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**Attaining Selected Sustainable Development Goals in
Guatemala: Spending, Provision, and Financing Needs**

by Esther Perez Ruiz and Mauricio Soto

I N T E R N A T I O N A L M O N E T A R Y F U N D

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Attaining Selected Sustainable Development Goals in Guatemala: Spending, Provision, and Financing Needs

Prepared by Esther Perez Ruiz (WHD) and Mauricio Soto (FAD)

Authorized for distribution by Trevor S. Alleyne

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Abstract

Raising living standards continues to be the main challenge facing Guatemala, as a matter of economic success and social cohesion. This paper discusses the spending, financing, and delivery capacity aspects of a development strategy for Guatemala couched within the United Nations Sustainable Development Goals (SDGs) agenda. Overall, Guatemala faces additional spending of about 8½ percent of GDP in 2030 to attain health, education, and roads, water, and sanitation infrastructure SDGs. While substantial, these cost estimates are commensurate with a financing strategy encompassing continuing tax administration efforts, broad-based tax reform, scaled-up private sector participation, and greater spending efficiency. Improving delivery capacities is also essential to secure access of those public goods to all Guatemalans, irrespective of their place of residence, ethnic group, or ability to pay.

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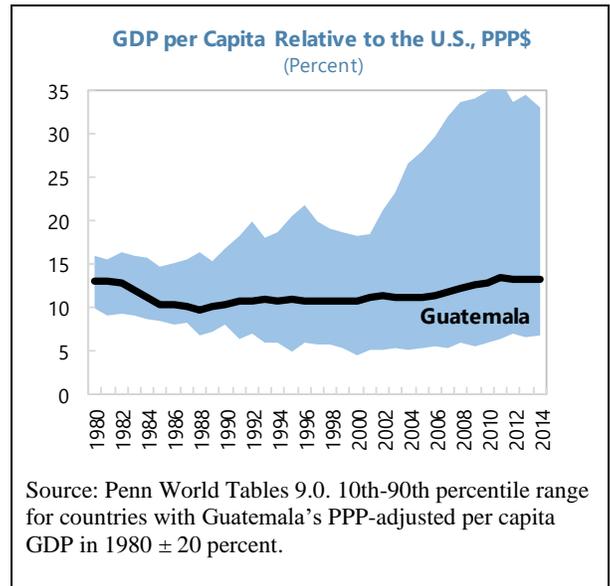
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Author's E-Mail Address: eperezruiz@imf.org; msoto@imf.org

Contents	Page
I. Introduction	4
II. Progress Towards Sustainable Development	6
III. Spending Needs of Achieving Key SDGs	8
IV. Enhancing Delivery Capacities.....	13
V. Financing Strategy	26
VI. Conclusion.....	29
Appendixes	
I. Costing Methodology	31
II. Financing Strategy: Tax Reform Options	32
References.....	33

I. INTRODUCTION¹

1. Raising Guatemalans' living standards is key to capitalizing on the demographic dividend expected to occur over the next two decades. Raising living standards continues to be *the* main challenge facing Guatemala, as a matter of economic success and social cohesion. Most of the countries with similar income per capita in 1980 currently outperform Guatemala. Over the past decade, income per capita has grown at an average rate of 1.2 percent per year, which remains inadequate to meaningfully reduce Guatemala's high levels of poverty. Current levels of social spending fall short of the targets that were enshrined in the 1996 Peace Accords that ended the prolonged Civil War,² impairing the government's ability to fulfill its basic public functions.



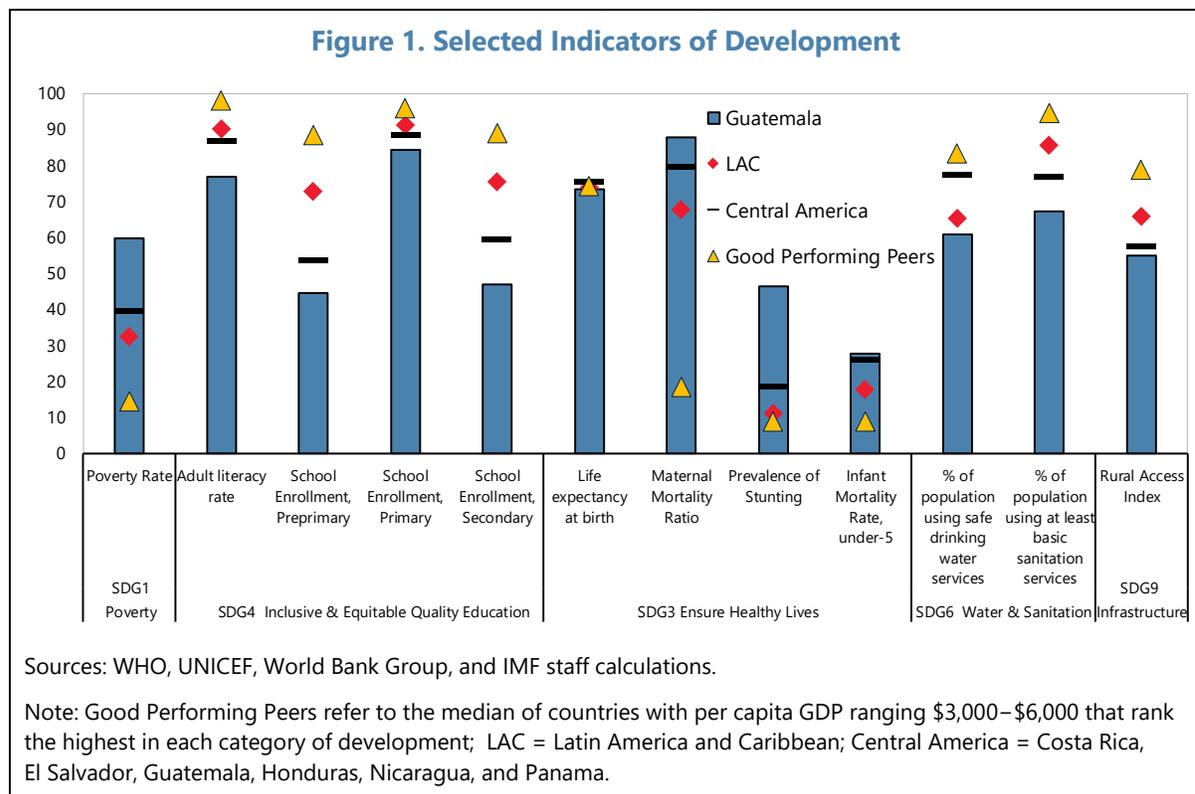
2. Guatemala's development outcomes lag other countries that are at a similar income level (Figure 1). Poverty and extreme poverty, at 60 and 23 percent of the population respectively, are amongst the highest in the region and have been increasing over the last decade. The prevalence of stunting in children under 5 years old is amongst the highest in the world. Infant and maternal mortality rates are well above Latin American and Caribbean averages and over 40 percent of the population does not have access to safe drinking water. Pre-primary education and secondary school enrollment rates are low in regional comparison. A range of social outcomes are markedly worse in rural areas and for indigenous populations. Overall, Guatemala's provision levels of public goods are far off what the literature finds as

¹ Prepared by Esther Perez and Mauricio Soto. The authors are thankful for comments from IMF staff participating in the interdepartmental group on SDG costing. The authors are also grateful, for fruitful discussions during the missions held in Guatemala on March 21–23 and June 18–22, to V. Spross (*Empresarios por la Educación*), V. Lemus, (Ministry of Finance), L. M. Urcuyo and J. Román (Ministry of Communications, Infrastructure and Housing), M. Ponciano and M. García (Ministry of Education), H. Fotouhi, S. Davies, T. Dmytraczenko, and B. C. Marcelo (World Bank), K. Gramajo (SEGEPLAN), F. Gómez (Statistics National Institute), C. Colom and D. Iglesias (IDC Group), J. Arévalo, P. Ramírez and B. De León (Ministry of Public Health and Social Assistance), A. Medina and W. Figueroa (ICEFI), A.M. Díaz (UNDP), B. Pineda (Millennium Challenge Corporation), Y. Osman (USAID), R. Narciso and A. Contreras (UNICEF). We also indebted to A. G. De León, N. Herrera and J. Martinez (UNDP), J. Blas (Ministry of Finance), and J.C. Verdugo (Inclusive Health Institute), for valuable insights and comments. Finally, we would like to thank Christian Vera for excellent research support, and Gerardo Peraza and Roany Toc Bac for their first-rate collaboration from the IMF Regional Office in Central America, Panama, and the Dominican Republic.

² IMF, Country Report No. 18/54, International Monetary Fund, June 2018.

the optimal size of the government with respect to human development (Peden, 1991, Karras, 1997, and Davies, 2009).

3. The authorities have embraced the Sustainable Development Goals (SDGs) as part of their national development strategy. Through a process of consultation within the public sector and with civil society, the Secretary of Planning and Programming (SEGEPLAN) has mapped the key elements of the K'atun 2032 National Development Plan into the SDGs and into 10 National Priorities. However, moving from planning to executing policies remains challenging.



4. This paper aims to bridge a long-term development vision with a more practical spending, provision, and financing strategy. The first stage in designing a development agenda is costing the needs, and then, formulating implementation priorities and identifying the financing—including the decision about the participation of the public versus the private sector. The focus is therefore threefold. First, we cost the *additional* spending consistent with high performance in 2030. Operationally, this means bringing Guatemala's spending patterns in line with good performing countries of a similar level of income by 2030.³ Second, we discuss government policies and the institutional capacity aspects that would enable the delivery of the public goods. Third, we discuss potential sources of financing for

³ In this paper, Guatemala's peers are taken to be countries with per capita GDP ranging from \$3,000 to \$6,000 in 2016.

development, encompassing continued tax administration efforts, tax policy changes, private sector participation, and greater spending efficiency.

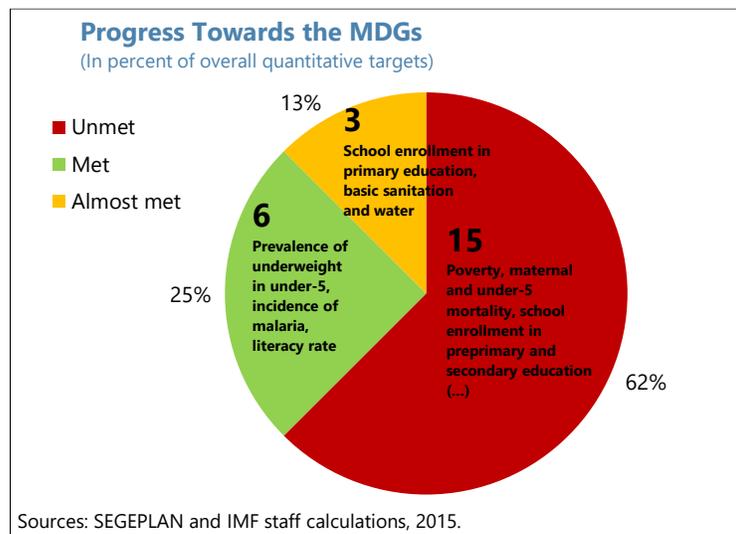
5. Attaining the SDGs would require a sizable increase in spending. Overall additional spending needs to achieve health, education, and infrastructure goals amount to about 8½ percent of GDP in 2030. However, efficient provision and positive synergies across SDGs could help lower the cost of enhanced development.

6. Institutional and delivery capacity aspects are also crucial for ensuring that the additional government spending leads to the desired SDG outcomes. Higher spending alone is unlikely to lead to better outcomes given Guatemala’s significant provision challenges. This, alongside the need to secure political buy-in for greater revenue mobilization, calls for a gradual scaling-up of spending, *pari passu* with improvements in the provision of public goods.⁴

7. The rest of the paper is organized as follows. Section II evaluates Guatemala’s progress towards sustainable development so far. Section III describes the methodology and costing of spending needs for attaining key SDGs. Section IV provides context and discusses needed improvements to the provision of education, health, and infrastructure (water, sanitation, and roads). Section V discusses a possible financing strategy. Section VI concludes.

