 1 (Figure 35). Assuming the entire public health expenditure increase is reflected in a corresponding decrease in out-of-pocket health expenditure, the decrease in out-of-pocket health expenditure varies from 1.73% of current health expenditure in Mexico to 5.42% of current health expenditure in Uruguay.

As with scenario 1, the suitability and feasibility of harmful product tax increases are dependent on country and industry context, where political feasibility or economic desirability might be lower in countries with large local industries producing alcoholic beverages and tobacco or tobacco products. A public agreement to earmark the revenue for specific purposes might improve feasibility and make increases in these taxes more palatable amongst consumers.

Figure 35: Health expenditure before and after public health expenditure increase (scenario 2)



***Source**: LSE calculations.*

Scenario 3: Improving efficiency

A large proportion of available resources expended on health across the ten study countries is likely to be inefficiently spent. Consequently, by increasing the level of available resources through one of the scenarios outlined earlier in this section without addressing the challenges of inefficiency and poor performance would be a fundamental omission of local competent authorities and decisionmakers.

While the objective of this report is not to address efficiency trade-offs across the study countries, we offer a number of thoughts on the likely sources of inefficiency. To that end, any increase in the available financial resources for health should be combined with an active reform agenda to improve efficiency in resource allocation. Specifically, inefficient expenditure can be examined based on three classifications that are discussed below.

First, there is governance waste which relates to unnecessary administrative processes, corruption, and fraud (OECD, 2017). For example, in Mexico, the proportion of the national health budget expended on administration is the highest in the OECD at approximately 10% (OECD, 2016), representing significant scope for efficiency gains. Although this does not necessarily relate to unlawful or corrupt

activity, it is partly the outcome of the fragmentation in the Mexican healthcare system, the different funding modalities and providers.

Second, there is inefficient clinical care, which comprises avoidable clinical adverse incidents, and duplication of services (OECD, 2017). Research and evidence on avoidable mortality suggests that despite significant efforts undertaken by policymakers, a large proportion of mortality in individuals still in working age is avoidable. Equally, adverse events are responsible for increased hospitalisations and re-hospitalisations and services are often duplicated as there is little monitoring at health system level and, very often, fragmented provision results in excess expenditure.

Third, there is operational waste, where care could be provided utilising fewer resources, for example, by using more generics rather than originators, where appropriate (assuming local regulatory agencies guarantee the quality of generic medicines and provide adequate oversight to monitor this), and early treatment of illnesses in primary care rather than in emergency departments (OECD, 2017). In Peru, for example, most primary care providers can only deliver child and maternal care. This means hospitals receive significant demand for services which should be provided at primary care level, especially relating to non-communicable diseases (World Bank, 2017b). Likewise, in Brazil, smaller municipalities have struggled to expand primary care due to insufficient resources and personnel. This means they are unable to manage services in an efficient way (World Economic Forum, 2014).

There are several reforms through which resource allocation efficiency can be improved. The reforms required span health system governance, health service management, and healthcare delivery.

The first type of efficiency-related reform includes improvement in access to primary care to avoid unnecessary attendance to emergency departments. This would involve ensuring the appropriate training of staff and equipment availability in primary care, to provide early treatment to patients with chronic conditions.

The second type of efficiency improvement involves the adoption of HTA for assessing the value of new technologies, including innovative pharmaceuticals, and the promotion of generics. Given pharmaceuticals account for a significant proportion of health expenditure, these drug-related efficiency improvements could release substantial resources.

The third efficiency improvement strategy would involve reimbursing hospitals based on prospective payment systems such as diagnosis-related groups (DRGs). Through grouping cases which are medically and economically comparable, DRGs commonly enhance hospital efficiency by lowering the average length of hospital stay. For its

successful implementation, a DRG-based payment system would require health financing which originates predominantly from public sources (WHO, 2013). Therefore, such an efficiency improvement could fair better if adopted alongside enhanced public health expenditure revenue generation under scenario 1 or 2. Nonetheless, the data and information technology required for DRG implementation is significant.

A final strategy to enhance overall efficiency across the ten study countries, would be data system implementation to: oversee health system advances; enable adverse event reporting; encourage data sharing amongst stakeholders to enhance their communication, and reduce health system fragmentation; and enable the publication of indicators pertaining to health system inefficiency to incentivise change (OECD, 2017).

The high levels of out-of-pocket expenditure seen in the study countries, reflect a failure of effective health insurance, and a lack of provision of quality health services (OECD, 2016). Health system efficiency improvements through reforms, would enable study countries to enhance treatment of patients at lower cost, thereby releasing further resources in their healthcare budgets for quality improvement in care, and a subsequent reduction in citizens' out-of-pocket burden. Consequently, additional public health expenditure in scenario 1 or 2 could have an even greater impact on reducing out-of-pocket expenditure when combined with efficiency improvements. Figure 36 shows how an increase in public health expenditure would increase funds thereby contributing to the UHC dimension of cost sharing and fees reduction, and thereby leading the study countries closer to the achievement of universal health coverage.

Countries and competent authorities should, therefore, focus their attention not only on raising additional resources through (indirect) taxation, but also exploring the efficiency agenda and pursuing appropriate reform policies and relevant institution-building.

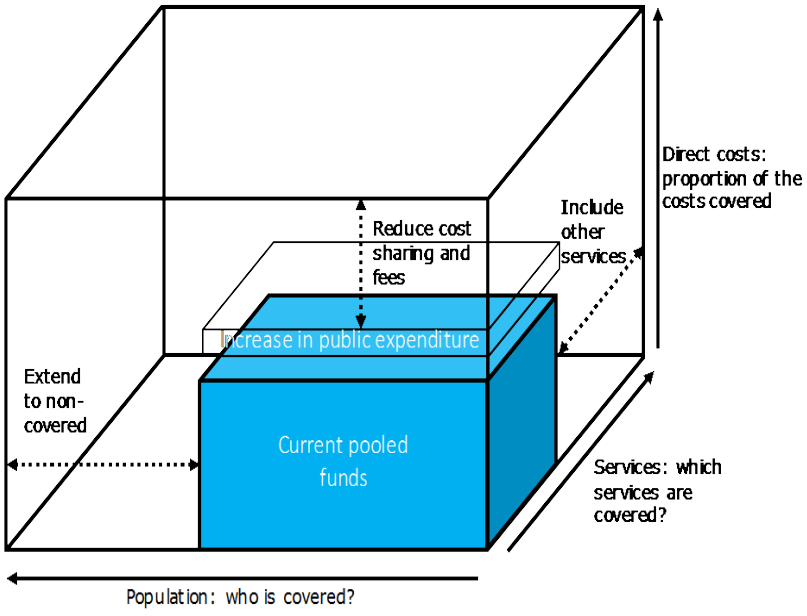


Figure 36: Impact of expenditure increase on achieving universal health coverage

Source: *Adapted by the authors from WHO, 2010*

SUMMARY

Simulation scenarios and the fiscal gap

Having ascertained that one percentage point of VAT increase and five percentage point increases in alcohol and tobacco products can deliver significant additional resources, both in absolute monetary terms and as a proportion of GDP, we focused on the magnitude of increases required to fill the funding gap in healthcare, i.e. what tax increases would be required to reach the benchmark spending level on health as a percent of GDP from the current levels of health expenditure. This was undertaken in order to highlight the level of effort required and how this differed by country.

Three scenarios were used to outline how the fiscal gains from increased indirect taxation could be allocated. The first, assumes that all fiscal benefits will be earmarked for the purposes of increasing the funding of healthcare services; the second, assumes that healthcare is prioritised, but the proceedings from increased indirect taxation are distributed on a weighted basis in accordance with other governmental priorities; and, the third, assumes that healthcare benefits are benefiting from the increased resources from tax revenue but the key focus is placed on improving efficiency in the healthcare system.

If all additional tax revenue is allocated to health only, the remaining fiscal gap would be filled to varying degrees. Mexico and Peru would require a significant increase in VAT (16.1 and 10.1 percentage points, respectively) and harmful product tax (80 and 55 percentage point rise, respectively) to cover their overall funding gaps. By contrast, Uruguay and Costa Rica would require 0.7 and 2.3 percentage point increase in VAT and 3.3 and 11.3 percentage point increase in harmful product tax, respectively, to do the same. To fill the funding gap, the VAT increases necessary are significantly lower than potential harmful product tax increases. Therefore, countries could look to VAT first to consider addressing funding gaps they have.

If revenue generated is allocated in a weighted fashion, VAT and harmful product tax increases required to close the remaining fiscal gap are significantly higher than under the previous scenario. Mexico and Peru still require a significant increase in VAT and harmful product tax (in percentage point terms) to fill their fiscal gaps. As with the previous scenario, VAT increases required (in percentage points) are significantly lower than the tax increases on alcohol and tobacco required to cover the fiscal gap across all countries.

With regards to the third scenario, it is generally acknowledged that allocating additional funding to healthcare without the implementation of reforms to improve efficient use of resources is not a wise strategy and may perpetuate wasteful use of resources. Consequently, raising additional revenue through taxation, should be combined with efforts to improve (a) the governance of healthcare systems (e.g. reduce unnecessary administrative processes), (b) reduce inefficiencies in clinical care (e.g. reduce the rate of avoidable clinical adverse incidents) and (c) reduce the degree of operational waste. Several potential reforms aimed at improving efficiency in current health systems are possible, including improved access to primary care, value-led approaches to pharmaceutical care, promotion of cost-effective products, including generics, and streamlining hospital financing mechanisms with focus on prospective payments.

Allocation of the generated revenue to these reforms would require carefully designed approaches based on evidence to ensure the aim is achieved. To that end, financing and implementing robust data collection systems may allow decisionmakers to make informed budget allocations and streamline inefficiencies.

The suitability and feasibility of applying harmful product tax increases are dependent on country context. In countries producing these products (e.g. wine in Argentina and Chile, or tobacco in Colombia), increased taxation on these goods might not be politically feasible or economically desirable. The political feasibility of these taxes might increase if there is a public declaration (and subsequent action) to earmark the revenue for the purposes of funding health services.

CONCLUSIONS AND POLICY IMPLICATIONS

Summary of key results

The region faces several challenges in the financing, organization and delivery of its healthcare systems; this includes inefficient delivery of care and slow uptake of policies to improve performance and efficiency. Total health expenditure as a percentage of GDP ranges between 5% and 9%, but for most countries in the region, publicly funded health expenditure is well below 6%, the remainder being out-of-pocket expenditure, which range from 16% of total health expenditure (Uruguay) and 43% (Ecuador).

Despite the above trend, total health expenditure as a proportion of GDP has increased in the majority of Latin American countries (particularly in Argentina, Chile, Colombia, Costa Rica, Ecuador, Panama, and Peru) over the past 15 years, while out-of-pocket expenditure on health increased in Colombia, Ecuador, Panama, Peru and Uruguay but decreased in Argentina, Brazil, Chile, Costa Rica, Mexico over the same period. Private health expenditure increased in all countries besides Argentina, Costa Rica, Mexico, and Uruguay during the same period.

While several countries rely heavily on general taxation to finance healthcare, large informal economies contribute to difficulties in tax collection and financing healthcare (and other public services) to an adequate level via taxation. In line with global trends, the Latin American region is affected by the burden of NCDs as the leading causes of death, with the proportion of deaths due to NCDs increasing in all Latin American countries between 2000 and 2015. NCDs, therefore, pose the highest burden on the healthcare system and the resources available. Despite the above challenges, key health indicators, such as infant mortality and life expectancy are improving across the region.

Underfunding of healthcare systems across the region remains a key concern. The average observed fiscal gap across the ten study countries between public spend on health (as % of GDP) and the benchmark health spend of 6% of GDP stands at 1.9% GDP (ranging from 1.1 – 2.9% of GDP). The majority of countries currently spend considerably below the 6% WHO/PAHO benchmark, with only Costa Rica and Uruguay meeting and slightly exceeding that benchmark. In monetary terms, Brazil, Mexico, and Peru have the largest fiscal gaps to close in terms of additional resources required for their healthcare systems (US$70.6, US$63.8 and US$12.4 billion, respectively).

Although macroeconomic performance cannot be characterised as overarchingly and sustainably positive in its entirety for all Latin American countries and a variety of macroeconomic instabilities remain in

the region, the outlook remains positive and these instabilities can be balanced out by positive growth levels, recovering commodity prices, and low inflation. On balance, macroeconomic performance seems to provide some support to the arguments around the existence of modest to moderate fiscal space, which could be leveraged to improve the range, performance and quality of healthcare services provided and contribute towards the achievement of universal health coverage.

Forming policy and deciding on equity-efficiency trade-offs by implementing policy interventions involves political discourse and multidimensional stakeholder influence. Based on survey results, there seemed to be agreement on the necessity and political feasibility of additional funding options to increase the level of investment in healthcare, in combination with measures to improve the efficiency of resources that are already deployed. In parallel, private funding options at healthcare system level were met with some scepticism, perhaps with the exception of top-ups for specific types of coverage (expensive technologies) and, where possible, health savings accounts.

Driven partly by survey results suggesting that indirect and 'sin' tax increases have a greater degree of political acceptance and feasibility compared with other types of taxation, we have explored the use of indirect taxation – particularly VAT and taxes on alcohol and tobacco (products that can be characterised as 'harmful' and justifying the levying of the so-called 'sin' taxes), as a vehicle to generate fiscal space and generate additional resources to be used for the funding of healthcare services. Despite their regressive nature, modest increases in these taxes could generate significant resources that, if earmarked, can contribute to UHC.

The financial impact of a 1 percentage point increase in the standard and non-standard VAT rates was explored in order to showcase what impact this will have on additional revenue generation. The extent of additional revenue generation is dependent on demand elasticity – how demand will respond to changes in prices – and the VAT base. The analysis that a 1% rise in VAT would result in additional revenue ranging between 0.12% of GDP (Mexico) and 0.63% of GDP (Uruguay). In monetary terms the maximum achievable increase in VAT revenue across all scenarios assuming there is no price elasticity effect, varies from US$214 million in Panama to US$11,805 million in Brazil. These figures represent a significant level of new resources, which, if available for the purposes of improving health services could make a significant difference in the study countries if targeted appropriately.