II. PROGRESS TOWARDS SUSTAINABLE DEVELOPMENT

8. Guatemala made some progress towards meeting the Millennium Development Goals (MDGs) (Table 1). The MDGs provided an important set of targets for securing progress towards better health and education outcomes. For example, by 2015, the goal year of the MDGs, the prevalence of underweight and mortality in under-five children were more than halved from their 1990 level, the incidence of malaria was reduced to 0.31 (per 1,000), and the literacy rate among youth aged 15–24 increased to 93.3 percent. However, Guatemala made less headway, or even lost ground, in other development indicators such as absolute and relative poverty, maternal mortality, or



⁴ The discussion on provision priorities and modalities heavily draws from previous work by the World Bank, UN agencies, and local think tanks.

school enrolment in preprimary and secondary education. In all, as noted in Guatemala's own assessment of the MDGs (SEGEPLAN, 2015), about 62 percent of the quantitative SDG indicators were still far from their targets in 2015.

Table 1. Guatemala: Progress Towards MDGs

	Guatemala			Global Targets	
	1990	2000	2015	Definition 1/	Average Target 2/
Goal 1: Eradicate extreme poverty and hunger					
Proportion of population below the international poverty line (%)	--	55	60	Halve the proportion of people whose income is below the international poverty line.	24
Prevalence of underweight in children (percent of children under five)	28	20	13	Halve the proportion of people who suffer from hunger.	12
Goal 2: Achieve universal primary education					
Primary completion rate, total (percent of relevant age group)	40	56	83	Achieve full completion of primary schooling by all children.	100
Goal 4: Reduce child mortality					
Under-five mortality rate (per 1,000)	81	52	30	Reduce by two-thirds the under-five mortality rate.	33
Goal 5: Improve maternal health					
Maternal mortality ratio (per 100,000 live births)	205	178	88	Reduce by three-quarters the maternal mortality ratio.	108
Goal 6: Combat HIV/AIDS, malaria, and other diseases					
Incidence of tuberculosis (per 100,000)	--	31	26	Halt and beginning to reverse spread of HIV/AIDS and other diseases.	--
Prevalence of HIV, total (percent of population 15-49)	0.1	0.3	0.5		--

Sources: World Bank database, *World Development Indicators*, *United Nations*.

1/ Global targets are defined as improvements from 1990 to 2015.

2/ Average global target is computed as the target for the developing country average.

9. The SDGs broaden the notion of development. The 17 SDGs cover a broader set of development outcomes than the MDGs, in line with the view that development needs to be economically, socially, and environmentally sustainable (Figure 2). The revamped SDG agenda reveals that attaining inclusive economic and social progress poses significant challenges for Guatemala in the areas of planning, financing, and institutional redesign to secure universal provision of the public goods. Sections III–IV below elaborate on these challenges and how to address them.

10. The Guatemalan government is committed to achieving the SDGs. Guatemala is one of the countries that conducts the Voluntary National Reviews, with the latest report published in 2017. The Guatemalan President steers the development agenda as head of the National Council for Urban and Rural Development (CONADUR by its acronym in Spanish). Through a process of consultation within the public sector and with civil society, the SDGs have been mainstreamed into the National Development Plan (K'atun 2032), which includes 5 axes, 36 priorities, and 75 goals. SEGEPLAN has mapped the key elements of the K'atun 2032 into 10 National Priorities including 16 Strategic Goals. To suit the country's socio-economic traits, K'atun pays special attention to vulnerable groups such as the poor, rural, and indigenous populations.



III. SPENDING REQUIRED TO ACHIEVE KEY SDGs

11. This section focuses on the additional spending required for a selection of SDGs related to investments in human capital and physical infrastructure. Education, health, and infrastructure, particularly water, sanitation, and road infrastructure, are crucial for delivering sustainable development and growth. Although these areas are only a selection of SDGs, they exhibit synergies with other goals, such as ending poverty and hunger, promoting gender equality, and tackling inequality. These areas are also very important from the point of view of public spending, as they typically represent a large share of the government budget.

12. Costs are estimated using as a benchmark the spending levels in countries that exhibit relatively good performance in these sectors. The exercise developed by Gaspar and others (2018), involves several steps (see Appendix I for further details).⁵ First, countries that perform well today in the areas of health, education and infrastructure are identified for each income group. For example, countries exceeding an SDG education index level of 80, out of 100, are considered good performers.⁶ Second, the median of the main factors driving cost is calculated for these good performing peers. Third, based on the median values for the good performers, and also taking into account country-specific projections for Guatemala, such as economic growth and demographics, spending needs for 2030 are estimated. The additional spending needs are derived comparing the objective (i.e. estimated needs for 2030

⁵ The aggregate estimates from Gaspar and others (2019) are broadly in line with estimates from other institutions (UNCTAD 2014, Schmidt-Traub, 2015, and Manuel and others, 2018).

⁶ A score of 80 means that a country is 80 percent of the way to the best outcome.

consistent with achieving good performance) with the baseline (i.e. the current total spending, both public and private).

13. Overall Guatemala faces additional spending of about 8½ percent of GDP in 2030 to attain health, education, and infrastructure SDG goals. The costing exercise suggests that the cost of pursuing better education and roads infrastructure outcomes could be significantly higher at about 3.3 and 3.2 percent of GDP in 2030, respectively. The analysis also suggests that an increase of 1.4 and 0.6 percent of GDP in 2030 in health and water and sanitation infrastructure spending, respectively, would be consistent with good performance in these areas.⁷

Education

14. Despite past progress, Guatemala still faces significant challenges in improving education outcomes. Education performance is assessed with the SDG4 index constructed using three variables: net primary school enrolment rate, expected years of schooling, and literacy rate for the population aged 15–24. The SDG4 index reaches 64 for Guatemala, well below the median among good performing peers of 87. The benchmarking exercise consists of deriving the median value for cost items for education (e.g. teachers' salaries, pupils per teacher, and allocation of total expenses between other non-compensation current spending and capital spending) consistent with delivering an SDG4 score of 80 to 100 in countries with GDP per capita within the range \$3,000–\$6,000. Based on these reference values, we estimate total education expenditure as a percent of GDP in 2030.

15. Guatemala's public education spending per student is lower than that of good performing peers. At the median, the good performing peers have 13.3 students per teacher, teacher wages equivalent to 1.7 times GDP per capita, a share of other current and capital cost of 35.7 percent, and yearly spending of \$826 per student or 3.2 percent of GDP (Table 2). Low spending per student in Guatemala is mainly driven by higher student-to-teacher ratios than what is observed in good performing peers (17.9 versus 13.3 students per teacher respectively). In terms of composition, current spending should strike a better balance between teacher compensation and other current and capital spending.

16. If Guatemala were to gradually align the inputs at the levels observed for good performers, education spending would increase from 3.7 to 7 percent of GDP by 2030. This assumes full enrollment for primary and secondary education, plus two years of pre-primary education and two years of post-secondary education; and yearly real GDP and

⁷ The costing exercise focuses on annual spending flows in 2030. However, spending would have to rise before 2030, so cumulative expenses up to 2030 would be significantly larger. After 2030, education and health spending would recur, whereas infrastructure spending would be expected to decline to cover depreciation of the capital stock built through 2030.

population growth of 3½ and 1.8 percent, respectively, over 2023-2030.⁸ Most of the increase in spending should happen in the public sector. If Guatemala follows the example of good performing peers, the share of private education spending would gradually decline from about 20 percent today to 5 percent of GDP by 2030.

	GDP per capita \$3,000-6,000			Guatemala	
	All	Low performance	High performance	2016	2030
GDP per capita	4,185	4,224	4,125	4,147	5,209
Population (thousand)	38,074	68,763	16,910	16,582	21,424
<i>Main factors</i>					
Students per teacher ratio	17.6	21.2	13.3	17.9	13.3
Teacher wages (ratio to GDP per capita)	2.3	4.1	1.7	1.8	1.7
Other current and capital spending (% total spending)	39	39	36	25	36
<i>Other</i>					
Student age population (% total population)	38	42	31	52	44
Enrollment rate (preprimary to tertiary)	69	64	69	52	80
Private share (% of total spending)	19	41	5	19	5
<i>Results</i>					
Education spending (percent of GDP)	5.7	8.5	4.4	3.7	7.0
Public	4.6	5.0	4.1	3.0	6.6
Private	1.1	3.4	0.2	0.7	0.3
Spending per student (USD 2018)	902	1,338	826	562	1,043
SDG4 index	78	75	87	64	>80

Source: IMF staff calculations using Garcia-Escribano, Prady and Soto (2018), and Gaspar and others (2019).

Health

17. Guatemala also has ample room for improvements in health. Health performance as assessed by SDG3 index reaches 70 in Guatemala, against a median among good performing peers of 81. The SDG3 index is constructed using 14 variables, among which maternal, neonatal and under-5 mortality rates, HIV prevalence, and healthy life expectancy at birth. The benchmarking exercise then consists of deriving the median value for cost drivers in healthcare (population density of different types of health personnel, doctors' and nurses' remuneration, and shares of current and capital expenditure in total health spending) consistent with delivering an SDG3 score of 80 to 100 in countries with GDP per capita within the range \$3,000–\$6,000. Based on these reference values, we estimate total health expenditure as a percent of GDP in 2030. The exercise accounts for total health spending (including all levels of care) as well as capital and current expenditure.

18. Guatemala's total health spending per capita is lower than in good performers. At the median, good performing countries have 1.8 and 6.3 doctors and other medical

⁸ In Guatemala, education spending in 2030 consistent with good SDG performance is 7 percent of GDP. This is higher than in good performing countries today reflecting a higher projected share of student age population and higher target enrollment rate.

personnel, respectively, per 1,000 people; doctors' wages equivalent to 5.4 times GDP per capita; a share of other current and capital cost of 62 percent; and overall spending per capita of \$352 or 7.1 percent of GDP (Table 3). The relatively low per-capita spending in Guatemala is driven by too few doctors and other health personnel, and, to a much lesser extent, doctors' wages. If Guatemala were to gradually align the inputs with the levels observed for good performing countries, health spending would increase from 5.8 to 7.2 percent of GDP by 2030, and the share of private health spending would gradually decline from about 65 percent today to 38 percent of GDP by 2030. The additional spending needs net off cost rationalization in supply chain costs.

	GDP per capita \$3,000-6,000			Guatemala	
	All	Low performance	High performance	2016	2030
GDP per capita	4,185	4,088	4,986	4,147	5,209
Population (thousand)	9,479	9,758	7,058	16,582	21,424
<i>Main factors</i>					
Doctors per 1,000 population	1.2	0.9	1.8	0.7	1.8
Other medical personnel per 1,000 population	5.6	5.4	6.3	1.8	6.3
Doctor wages (% GDP per capita)	5.8	5.9	5.4	5.3	5.4
Other current and capital spending (% total spending)	62	62	62	85	62
Private share (% total spending)	42	43	39	66	39
<i>Results</i>					
Health spending (percent of GDP)	6.8	6.5	7.1	5.8	7.2
Public	3.9	3.7	4.3	2.0	4.4
Private	2.9	2.8	2.8	3.8	2.8
Per capita spending (USD 2018)	283	268	352	239	374
SDG3 index	76	74	81	70	>80
Sources: IMF staff calculations using Garcia-Escribano, Prady and Soto (2018), and Gaspar and others (2019).					
Note: Data on doctors and other medical personnel and their compensation are from the National Health Accounts 2016. These include information for medical personnel in the Ministry of Health, Social Security, and the private sector. Compensation data are available for personnel in the Ministry of Health and Social Security. For private doctors, we impute compensation assuming 85 percent of private health spending corresponds to remuneration.					