In the case of taxes on harmful products, having explored a 5 percentage point increase in tobacco and alcohol tax rates, we found that resources equivalent to 0.03% and 0.16% of GDP can be raised. Overall, the ability of tax increases on

alcohol and tobacco to generate significant tax revenue, was found to be small both in absolute terms as well as relative to the comparator countries. Brazil and Uruguay had the highest increase in revenue, with most of the increase coming from alcohol taxes. By contrast, taxes on alcoholic beverages would be least effective in raising additional revenue in Chile. Argentina, Chile and Mexico also had a high increase in revenue, with the most revenue resulting from tobacco taxes. Tobacco taxes were least effective in raising additional revenue in Colombia, Costa Rica, and Panama.

The suitability and feasibility of applying tax increases on tobacco and alcohol products are very often contestable and dependent on country context: where countries are producers of such goods (e.g. wine in Argentina, Chile or Brazil, or tobacco in Colombia) increases in taxation of these goods might not be politically feasible or economically desirable. It may also artificially raise product prices for local goods and reduce local consumption, threatening the viability of local industry. However, the political feasibility of raising indirect taxes might increase if the taxation proceedings are earmarked for the purpose of being used to improve the quality of health services.

Simulation analysis was conducted in order to determine what resources would be required to cover the fiscal gap in healthcare across Latin American countries. The three scenarios that were explored in this context were (a) that all fiscal benefits should be earmarked for the purposes of increasing the funding of healthcare services; (b) that healthcare should prioritised, but the proceedings from increased indirect taxation ought to be distributed on a weighted basis in accordance with other governmental priorities; and (c) that while there are fiscal benefits from increased indirect taxation, the key focus is placed on improving efficiency in the healthcare system.

If all additional tax revenue is allocated to health only, the remaining fiscal gap would be filled to varying degrees. Mexico and Peru would require a significant increase in VAT (16.1 and 10.1 percentage points, respectively) and harmful product tax (80 and 55 percentage point rise, respectively) to cover their overall funding gaps. By contrast, Uruguay and Costa Rica would require 0.7 and 2.3 percentage point increase in VAT and 3.3 and 11.3 percentage point increase in harmful product tax, respectively to do the same. To fill the funding gap, the VAT increases necessary are significantly lower than potential harmful product tax increases. Therefore, countries could look to VAT first to consider addressing funding gaps they have.

If revenue generated is allocated in health in a way that addresses need in other areas of human services (e.g. education, pensions & social security, and defence), VAT and harmful product tax increases required to close the remaining fiscal gap

are significantly higher than under the previous scenario. Mexico and Peru still require a significant increase in VAT and harmful product tax (percentage points) to fill their fiscal gaps.

The purpose of the modelling and simulation exercise pursued in the context of this report were not to advocate in favour of tax increases. Rather, it was to showcase that indirect taxes can be used effectively to raise additional revenue to invest in health. This can be done in varying degrees in the study countries, as their dependence on and exposure to indirect taxes (both VAT and taxes on alcohol and tobacco) differs quite fundamentally. Equally, national governments need to reflect very carefully on expected revenue and the impact that additional tax rises will have on consumption.

Policy implications

Decisionmakers faced with increased pressure to accelerate towards the goal of UHC need to very actively consider the possibility of raising additional resources to fund health services, whilst at the same time working towards improving the efficiency with which existing sources are deployed. The concept of fiscal space, therefore, is far from theoretical and can provide significant opportunities to expand on the level of resources available. Still, there are several dimensions that need to be taken into account in order to ensure that appropriate decisions are taken.

First, any discussion on fiscal space needs to be based on good macroeconomic performance that does not jeopardize the sustainability of public finances. In circumstances where there are persistent macroeconomic imbalances (e.g. fiscal deficits, high debt levels, deteriorating external balances and loss of competitiveness), the fiscal space to increase meaningfully public spending on health may not be there and, even if there was, the temptation would be to use any additional resources to cover deficits rather than invest these in public health.

Second, it takes political courage to propose and promote increases in taxation and this needs to be judged against political feasibility, which may vary depending on country context. While tax rises is never desirable, they can become more palatable if use of the additional resources has been identified ex ante and communicated to the electorate. Earmarking is, therefore, critical.

Third, although a 1 percentage point rise in VAT and a 5 percentage point rise in tobacco and alcohol would have different impact on resources raised, the fiscal figures found as part of the modelling exercise represent a significant level of new resources, which, if available for the purposes of improving health services could make a substantial difference in the study countries if targeted appropriately.

Fourth, decisionmakers must have a sense not only of what is desirable but also what

is feasible. From a political feasibility perspective, it may not be possible to raise standard VAT rates in some countries because they are already considered to be high; this is the case in Uruguay (where the VAT rate stands at 22%), Argentina (21%), Chile (19%) and Colombia (19%). In these countries, any potential increase in increasing revenue from VAT may come from either increasing the non-standard VAT rates or the overall VAT base. The former may be feasible in all the above countries, perhaps with the exception of Argentina. Nevertheless, all other countries present opportunities to raise the basic rate of VAT by at least one percentage point, as basic rates range between 7% (Panama) and 18% (Peru). In this report, we have assumed a one percentage rise in VAT in order to gauge the yield that such an increase would deliver across countries.

Fifth, raising taxes on alcohol and tobacco is often contestable and it has been the case that these two products have already attracted significant attention. While the fiscal gains from increased alcohol and tobacco taxes are expected to be moderate at best, focus on these 'sin' taxes carry two interconnected policy and political messages: first, that higher taxes for these products are a signal to deter people from consuming or consuming in excess because of the health implications and, second, those who engage in their consumption run the risk of developing disease over the longer term and ultimately they contribute to funding care and treatment caused by their behaviour.

Sixth, while we have modelled the effect of taxes on alcohol and tobacco, clearly they are not the only taxes related to behaviour: taxing sugar and fat or levying environmental taxes also present valid policy options. Taxing sugar and fat is one way of raising additional resources, but the public health dimension is also very important, as increased levels of sugar and saturated fat in processed food are major predictors of obesity and, ultimately, poor health. There are obvious trade-offs between raising the rate of taxation on foods that have a high saturated fat content and beverages versus working with the food industry or regulating sugar and fat content in order to mitigate their harmful effects on human health. Environmental taxes are also important, but their imposition in the Latin American context needs to be balanced against the range of options that can be made available to encourage change in consumer behaviour.

Seventh, the explicit assumption made is that indirect taxes represent a desirable option to raise additional resources compared with direct taxes. It is, nevertheless, well known that indirect taxes are inherently regressive and tax more heavily the lower socioeconomic groups. Apart from having a higher impact on consumption amongst those groups, indirect taxes may be seen as 'stealth' taxes, particularly if there is no clear plan for their use. Consequently, hypothecation

would be required so that the proceeds are earmarked for specific purposes, of which, improvements in healthcare is the most worthwhile causes.

Eighth, it is assumed that competent authorities are (a) neutral to the selection of tax modality; (b) interested in closing the funding gap that exists in healthcare; and (c) willing or able to raise taxes across settings and products. However, taxes are not only a fiscal tool used to raise resources, but also a means of industrial policy and, consequently, tax rates should be calibrated and tailored to the type of product and the need they are required to fulfil.

Ninth, as detailed information on price elasticities of demand is not widely available, the modelling results may need to be interpreted with some caution. Before proceeding with tax rises in specific products, decisionmakers will have to account for the appropriate elasticities in order to estimate potential impact on consumption and on fiscal yield.

Tenth, it has been implicitly assumed that governments would undertake modest increases in indirect taxation in order to cover part of their funding gap for healthcare. Yet, decisions of this kind should be taken after very careful consideration and based on a needs assessment exercise, particularly around what services should be targeted, where the highest needs are and who the likely beneficiaries are going to be. If additional sources of revenue are delivered by taxing more the less well-off, then there is a legitimate argument for the benefits to accrue proportionately more to weaker socio-economic groups and improve their access to services and care.

Eleventh, as decisions to reduce the fiscal gap in healthcare are likely to be long-term in nature, over the short-term three types of activity can take place: (a) needs assessment exercises can reveal what the most pressing areas of need are in a healthcare system and provide estimates of funding these; (b) priorities can be set that can be fulfilled during a specific timeframe and budget; and (c) a series of pilots can take place that would test the potential of new interventions; pilots would require additional resources, therefore, smaller scale increases in indirect taxes could be implemented to raise these on the assumption that they remain earmarked. Peru and Paraguay have had some experience in that context.

Finally, it would be unwise not to implement reforms to improve efficient use of resources and could perpetuate wasteful use of resources. Consequently, raising additional revenue through taxation should be combined with efforts to (a) improve the governance of healthcare systems; (b) reduce inefficiencies in clinical care (e.g. reduce the rate of avoidable clinical adverse incidents) and; (c) reduce the degree of operational waste. Several potential reforms aimed at improving efficiency in current health systems are possible,

including improved access to primary care, value-led approaches to pharmaceutical care, promotion of cost-effective products, improvements in quality of products and services, and streamlining hospital financing mechanisms with focus on prospective payments, among others; and (d) finance and implement robust data collection systems, which would allow decisionmakers to make informed budget allocations and streamline inefficiencies.

BIBLIOGRAPHY

Aguilar, R. et al. (2015). *Programa Estado de la Nación en Desarrollo Humano Sostenible (Costa Rica).* Available at: http://www.estadonacion.or.cr/21/assets/pen-21-2015-baja.pdf [Accessed: November 15, 2018]

Alcohol and Tobacco Tax and Trade Bureau (2012). *International Affairs Resources for Costa Rica*. Available at: https://www.ttb.gov/itd/costa_rica.shtml [Accessed: September 14 2018].

Alcohol and Tobacco Tax and Trade Bureau (2014). *International Trade Resources for Brazil*. Available at: https://www.ttb.gov/itd/brazil.shtml [Accessed: September 14 2018].

Almendarez-Hernández, M.A. (2013). Economic valuation of water in a natural protected area of an emerging economy: Recommendations for El Vizcaino Biosphere reserve, Mexico. *Interciencia*. 38 (4), 245–253.

Anderson, K. (2014). *Excise Taxes on Wines, Beers and Spirits: An Updated International Comparison*. Available at: www.adelaide.edu.au/wine-econ/ [Accessed: September 14 2018].

Andreyeva, T., Long, M.W. & Brownell, K.D. (2010). The impact of food prices on consumption: a systematic review of research on the price elasticity of demand for food. *American journal of public health*. 100 (2), 216–222. Available at: doi:10.2105/AJPH.2008.151415 [Accessed: September 14 2018].

Anon (2016). *Chile: Tobacco Taxation In Chile*. Available at: http://www.mondaq.com/x/512922/sales+taxes+VAT+GST/Tobacco+taxation+In+Chile [Accessed: September 14 2018].

Asante, A., Price, J., Hayen, A., Jan, S., Wiseman, V. (2016). Equity in Health Care Financing in Low- and Middle-Income Countries: A Systematic Review of Evidence from Studies Using Benefit and Financing Incidence Analyses. *PLoS ONE*, 11(4). Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4827871/. [Accessed: August 18 2018].

Auxadi (2016). *Changes In Tax Regulations Of Ecuador - Auxadi*. Available at: https://www.auxadi.com/en/changes-in-tax-regulations-of-ecuador/ [Accessed: September 14 2018].

Baquero, C.S. (2017). *Sugar tax in Spain: Catalonia region introduces "soda tax" on sugary drinks*. El Pais. Available at: https://elpais.com/elpais/2017/05/01/inenglish/1493645507_575034.html [Accessed: September 14 2018].

Baumgarten Jr., A. L. Demanda de automóveis no Brasil. Revista Brasileira de Economia, v. 26, n. 2, p. 203-297, 1972.

Benavente et al. (2005). Estimando la Demanda Residencial por electricidad en Chile: El Consumo es Sensible al Precio. Cuadernos de Economia, 42: 31-61.

BMI (2018a). *Argentina pharmaceuticals & healthcare report- Q2 2018.* Available at: https://search.proquest.com/docview/2011401153?accountid=9630 [Accessed: November 2 2018].

BMI (2018b). *Brazil pharmaceuticals & healthcare report- Q2 2018.* Available at: https://search.proquest.com/docview/2037738820?accountid=9630 [Accessed: November 2 2018].

BMI (2018c). *Chile pharmaceuticals & healthcare report- Q2 2018.* Available at: https://search.proquest.com/docview/2037738820?accountid=9630 [Accessed: November 2 2018].

BMI (2018d). *Colombia pharmaceuticals & healthcare report- Q2 2018.* Available at: https://search.proquest.com/docview/2025946108?accountid=9630 [Accessed: November 2 2018].

BMI (2018e). *Costa Rica pharmaceuticals & healthcare report- Q2 2018.* Available at: https://search.proquest.com/docview/2033442515?accountid=9630 [Accessed: November 2 2018].

BMI (2018f). *Ecuador pharmaceuticals & healthcare report- Q2 2018.* Available at: https://search.proquest.com/docview/1991485271?accountid=9630 [Accessed: November 2 2018].

BMI (2018g). *Mexico pharmaceuticals & healthcare report- Q2 2018.* Available at: https://search.proquest.com/docview/2011756995?accountid=9630 [Accessed: November 2 2018].

BMI (2018h). *Panama pharmaceuticals & healthcare report- Q2 2018.* Available at: https://search.proquest.com/docview/2029898621?accountid=9630 [Accessed: November 2 2018].

BMI (2018i). *Peru pharmaceuticals & healthcare report- Q2 2018.* Available at: https://search.proquest.com/docview/2025951000?accountid=9630 [Accessed: November 2 2018].

BMI (2018j). *France pharmaceuticals & healthcare report- Q2 2018.* Available at: https://search.proquest.com/docview/2026696211?accountid=9630 [Accessed: November 2 2018].

BMI (2018k). *Spain pharmaceuticals & healthcare report- Q2 2018.* [Online]. 2018. Available at: https://search.proquest.com/docview/2032533363?accountid=9630 [Accessed: November 2 2018].

BMI (2018l). *United Kingdom pharmaceuticals & healthcare report- Q2 2018.* Available at: https://search.proquest.com/docview/2013121530?accountid=9630 [Accessed: November 2 2018].

Bouamra-Mechemache, Z., Réquillart, V., Soregaroli, C. & Trévisiol, A. (2008) Demand for dairy products in the EU. *Elsevier*. 33 (6), 644–656.

Brazilian Ministry of Health (2016). *Plano National de Saude 2016 – 2019.* Available at: http://conselho.saude.gov.br/ultimas_noticias/2016/docs/planonacionalsaude_2016_2019.pdf [Accessed: November 15, 2018].

Briggs, A.D.M., Mytton, O.T., Kehlbacher, A., Tiffin, R., Elhussein, A., Rayner, M., Jebb, S.A., Blakely, T., Scarborough, P. (2017). *Health Impact Assessment of the UK Soft Drinks Industry Levy: A Comparative Risk Assessment Modelling Study*. Lancet Public Health, 2(1), pp.15-22.

Caro, J.C., Ng, S.W., Bonilla, R., Tovar, J., Popkin, B.M. (2017). *Sugary Drinks Taxation, Projected Consumption and Fiscal Revenues in Colombia: Evidence from a QUAIDS Model*. PLoS, 12(12). Available at: http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0189026. [Accessed: June 9 2018].

Chang, Y. and Martinez-Chombo, E. (2003). Electricity Demand Analysis Using Cointegrating and Error-Correction Models with Time Varying Parameters: the Mexican Case. Working Paper 2003 - 08. Department of Economics, Rice University, Houston.

Chevreul K., Berg Brigham K., Durand-Zaleski I., Hernández-Quevedo C. (2015). *France: Health system review.* Health Systems in Transition, 17(3): 1–218.

Chowdhury, A., Islam, I. (2012). *An Optimal Public Debt-to-GDP Ratio?* G24 Policy Brief, 65. Available at: https://www.g24.org/wp-content/uploads/2016/01/G24-Policy-Brief-65-04-09-2012-.pdf. [Accessed: November 14 2018].

Clements, B.J., Coady, D., Gupta, S. (2012). *The Economics of Public Health Care Reform in Advanced and Emerging Economies*. Washington. International Monetary Fund. Available at: http://bit.ly/1NMhmtg. [Accessed: June 11 2018].

Colombian Ministry of Health (2013). *Plan Decenal de Salud Pública, PDSP, 2012 – 2021.* Available at: https://www.minsalud.gov.co/Documentos%20y%20Publicaciones/Plan%20Decenal%20-%20Documento%20en%20consulta%20para%20aprobaci%C3%B3n.pdf [Accessed: November 15, 2018].

Cornelsen, L., Green, R., Dangour, A., Smith, R. (2015). *Why Fat Taxes Won't Make Us Thin*. Journal of Public Health, 37(1), pp.18-23.

Cylus J., Richardson E., Findley L., Longley M., O'Neill C., Steel D. (2015). *United Kingdom: Health system review*. Health Systems in Transition, 17(5): 1–125.

De Paepe, P., Echeverría Tapia, R., Aguilar Santacruz, E., Unger, J. P. (2012). *Ecuador's silent health reform.* International journal of health services: planning, administration, evaluation, 42(2):219-33. Available at: https://www.ncbi.nlm.nih.gov/pubmed/22611652 [Accessed: November 20 2018].

Del Rocío Sáenz, M., Bermúdez, J. L., Acosta, M., (2010). *Universal Coverage in a Middle Income Country: Costa Rica.* World Health Report (2010) Background Paper, 11. World Health Organization. Available at:

http://www.who.int/healthsystems/topics/financing/healthreport/CostaRicaNo11.pdf [Accessed: November 20 2018].

Doherty, J., Kirigia, D., Okoli, C., Chuma, J., Ezumah, N., Ichocku, H., Hanson, K., McIntyre, D. (2018). *Does Expanding Fiscal Space Lead to Improved Funding of the Health Sector in Developing Countries?: Lessons from Kenya, Lagos State (Nigeria) and South Africa.* Global Health Action, 11(1).

Durán C, E., Lucio, R., Rovira, J. (2017). *Pharmaceutical Policy in Ecuador.* Pharmaceutical Policy in Countries with Developing Healthcare Systems, PP 221-236. Available at: https://link.springer.com/chapter/10.1007/978-3-319-51673-8_11 [Accessed: November 20 2018].

Durand-Zaleski (2008) *The health system in France.* Eurohealth, 14 (1). Available at: http://www.lse.ac.uk/lse-health/assets/documents/eurohealth/issues/eurohealth-v14n1.pdf [Accessed: November 20 2018].

European Commission (2018) *Excise duties on alcohol, tobacco and energy*. Available at: https://ec.europa.eu/taxation_customs/business/excise-duties-alcohol-tobacco-energy_en [Accessed: October 1 2018].

Fitch Solutions (2018) *Sugar Taxes In The Americas: Brazil And Canada Most Likely To Follow Mexico's Lead*. Available at: https://www.fitchsolutions.com/corporates/commodities/sugar-taxes-americas-brazil-and-canada-most-likely-follow-mexicos-lead-24-01-2018 [Accessed: September 14 2018].

Galindo, L.M., Samaniego, J., Alatorre, J.E., Carbonell, J.F., et al. (2015) *Meta-analysis of the income and price elasticities of gasoline demand: public policy implications for Latin America*.

García-Armesto S., Abadía-Taira M.B., Durán A., Hernández-Quevedo C., Bernal-Delgado E. (2010). *Spain: Health system review.* Health Systems in Transition, 12(4):1–295.

Global Network for Health Equity (GNHE), 2015a. Available at: Universal Health Coverage Assessment: Colombia. Available at: https://www.icesi.edu.co/proesa/images/GNHE%20UHC%20assessment_Colombia%204.pdf# [Accessed: November 2 2018].

Global Network for Health Equity (GNHE), 2015b. Universal Health Coverage Assessment: Costa Rica. Available at: http://gnhe.org/blog/wp-content/uploads/2015/05/GNHE-UHC-assessment_CostaRica.pdf [Accessed: November 2 2018].

Gonzalez-Rozada, M. & Ramos-Carbajales, A. (2016) Implications of raising cigarette excise taxes in Peru. *Revista Panamericana de Salud Publica*. 40 (4), 250–255. Available at: http://search.ebscohost.com/login.aspx?direct=true&db=rzh&AN=120443556&site=ehost-live [Accessed: November 20 2018].

Government of Chile (2011) *Estrategia Nacional De Salud para el cumplimiento de los Objetivos Sanitarios de la Década 2011-2020*. Available at: http://www.bibliotecaminsal.cl/wp/wp-content/uploads/2011/12/Metas-2011-2020.pdf [Accessed: November 15, 2018].

Government of Mexico (2013). *Plan Nacional de Desarrollo 2013 – 2018: Programma Sectorial de Salud.* Available at: http://www.omm.org.mx/images/stories/Documentos%20grandes/Programa%20Sectorial%20de%20Salud%202013-2018.pdf [Accessed: November 15, 2018].

Green, R. et al. (2013) 'The effect of rising food prices on food consumption: systematic review with meta-regression', BMJ. 2013;346:f3703

Guerrero-López, C.M., Unar-Munguía, M. & Colchero, M.A. (2017) Price elasticity of the demand for soft drinks, other sugar-sweetened beverages and energy dense food in Chile. *BMC public health*. 17 (1), 180. Available from: doi:10.1186/s12889-017-4098-x [Accessed: September 14 2018].

Gupta, I., Mondal, S. (2013). *Fiscal Space for Health Spending in Southeast Asia.* Journal of Health Care Finance, 39(4), pp.68-82.

Hartwig, J. (2008). *What Drives Health Care Expenditure- Baumol's Model of 'Unbalanced Growth' Revisited.* Journal of Health Economics, 27(3), pp.603-623.

Heller, P. (2005). *Back to Basics: Fiscal Space: What It Is and How to Get It. Finance and Development*. International Monetary Fund. Available at: http://www.imf.org/external/pubs/ft/fandd/2005/06/basics.htm [Accessed: June 09 2018].

HM Revenue & Customs (2018) *Check if your drink is liable for the Soft Drinks Industry Levy*. Available at: https://www.gov.uk/guidance/check-if-your-drink-is-liable-for-the-soft-drinks-industry-levy#levy-bands [Accessed: September 14 2018].

Hopkins, S. (2010). *Health Expenditure Comparisons: Low, Middle and High-Income Countries*. The Open Health Services and Policy Journal, 2010, 3, 111-117.

Huang, W.-C. & Durón-Benítez, Á.A. (2015) Analysis of Demand for Dairy Product in Central American Countries under the CAFTA. *Microeconomics and Macroeconomics*. 3 (1), 7–14. Available at: doi:10.5923/j.m2economics.20150301.02.

Iglesias, R.M. (2016) Increasing excise taxes in the presence of an illegal cigarette market: the 2011 Brazil tobacco tax reform. *Revista panamericana de salud publica = Pan American journal of public health*. 40 (4), 243–249.

International Monetary Fund (2018a) *Latin America and Caribbean: Seizing the Momentum*.

International Monetary Fund (2018b) *Regional economic outlook. Western Hemisphere : seizing the momentum*.

International Monetary Fund (IMF) and World Bank. (2006). *Fiscal Policy for Growth and Development: An Interim Report.* DC2006-0003. Development Committee. Available at: http://bit.ly/1O0dirb. [Accessed: 9 June 2018].

INS (n.d.). Seguro Obligatorio de Riesgos del Trabajo Condiciones Generales. Available at: https://sevins.ins-cr.com/SIEL/VerArchivo.aspx?ID=9028. [Accessed 20 September 2019].

Jack, A. (2013). *Health Spending Suffers Since Global Financial Crisis.* Financial Times, 21 November. Available at: https://www.ft.com/content/aabec606-51e8-11e3-adfa-00144feabdc0 [Accessed: June 10 2018].

Jenkins, R. (1977) *Dependent Industrialization in Latin America. The Automotive Industry in Argentina, Chile and Mexico*. New York.

Jenner, F. (2018) *Peruvian government puts a 25% tax on sugary drinks to combat rising levels of obesity*. Available at: https://perureports.com/2018/05/10/peru-sugar-drink-tax/ [Accessed: September 14 2018].

Knaul FM, Wong R, Arreola-Ornelas H. (2012). Financing Health In Latin America Editors: Household Spending and Impoverishment Household Spending and Impoverishment [Internet]. Harvard University Press. Available at: https://www.idrc.ca/sites/default/files/sp/Documents%20EN/Financing-Health-in-Latin-America-Volume-1.pdf [Accessed: 2018 Aug 14].

Laugesen, M., Epton, M., Frampton, C.M.A., Glover, M., et al. (2009) Hand-rolled cigarette smoking patterns compared with factory-made cigarette smoking in New Zealand men. *BMC public health*. 9, 194. Available at: doi:10.1186/1471-2458-9-194 [Accessed: August 24 2018].

Lucio, R., Villacrés N., Henríquez R. (2011) The health system of Ecuador. *Salud publica de Mexico.* 53 (2), 177-187. Available at: https://www.researchgate.net/publication/51604999_The_health_system_of_Ecuador [Accessed: November 13 2018].

Maddock, R., Castano, E., And Vella, F. (1992). Estimating Electricity Demand: the Cost of Linearising the Bugdget Constraint. Review of Economics and Statistics 74 (2) 350 54.

Maldonado, N., Llorente, B. & Deaza, J. (2016) Cigarette taxes and demand in Colombia. *REVISTA PANAMERICANA DE SALUD PUBLICA-PAN AMERICAN JOURNAL OF PUBLIC HEALTH*. 40 (4), 229–236.

McPartland, B. (2017) France tackles obesity by hiking 'soda tax' on sugary drinks. *The Local*. Available at: https://www.thelocal.fr/20171027/france-tackles-obesity-by-hiking-soda-tax-on-sugary-drinks [Accessed: September 14 2018].

Mercer, A. (2014). *Infections, chronic disease, and the epidemiological transition: a new perspective.* Woodbridge: Boydell & Brewer, Rochester: University of Rochester Press.

Mills, A. (2014). *Health Care Systems in Low- and Middle-Income Countries*. The New England Journal of Medicine, 370, pp.552-557.

Ministry of Agriculture, Fisheries and Food, Office for National Statistics. (2004). National Food Survey, 1997. [data collection]. 2nd Edition. UK Data Service. SN: 3966, http://doi.org/10.5255/UKDA-SN-3966-1

Ministry of Health, Peru (2018). *Boletin Estatistico Mensual. Del Seguro Intergal de Salud. October 2018*. Available at: Thttps://app.powerbi.com/view?r=eyJrIjoiZjI2ZGEzOWQtZjZiZC00ODRhLTliZWMtNmExO

WQ0ZDdhMTk3IiwidCI6IjZmZTkxN2VlLWQ5OWMtNGJmNy05OGQ1LThhOTUyYTE3NzhjNCIsImMiOjR9 [Accessed: November 21 2018].

Mladovsky, P., Srivastava, D., Cylus, J., Karanikolas, M., Evetovits, T., Thomson, S., McKee, M. (2012). *Health Policy in the Financial Crisis.* EuroHealth, 18(1).

Nelson, J.P. (2013) Meta-analysis of alcohol price and income elasticities - with corrections for publication bias. *Health economics review*. 3 (1), 17. Available at: doi:10.1186/2191-1991-3-17 [Accessed: September 14 2018].