Water and Sanitation Infrastructure

19. Guatemala's much-needed improvements in water and sanitation infrastructure would entail a modest increase in spending. Water and sanitation performance is assessed by the SDG6 index, which comprises universal safe drinking water and adequate sanitation. As of 2015, over 3 million people (20 percent of the population) do not have access to basic water and sanitation, and nearly 12 million people (75 percent of the population) lack safely managed water and sanitation. According to the World Bank WASH costing model (World Bank, 2015, 2016, and 2017), to achieve the SDG targets of universal safe access to water and sanitation by 2030, total new investment would need to be on average \$589 million per year (0.6 percent of 2030 GDP) (Table 4).

Table 4. Benchmarking Water and Sanitation Infrastructure Needs

	Ending open defecation	Basic										Total SDG6
		Water		Sanitation		Hygiene		Water		Sanitation		
		Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	
Total target population (million)	1.9	2.4	5.1	3.7	5.8	2.4	5.5	7.9	7.8	6.7	11.5	11.5
Population unserved in 2015 (million)	0.8	0.9	0.3	2.2	1.0	0.9	0.7	6.4	3.0	5.2	6.7	11.9
Population growth 2015-2030 (million)	1.5	1.5	4.8	1.5	4.8	1.5	4.8	1.5	4.8	1.5	4.8	6.3
Cost (per capita, \$)	19	21	87	34	87	2	2	185	185	266	281	765
Total cost (\$ million)	35	52	444	127	505	5	13	1,457	1,443	1,778	3,247	8,840
Annual cost (\$ million)	2.3	3.5	29.6	8.4	33.7	0.4	0.9	97.1	96.2	118.5	216.5	589
Total cost (% of 2030 GDP)	0.0	0.0	0.4	0.1	0.5	0.0	0.1	1.4	1.4	1.7	3.1	8.3
Annual cost (% of 2030 GDP)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.6

Source: IMF staff calculations using World Bank (2017).

Roads Infrastructure

20. With about 16,500 kilometers of roads, Guatemala has relatively low road density. At about 16 kilometers of road per 100 square kilometers of area, road density in Guatemala is about one fourth of that of good performing peers for roughly similar population density. Inspired by SDG9 on the link between infrastructure and economic development, the proposed methodology estimates the costs of closing the existing road infrastructure gap by 2030. The road infrastructure gap is measured as the target road density minus the current road density. The target road density is determined by GDP per capita, population density, and access by those living in remote locations in the sense of the World Bank Rural Access Index (RAI) (share of rural population with access to an all-season road within 2 kilometers). The total cost is obtained by multiplying the road gap by a unit cost per kilometer.

21. Approaching the density observed in good performing countries would imply an increase in expenditure of about 3.2 percent of GDP. This would be enough for Guatemala to build about 35,000 kilometers of additional roads over the next 12 years, assuming a unit (construction and maintenance) cost of \$800,000 per kilometer (Table 5). Local estimates of needs are more ambitious, aiming at increasing the road network by over 47,500 additional kilometers to approach the Latin American average in road Kilometer per capita (Grupo IDC, 2018).

Table 5. Benchmarking Roads Infrastructure Needs

	GDP per capita \$3,000-6,000			Guatemala	
	All	Low performance	High performance	2016	2030
GDP per capita	4,136	4,147	3,851	4,147	5,209
Road density	18	13	36	16	48
Roads (KM)				16,457	51,345
Rural Access Index (RAI)	62	57	87	55	>90
Annual cost (percent of 2030 GDP)					3.2

Source: IMF staff calculations using Garcia-Escribano, Prady and Soto (2018), and Gaspar and others (2019).

Note: Road density in kilometers of road per 100 square kilometers of area.

IV. ENHANCING DELIVERY CAPACITIES

22. Institutional and delivery capacity aspects are crucial for ensuring that the additional government spending leads to the desired SDG outcomes. Significant challenges remain to overcome existing provision shortfalls and segmentation, in a way to secure an effective delivery of health, education, and infrastructure services to all Guatemalans. This calls for a well-prioritized agenda and for building state capacities that are commensurate with the challenges ahead.

Education

23. The education system faces significant challenges in terms of coverage, inclusion, and quality of the services provided (Figures 3, 4, 5).

- **Coverage.** Coverage at the primary level reaches about 80 percent but remains very low otherwise. Only 3 (47) percent of children aged 0–4 (5–6) receive preschool education and just about 48 (24) percent of children receive basic (diversified)⁹ secondary schooling. Dropout rates at both the primary and secondary levels are mainly owed to financial constraints: while preschool aged 5–6 and primary education is publicly funded, secondary schooling is mostly private. In 2016 the average annual spending per student school amounted to US\$562, representing about 68 percent of the investment made in well-performing countries with a similar level of per-capita income.
- **Inclusiveness.** High repetition rates and poor outcomes from the national tests suggest there is scope to improve the quality of education. In 2014, only half and 30 percent of the students in grade 6 achieved the expected level in mathematics and reading, respectively (General Directorate of Educational Evaluation and Research, DIGEDUCA). Reflecting provision segmentation, education outcomes widely vary across administrative departments, ethnicities, and urban versus rural areas. For example, the illiteracy rate in Quiche (37 percent) is four times that in the department of Guatemalan; and years of schooling for students from rural areas and the poor and roughly half those for students from urban areas and the nonpoor.
- **Infrastructure.** A deficient school infrastructure (one in five schools lacks piped water, adequate sanitation, electricity or rain shelter; Ortega, 2012) negatively affects teachers' and students' motivation (Azurdia, 2011). The lack of an updated infrastructure census and inadequate coordination between the Ministry of Education (MINEDUC, policy making agency) and the Ministry of Communications,

⁹ Secondary education in Guatemala comprises three years of general education (basic), and two to three years of vocational training (diversified) that prepares students for a career in the technical, agricultural, commercial, industrial, or teaching domains.

Infrastructure and Housing (MICIVI, implementation agency) hinders infrastructure planning and maintenance.

Figure 3. Education Performance, by Population Group

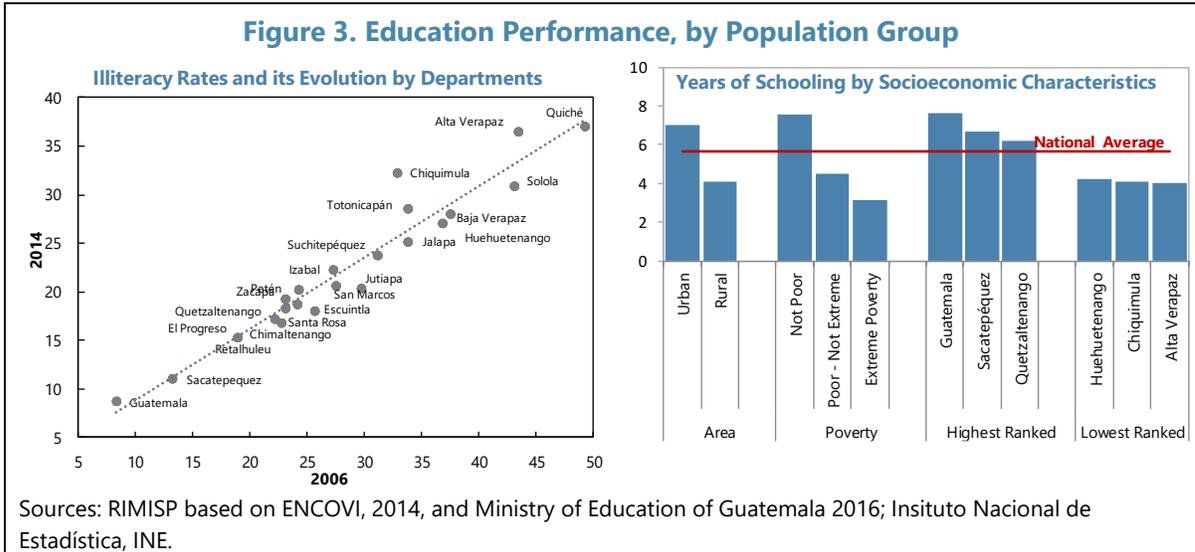


Figure 4. Policy Priorities in Education

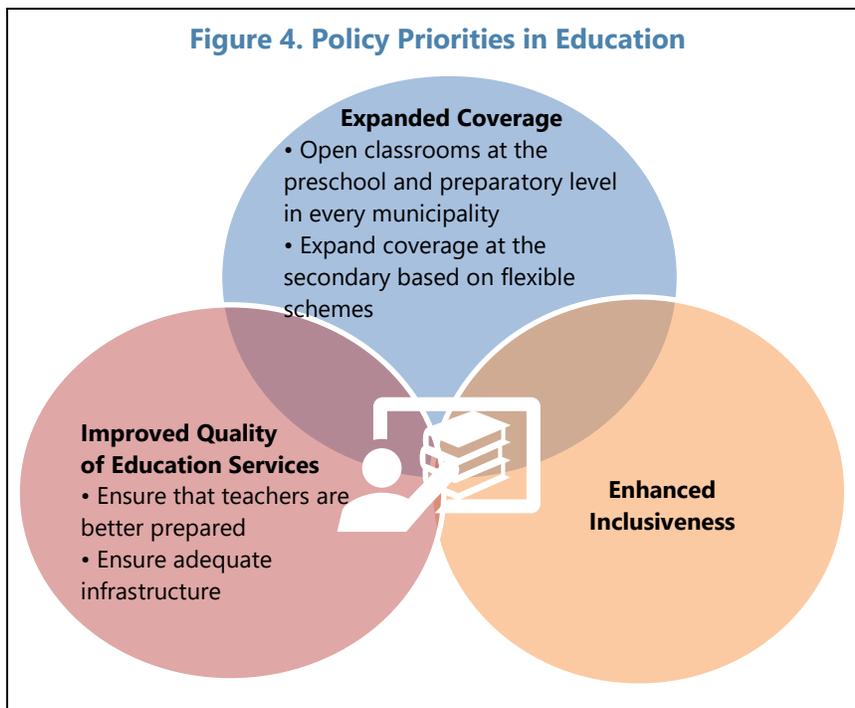
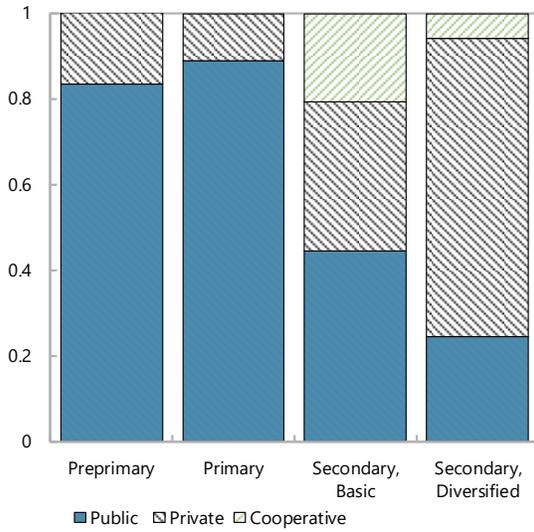
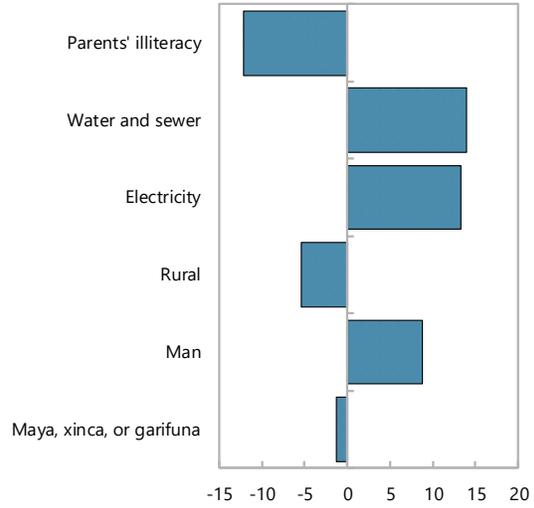