Nordea Trade (2018) *Tax rates in Peru*. Available at: https://www.nordeatrade.com/fi/explore-new-market/peru/taxes [Accessed: September 14 2018].

Organization for Economic Co-Operation and Development (OECD) (2018) *Revenue Statistics - Latin American Countries*. Available at: https://stats.oecd.org/Index.aspx?DataSetCode=REVBRA [Accessed: September 14 2018].

Organization for Economic Co-Operation and Development (OECD) (2018a) *Global Revenue Statistics Database*. 2018.

Organization for Economic Co-Operation and Development (OECD) (2018b) *OECD Tax Database*. Chapter D. Taxes on consumption. 18 July 2018. Available at: doi:10.1787/tax_wages-2011-en [Accessed: September 14 2018].

Organization for Economic Co-Operation and Development (OECD) (2017). *Tackling Wasteful Spending on Health.* Available at: http://dx.doi.org/10.1787/9789264266414-en [Accessed: November 2 2018].

Organization for Economic Co-Operation and Development (OECD) (2017a). OECD Reviews of Health Systems: Peru 2017. Available at: https://www.oecd-ilibrary.org/docserver/9789264282735-en.pdf?expires=1559301339&id=id&accname=ocid71015720&checksum=E555934B8F11ED73CA3DA2B85220E6CC#_ga=2.106524867.1575295018.1559300407-118401193.1559300407

Organization for Economic Co-Operation and Development (OECD) (2016). *OECD Reviews of Health Systems: Mexico 2016.* Available at: http://dx.doi.org/10.1787/9789264230491-en [Accessed: November 2 2018].

Organization for Economic Co-Operation and Development (OECD) (2015). *Pension Spending*. Available at: https://data.oecd.org/socialexp/pension-spending.htm [Accessed: September 14 2018].

OECD, CAF & ECLAC (2018) *Latin American Economic Outlook 2018: Rethinking Institutions for Development*. Paris, OECD Publishing.

Pan American Health Organization (PAHO) (2017a). *Health in the Americas: Chile*. Available at: https://www.paho.org/salud-en-las-americas-2017/?p=2518[Accessed: November 2 2018]

Pan American Health Organization (PAHO) (2017b). *Health in the Americas: Peru*. Available at: https://www.paho.org/salud-en-las-americas-2017/?p=3232 [Accessed: November 2 2018]

Pan American Health Organization (PAHO) (2017c). *Health in the Americas: Uruguay.* Available at: https://www.paho.org/salud-en-las-americas-2017/?p=4314 [Accessed: November 2 2018]

Pan American Health Organization (PAHO) (2017d). *Health in the Americas: Panama.* Available at: https://www.paho.org/salud-en-las-americas-2017/?p=4289 [Accessed: November 2 2018]

Pan American Health Organization (PAHO) (2017e). *Health in the Americas: Ecuador.* Available at: https://www.paho.org/salud-en-las-americas-2017/?page_id=117 [Accessed: November 13 2018].

Pan American Health Organization (PAHO) (2017f). *Health in the Americas: Argentina.* Available at: https://www.paho.org/salud-en-las-americas-2017/?page_id=83 [Accessed: November 15 2018]

Pan American Health Organization (PAHO) (2017g). Health in the Americas: Costa Rica. Available at: https://www.paho.org/salud-en-las-americas-2017/?p=2656 [Accessed: November 15 2018]

Pan American Health Organization (PAHO) (2015). *Fiscal Space for Increasing Health Priority in Public Spending in the Americas Region*. Available at: https://www.paho.org/uhexchange/index.php/en/uhexchange-documents/technical-information/40-fiscal-space-for-increasing-health-priority-in-public-spending-in-the-americas-region/file. Accessed 9 June 2018.

Pan American Health Organization (PAHO) (2014). *Health Financing in the Americas*. Available at: https://www.paho.org/salud-en-las-americas-2017/?p=178

Pan American Health Organization (PAHO) (2012). Health Care Expenditure and Financing in Latin America and the Caribbean [Fact sheet]. Available at: https://www.paho.org/hq/dmdocuments/2013/FactsheetHEFJan31.pdf

Pan American Health Organization (PAHO) (2008). *Health system profile: Ecuador monitoring and analysis of the change and reform processes.* Available at: http://new.paho.org/hq/dmdocuments/2010/Health_System_Profile-Ecuador_2008.pdf [Accessed: November 13 2018].

Pan American Health Organization (PAHO) (2007). Uruguay Country Profile, Health in the Americas. Available at: http://www1.paho.org/hq/dmdocuments/2010/Health_in_the_Americas_2007-Uruguay.pdf

PAMI (2018). ¿Qué hicimos en PAMI en 2018? Resumen de Gestión. Available at: https://www.pami.org.ar/pdf/memoria-pami-2018.pdf [Accessed September 23, 2019].

Paraje, G. (2016). The Effect of Price and Socio-Economic Level on the Consumption of Sugar-

Sweetened Beverages (SSB): The Case of Ecuador Aurora García-Gallego (ed.). *PLOS ONE*. 11 (3), e0152260. Available at: doi:10.1371/journal.pone.0152260 [Accessed: 14 September 2018].

Peruvian Ministry of Health et. al. (2014). *Acuerdo National: Los Objectivos de la Reforma de Salud.* Available at: http://acuerdonacional.pe/wp-content/uploads/2015/10/ACUERDO-NACIONAL-LOS-OBJETIVOS-DE-LA-REFORMA-DE-SALUD-FINAL.jpg [Accessed: November 15, 2018]

Post, C. (2017). *Peru's craft brewers face high barriers to compete with beer monopoly*. Available at: https://perureports.com/2017/01/26/perus-craft-brewers-want-different-tax-scheme-beer-monopoly/ [Accessed: 14 September 2018].

PWC (2018a). *Argentina - Other taxes impacting corporate entities*. Available at: http://taxsummaries.pwc.com/ID/Argentina-Corporate-Other-taxes [Accessed: 14 September 2018].

PWC (2018b). *Brazil Corporate- Other taxes. 2018.* Available at: http://taxsummaries.pwc.com/ID/Brazil-Corporate-Other-taxes[Accessed: November 21 2018]

PWC (2018c). *Panama - Other taxes impacting corporate entities*. Available at: http://taxsummaries.pwc.com/ID/Panama-Corporate-Other-taxes [Accessed: 14 September 2018].

Rechel, B., Doyle, Y., Grundy, E., McKee, M. (2009). How Can Health Respond to Population Ageing? Health Systems and Policy Analysis. Available at: http://www.who.int/ageing/health-systems/uhc-ageing/en/. [Accessed: 9 June 2018].

Republic of Ecuador (2017). Plan National de Desarrollo 2017 - 2021. Available at: http://www.planificacion.gob.ec/wp-content/uploads/downloads/2017/10/PNBV-26-OCT-FINAL_0K.compressed1.pdf [Accessed: November 19 2018].

Roberts, M., Hsiao, W., Reich, M. (2015). Disaggregating the Universal Coverage Cube: Putting Equity in the Picture. *Health Systems & Reform.* 1 (1), 22-27.

Selvanathan, E.A. & Selvanathan, S. (1994). The demand for transport and communication in the United Kingdom and Australia. *Elsevier*. 28 (1), 1–9.

Schneider, F., Williams, C. (2013). The Shadow Economy. *The Institute of Economic Affairs.* Available from: https://iea.org.uk/wp-content/uploads/2016/07/IEA%20Shadow%20Economy%20web%20rev%207.6.13.pdf [Accessed: October 1 2018].

Schmidt, C. A. J., & Lima, M. A. (2004). A demanda por energia elétrica no Brasil. Revista Brasileira de Economia, 58(1), 68-98. http://dx.doi.org/10.1590/S0034-71402004000100004.

Scottish Government (2009). Food Prices: An Overview of Current Evidence. Rural and Environment Analytical Services Rural and Environment Research and Analysis Directorate The Scottish Government. Available at:

https://www2.gov.scot/resource/doc/277278/0083249.pdf

Sourrouille, J. (1980) *Transnacionales en América Latina. El complejo automotor en Argentina*. México.

Sorenson, C., Drummond, M., Khan, B.B. (2013). *Medical Technology as a Key Driver of Rising Health Expenditure: Disentangling the Relationship.* ClinicoEconomic and Outcomes Research, 5, 223-234.

Staudinger, U.M., Finkelstein, R., Calvo, E., Sivaramakrishnan, K. (2016). *A Global View on the Effects of Work on Health in Later Life.* The Gerontologist, 56(2), pp. 281-292.

Sullivan, G.M., Artino, A.R. (2013). Analyzing and Interpreting Data from Likert-Type Scales. Journal of Graduate Medical Education, 5(4), pp.541-542.

Tandon A, Cashin C (2010). Assessing public expenditure on health from a fiscal space perspective. *Human Nutrition and Population, The World Bank,* February.

Tordrup, D., Angelis, A., Kanavos, P. (2013). *Preferences on Policy Options for Ensuring the Financial Sustainability of Healthcare Services in the Future: Results of a Stakeholder Survey.* Applied Health Economics and Policy, 11(6), pp.639-652.

Trading Economics (2018a). *Brazil Sales Tax Rate - VAT*. Available at: https://tradingeconomics.com/brazil/sales-tax-rate [Accessed: November 20 2018]

Trading Economics (2018b). *Credit Rating*. Available at: https://tradingeconomics.com/country-list/rating [Accessed: November 20 2018]

Trading Economics (2018c). *Country List Government Debt to GDP|Europe.* Available at: https://tradingeconomics.com/country-list/government-debt-to-gdp?continent=europe[Accessed: November 21 2018]

UNICEF (2002) The State of The World's Children 2003. Available at: https://www.unicef.org/publications/files/pub_sowc03_en.pdf (Accessed: 31 August 2018).

UNICEF (2016) The State of the World's Children 2016 statistical tables. Available at: https://data.unicef.org/resources/state-worlds-children-2016-statistical-tables/ (Accessed: 31 August 2018).

United States Trade Representative (2010). *Trade Summary*. Available at: https://ustr.gov/sites/default/files/2013 NTE Ecuador Final.pdf [Accessed: September 14 2018].

Werner, A. (2017). *Economic Recovery in Latin America and the Caribbean: A Tale of Two Adjustments*. Diálogo a fondo, IMF. Available at: https://www.imf.org/external/np/blog/dialogo/042117.pdf [Accessed: November 20 2018]

World Bank (2018a). *ASPIRE: The Atlas of Social Protection - Indicators of Resilience and Equity | Social Expenditure | The World Bank*. Available at: http://datatopics.worldbank.org/aspire/indicator/social-expenditure [Accessed:

September 14 2018].

World Bank (2018b). *Domestic general government health expenditure (% of GDP)*. Available at: https://data.worldbank.org/indicator/SH.XPD.GHED.GD.ZS?locations=AR-BR-CL-CO-CR-EC-MX-PA-PE-UY-FR-ES-GB [Accessed: 09 November 2018].

World Bank (2018c). *World Development Indicators*. Available at: http://databank.worldbank.org/data/source/world-development-indicators [Accessed: 14 September 2018].

World Bank (2018d). *Current health expenditure (% of GDP)*. Available at: https://data.worldbank.org/indicator/SH.XPD.CHEX.GD.ZS?end=2015&locations=AR-BR-CL-CO-CR-EC-MX-PA-PE-UY-FR-ES-GB&start=2005 [Accessed: 14 September 2018].

World Bank (2018e). *Health expenditure, out-of-pocket (% of GDP)*. Available at: http://databank.worldbank.org/data/source/world-development-indicators [Accessed: November 12 2018].

World Bank (2018f) Health expenditure, private (% of GDP). 2018. Available from: http://databank.worldbank.org/data/source/world-development-indicators [Accessed: 12 November 2018].

World Bank (2018g) Health expenditure, public (% of GDP). 2018. Available from: http://databank.worldbank.org/data/source/world-development-indicators [Accessed: 12 November 2018].

World Bank (2018h) Health expenditure, external (% of GDP). 2018. Available from: http://databank.worldbank.org/data/source/world-development-indicators [Accessed: 12 November 2018].

World Bank (2018i) GDP, PPP (constant 2011 international $). 2018. Available from: http://databank.worldbank.org/data/source/world-development-indicators [Accessed: 15 November 2018].

World Bank (2017a). *Military expenditure (% of GDP)*. Available at: https://data.worldbank.org/indicator/ms.mil.xpnd.gd.zs [Accessed: September 14 2018].

World Bank (2017b). *Peru Universal Health Coverage (P163255).* Available at: http://documents.worldbank.org/curated/en/938681507062142147/pdf/Concept-Project-Information-Document-Integrated-Safeguards-Data-Sheet-Peru-Universal-Health-Coverage-P163255-Sequence-No-00.pdf [Accessed: November 2 2018].

World Bank (2014). Health Financing Profile - Argentina [Internet]. Available from: http://documents.worldbank.org/curated/en/471621468250210761/pdf/893740BRI0P12300Box385278B00PUBLIC0.pdf [Accessed: 2018 Aug 15].

World Bank (2014a). Health Financing Profile - Brazil [Internet]. Available from: http://documents.worldbank.org/curated/en/638281468226148870/pdf/883440BRI0P1230l0final0January02014.pdf [Accessed: 2018 Aug 15].

World Bank (2014b). Health Financing Profile - Chile [Internet]. Available from:

http://documents.worldbank.org/curated/en/726041468238167664/pdf/883450BRI0P1230e0final0January02014.pdf [Accessed: 2018 Aug 15].

World Bank (2014c). Health Financing Profile - Colombia [Internet]. Available from: http://documents.worldbank.org/curated/en/202221468026099677/pdf/893770BRI0P1230LIC000Colombia0final.pdf [Accessed: 2018 Aug 15].

World Bank (2014d). Health Financing Profile - Mexico. Available from: http://documents.worldbank.org/curated/en/683351468049216494/pdf/893760BRI0P1230IC00HFP0Mexico0final.pdf [Accessed: 2018 Aug 15].