Figure 5. Education Enrollment and Performance

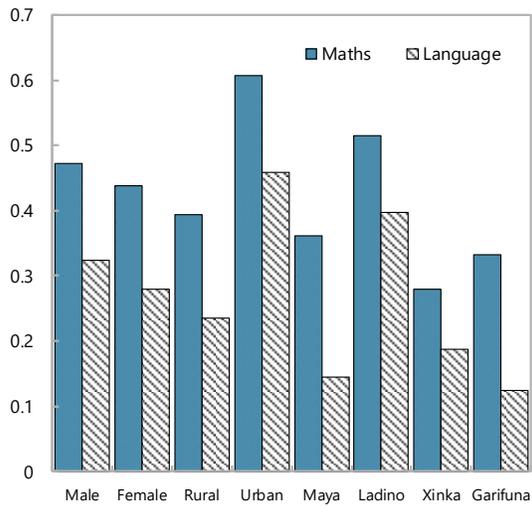
Enrollment by Education Level and Provision Type
(In Percent of Total Enrollment)



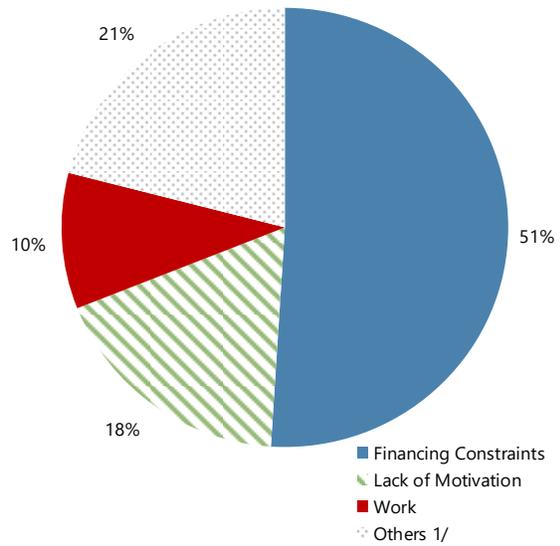
Probability of Enrollment in Secondary Education
(In Percent, Marginal Impact on Probability by Variable)



Student Performance by Socioeconomic Traits
(Success Rate for 6th Grade Students, in Percent)

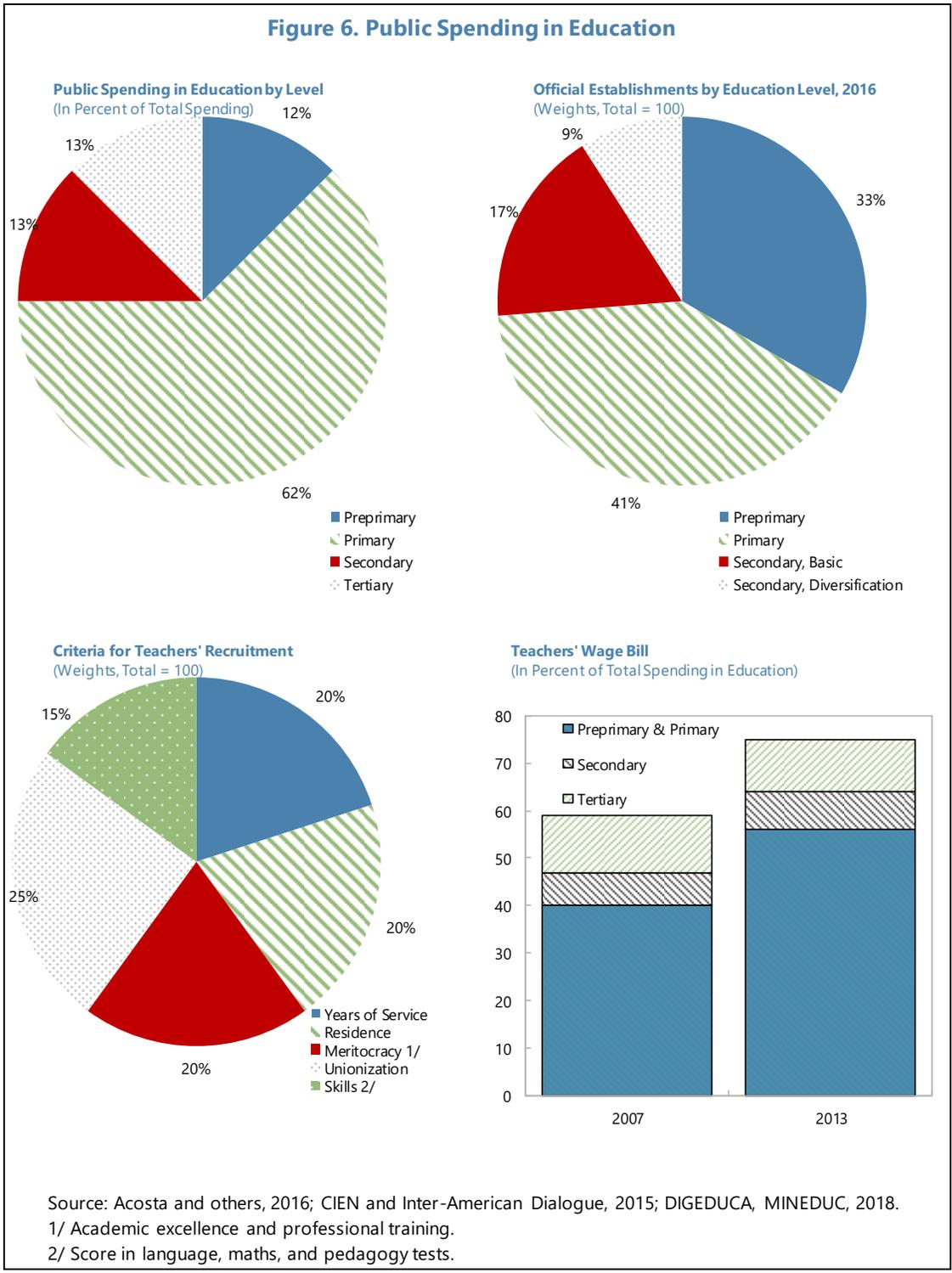


Reasons for Dropouts at Secondary School
(In Percent, Total = 100)



Source: Acosta and others, 2016; CIEN and Inter-American Dialogue, 2015; ICEFI, 2011.
1/ Sickness, pregnancy, age, inadequate provision, and others.

24. Continued efforts are needed to extend the coverage of preschool and secondary education, make education more inclusive, and improve the quality of teachers (Figure 6).



- **Expanded coverage.** Preprimary coverage should be increased to about 2 years of schooling (akin to the authorities' preprimary enrollment target of 60 percent of children age 4–6) and coverage for (basic and diversified) secondary education should continue to be expanded using flexible schemes suitable for those students that cannot attend school daily. During the last decade, the government has invested in various programs meant to promote access to secondary education through approaches that are more suitable for the rural and indigenous populations, such as distance education (*telesecundaria*) and the so-called Core Family Education groups for Development (*Núcleos Familiares Educativos para el Desarrollo*). However, these programs have not achieved the expected results. Further efforts are needed to improve the effectiveness of these and consider other flexible modalities to optimize the use of the existing infrastructure.
- **Improved teachers' quality.** Better prepared teachers can make a difference to education outcomes. Selection criteria for primary school teachers should allocate a greater weight to the knowledge test and classroom probationary period (over, e.g., union membership). The recruitment of secondary-school teachers should be based on objective criteria and competitive exams. Teachers' remuneration should be linked to performance, specifically: (i) the end-of-year bonus could be contingent on the school's completing the 180-day calendar or students' achievement of the expected level for mathematics or reading; (ii) the professional development bonus could be granted to those who have completed a university degree; (iii) well-performing teachers should be provided with incentives to take on assignments in vulnerable schools. There is also a need to strengthen existing on-the-job training for teachers (Academic Program for Teachers' Professional Development, PADED/D,¹⁰ *Llegando al Aula*, Teacher Premium 100 Points). School Principals should play a greater role in guiding teachers, both academically and pedagogically.
- **Enforcement of school calendar.** Centers abiding by the school calendar (180 teaching days, five hours a day) should gain explicit recognition and penalties should be considered for noncompliance. Enforcing a 200-day school year as in other Central American countries would be a plus.
- **Improved infrastructure.** Improved coordination between MICIVI and MINEDUC and greater involvement of municipalities in the maintenance of education facilities, are important to overcome poor quality of infrastructure and bottlenecks, as well as to optimize the territorial distribution for school buildings.
- **Enhanced inclusiveness.** International evidence highlights the importance of education as a determinant of inclusive growth (Anand and others, 2013) and also suggests that successful education for indigenous students requires the design of strategies specific to

¹⁰ Between 2009 and 2015, approximately 20 percent of preprimary and primary school teachers graduated from this program.

this population group (Box 1). This includes promoting access to bilingual teachers in rural areas, involving parents in preprimary education, integrating the culture of the community into the educational curriculum, and reinforcing the leadership of the school principal.

Box 1. Supporting Success for Indigenous Students

Lessons from international evidence (OECD, 2017) on how to successfully support indigenous students include:

Engaging families and providing extra support for indigenous students. The experience of Canada is particularly remarkable. An early childhood education in an impoverished and indigenous community in Manitoba follows an abecedarian model for early learning where families are an integral part of the program. In an elementary school in New Brunswick that has eliminated academic gaps between indigenous and non-indigenous students, teachers and parents meet before the start of the school year to manage each child's transition to school. In a high school in Alberta, a dedicated coaching program supports indigenous students to succeed with their study programs.

Monitoring progress. The Starting Block Program in Australia equips teachers with resources to daily record student progress in literacy, attendance, and general conduct. At the end of each term, students' families and community members attend an award ceremony to recognize their achievements.

School leadership and support for teachers. In schools where indigenous students are achieving good results, there is generally a highly committed principal who has done whatever it takes to ensure school attendance and families' engagement in learning. Effective principals also require teachers to monitor indigenous students' progress and to intervene in a timely manner to ensure that expectations are met.

Support for teachers. Much that can be done to help teachers feel confident and competent in establishing positive relationships with their indigenous students. A very easy step for schools to take is to provide and use books and other resources developed by indigenous people. For example, the "Show Me Your Math Program" in Nova Scotia supports teachers and students to engage with mathematics in their own cultural practices and has now spread to other provinces as an effective way for both indigenous and non-indigenous students to learn math.

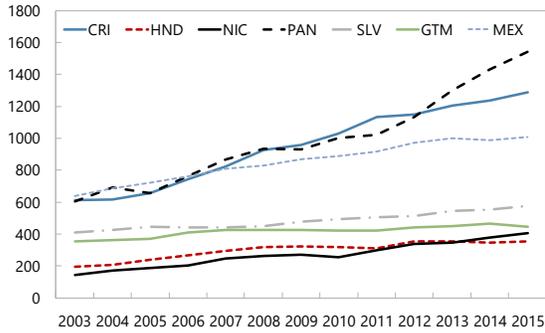
Health

25. Guatemala faces significant challenges in providing healthcare coverage, both primary and on a life-cycle basis (Figure 7).¹¹ Relatively low levels of overall and, most of all, public health expenditure, a markedly fragmented and unequal healthcare provision, and poor incentives for healthcare workers are important challenges to address.

¹¹ Throughout this section, basic or primary-level healthcare refer to the provision of vaccination, and maternal and child healthcare including basic nutrition. Secondary- and hospital-level healthcare respectively refer to diagnostic services and specialized care, and cure and care rehabilitation, for the entire population.

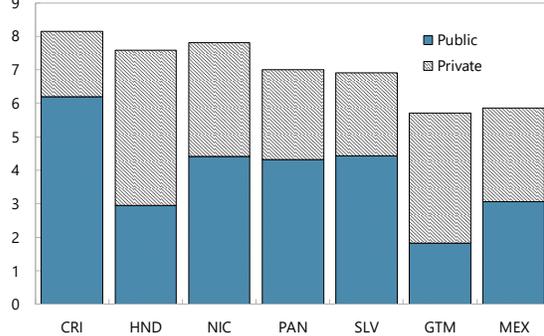
Figure 7. Healthcare Indicators: Expenditure, Financing, and Outcomes

Health Expenditure
(Per capita)



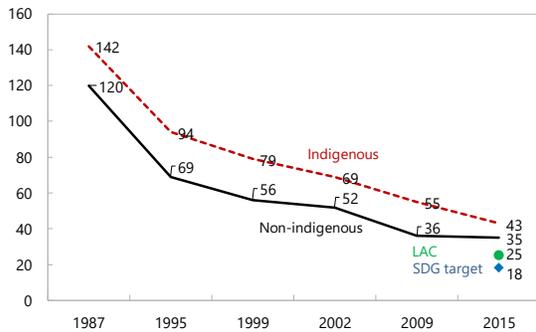
Sources: Global Health Expenditure database, WHO.

Health Expenditure, 2015
(In percent of GDP)



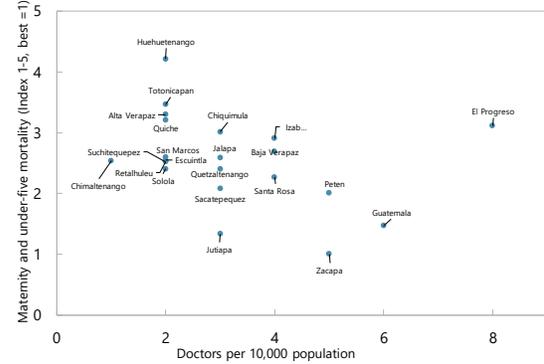
Sources: Global Health Expenditure Database, WHO, 2015.

Under-five Mortality
(Deaths per 1,000 live births)



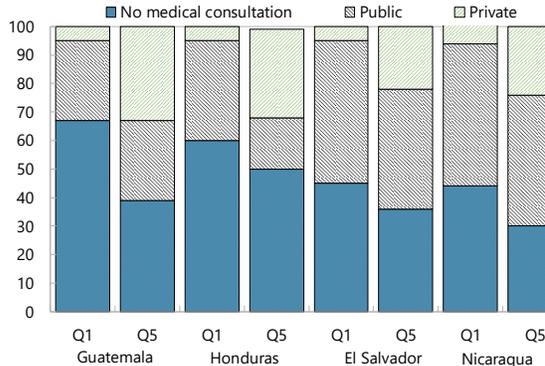
Sources: Maternal and Children's Health National Survey, WB World Development Indicators.

Access to Health Care and Outcomes



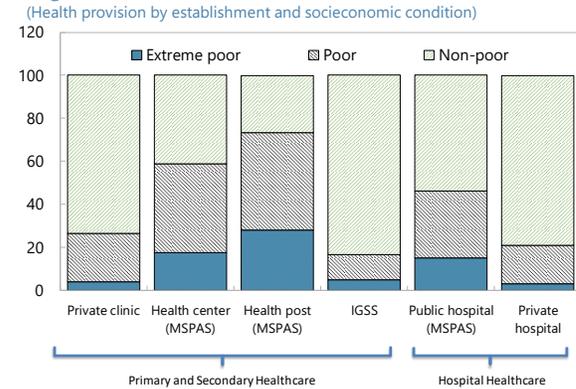
Sources: Maternal and Children's Health National Survey, 2015.

Access to Health by Income Quintile
(Percent of sick population)



Sources: ENCOVI.

Segmentation in Health Provision

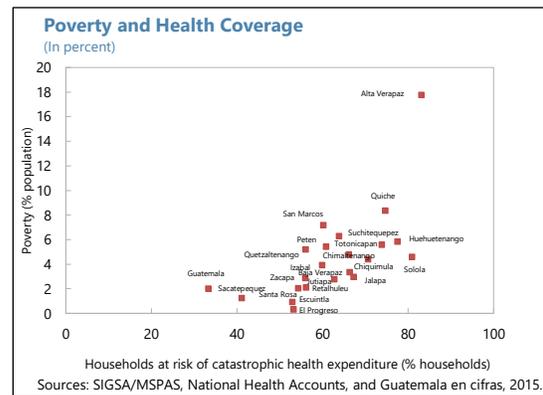


Sources: ENCOVI 2014.

- Overall health expenditure and coverage.** Guatemala features one of the lowest levels of (PPP-adjusted) per capita health spending amongst Central American countries and the highest coverage gap for basic healthcare (about 50 percent). Access to hospitals and specialized care is concentrated in the two major cities Guatemala City and Quetzaltenango where employment is predominantly formal, while the poor and rural areas are left with minimal (or no) access to these services. Large regional and ethnic disparities in healthcare provision result in differentiated health outcomes. For example, only 30 percent of indigenous women give birth in healthcare facilities staffed

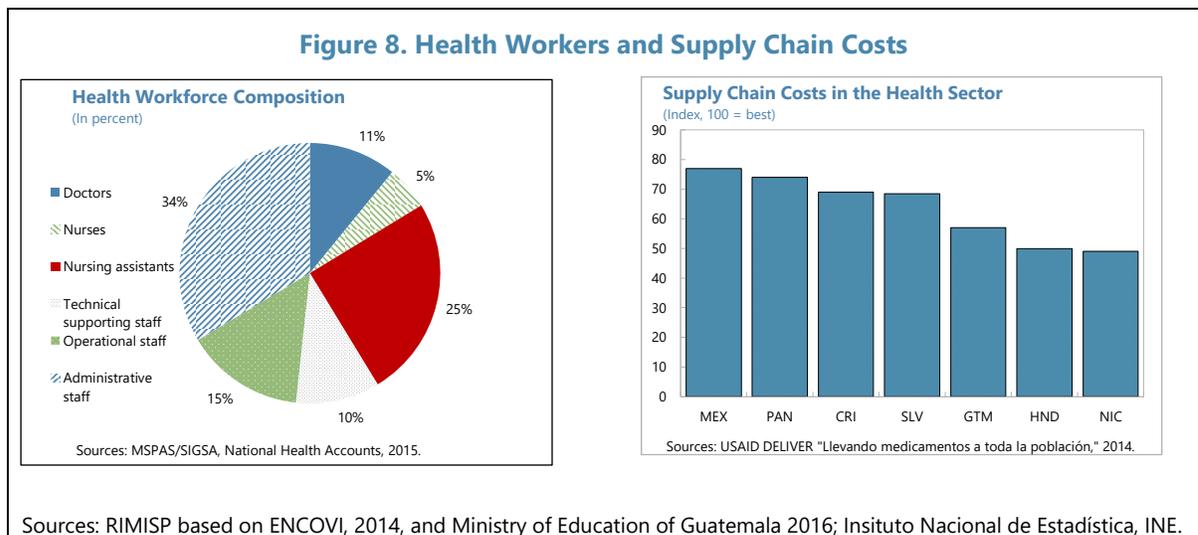
by qualified practitioners while maternal mortality for that group reaches 163 per 1,000 births (versus national averages of 50 percent and 113 per 1,000 births, respectively).

- Fragmented provision.** Healthcare services are provided by the Ministry of Health and Social Services (MSPAS), the Guatemalan Social Security Institute (IGSS), private clinics and hospitals, and non-governmental organizations. These sub-systems operate separately, involving some duplication and outright discrimination among beneficiaries based on ability to pay, job situation, and geographical access. Specifically, the IGSS provides healthcare for 17 percent of the workforce (in formal employment). The remaining 83 percent would *de jure* be covered by MSPAS or health insurance schemes. In practice, coverage, where it exists, is highly unequal: the annual per capita expenditure of the MSPAS is approximately one-fifth of that for the beneficiaries of the IGSS. Moreover, many lack of access to the minimal services provided by MSPAS.
- Financing.** Guatemala's healthcare system is predominantly privately-financed (63 percent of the total health expenditure, of which 11 percent is channeled through private insurance companies and the remaining 52 percent is out-of-pocket spending). Public financing has remained unchanged over the past decade at around 2.2 percent and represents slightly over one-third of total health expenditure (17.8 percent channeled through the IGSS and 19.2 percent channeled through the MSPAS and the municipalities). The high incidence of out-of-pocket costs amongst the poor and informal workers means that 65 percent of households in the lowest income bracket incur healthcare costs in excess of 40 percent of the household's capacity to pay, compared to 3 percent for those in the highest income bracket ("catastrophic" healthcare costs, see Bowser and Mahal, 2011).
- Inadequate infrastructure.** Health posts and health centers, respectively delivering basic and second-level healthcare, covered just about one-fifth and one-fourth of the population of Guatemala in 2013. Providing basic healthcare has remained challenging since the cancellation in 2014 of the Program for Extended Coverage (PEC).¹² In place since 1997, PEC's coverage for primary healthcare extended to around 4.5 million. PEC's cancellation led to a decline in vaccination rates and to an outbreak of diseases (e.g. measles and poliomyelitis) that had previously been eradicated.



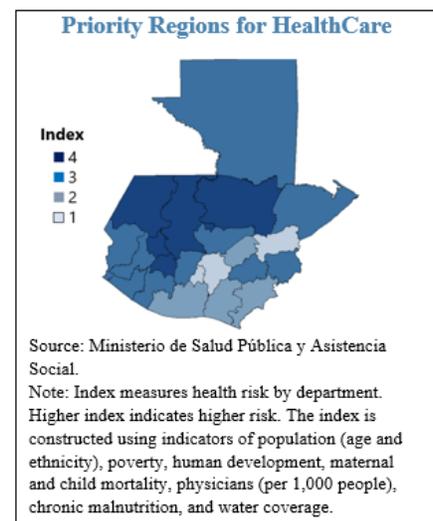
¹² The Transparency Law from 2013 stated that, starting in 2016, NGOs would no longer be able to receive government funds for the delivery of healthcare services, as foreseen by the Program to Expand Coverage in place since 1997. Since then, health policy debates have focused on how to achieve universal coverage.

- Medical staff** (Figure 8). There is a shortage of health workers across the country, particularly in the rural areas. Guatemala has 12½ health workers per 10,000 inhabitants (including technical and administrative supporting staff)—the lowest ratio in Central America, and half of the WHO standard. The ratio in urban areas is almost ten times higher than in rural areas (25.7 compared to 2.96 for every 10,000 inhabitants), reflecting linguistic and cultural barriers in medical practices. The number of nurses per doctor is low (0.66 nurses per doctor, compared to the WHO standard of 2.8) while the number of medical staff involved in administrative tasks is disproportionately high.



- Costs of the supply chain.** Over a third of cost of drugs owes to supply costs, which places Guatemala in the upper band of the expected range (USAID, 2014). This reflects high transportation and customs clearance costs, and lack of competition among providers of logistics services (Guasch, 2011).