World Bank (2014e). Health Financing Profile - Peru [Internet]. Available from: http://documents.worldbank.org/curated/en/242851468099278957/pdf/883460BRI0P1230ru020140January02014.pdf [Accessed: 2018 Aug 15].

World Economic Forum (WEF) (2014). *How Brazil can make healthcare more efficient.* Available from: https://www.weforum.org/agenda/2014/11/how-brazil-can-make-healthcare-more-efficient/ [Accessed: November 2 2018].

World Health Organization (WHO) (2018a). *Key points about fiscal space for health*. WHO website (who.int). http://www.who.int/health_financing/topics/fiscal-space/key-points/en/ [Accessed: November 2 2018].

World Health Organization (WHO) (2018b). *What is 'fiscal space' and why does it matter?* WHO website (who.int). Available at: http://www.who.int/health_financing/topics/fiscal-space/why-it-matter/en/ [Accessed: November 2 2018].

World Health Organization (2018c). *Peru*. Global Health Workforce Alliance. Available at: http://www.who.int/workforcealliance/countries/per/en/ [Accessed: November 21 2018].

World Health Organization (2018d). Available at: *Main drivers of fiscal space for health*. http://www.who.int/health_financing/topics/fiscal-space/main-drivers/en/[Accessed: November 20 2018]

World Health Organization (2018e). *New WHO resources for policymakers*. Available at: http://www.who.int/health_financing/topics/fiscal-space/resources-for-policymakers/en/ [Accessed: November 20 2018]

World Health Organization (WHO) (2017). *WHO report on the global tobacco epidemic, 2017 - Uruguay*. Available from: http://www.who.int/tobacco/surveillance/policy/country_profile/ury.pdf [Accessed: September 14 2018].

World Health Organization (WHO) (2014). *Global status report on alcohol and health, 2014*. Available from: http://apps.who.int/iris/bitstream/handle/10665/112736/9789240692763_eng.pdf;jsessionid=393B555074EB814AD6264BEFE67F12C7?sequence=1 [Accessed: November 20 2018]

World Health Organization (WHO) (2013). *Hospital payment systems based on diagnosis-related groups: experiences in low-and middle-income countries.* Available at:

http://www.who.int/bulletin/volumes/91/10/12-115931/en/ [Accessed: November 2 2018].

World Health Organization (WHO) (2010). *Health Systems Financing: the path to universal coverage.* World Health Report. World Health Organization: Geneva.

World Health Organization (WHO) (2004). *Global Status Report - Uruguay*. Available at: http://www.who.int/substance_abuse/publications/policy_uruguay.pdf [Accessed: September 14 2018].

WHO & WB (2017). *Tracking Universal Health Coverage: 2017 Global Monitoring Report.* Available at: http://documents.worldbank.org/curated/en/640121513095868125/pdf/122029-WP-REVISED-PUBLIC.pdf [Accessed November 2 2018]

Wright, A. et al. (2017). Policy lessons from health taxes: a systematic review of empirical studies. BMC Public Health. BMC series 2017 17:583

APPENDICES

Appendix 1: Collected Indicators

Thematic area	Indicator
DEMOGRAPHICS AND DISEASE PREVALENCE	Population ('000s) under 18
	Inverse Old age dependency ratio (for every 1 older person there are x workers)
	Inverse Dependency ratio (for every 1 non-worker there are x workers)
	Population growth (year-on-year)
	Cause of death, by communicable diseases and maternal, prenatal and nutrition conditions (% of total)
	Cause of death, by non-communicable diseases (% of total)
	DALYs lost due to illness
HEALTHCARE SYSTEM VARIABLES	Health spend (% of GDP)
	Health spend per capita (PPP, 2011)
	Health spend per capita (Current US$)
	Public health spend (% total)
	Public health spend (% GDP)
	Private health spend (% total)
	Private health spend (% GDP)
	Out of pocket spend as % private spend
	Out of pocket spend as a % of total expenditure on health
	Drug spend (% of health spend) (Pharmaceutical sales)
	Government healthcare expenditure (Pharmaceuticals and other medical non-durable goods) (Million $)
	Drug spend per capita ($) (Pharmaceutical sales)
	Total private health insurance (PHI) coverage (% population)
	Curative and rehabilitative (% of current spend on health)
	Long term care (% of current spend on health)
	Preventive care (% of current spend on health)
	Number of doctors per 1000 population
	Number of nurses and midwives per 1000 population
	Number of hospital beds per 1000 population
	Number of Mammography units per million population
	Number of Radiotherapy units per million population
	Number of MRI Scanners per million population
	Number of CT scanners per million population
HEALTH INDICATORS	Life Expectancy Male
	Life Expectancy Female
	Healthy life expectancy Male (at birth)
	Healthy life expectancy Male (at 60)
	Healthy life expectancy Female (at birth)
	Healthy life expectancy Female (at 60)
	Mortality rate, infant (per 1,000 live births)

	Mortality rate, neonatal (per 1,000 live births)
	Maternal mortality (deaths/100,000 live births)
	Smoking prevalence (% adults) Male
MACROECONOMIC ENVIRONMENT AND POLICIES	Total GDP (PPP 2011)
	GDP per capita (constant 2010 US$)
	GDP per capita (PPP 2011)
	GDP growth (annual %)
	Direct tax revenue ($)
	Direct tax revenue (% of GDP)
	Indirect tax revenue ($)
	Indirect tax revenue (% of GDP)
	Corporate Income tax revenue ($)
	Personal income tax revenue ($)
	VAT/sales tax revenue ($)
	VAT revenue (million $)
	VAT level %
	Alcohol duty revenue ($)
	Beer duty (USD per litre per %ABV)
	Wine duty (USD) per litre
	Alcohol duty (USD) (per litre absolute alcohol)
	Sugar duty revenue ($ on l of soft drink depending on sugar content)
	Sugar Tax (price per litre drink, $)
	Tobacco duty revenue ($)
	Tax on Cigarettes (1000) ($)
	Tax on Cigars (1000) ($)
	Tax on Tobacco (1000g) ($)
	Salt duties
	Fuel Tax micro (levy per litre fuel) $)
	Fuel tax revenue (million $)
	Customs and import revenue ($)
	Tax revenue (% of GDP)
	Total tax revenue as % of GDP
	Pensions spend (as % of GDP)
	Education spend (% of GDP)
	Public Social Expenditure (% GDP)
	Military spend (% of GDP)
	Gross fixed capital formulation (as % GDP)
	Public Infrastructure (spend in million $)
	Fiscal balance (as % GDP)
	Debt servicing (% GNI)
	Central Government Debt (% GDP)
	Proportion of informal economy (% GDP)

Appendix 2: Protocol for Comprehensive Literature Review

Scope

The primary goal for the comprehensive literature review was to identify the effect of sin taxes on health outcomes in Latin American countries. Furthermore, the review aimed to understand if sin taxes contribute to the increase in revenue and the decrease in consumption of taxed products.

The geographic scope of the literature review covered the countries of interest: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Panama, Peru and Uruguay.

Endpoints

The primary endpoints were changes in revenue, consumption and health outcomes as a result of taxes on alcohol, sugar, salt, calorie dense foods and/or tobacco products.

When investigating health outcomes, there was no specific disease of interest given the consumption of tobacco, sugar, salt and alcohol are associated with a range of diseases. General health outcomes or specific disease topics were considered for inclusion (depending on other inclusion/exclusion criteria). There is also not a direct comparator for this study. However, studies may have identified the differences in health outcomes, consumption and revenue before and after the harmful product tax was introduced, which would provide further information on the effect of harmful product taxes on the outcomes of interest.

Search strategy

Peer-reviewed articles

The databases that were searched were PubMed, ProQuest, Web of Science, CINAHL, and EconLit. Systematic literature reviews, meta-analyses, presentation abstracts, dissertations, theses and book chapters were not considered for inclusion. Furthermore, evidence from countries and outcomes not of interest were excluded. The keyword strategy for the search is presented in Appendix Box 1.

Appendix Box 1: Search terms

Search in Title/Abstract or when not available in title only.

"Sin Tax" OR "Sugar Tax*" OR "Tobacco Tax*" OR "Alcohol Tax*" OR "Salt Tax*" OR "Sodium Tax*" OR "Excise Tax*" OR "Food Tax*" OR "Earmark* Tax*" OR "Cigarette Tax*" OR "Beer Tax*" OR "Wine Tax*" OR "Beverage Tax*" OR "Calorie Tax*" OR "Processed Food Tax*"*

AND

"Latin America" OR "South America" OR "Central America" OR "Argentina" OR "Belize" OR "Bolivia" OR "Brazil" OR "Brasil" OR "Chile" OR "Colombia" OR "Costa Rica" OR "Ecuador" OR "El Salvador" OR "French Guiana" OR "Guatemala" OR "Guyana" OR "Honduras" OR "México" OR "Mexico" OR "Nicaragua" OR "Panama" OR "Paraguay" OR "Peru" OR "Suriname" OR "Uruguay" OR "Venezuela"

Grey literature

Additional grey literature was hand-searched using Google Scholar and websites for the Organization for Economic Co-operation and Development (OECD), International Monetary Fund (IMF), World Bank, World Economic Forum (WEF), World Health Organization (WHO), and Pan-American Health Organization (PAHO) websites. The sources were reviewed in line with the keyword strategy used for the peer-reviewed articles (see Appendix Box 1).

Results

The search strategy was limited to publications in Spanish and English between 2007 and 2017, yielding 131 papers. Using these strategies, an additional 89 articles on harmful product (sin) taxes in ten Latin American countries were identified. Systematic literature reviews, meta-analyses, presentation abstracts, dissertations, theses and book chapters were not considered for inclusion. Furthermore, evidence from countries and outcomes not of interest were excluded. After excluding duplicates and applying exclusion criteria, 35 papers were included in the overall analysis.

Appendix 3: Modelling the Effect of Changes in VAT – Data and Assumptions

Scenarios and scenario calculations

In Scenarios 1 through 4 we examined the impact on VAT revenue of a one percentage point increase in the standard VAT rate, maintaining the non-standard VAT rate at its current rate. This is because it is less politically acceptable to change the non-standard, compared to the standard VAT rate. In Scenario 5 we modelled the impact on VAT revenue of increasing both the standard and non-standard VAT rates by one percentage point.

In all five scenarios, due to the unavailability of VAT revenue breakdown by standard and non-standard VAT rated goods/services and the requirement to understand the revenue apportionment by VAT rates, we first calculated the proportion of total VAT revenue attributable to the standard and non-standard VAT rated goods/services for each country. This was done by taking the publicly available total VAT revenue and multiplying it by the weighting allocated to each of the standard and non-standard VAT rates. These weightings represent how much the standard and non-standard rated goods/services each contribute to VAT revenue. For example, we allocated a receipt weighting of 99%/1% to standard/non-standard rated goods and services in scenario 1 (Table 1). Since each of the scenarios modelled different assumptions around how much the standard and non-standard rated goods/services contribute to total VAT revenue[11], we allocated different weightings (see receipt weightings in Table 1) to the standard and non-standard rates in each scenario. Where a country's non-standard VAT rate was 0%, such as in Ecuador, Chile, and Mexico, or where there is only one VAT rate like in Peru, we assumed 100% of VAT revenue comes from standard VAT rated goods/services, in all five scenarios.

Revenue is calculated by multiplying price by quantity demanded. Therefore, to calculate new revenue following the VAT changes, we needed to calculate the new price and quantity demanded and multiply them together. We assumed the VAT base[12] and tax rate were proxies for quantity demanded (Q_D) and price (P) respectively, given this information for an average basket of goods is publicly unavailable.

Second, we calculated the VAT base for the standard and non-standard rates separately. Since we assumed the VAT base and tax rate were proxies for Q_D and P, we could calculate VAT

[11] Scenario 5 uses the same assumption as in scenario 4 regarding the percentage of VAT revenue derived from standard and non-standard rated goods/services
[12] VAT base is the total VAT-taxable goods and services sales i.e. represents the goods and services sold (million, USD) to which the VAT rate is applied to calculate VAT revenue

base by taking the VAT revenue apportioned to each of the standard and non-standard rated goods/services from the first stage and dividing by their respective current VAT rates.

Third, we calculated the percentage change in VAT base by calculating the percentage change in the VAT rate multiplied by the price elasticity of demand, given our assumption that VAT base and tax rate represent Q_D and P, and $\%\Delta Q_D = \%\Delta P$ X PED. We included PED in our model, because it allowed us to calculate the fiscal yield of increasing VAT, and consider the effect of such VAT increases on consumption.

Fourth, we computed the new VAT base by multiplying the original VAT base before the VAT change, by 1+%ΔVAT base. For the fifth stage in scenarios 1 to 4, we calculated the new VAT revenue generated for standard rated goods/services (N.B. the non-standard VAT revenue generated remains unchanged from stage 1), by multiplying the new VAT base by the new standard rate. For the fifth stage in scenario 5, we calculated the new VAT revenue generated for each of the standard and non-standard rated goods/services separately, by multiplying the new VAT base by the new standard and non-standard rates respectively.

Fifth, we calculated the total VAT revenue generated following change/s in VAT rate/s, by adding together the standard and non-standard VAT revenue streams. In scenarios 1 to 4 this was calculated by adding together the new standard VAT revenue stream and the original non-standard VAT revenue stream, given only the standard rate was modified. In scenario 5, we added together both the new standard and non-standard VAT revenue streams since both rates were modified.

Finally, to calculate the revenue increase following the change/s in VAT rate/s, we deducted the original total VAT revenue from the new total VAT revenue calculated in the previous step.

We followed these five steps for each scenario. The only differences between the scenarios were the weightings applied to the standard and non-standard VAT rates, and the specific rates experiencing increases. In scenarios 1 to 4 only the standard rate was increased, whereas in scenario 5 both the standard and non-standard rates were increased. We simulated the model for each of the five scenarios three times, to incorporate different PEDs. We set PED equal to (1) 0; (2) the upper bound of -0.09 and -0.1 in the study, and comparator countries respectively; and (3) the upper bound of -0.58 and -0.74 in study, and comparator countries respectively. In (1) we assume zero impact of VAT rate increase on consumption (i.e. perfectly inelastic demand), and in (2) and (3) we accounted for the effect of demand elasticity on consumption.

Price elasticity of demand (PED)

The model included price elasticity of demand (PED) to account for (a) zero impact on consumption and (b) some impact on consumption resulting from the goods/services price increase due to increased VAT rates. We modelled (a) zero impact on consumption across the five scenarios by initially setting PED equal to 0 in our model. We then modelled (b) some impact on consumption across the five scenarios by setting PED equal to (1) the lower bound of our computed PED range for each country, and (2) the upper bound of our PED range for each country. We therefore modelled the five scenarios three times, each time including a different PED value for each country in our model.

In the absence of rigorous, validated research on the PED in the individual countries for an expansive basket of goods, we formed the PED ranges using the PEDs in studies dating from 1972-2016 which we identified in our literature review, and from further research. We did not include literature on the PEDs for harmful products, given these were used to formulate the PED in the harmful product modelling. The literature we used included studies on PEDs in a limited number of individual countries such as for Argentina, Brazil, Chile, Colombia, and Mexico. The literature also included studies on PEDs in regions such as the UK, Great Britain, European countries, Latin America, and cities in Central America and Venezuela. The literature for the UK, Great Britain and European countries included studies on PEDs for food products, private transport, public transport, and communications. The literature for Latin America included studies on PEDs for gasoline, dairy products, residential water, and electricity. Nonetheless, studies did not exist on an individual basis for all countries, and the few studies focusing on an individual country, examined the PED for specific goods such as cars, rather than a wide range of products.

We calculated a separate PED range for the three comparator countries, and the ten study countries. This is because we would expect the PED to differ across these country groupings, given their different economic statuses, and cultural differences. Within the two groupings, we assumed the countries had the same PED. We based the PED range for the three comparator countries on the PEDs we identified for Great Britain, UK, European countries, and high-income countries. In the absence of PEDs specific to the comparator countries, we would expect their PEDs to be comparable with these regions. Nevertheless, we excluded the PEDs for Great Britain, UK, European countries, and high-income countries when calculating the PED for the ten Latin American study countries. This is because we would expect their PED to differ significantly to the PEDs in these regions due to differences in income levels, culture, and taste. For example, the research identified more inelastic demand for basic food products in Latin America compared to European countries. The studies showed the PED of dairy products was -0.09 in Argentina, and -0.57 in European countries (Bouamra-Mechemache et al., 2008).

It is to be expected that basic food stuffs have an inelastic demand irrespective of country as they are a necessity, and furthermore, that the PED is more inelastic in low and upper middle income countries such as those in Latin America, compared to high income countries in Europe. This is because low and upper middle income countries may have a diet which relies more heavily on necessities such as dairy products, by their being fewer close substitutes to dairy products. The more substitutes for a product that exist in a market, the easier consumers find it to switch to these alternatives, and therefore the more elastic is that product's demand. For example, although dairy products may be considered a necessity in Europe, it is likely to have alternatives such as soy-, nut-, and coconut-based products. Therefore, when the price of dairy products increases, consumers in Europe may switch to such alternatives, resulting in more elastic demand for dairy products.

Based on the PEDs identified in our research, we computed a PED range of -0.1 to -0.74 to be used for the three comparator countries, and a separate PED range of -0.09 to -0.58 to be used for the ten study countries. Consequently, we set PED equal to (1) the lower bound of -0.1 and -0.09 in the comparator and study countries respectively, and (2) the upper bound of -0.74 and -0.58 in the comparator and study countries respectively.

Assumptions

Due to information limitations which meant certain data was unavailable, it was necessary to make a number of assumptions. The assumptions included:

VAT base can be a proxy for quantity demanded

VAT rate can be a proxy for price

A **one percentage point** increase in the standard VAT rate and no change in the non-standard VAT rate in scenarios 1 to 4

A **one percentage point** increase in the standard and the non-standard VAT rates in Scenario 5

If a country has more than one non-standard VAT rate, they are weighted equally and the non-standard rate used in the model was calculated as the average of these rates.

Demand is perfectly inelastic (PED is zero) when we initially modelled the 5 scenarios.

For some impact on consumption, PED can be modelled as -0.09 to -0.58 **in the study countries and -0.1** to **-0.74** in the comparator countries.

PED can model the impact on consumption of a percentage point increase in price[13].

PED, when modelling some impact on consumption, is constant.

PED is the same for all countries in a country grouping.

PED holds **across the range of goods & services consumed.**

Time allowed for price change is irrelevant, and we can therefore treat short run PED and long run PED the same.

VAT exempt goods/services before the rate increase remain exempt and do not experience a rate increase.

Randomly-assigned weightings which represent how much standard and non-standard rated goods/services contribute to VAT revenue.

Weightings assume most VAT revenue comes from standard rated goods/services.

Weightings assigned to standard and non-standard rated goods remain constant after rate increases.

Limitations

There are several limitations associated with our model. Most of these are due to data unavailability. First, we could not identify PED at a country level. However, we could mitigate this issue by utilising PEDs identified in our research to form a separate PED range for each of the country groupings. The same PED range was used for all the countries in a grouping[14].

Second, we did not have information on the quantity demanded nor price of an 'average' basket of VAT-taxable goods/services across the countries. Consequently, we assumed the VAT base and VAT rate, could be used as a proxy for quantity demanded, and price respectively. This is a significant limitation of our model, given VAT base is a closer representation of revenue from VAT-taxable goods/services pre-VAT, and VAT rate is a component of, rather than the entire price.

Third, we used PED to calculate the consumption impact of a percentage point increase in VAT rates. PED calculates the percentage change in quantity demanded for a 1%, not a one

[13] even though PED models the impact on quantity of a 1% increase in price

[14] PEDs identified in our research were used to form a separate PED range for each of the country groupings. The same PED range was used for all the countries in a grouping.

percentage point, change in price. Consequently, we made the limiting assumption that PEDs identified in the literature for a 1% change in price could be used to model up to a +40% change in price[15].

Fourth, we are making a very fundamental assumption that PED holds across the range of goods & services consumed, e.g. food stuffs, clothing etc. Given the demand response to changes in price differs across goods, and we are looking at the aggregate effect across many goods and services, our model is therefore likely to be flawed. We have mitigated this impact through using a range of PEDs across different goods, and by modelling both the lower and upper bounds of the PEDs identifies in studies.

Additionally, the VAT revenue breakdown by standard and non-standard VAT rated goods is not publicly available. This meant we had to assume the proportion that standard and non-standard goods/services contribute to VAT revenue, and assign the corresponding weightings in our model to standard and non-standard rates. The weightings were not underpinned by knowledge of the tax systems since this information is unavailable. Rather we used weightings which took on a range of values to allow for a variety of possible contributions by each rate to VAT revenue.

Sixth, since we did not have VAT revenue breakdown by rates, for countries with more than one non-standard VAT rate, it was necessary to assume that each non-standard rate contributed equally to non-standard VAT revenue. Based on this assumption, we calculated an average of these rates to input as a single non-standard VAT rate into the model.

Despite these limitations, the model efficiently utilises publicly available information, and when additional information is made available, it can be incorporated into the model, and assumptions can be relaxed. We used the most recently available VAT revenue for each country, and the design of the model allows for efficient update to the VAT revenue when more updated figures become available.

[15] The one percentage point increase in Colombia's non-standard VAT rate from 2.5% to 3.5%, is equivalent to a 40% increase in the VAT rate, which is the largest relative change in 'price' in our model.

Appendix 4: Modelling the Effect of Changes in Harmful Product Taxes – Data and Assumptions

In all scenarios, the additional revenue generated by increasing taxation by 5% points with a PED of 0 was calculated, respectively. Scenarios 2 increased taxation by 5 percentage points, but had country-specific PEDs. OECD alcohol revenue data for the most current year available was used, however it did not differentiate the revenue earned from taxation on different alcohol and tobacco products. Therefore, consumption data was collected to ensure properly weighted tax revenues (Table 19). The alcohol and tobacco tax revenues were then multiplied by the respective consumption data for each country to obtain the weighted revenues for beer, wine, spirits, cigarettes, cigars and loose tobacco. Countries such as Argentina, Uruguay, Peru and Spain do not have a tax on wine, whereas Peru does not have a tax on spirits. To calculate the change in tax revenue with a 5 percentage point increase in these countries, the harmful product tax base for beer and spirits was summed (in the case of Peru, only the tax base for beer was used), then multiplied by the per capita consumption of wine (and spirits, separately, in Peru).

Table 19: Consumption of differentiated alcohol and tobacco products

	Per capita consumption of beer	Per capita consumption of wine	Per capita consumption of spirits	Percent consumption of cigarettes	Percent consumption of cigars	Percent consumption of loose tobacco
ARGENTINA	41%	48%	5%	78%	2%	20%
BRAZIL	60%	4%	36%	78%	2%	20%
CHILE	30%	41%	29%	78%	2%	20%
COLOMBIA	66%	1%	33%	78%	2%	20%
COSTA RICA	59%	5%	36%	78%	2%	20%
ECUADOR	67%	1%	32%	78%	2%	20%
MEXICO	76%	1%	22%	78%	2%	20%
PANAMA	69%	5%	26%	78%	2%	20%
PERU	47%	6%	47%	78%	2%	20%
URUGUAY	31%	60%	9%	78%	2%	20%
FRANCE	19%	59%	23%	78%	2%	20%
SPAIN	48%	22%	29%	78%	2%	20%
UK	37%	41%	22%	78%	2%	20%

***Sources**: Alcohol: World Health Organization, 2014; Cigarettes: Laugesen et al., 2009*

The percentage change in harmful product tax base was then calculated:

((Increased harmful product tax – current harmful product tax) / current harmful product tax) * PED)

With this calculation, the new product-specific harmful product tax base was calculated by multiplying the previous harmful product tax base by 1 + the percent change in harmful product tax base. The new beer harmful product tax base was then multiplied by the new harmful product tax, resulting in the new revenue raised for each harmful product tax, with a 5 percentage point increase in harmful product tax. Finally, the increase in revenue for each individual harmful product tax (i.e. beer, cigarettes, etc.) and each category of harmful product tax was calculated by subtracting the original total harmful product tax revenue from the new harmful product tax revenue.

Limitations and Assumptions

All data used in the model was searched for extensively through a literature review; however, due to a lack of available data, many assumptions were used. Below outlines the assumptions and limitations with the model not already addressed above.

Assumptions for Harmful Product Tax Modelling

Where no excise tax was available in the literature, the tax was assumed to be 0%. Furthermore, Revenue data for alcohol products were not available for Brazil, Chile, Mexico and Peru. Therefore, based on the country's population size and GDP, the revenue was assumed to be similar to another country of interest. Brazil, Chile, Mexico and Peru's revenue data was from Uruguay. However, to account for the difference in population across the countries, the ratio of the total population was taken and multiplied by the revenue (i.e. (Brazil population / Uruguay population)* Uruguay harmful product tax revenue). Five percentage point increases in excise tax were chosen to be modelled for the harmful products because it represents increases in taxation which could theoretically be considered plausible since it is well within the range of taxation fluctuation between the study countries.

Furthermore, Brazil, Ecuador, Colombia, Peru, Uruguay and the UK did not have cigar tax available, whilst Colombia, Costa Rica, Ecuador and Peru did not have loose tobacco tax available. In these cases, it was assumed that the cigar or loose tobacco tax was the same as the cigarette tax. Brazil's tobacco revenue only included the revenue from cigarettes, therefore, the cigarette revenue was multiplied by the cigar and loose tobacco consumption rates, respectively. The sum of these values were then used as the total revenue due to tobacco.

The PED data from the literature was lacking for many of the study countries, so the following assumptions were made. Firstly, all study countries used the UK PED data for beer, wine and spirits. Secondly, high income countries utilised PED data from Chile; and the middle- to low-income countries utilised PED Data from Ecuador. Finally, whilst the study countries, with exceptions each had their own tobacco PED data, France and Spain used UK data. The exceptions being Panama, which utilised the same PED as Uruguay, and Costa Rica using Brazil's PED data. This study also assumed that the majority of beer, wine and spirits contained 4.5%, 13%, and 40% alcohol.

Limitations for harmful product tax modelling

The primary limitation is that the current excise taxes on harmful product were found from a multitude of sources, resulting in a lack of cohesive data and large assumptions regarding the similarity in PED and revenue and tax data for countries with missing information. Furthermore, the assumptions made regarding countries having a revenue or PED similar to other countries with available data, limits the accuracy of the model considering consumption data and the taxes in country may vary. Also, the fact that countries such as Chile, Mexico and Peru have sugar taxes, but the revenue data is not available, limits the understanding of the impact of sugar taxes on revenue. Another limitation is that UK PED had to be utilised for all alcohol products, despite GDP and income-levels across countries are significantly different. This is also the case for the consumption of cigarettes, cigars and loose tobacco. The PED for tobacco products accounted primarily for cigarettes, which does not give an accurate estimation of the effect of increasing cigar and loose tobacco taxes.