26. The short-term priority for Guatemala is to extend its primary healthcare coverage. The emphasis should be on prevention (vaccinations and immunizations, maternal and child health, and nutrition education) especially in the rural areas affected by the elimination of the PEC. The experiences of other countries in the region, including Brazil, Costa Rica, and Peru, highlight various approaches that countries can use to finance and organize the provision of primary healthcare. The ultimate, medium-term, objective is achieving universal access to quality healthcare services in all the stages of the life through the integration of secondary (curative and rehabilitation services) and tertiary (hospitals) healthcare levels. This approach needs:



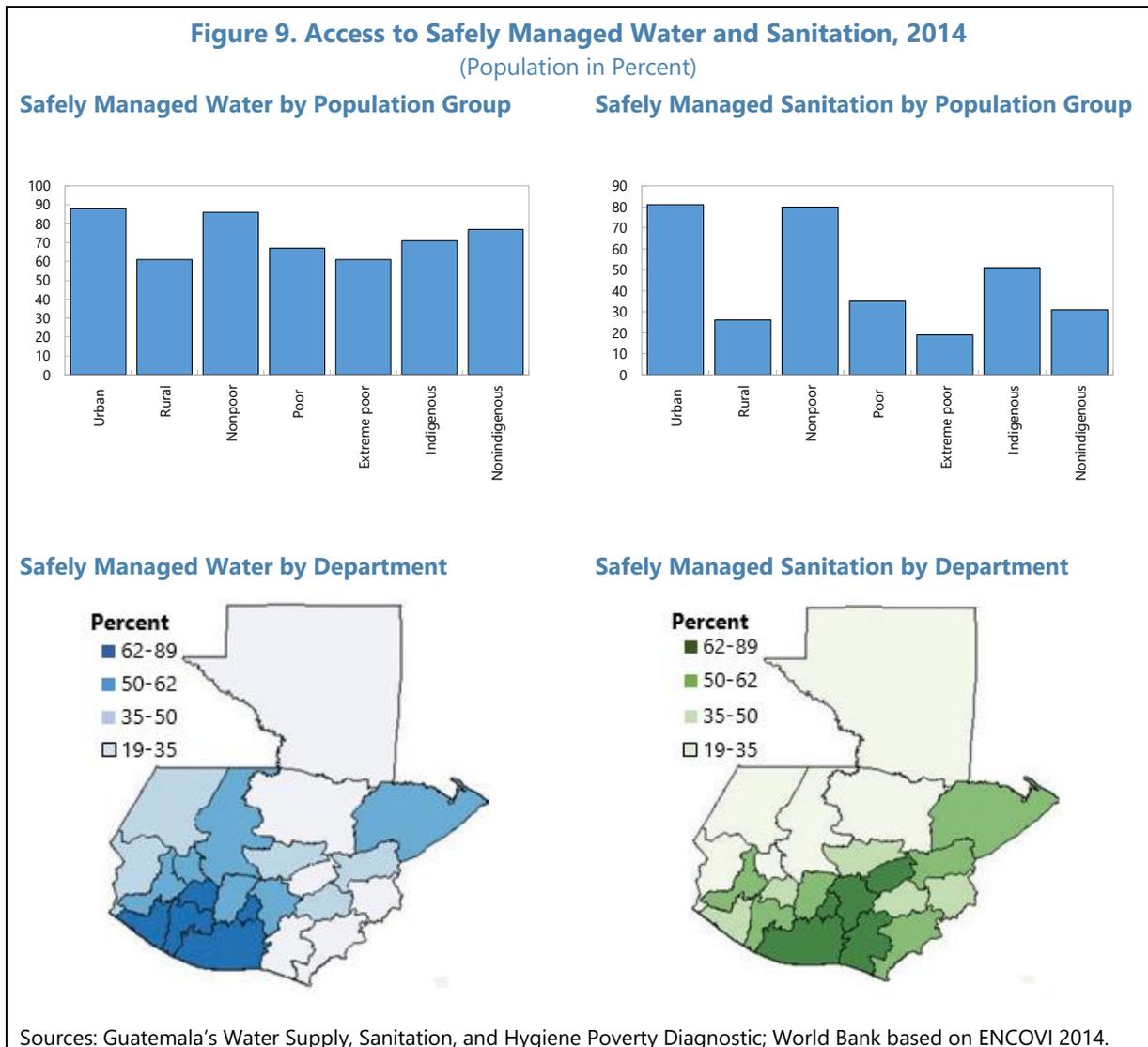
- **Improved healthcare governance.** Healthcare policies should be robust to changes in the administration. The National Health Council should be given the authority to effectively coordinate the delivery of health services between the MSPAS and the IGSS, seeking synergies and avoiding duplication (of establishments, personnel, and medical equipment). The financial and operational organization for healthcare should be handled by the Health Regional Directorates to adjust MSPAS provision to regional needs.
- **Financing strategy.** The long-term goal should be to implement a financing scheme with increased crossed subsidies that integrate health risks and the ability to pay on a solidarity basis. This could be achieved by unifying healthcare services provided by IGSS and the MSPAS¹³ or by creating a new entity in charge of universal provision and financed through a noncontributory scheme. Short-term options to expand primary healthcare typically comprise hybrid programs combining voluntary contributions with subsidies to low-wage earners working in the informal sector. Positive experiences in this area include Peru, which provides subsidized healthcare for those living in poverty and extreme poverty.
- **Improved incentives for healthcare workers.** Although average doctor compensation seems in line with good performing countries, inadequate economic and other incentives for doctors and nurses in the public sector are one reason behind the high dropout rates of students in healthcare streams and the low density of professionals in rural areas (Maeda and others, 2014). There is a need to expedite the Law on Careers in Health Administration to professionalize the medical workforce and establish transparent hiring, compensation, and promotion mechanisms. Gaining familiarity with the language and medical practices used in indigenous communities, further use of community facilitators, and economic incentives would help attract and maintain health professionals in the rural areas.
- **Reduce supply chain costs** (USAID, 2015). Framework contracts for joint purchases by the MSPAS and the IGSS of essential drugs should be standardized to generate savings. Cost savings can also arise from streamlining the logistics process, automating the handling of inventories, and reducing transportation costs by optimizing the distribution routes. Costs from human resources devoted to logistics could be rationalized by outsourcing some of those functions and increasing staff efficiency, which would incidentally free up resources for actual healthcare provision.

Water and Sanitation Infrastructure

27. The supply of water and sanitation (WS) in rural areas remains one of the most important challenges facing Guatemala. Guatemala possesses adequate hydrological resources yet one quarter of Guatemalans lack a water connection in their home. Enormous

¹³ Such transformation was already envisaged in the Organic Law of the IGSS of 1946.

gaps remain between departments: whereas Sololá has near-universal access to sources of improved water, Alta Verapaz, Chiquimula, El Progreso, Petén, and Santa Rosas are still dependent on untreated surface water (Figure 9). Large portions of poor, rural, and indigenous people spend over 30 minutes a day collecting water. Nearly half of all Guatemalans lack access to safely managed sanitation, and such coverage is very poor in the northern and easterly regions where the proportion of population without access to sanitation is well above the national average.



28. Inadequate institutional capacity affects WS provision. The two main challenges to overcome are poor coordination amongst the entities involved in the provision of WS and budget under-execution.

- **Coordination amongst WS entities.** SEGEPLAN approves WS projects, the Ministries of Public Health and of Environment and Natural Resources (MSPAS and

MARN) regulate WS services, and the local governments are responsible for the provision of WS (through the Drinking Water Administrative Committees, CAAPs). The responsibility for the construction and supervision of WS systems is shared among all levels of government. Through the Rural Water Supply Program Executing Unit (UNEPAR), the Municipal Development Institute (INFOM) has played an important role in assisting local governments with the development of WS infrastructure. Poor coordination amongst the requirements established by MSPAS, MARN, INFOM, and SEGEPLAN often turns into a burden for the local governments, whose projects are not approved in a timely manner.

- **Budget under-execution.** WS spending stood at a modest 0.34 percent of GDP on average over 2010–14 (of which 0.28 percent from municipal governments) of which about one fourth was under-executed due to bottlenecks in the approval process and low implementation capacity of local governments. Obstacles related to internal procedures, environmental permits, water quality certification, or the procurement law drag out the process to 170 days, (compared with the 71–day wait time set by law), from a project’s initiation to its approval. As a result, UNEPAR is currently completing some 20 water projects per year (versus 2,500 pending applications and over 6,000 projects consistent with the attainment of SDG6).

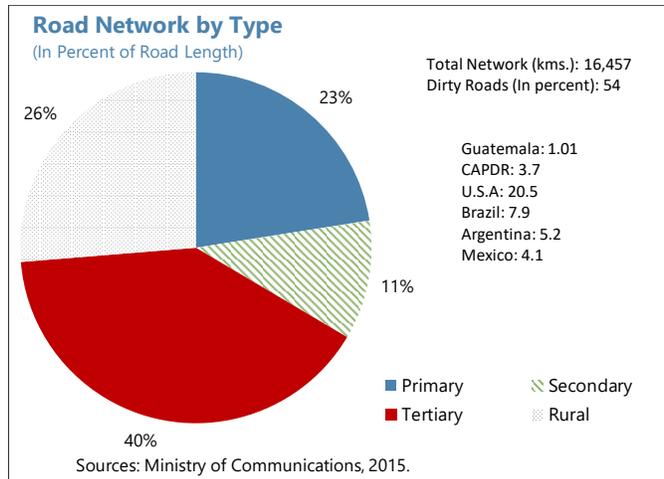
29. The provision of WS services would benefit from stronger central government leadership. Delivering WS to those areas currently underserved needs the creation a governing body responsible for the formulation, coordination, and implementation of WS policies. Such a governing body would formulate a WS policy considering water endowment by hydrographic basins and demographic trends. There is also room to strengthen UNEPAR regional offices and local governments’ capacities, to integrate CAAPs into the sector’s institutional framework, and to consolidate the Health Management Information and Water Quality Control Systems to assess WS needs. To increase WS execution, requirements for small projects from MSPAS and MARN should be eased and made consistent. Further technical assistance is also needed in the preparation and implementation phases of projects in less-developed areas.

Roads Infrastructure

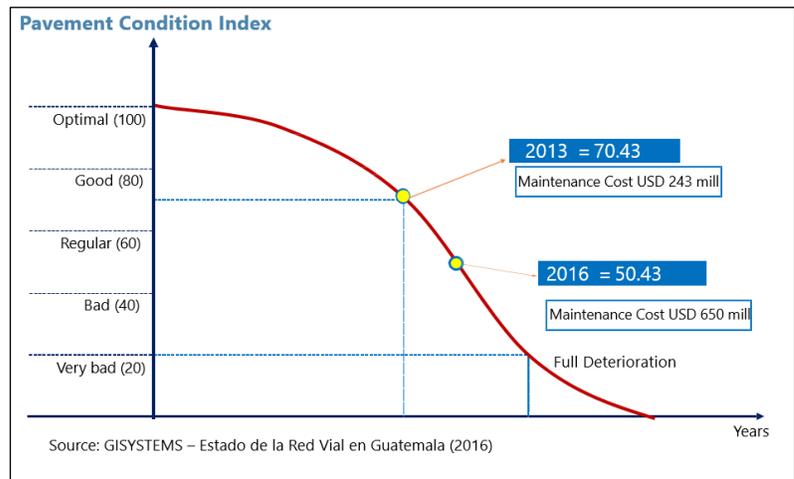
30. Guatemala’s roads infrastructure needs are large and should be addressed to bolster the domestic market, promote development, and reduce inequality. Poor roads infrastructure acts as a major impediment to growth. Out of 160 countries, Guatemala’s overall World Bank’s Logistics Performance Index worsened from 77 in 2014 to 111 in 2016. The transport of goods and people to ports and other destinations runs at an average speed of 37 km per hour, a long way off the international average speed of 60 km per hour. On average, it takes 1.61 minutes/km and costs US\$2.52/km to transport a standardized shipment of goods from a warehouse to the domestic port of export (compared to, e.g., 1.07 minutes/km and US\$1.16/km in Mexico). Infrastructure deficiencies also impair import

substitution in response to supply-side shocks, resulting e.g. in bouts of food inflation that directly hurt the poor.