Appendix 5: Demographic and Health Indicators

Table 20: Demographic and Health Indicators

		Population under 18 ('000s) [1,5]	Population, total[2]	Inverse Old Age Dependency Ratio[2]	Inverse Dependency Ratio[2]	Population Growth[2]	Proportion of Deaths Caused by communicable diseases and maternal, prenatal and nutrition conditions[2]	Proportion of Deaths Caused by Non-Communicable Diseases[2]	DALYs Lost due to Illness[4]	Life Expectancy Male (at birth)[2]	Life Expectancy Female (at birth)[2]
ARGENTINA	**2000**	12,278	37,057,452	6.27	1.64	1.11	12.2	80.8	10,025	70.15	77.54
	2015	13,005.76	43,417,765	5.85	1.77	1.01	15.5	78.8	10,687	72.59	80.18
BRAZIL	**2000**	59,214	175,287,587	12.8	1.84	1.45	17.4	70.3	50,343	66.25	73.97
	2015	58,432.68	205,962,108	8.73	2.28	0.85	13.8	74	51,397	71.64	78.93
CHILE	**2000**	5,134	15,262,754	8.75	1.89	1.22	10.8	79.3	3,148	73.71	79.72
	2015	4,397.65	17,762,681	6.6	2.2	0.84	7.5	85	3,933	76.71	81.74
COLOMBIA	**2000**	16,407	40,403,958	13.44	1.76	1.46	12.9	61.7	8,786	67.34	74.82
	2015	14,143.97	48,228,697	9.76	2.19	0.91	10.3	74.1	10,648	70.66	77.82
COSTA RICA	**2000**	1,562	3,925,443	11.15	1.74	1.97	8.8	78.9	705	75.13	79.83
	2015	1,307.54	4,807,852	7.73	2.2	1.05	6.5	83.1	935	77.23	82.11
ECUADOR	**2000**	5,108	12,628,596	12.07	1.52	1.84	20.9	63.6	3,228	69.97	76.07
	2015	5,587.75	16,144,368	9.59	1.8	1.51	14.7	72.5	3,492	73.4	78.9
MEXICO	**2000**	38,933	101,719,673	12.04	1.54	1.4	17.7	70.6	22,346	71.95	76.77
	2015	42,245.07	125,890,949	10.19	1.95	1.33	9.7	79.7	26,853	74.52	79.37

PANAMA	**2000**	1,062	3,030,347	11.32	1.67	1.97	19.5	69	670	72.64	77.69
	2015	1,274.94	3,969,249	8.55	1.82	1.66	14.9	75.3	843	74.86	80.93
PERU	**2000**	10,219	25,914,879	12.44	1.55	1.37	31.5	58.7	7,229	67.97	73.18
	2015	10,417.09	31,376,671	9.56	1.88	1.29	20.7	68.8	6,981	72.13	77.43
URUGUAY	**2000**	983	3,321,245	4.76	1.66	0.36	7.4	85.9	948	71.07	78.49
	2015	888.64	3,431,552	4.44	1.79	0.35	7.2	85.5	926	73.68	80.76
FRANCE	**2000**	13,414	60,912,500	4.07	1.87	0.68	6.4	85.4	14,759	75.3	83
	2015	14,211.20	66,593,366	3.32	1.69	0.42	6	87.5	15,155	79.2	86
SPAIN	**2000**	7,186	40,567,864	4.1	2.18	0.45	4.7	90.8	10,350	75.6	82.5
	2015	8,119.44	46,444,832	3.51	1.96	-0.08	5.2	91.4	11,158	80.1	85.7
UK	**2000**	13,467	58,892,514	4.09	1.86	0.36	11.8	85	16,965	75.4	80.2
	2015	13,715.01	65,128,861	3.55	1.8	0.79	8	88.6	16,746	79.2	82.8

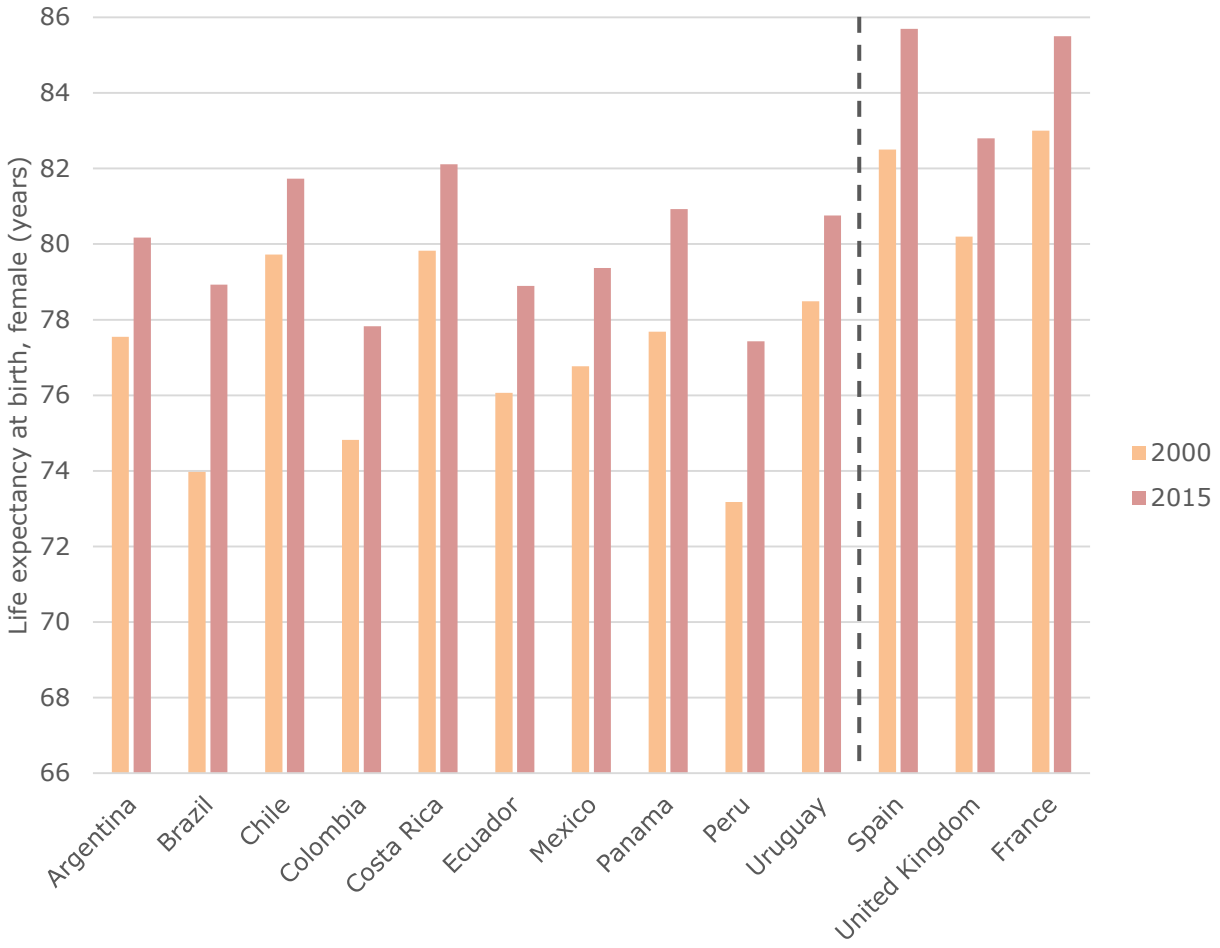
		Healthy life expectancy Male (at birth)[3]	**Healthy life expectancy Male (at 60) [3]**	**Healthy life expectancy Female (at birth) [3]**	**Healthy life expectancy Female (at 60) [3]**	**Infant Mortality rate (per 1,000 live births) [2]**	**Neonatal Mortality rate (per 1,000 live births) [2]**	**Maternal mortality rate (deaths/100,000 live births) [2]**	**Smoking Prevalence (% adults) Male [2]**	**Smoking Prevalence (% adults) Female [2]**
ARGENTINA	**2000**	63	13.9	68.4	17.7	17.3	11.2	60	45.3	37.8
	2015	65.7	15.2	70.5	19	10.3	6.6	52	28.4	17
BRAZIL	**2000**	58.8	12.9	64.2	15.4	31.3	17.1	66	30.6	20.1
	2015	63.1	15.1	68.4	17.7	14	8.2	44	18.4	10.5
CHILE	**2000**	65.5	14.8	69.9	18.1	9.2	5.7	31	59.3	54
	2015	67.7	16.3	71.4	19.2	7.3	5.4	22	42.5	35.1
COLOMBIA	**2000**	60.2	14.1	66.8	16.2	21.2	13.7	97	27.4	13.1
	2015	64.1	15.6	69.6	18.1	13.6	8.7	64	14.2	5
	2000	67.2	16.2	70.8	18.5	11.1	7.6	38	26.5	9.5

COSTA RICA	**2015**	68.9	17.9	72.5	19.9	7.9	6	25	17.7	6.5
ECUADOR	**2000**	62.2	15.7	66.6	17.5	28.4	17.2	103	22.1	5.7
	2015	65.8	16.8	69.5	18.6	18.3	11.5	64	12.7	2.1
MEXICO	**2000**	63.6	15.2	67.6	17.1	22.5	12.9	77	35.8	12.7
	2015	65.5	16	69.4	17.8	12.9	7.8	38	22.1	7.1
PANAMA	**2000**	65.4	16.5	69.7	18.8	21.9	15.2	82	25	5
	2015	67.1	17.5	71.6	19.9	14.5	9.9	94	10.5	2.5
PERU	**2000**	61.7	14.5	64.9	16.1	29.5	16	140	..	12.1
	2015	65.5	15.8	68.9	17.9	12.4	7.8	68	..	5
URUGUAY	**2000**	63.8	14	69.5	18.2	14.8	8.4	31	59.9	46.2
	2015	65.6	15.2	70.9	19.3	8	5.1	15	21.4	15.1
FRANCE	**2000**	68	16.5	72.6	20.1	4.4	2.7	12	39.8	30.3
	2015	71.6	18.9	74.8	21.8	3.2	2.4	8	35.8	30
SPAIN	**2000**	68.3	16.4	72.9	19.7	4.3	2.8	5	47.3	32.1
	2015	71.9	18.4	75.2	21.6	2.8	2.1	5	32	27.5
UK	**2000**	67.4	15.6	70.4	18.1	5.5	3.8	12	38.9	37.5
	2015	70.7	18.1	72.7	19.9	3.7	2.7	9	25.6	20.7

Notes: *N.B. Proportion of deaths caused by communicable diseases and maternal, prenatal and nutrition conditions (% of total), and proportion of diseases caused by non-communicable diseases do not sum to 100 because they exclude the proportion of deaths caused by injury (% of total).*

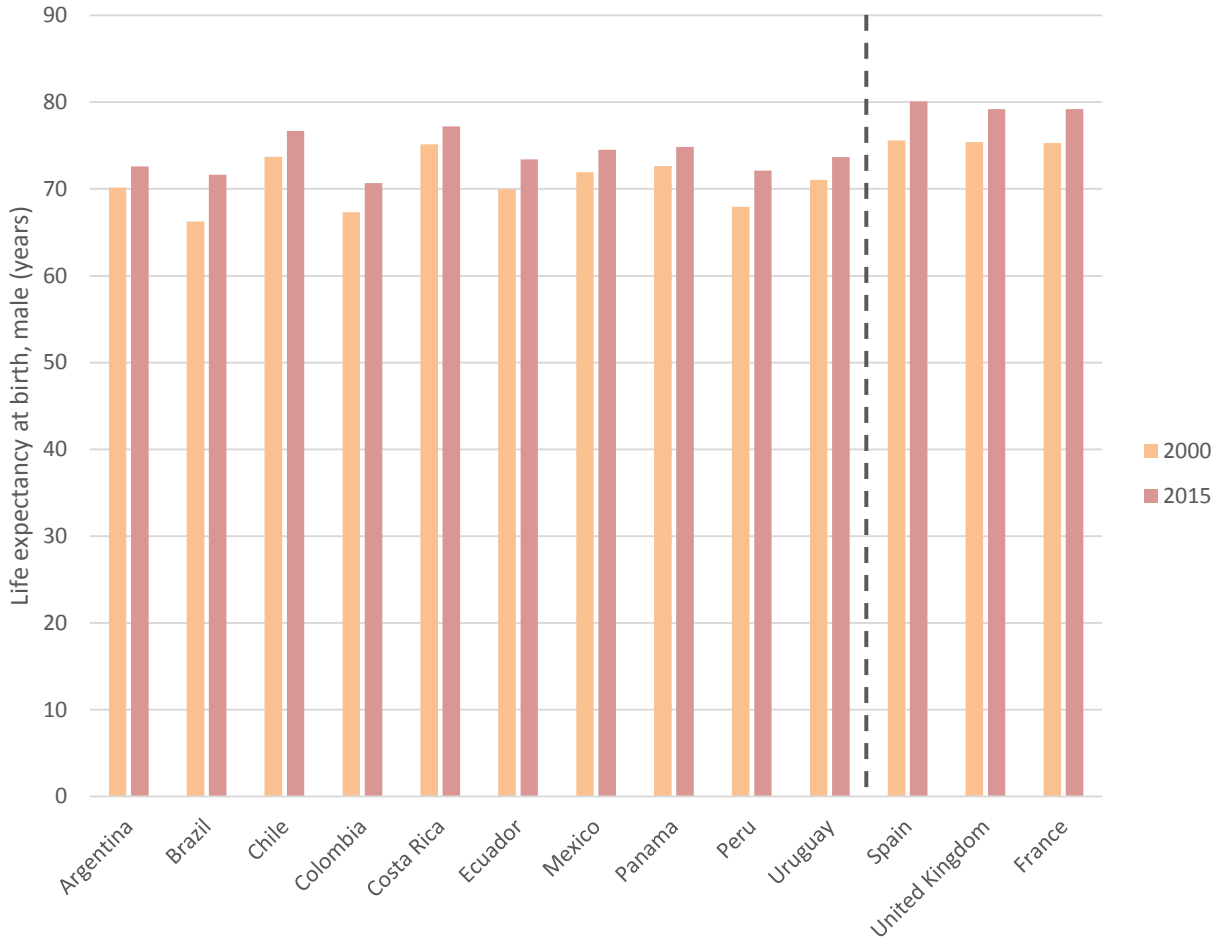
Sources*: [1] UNICEF (2002), [2] World Bank (2018c), [3] World Health Organization (2018c), [4] World Health Organization (2018d), [5] UNICEF (2016).*

Figure 37: Life expectancy at birth, female (years)



***Source**: World Bank, 2018c*

Figure 38: Life expectancy at birth, male (years)



***Source**: World Bank, 2018c*

Appendix 6: Price Elasticity of Demand used for VAT modelling

Table 21: VAT PED (supporting evidence for study countries)

Source	Good	Elasticity	Country/Region
GALINDO ET AL., 2015	Gasoline	Long-run PED: -0.31 Short-run PED: -0.17	Latin America
HUANG ET AL., 2015	Dairy products	-0.09	Argentina
ALMENDAREZ-HERNÁNDEZ, 2013	Residential water	-0.22 to -0.58	Mexico
SCHMIDT AND LIMA, 2004	Electricity	LR PED for: residential sector=-0.15 industrial sector=-0.13	Brazil
CHANG AND MARTINEZ-CHOMBO, 2003		LR PED for: residential sector=-0.44 industrial sector=-0.25	Mexico
BENAVENTE ET AL., 2005		SR PED for: residential consumers=-0.33 commercial consumers=-0.19 LR PED for: residential consumers=-0.41 commercial consumers=-0.21	Chile
MADDOCK, CASTANO AND VELLA, 1992		SR PED for residential consumers: -0.17 to -0.47	Colombia
JENKINS, 1977 ; SOURROUILLE, 1980	Cars	-0.3 to -0.5	Argentina
BAUMGARTEN, 1972		-0.1 to -0.5	Brazil

Table 22: VAT PED (supporting evidence for comparator countries)

Source	Good	Elasticity	Country/Region
BOUAMRA-MECHEMACHE ET AL., 2008	All dairy	-0.57	EU countries
	Milk	-0.53	
	Fresh dairy products	-0.74	
	Butter	-0.47	
	Cheese	-0.60	
	Other dairy products	-0.18	
MINISTRY OF AGRICULTURE FISHERIES AND FOOD, OFFICE FOR NATIONAL STATISTICS, 2004 **SCOTTISH GOVERNMENT (2009)**	Milk and cream	-0.36	Great Britain
	Cheese	-0.35	
	Carcase meat	-0.69	
	Eggs	-0.28	
	Potatoes	-0.12	
	Fresh green vegetables	-0.66	
	Fruit	-0.29	
	Bread	-0.40	
GREEN ET AL., 2013	All food groups combined	-0.56	High income countries
SELVANATHAN AND SELVANATHAN, 1994	Private transport	-0.5	UK
	Public transport	-0.4	
	Communications	-0.1	

Appendix 7: VAT Modelling Results

Table 23: VAT Modelling (PED=0)

	Current VAT receipts (million, USD)	PED	Scenario 1		Scenario 2		Scenario 3		Scenario 4		Scenario 5	
			Revenue raised from VAT (million, USD), calculated using new VAT rate	*Increase in revenue due to new VAT rate (million, USD)*	*Revenue raised from VAT (million, USD), calculated using new VAT rate*	*Increase in revenue due to new VAT rate (million, USD)*	*Revenue raised from VAT (million, USD), calculated using new VAT rate*	*Increase in revenue due to new VAT rate (million, USD)*	*Revenue raised from VAT (million, USD), calculated using new VAT rate*	*Increase in revenue due to new VAT rate (million, USD)*	*Revenue raised from VAT (million, USD), calculated using new VAT rate*	*Increase in revenue due to new VAT rate (million, USD)*
ARGENTINA	36,789	0	38,523	1,734	38,190	1,401	38,103	1,314	37,840	1,051	38,625	1,836
BRAZIL	202,709	0	214,514	11,805	212,248	9,539	211,652	8,943	209,863	7,154	214,246	11,537
CHILE	20,789	0	21,883	1,094	21,883	1,094	21,883	1,094	21,883	1,094	21,883	1,094
COLOMBIA	13,950	0	14,677	727	14,537	587	14,501	551	14,391	441	16,623	2,673
COSTA RICA	2,499	0	2,689	190	2,653	154	2,643	144	2,614	115	2,814	315
ECUADOR	6,352	0	6,806	454	6,806	454	6,806	454	6,806	454	6,806	454
MEXICO	42,419	0	45,070	2,651	45,070	2,651	45,070	2,651	45,070	2,651	45,070	2,651
PANAMA	1,516	0	1,730	214	1,689	173	1,678	162	1,646	130	1,694	178
PERU	11,764	0	12,418	654	12,418	654	12,418	654	12,418	654	12,418	654
URUGUAY	4,159	0	4,346	187	4,310	151	4,301	142	4,272	113	4,605	446
FRANCE	171,603	0	180,097	8,494	178,467	6,864	178,038	6,435	176,751	5,148	194,657	23,054
SPAIN	79,239	0	82,975	3,736	82,258	3,019	82,069	2,830	81,503	2,264	88,295	9,056
UK	166,171	0	174,396	8,225	172,818	6,647	172,402	6,231	171,156	4,985	197,743	31,572

Table 24: VAT Modelling (PED=lower bound)

	Current VAT receipts (million USD)	PED	Scenario 1		Scenario 2		Scenario 3		Scenario 4		Scenario 5	
			Revenue raised from VAT (million, USD), calculated using new VAT rate	*Increase in revenue due to new VAT rate (million, USD)*	*Revenue raised from VAT (million, USD), calculated using new VAT rate*	*Increase in revenue due to new VAT rate (million, USD)*	*Revenue raised from VAT (million, USD), calculated using new VAT rate*	*Increase in revenue due to new VAT rate (million, USD)*	*Revenue raised from VAT (million, USD), calculated using new VAT rate*	*Increase in revenue due to new VAT rate (million, USD)*	*Revenue raised from VAT (million, USD), calculated using new VAT rate*	*Increase in revenue due to new VAT rate (million, USD)*
ARGENTINA	36,789	-0.09	38,360	1,571	38,058	1,269	37,979	1,190	37,741	952	38,451	1,662
BRAZIL	202,709	-0.09	213,389	10,680	211,339	8,630	210,800	8,091	209,182	6,473	213,149	10,440
CHILE	20,789	-0.09	21,780	991	21,780	991	21,780	991	21,780	991	21,780	991
COLOMBIA	13,950	-0.09	14,608	658	14,482	532	14,448	498	14,349	399	16,300	2,350
COSTA RICA	2,499	-0.09	2,671	172	2,638	139	2,629	130	2,603	104	2,781	282
ECUADOR	6,352	-0.09	6,762	410	6,762	410	6,762	410	6,762	410	6,762	410
MEXICO	42,419	-0.09	44,817	2,398	44,817	2,398	44,817	2,398	44,817	2,398	44,817	2,398
PANAMA	1,516	-0.09	1,708	192	1,671	155	1,662	146	1,633	117	1,676	160
PERU	11,764	-0.09	12,355	591	12,355	591	12,355	591	12,355	591	12,355	591
URUGUAY	4,159	-0.09	4,329	170	4,296	137	4,287	128	4,262	103	4,559	400
FRANCE	171,603	-0.1	179,205	7,602	177,746	6,143	177,362	5,759	176,211	4,608	191,859	20,256
SPAIN	79,239	-0.1	82,583	3,344	81,941	2,702	81,772	2,533	81,266	2,027	87,233	7,994
UK	166,171	-0.1	173,533	7,362	172,120	5,949	171,748	5,577	170,633	4,462	193,498	27,327

Table 25: VAT Modelling (PED=upper bound)

	Current VAT receipts (million USD)	PED	Scenario 1		Scenario 2		Scenario 3		Scenario 4		Scenario 5	
			Revenue raised from VAT (million, USD), calculated using new VAT rate	*Increase in revenue due to new VAT rate (million, USD)*	*Revenue raised from VAT (million, USD), calculated using new VAT rate*	*Increase in revenue due to new VAT rate (million, USD)*	*Revenue raised from VAT (million, USD), calculated using new VAT rate*	*Increase in revenue due to new VAT rate (million, USD)*	*Revenue raised from VAT (million, USD), calculated using new VAT rate*	*Increase in revenue due to new VAT rate (million, USD)*	*Revenue raised from VAT (million, USD), calculated using new VAT rate*	*Increase in revenue due to new VAT rate (million, USD)*
ARGENTINA	36,789	-0.58	37,470	681	37,339	550	37,305	516	37,201	412	37,507	718
BRAZIL	202,709	-0.58	207,264	4,555	206,390	3,681	206,160	3,451	205,470	2,761	207,173	4,464
CHILE	20,789	-0.58	21,215	426	21,215	426	21,215	426	21,215	426	21,215	426
COLOMBIA	13,950	-0.58	14,233	283	14,179	229	14,164	214	14,122	172	14,541	591
COSTA RICA	2,499	-0.58	2,570	71	2,557	58	2,553	54	2,542	43	2,603	104
ECUADOR	6,352	-0.58	6,524	172	6,524	172	6,524	172	6,524	172	6,524	172
MEXICO	42,419	-0.58	43,436	1,017	43,436	1,017	43,436	1,017	43,436	1,017	43,436	1,017
PANAMA	1,516	-0.58	1,588	72	1,574	58	1,571	55	1,560	44	1,578	62
PERU	11,764	-0.58	12,017	253	12,017	253	12,017	253	12,017	253	12,017	253
URUGUAY	4,159	-0.58	4,233	74	4,219	60	4,215	56	4,204	45	4,305	146
FRANCE	171,603	-0.74	173,497	1,894	173,134	1,531	173,038	1,435	172,751	1,148	173,950	2,347
SPAIN	79,239	-0.74	80,079	840	79,917	678	79,875	636	79,748	509	80,437	1,198
UK	166,171	-0.74	168,005	1,834	167,653	1,482	167,561	1,390	167,283	1,112	166,326	155

Note: *Where revenue raised and increase is the same across all scenarios, that's because there is either one rate, or the non-standard rate is equal to zero. Either way in these situations the standard rate is given a 100% weighting.*

Appendix 8: Harmful Product Tax Modelling Results

See following page.

Table 26: Scenario 1 with 5 percentage point increase in harmful product taxes and PED = 0

	Increase in revenue due to beer tax increase	Increase in revenue due to wine tax increase	Increase in revenue due to spirits tax increase	Total increase in revenue from 5 percentage point increase in alcohol excise tax	Increase in revenue due to cigarette tax increase	Increase in revenue due to cigar tax increase	Increase in revenue due to loose tobacco tax increase	Total increase in revenue from 5 percentage point increase in tobacco excise tax
	USD, million	*USD, million*	*USD, million*	*USD, million*	*USD, million*	*USD, million*	*USD, million*	*USD, million*
ARGENTINA	31.93	16.22	1.86	50.01	159.25	11.43	142.92	313.60
BRAZIL	864.64	41.17	518.78	1424.59	180.78	3.62	66.68	251.08
CHILE	3.70	3.53	1.99	9.23	193.77	2.83	24.97	221.57
COLOMBIA	278.56	1.88	63.67	344.10	29.59	0.76	7.59	37.93
COSTA RICA	23.50	1.81	14.34	39.65	2.33	0.06	0.60	2.99
ECUADOR	34.10	0.15	4.89	39.13	10.02	0.26	2.57	12.85
MEXICO	507.68	6.44	73.48	552.19	460.16	6.71	67.14	534.02
PANAMA	20.36	1.48	7.67	29.50	1.04	0.03	0.27	1.33
PERU	147.00	8.82	69.09	224.91	12.47	0.25	2.49	26.73
URUGUAY	50.94	31.27	1.17	83.38	17.61	0.45	6.50	24.56
FRANCE	472.26	848.84	153.11	1523.12	1026.82	49.72	300.56	1377.10
SPAIN	494.05	137.32	130.16	761.53	606.60	50.21	191.15	847.96
UK	897.69	523.62	281.56	1702.87	2898.56	74.32	181.27	3154.16

***Source**: Authors' calculations using tax revenue data (Organization for Economic Co-Operation and Development, 2018), consumption per capita (*Table 19*) and current tax rates (*Table 13*) data*

Table 27: Scenario 2 with 5 percentage point increase in harmful product taxes with PED

	Increase in revenue due to beer tax increase	Increase in revenue due to wine tax increase	Increase in revenue due to spirits tax increase	Total increase in revenue from 5 percentage point increase in alcohol excise tax	Increase in revenue due to cigarette tax increase	Increase in revenue due to cigar tax increase	Increase in revenue due to loose tobacco tax increase	Total increase in revenue from 5 percentage point increase in tobacco excise tax
	USD, million	*USD, million*	*USD, million*	*USD, million*	*USD, million*	*USD, million*	*USD, million*	*USD, million*
ARGENTINA	18.46	16.22	0.64	35.32	133.66	9.38	116.12	259.15
BRAZIL	551.21	18.85	168.60	738.66	126.55	2.53	44.99	174.06
CHILE	2.27	1.53	0.72	4.52	144.04	2.15	19.01	165.20
COLOMBIA	172.53	0.89	24.38	197.80	2.02	0.05	0.52	2.59
COSTA RICA	13.28	0.60	2.72	16.60	1.67	0.05	0.43	2.14
ECUADOR	22.01	0.08	2.07	24.16	0.59	0.02	0.15	0.76
MEXICO	332.67	2.94	30.06	330.27	377.12	5.62	56.20	438.93
PANAMA	11.50	0.46	1.46	13.42	0.67	0.02	0.17	0.85
PERU	97.27	8.82	69.09	175.18	1.66	0.03	0.33	13.55
URUGUAY	21.39	31.27	0.49	53.15	10.99	0.28	3.95	15.23
FRANCE	265.71	343.53	59.18	717.34	395.20	16.70	113.34	525.24
SPAIN	273.24	137.32	43.29	453.86	233.60	13.19	71.21	318.00
UK	594.29	261.78	116.25	972.32	783.49	20.09	72.26	875.84

***Source**: Authors' calculations using tax revenue data (Organization for Economic Co-Operation and Development, 2018), consumption per capita (*Table 19*) and current tax rates (*Table 13*) data*