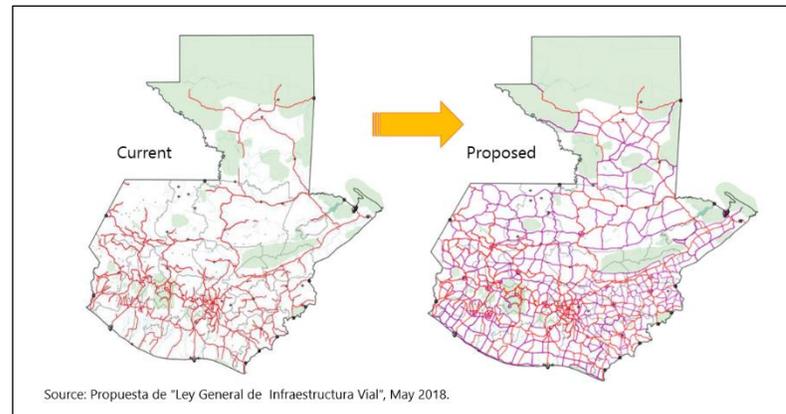
- Size of the road network.** With about 16,500 km, Guatemala’s road network provides about 1 meter of roads per inhabitant and 151 meters per square km (against 3.7 and 413 meters, respectively, in Central America, Panama and Dominican Republic, CAPDR). Since 1985, the network has been growing at about 200 km per year (vs. an objective of over 4,000 km currently needed to achieve the SDG for roads by 2030). Access to the northern part of the country, Puerto Barrios, and the area bordering Mexico from the capital is poor.



- Quality of the road network.** Approximately 46 percent of the network consists of dirt roads. This, alongside poor maintenance has led to the exponential deterioration of the network in recent years (current maintenance costs largely exceed those of five years ago).



- Envisaged challenge.** A local consultant envisions a more ambitious expansion of the roads network to about 65,000 km (Development and Investment Corporation for Central America

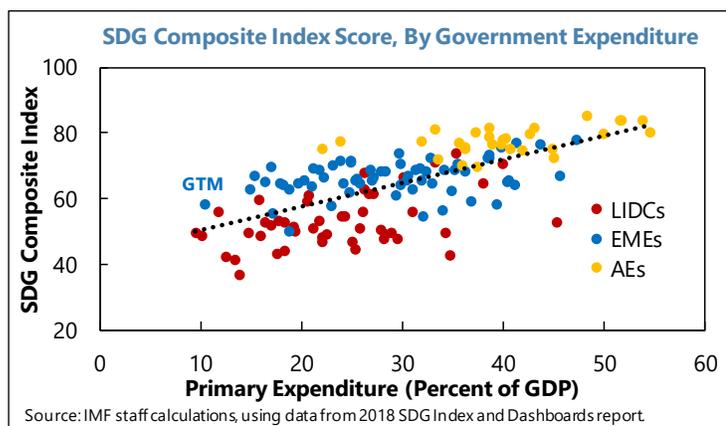


Group, *Grupo IDC*).¹⁴ The road layout would move Guatemala from the current spoke-hub system centered in Guatemala City to a new network linking the country's 10 largest cities, 22 departmental capitals, and 22,000 population centers. The primary network would connect ports and airports, border crossings, national and intermediate capitals, and tourist destinations. The secondary and tertiary networks would connect public services, such as hospitals and health centers, schools, and public safety locations with departmental capitals, towns, and villages.

31. The institutional framework for public infrastructure should be revamped. A new regulatory framework is needed to consolidate the myriad regulations in the sector, provide legal certainty on right-of-way acquisition, and the legal nature of the contract. Given the large infrastructure challenge as well as the need to reconcile private profitability with social goals for rural roads, both private and public disbursements are likely to be needed. Specific financing vehicles could include (i) conventional Public-Private Partnerships (PPPs) under the umbrella of the 2010 PPP law; and/or (ii) an overarching institutional arrangement tasked to plan, develop, maintain, and finance public roads through strengthened partnerships with the private sector. Any such financing schemes should deliver value-for-money vis-à-vis traditional procurement to minimize the potential fiscal costs and risks arising from these projects. To limit fiscal risks and secure value-for-money, consideration should be given to placing any newly created institutional arrangement inside the central government and assigning a clear mandate (and accountability) to the Minister of Finance in the approval and fiscal risk oversight of infrastructure projects.

V. FINANCING STRATEGY

32. Achieving the SDGs will require a sizable increase in total and public spending from currently low levels. Overall, additional spending needs to achieve health, education, and infrastructure goals amount to about 8½ percent of GDP in 2030. Guatemala can only achieve relevant development goals if the required financing



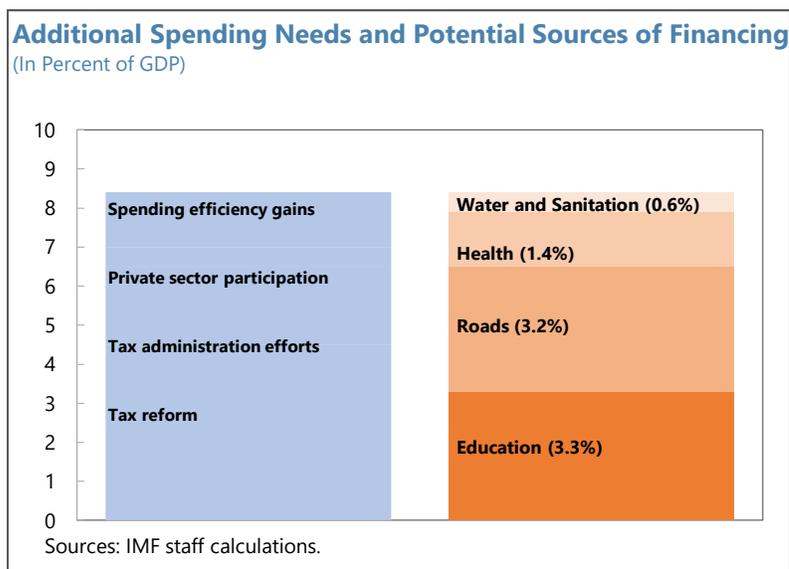
can be identified and mobilized. Public intervention is essential in these sectors. Public expenditure and tax revenue tend to rise with per capita income (Wagner, 1958). Indeed, compared to AEs, LIDCs and EMEs on average spend less on education, health, and

¹⁴ The network layout is based on a combination of the Salesman (circuit-type route between various points) and Steiner (minimum-cost route for a set of given points) connectivity methodologies. The network connects villages of 250, 1000, and 5000 inhabitants, configuring three types of national, secondary, and tertiary networks.

infrastructure, which is consistent with the latter falling behind in SDG achievements (Gaspar and others, 2019).

33. Meeting the large spending needs will require efforts on multiple fronts.

Potential sources of financing include a tax reform¹⁵, improvements in tax capacity, and spending efficiency gains. Support from the private sector would need to fill the remaining gap, hence the importance of fostering business environments where the private sector can thrive.¹⁶ Needs in each sector may lend themselves to a different



financing approach. As a matter of solidarity, it is expected that most of the additional financing for health, education, and water and sanitation services be provided publicly, given currently low provision levels for the poor, rural, and indigenous populations. Private sector participation should help fill a relatively larger part of the roads financing gap.

34. In the near term, Guatemala can use existing fiscal space to accommodate higher spending needs. Guatemala has substantial fiscal space to frontload part of the needed increase in spending on health, education, and public infrastructure through a temporary increase in the deficit without endangering debt sustainability.¹⁷ Over the medium term, this higher spending should be funded through higher revenues.

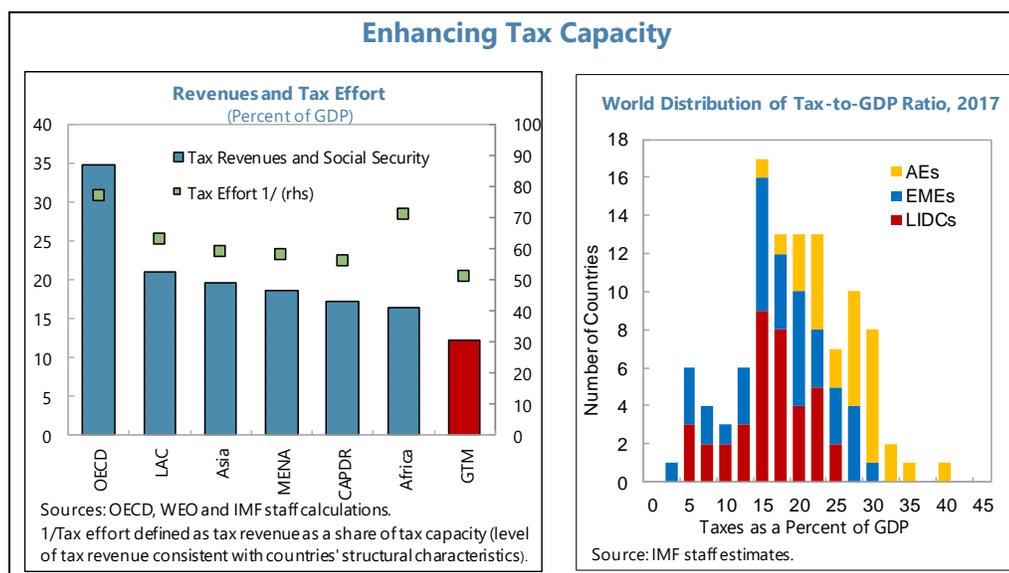
35. Over the medium term, an integral fiscal reform is needed to durably address additional spending needs. Guatemala can permanently raise revenues over the next ten years through continued tax administration efforts and a comprehensive tax reform. While development is a costly undertaking, it is expected that the private and social gains from expanded coverage of public goods far outweigh the (short-term) costs from further improvements in revenue mobilization, given extremely low levels of taxation at present (Gaspar and others, 2016; Gunter and others, 2018).

¹⁵ To ensure that the largest share of additional revenue from a tax reform goes to social spending, there is a need to tackle revenue earmarking (see paragraph 36).

¹⁶ IMF, Country Report No. 18/54, International Monetary Fund, June 2018.

¹⁷ IMF, Country Report No. 18/54, International Monetary Fund, June 2018.

- Tax administration.** Efforts should focus on reinforcing VAT controls, with an emphasis on risk-based auditing; strengthening the large-taxpayer office management; improving the use of tax information to correct non-compliance; enhancing tax collection enforcement faculties (including through easier implementation of bank secrecy provisions); and implementing a customs post-clearance audit program to deter non-compliance and facilitate trade.
- Tax reform.** Government tax revenue as a share of GDP is amongst the lowest in the world and far off Guatemala's revenue mobilizing potential and own aspirational objectives set in the 2000 Fiscal Pact. This suggests considerable room to increase domestic revenue as evidenced by an earlier technical assistance mission on tax reform for Guatemala (Appendix II).



36. Revenue mobilization should be supplemented with measures to raise spending efficiency and flexibility. Guatemala's social performance fares well relative to the small investments made in development, still improvements in spending efficiency have a role to play in filling part of the financing gap, both directly and to generate support for a broad-based tax reform. Although Guatemala stands out as one of the countries in the Latin America region where wasted spending is the lowest, inefficiencies remain in the areas of public procurement, the wage bill, and targeted transfers (Izquierdo and others, 2018, Kapsoli and Teodoru, 2017). To make the budget more responsive to spending needs, revenue earmarking and mandatory spending floors should be scaled back and spending objectives should be couched within a medium-term budget framework. Leveraging existing tools

such as the Observatory of Social Spending would greatly help to promote results-based budgeting and *ex-post* evaluation of program performance. Better aligning pay with performance in the provision of public services and reforming current regulations of the Laws on the Civil Service and Salaries in Public Administration will be important milestones. Completing the public-sector personnel census should help make the hiring of public officials more transparent and provide for a better cost-benefit assessment of the current structure of public employment.¹⁸

37. Private sector participation could also help fill the financing gap. Guatemala's Public-Private Partnership law holds the promise of increasing private sector participation to mobilize additional financing for investment in infrastructure. Guatemala will need to ensure this financing scheme delivers value-for-money vis-à-vis traditional procurement all the while limiting contingent fiscal risks arising from these projects. Spending in crucial areas for growth and development should in turn improve debt sustainability.

38. In parallel, attention should be focused on improving the execution of spending. Reforms of the Procurement Law, adopted over the past two years, have facilitated greater oversight over public spending and contributed to tackling corruption. However, as a side-effect, these improvements have led to a slower execution of spending. Efforts are underway to expedite those projects carried over from the previous year and to provide greater clarity for how Comptroller auditors will apply administrative versus criminal procedures in procurement. Additional measures could speed up budget execution, without diluting the focus on governance, by (i) shifting the General Comptroller's activities towards the development of preventive capacities and concurrent auditing; (ii) providing a clear interpretation of the norms applied to procurement and apply unified criteria to protect public employees from arbitrary decisions by auditors; and (iii) adopting a medium-term budget framework that would include a national investment strategy that is embedded within a multi-year investment budget.

VI. CONCLUSION

39. Guatemala made some progress towards meeting the MDGs. The MDGs provided an important set of targets to securing progress towards better health and education outcomes. As a result, by 2015, the goal year of the MDGs, the prevalence of underweight and mortality in under-five children were more than halved from their 1990 level, the incidence of malaria was significantly reduced, and the literacy rate among the youth aged 15–24 increased to over 93 percent. However, Guatemala made less headway, or even lost ground, in other development indicators, such as maternal mortality or school enrollment in preprimary and secondary education. In all, further efforts are needed for Guatemala to

¹⁸ Support is being provided by the European Union and the World Bank, with the CICIG as an observer. The census aims, *inter alia*, to identify and eliminate ghost positions in the public administration.

eradicate poverty, a major milestone, and to secure access of healthcare, education, water and sanitation, and road infrastructure services to all Guatemalans.

40. The additional spending consistent with good performance in human and physical capital related SDGs is sizable. Guatemala faces additional spending of about 8½ percent of GDP in 2030 to attain health, education, and roads, water, and sanitation infrastructure SDG goals. The costing exercise suggests that the cost of pursuing better education and roads infrastructure outcomes could be significantly higher at about 3.3 and 3.2 percent of GDP in 2030, respectively. The analysis also suggests that an increase of 1.4 and 0.6 percent of GDP in 2030 in health and water and sanitation infrastructure spending, respectively, would be consistent with good performance in these areas. While substantial, these cost estimates should be commensurate with a financing strategy encompassing continuing tax administration efforts, broad-based tax reform, scaled-up private sector participation, and greater spending efficiency.

41. Ensuring a supportive institutional environment is crucial to attain the desired SDG outcomes. Development challenges for Guatemala go beyond ramping up spending, and further require important institutional changes to enhance delivery capacities to move away from the pervasive segmentation in the provision of public goods and secure their secure access to all Guatemalans. As such, development primarily involves a major societal shift in expectations that underscores the medium-term growth potential and social progress to be unleashed through enhanced solidarity. The seeds for such a change in Guatemala are planted in the Constitution, the 1996 Peace Accords, and the 2000 Fiscal Pact. The K'atun 2032 National Development Plan constitutes a signal of national ownership and commitment to development, but more determined efforts are needed to meaningfully improve Guatemalan's living standards.

APPENDIX I. COSTING METHODOLOGY

The costing exercise focuses on education, health, and selected areas of infrastructure (roads and water and sanitation). The methodology follows Gaspar and others (2019). The estimations consider Guatemala's projections for economic growth and demographics. The exercise aims to estimate the cost of inputs needed to support good outcomes in these different sectors, independent of the form of financing. Our estimates account for spending efficiency as high-performing countries used as benchmarks spend more efficiently than other countries in the same income group. Our estimates also account for intersectoral synergies, to the extent that high performers in one sector (such as education) are likely to achieve high outcomes in others (such as health).

Education. We estimate the cost of setting key parameters (teacher salaries, pupils per teachers, and share of non-compensation expenses) in 2030 equal to the median values observed today in good performing countries (those that exceed 80 in the SDG education index) with GDP per capita between \$3,000 and \$6,000 in 2016.

Health. We estimate the cost of setting key parameters (medical personnel, doctors and other medical personnel per population, share of non-compensation expenses) in 2030 equal to the median values observed today in good performing countries (those that exceed 70 in the SDG health index) with GDP between \$3,000 and \$6,000 in 2016.

Roads. Using regression analysis, we estimate the additional kilometers of roads that will be needed to account for: i) projected changes in population and GDP per capita over 2016–2030, and ii) ensuring access for all (proxied by raising the Rural Access Index to 90 percent). The cost of the additional road network is estimated assuming a cost per kilometer of \$800,000. To account for depreciation, we add five percent of the total cost of the additional kilometers.

Water. We use the World Bank methodology, which estimates population in need of basic and improved access to water and sanitation (Hutton and Varughese, 2016).

Adjustments for Guatemala. We discussed the estimates with country authorities and development partners to validate the methodology. Reflecting these discussions, we adjusted the number of medical professionals to reflect administrative data, and updated the road infrastructure needs (we use the average from the methodology and the local estimates as the baseline) and cost (to \$800,000 per kilometer to reflect local estimates).

We summarize the results as additional spending in 2030. For education and health care, we report additional spending in percentage points of GDP, corresponding to the difference between the share of GDP in spending consistent with high performance in 2030 and the current level of spending as a share of GDP. For physical capital, additional spending in percentage points of GDP corresponds to the annualized spending required to close infrastructure gaps between 2019 and 2030.

APPENDIX II. FINANCING STRATEGY: TAX REFORM OPTIONS

A technical assistance mission on tax reform for Guatemala conducted in 2016 identified significant additional potential revenue from tax policy reform as summarized in Table AII below.

Table AII. Tax Reform Options
(Percent of GDP)

Options	Fiscal yield
Increase in VAT to 15 percent	1.20
Use three rates for ISRPI 7.5; 20; 32.5%	0.90
Increase ISC rates on gasoline (30%) and diesel (60%)	0.40
Increase ISRAL rate by 3 percentage points, as part of a comprehensive reform	0.40
Introduce ISC for telecommunications (10% rate)	0.20
Include ISC in VAT base	0.15
Apply dual regime only to natural persons at 10%	0.10
Introduce banking VAT (FAT)	0.05
Increase ISC on non-alcoholic beverages	0.05
Phase out IUSI deductions on ISO	0.05
Total	3.50

Source: Fenochietto and others, 2016.

Note: VAT stands for Value Added Taxes (Impuesto al Valor Agregado), ISRPI stands for personal income tax (Impuesto sobre la Renta de Personas Individuales), ISC for consumption taxes (Impuestos Selectivos al Consumo), and IUSI for property tax (Impuesto Único Sobre Inmuebles). In order to reach 4½ percent of GDP of additional revenues from tax reform, further measures equivalent to 1 percent of GDP should be identified.

REFERENCES

- Acosta P., R. Almeida y C. Lao Peña, 2016, “Guatemala. Estudio de gasto público social y sus instituciones: educación, salud, protección social y empleo,” Grupo Banco Mundial.
- Anand, R., S. Mishra, and S. J. Peiris, 2013, “Inclusive Growth Revisited: Measurement and Determinants,” Economic Premise, No. 122, The World Bank.
- Azurdia P., 2011, *Plan de desarrollo de infraestructura de las instituciones educativas*. Guatemala.
- Bowser, D. M. and Mahal, A., 2011, “Guatemala: The economic burden of illness and health system implications,” Health Policy, Elsevier, vol. 100(2), pages 159-66.
- Davies, A., 2009, “Human Development and the Optimal Size of Government,” Journal of Socioeconomics, 2009, 35(5): 868-76.
- Empresarios por la Educación (s.d.). *La infraestructura escolar*. Guatemala.
- Fenochietto, R., V. Flamini, E. Morales and C. Pérez Trejo, 2016, “Improving Tax Collection with Equity and Efficiency,” IMF, Technical Assistance Report.
- Garcia-Escribano, M., D. Prady, and M. Soto, 2018, “Fiscal Policy and Development: Spending Needs for Achieving Selected SDGs,” Methodological Note, (<https://imf.org/~media/Files/Topics/SDG/imf-sdg-note-methodology.ashx?la=en>).
- Gaspar, V., L. Jaramillo, and P. Wingender, 2016, “Tax Capacity and Growth: Is There a Tipping Point,” Working Paper 16/234, Washington D.C.: International Monetary Fund.
- Gaspar, V., D. Amoglobeli, M. Garcia-Escribano, D. Prady, and M. Soto, 2019, “Fiscal Policy and Development: Human, Social and Physical Investment for the SDGs,” Staff Discussion Note 19/03, Washington D.C.: International Monetary Fund.
- Gunter, S., D. Riera-Crichton, C. Vegh, and G. Vuletin, 2018, “Non-Linear Effects of Tax Changes on Output: The Role of the Initial Level of Taxation,” Policy Research Working Paper; No. 8668. World Bank, Washington, DC.
- Hutton, G. and M. Varughese, 2016, “The Costs of Meeting the 2030 Sustainable Development Goal Targets on Drinking Water, Sanitation, and Hygiene,” Water and Sanitation Program: Technical Paper. World Bank, Washington, DC. http://www.wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2016/02/08/090224b08415bdca/1_0/Rendered/PDF/The0costs0of0m0itation00and0hygiene.pdf

- ICEFI, 2011, “Un análisis sobre los mecanismos, costos y formas de financiamiento para eliminar la exclusión educativa en Guatemala, 2012-21,” Contamos ¿En dónde están los ausentes?, Boletín No. 5, Instituto Centroamericano de Estudios Fiscales.
- Izquierdo, A., C. Pessino, and G. Vuletin, 2018, “Mejor Gasto para Mejores Vidas: Como América Latina y el Caribe puede hacer más con menos,” Banco Interamericano de Desarrollo, 2016.
- Kapsoli, J. and I. Teodoru, 2017, “Benchmarking Social Spending Using Efficiency Frontiers,” IMF Working Papers No. 17/197, Washington DC: International Monetary Fund.
- Karras, G., 1997, “On the Optimal Government Size in Europe: Theory and Empirical Evidence,” The Manchester School LXV, No. 3, 280-294.
- Manuel, M., H. Desai, E. Samman, and M. Evans. 2018, “Financing the End of Extreme Poverty,” [Overseas Development Institute Report](#).
- OECD, 2017, “Promising Practices in Supporting Indigenous Students Success,” Directorate for Education and Skills, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264279421-en>
- Ortega, M., 2012, Auditoria social 2012. Guatemala. Asociación de Investigación de Estudios Sociales.
- Peden, E.A., 1991, “Productivity in the United States and its relationship to government activity: An analysis of 57 years, 1929-1986,” Public Choice, no. 69, 153-173.
- Schmidt-Traub, G., 2015, “Investment Needs to Achieve the Sustainable Development Goals, Understanding the Billions and Trillions,” Sustainable Development Solutions Network-A Global Initiative for the United Nations Working Paper, Version 2.
- Spross de Ribera V., and M. Abascal de Schwendener, 2015, “El estado de las políticas públicas, docentes,” Informes de Seguimiento PREAL, Centro de Investigaciones Económicas Nacionales, CIEN and Inter-American Dialogue.
- United Nations Conference on Trade and Development, 2014, “World Investment Report, Investing in the SDGs: An Action Plan,” United Nations.
- USAID | DELIVER, 2014, “Llevando medicamentos a toda la población”.
- USAID, 2015, “Experiencias y Oportunidades de Compras Conjuntas en Guatemala”.
- World Bank, 2015, Water Supply and Sanitation in Indonesia: Turning Finance into Service for the Future. World Bank, Washington, DC.

- , 2016, *The Costs of Meeting the 2030 Sustainable Development Goal Targets on Drinking Water, Sanitation, and Hygiene*. World Bank, Washington, DC.
- , 2017, *Reducing Inequalities in Water Supply, Sanitation, and Hygiene in the Era of the Sustainable Development Goals Synthesis Report of the WASH Poverty Diagnostic Initiative*. World Bank, Washington, DC.
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