

Brazil Human Capital Review

Investing in People



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Foreword



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Human capital formation is an urgent agenda. The reasons abound. Human capital fosters long-lasting benefits, unfolds new horizons, spurs talent and creativity in society. In the last two years, the COVID-19 pandemic has had detrimental impacts across the globe in education and health, which are components necessary for human capital accumulation. Brazil – in particular its vulnerable populations – was among the most severely affected by the pandemic. In face of these consequences, the question is how to rebuild a stronger country, accelerate inclusive growth, and ensure that lessons were learned from this crisis. The Brazil Human Capital Review (BHCR) argues that more and better investments in people is the best way to respond to this global emergency.

A significant challenge for Brazil and for most Latin American countries is to improve conditions that will allow children to flourish and develop their potential. Before the pandemic, the BHCR estimated that a child born in 2019 was only able to achieve 60 percent of their human capital potential. This report takes a closer look at this number and shows where urgent actions are needed by mapping the different levels of human capital in “many Brazils”; it identifies when particular municipalities started to fall behind in “better but unequal;” it elucidates who requires special attention by disaggregating the human capital differences by gender, race, race-gender in “many inequalities”; and how much human capital is actually been absorbed by the labor market in “talent at work.”

This report also documents the effects of a pandemic with multiple layers, and various overlapping crises on every stage of human capital formation. The overall impacts are considerable. It is estimated that Brazil has lost a decade of progress in human capital accumulation over the past two years. The BHCR shows the urgent need to counterbalance these effects and recommends that Brazil: (i) bolsters existing policies that have proven to be successful; (ii) learns how to replicate its own successful cases; (iii) augments resilience in management systems; and (iv) makes learning recovery its utmost priority. In the coming years, the government must unify actions towards the objective of fostering human capital formation and reassuring wellbeing in order to safeguard the productivity of the next generation of workers.

Although the road to recovery is likely to be long, it can be seen as an opportunity to reshape the future. The Brazil Human Capital Review attempts to outline a path towards recovery and can be a valuable source of information not just for Brazil but also for other Latin America countries. The World Bank Group is liaising with federal, state, and municipal governments in Brazil to participate in this discussion on recovery and to disseminate the key findings of this report. Our commitment is ultimately to ensure that all children have the opportunity to unlock their full potential.

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Acronyms List

ACRONYMS	NAME
AE	Emergency Aid (Auxílio Emergencial)
APGAR	Newborn Health Assessment
BFHI	Baby-Friendly Hospital Initiative
BHCR	Brazil Human Capital Review
BLH-BR	Brazilian Network of Human Milk Banks (Rede Brasileira de Bancos de Leite Humano)
BNCC	National Common Curriculum Base (Base Nacional Curricular Comum)
BPC	Continuous Cash Transfer Benefit (Benefício de Prestação Continuada)
CCT	Conditional Cash Transfer Program
CIEE	Company Integration Center School (Centro de Integração Empresa-Escola)
CLT	Consolidation of Labor Laws (Consolidação das Leis do Trabalho)
CONASS	National Council of Health Secretaries (Conselho Nacional de Secretários de Saúde)
COVID19-	Coronavirus disease 2019
CNAS	National Social Assistance Council (Conselho Nacional de Assistência Social)
CRAS	Reference Center for Social Assistance (Centro de Referência da Assistência Social)
CREAS	Specialized Reference Center for Social Assistance (Centro de Referência Especializado de Assistência Social)
DATASUS	Information Technology Department of the Unified Health System (Sistema de informática do Sistema Único de Saúde)
ECD	Early Childhood Development
ECLAC	Economic Commission for Latin America and the Caribbean
ECE	Early Childhood Education
ENEM	National High School Exam (Exame Nacional do Ensino Médio)
ENTRE	National Strategy for Successful Transition (Estrategia Nacional para la Transición Exitosa)
EYS	Expected Years of School
FCHM	Family and Community Health Medicine
FGV	Fundacao Getulio Vargas

ESF/FHS	Family Health Strategy Program (Estratégia Saúde da Família)
FIHF	Fraternity International Humanitarian Federation
FUNDEB	National Fund for the Development of Basic Education (Fundo Nacional de Desenvolvimento da Educação Básica)
FUNDEF	Fund for Maintenance and Development for Primary Education and the Appreciation of Teaching (Fundo de Manutenção e Desenvolvimento do Ensino Fundamental e de Valorização do Magistério)
GBV	Gender-based Violence
GDP	Gross domestic product
GERES	Longitudinal Study of the School Generation (Estudo Longitudinal da Geração Escolar)
HIV/AIDS	Human immunodeficiency virus/ Acquired immunodeficiency syndrome
HCI	Human Capital Index
HPV	Human papillomavirus
HLO	Harmonized Learning Outcomes
IBGE	Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística)
ICT	Information Communication Technology
ICU	Intensive Care Unit
IDEB	Basic Education Development Index (Índice de Desenvolvimento da Educação Básica)
IHME	Institute of Health Metrics and Evaluation
ILO	International Labor Organization
IMF	International Monetary Fund
IMDS	Mobility and Social Development Institute
INAMPS	National Institute of Medical Assistance and Social Security (Instituto Nacional de Assistência Médica da Previdência Social)
INEP	Brazilian National Institute of Educational Research and Studies (Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira)
IPV	Intimate Partner Violence
JME	Joint child malnutrition estimates
LAC	Latin America and the Caribbean
LAYS	Learning-Adjusted Years of School
LMP	Maria da Penha Law (Lei Maria da Penha)
LLECE	Latin American Laboratory for Assessment of the Quality of Education
NCDs	Noncommunicable diseases
NEET	Not in Education, Employment, or Training
NEM	New Secondary School (Novo Ensino Médio)

NGO	Non-governmental organization
OECD	Organisation for Economic Co-operation and Development
PAA	The Food Acquisition Program (Programa de Aquisição de Alimentos)
PADIN	Child Development Support Program (Programa de Apoio ao Desenvolvimento Infantil)
PAEFI	Protection and Specialized Care for Families and Individuals (Proteção e Atendimento Especializado a Famílias e Indivíduos)
PAIC	Pact for Literacy at the Right Age (Pacto pela Alfabetização na Idade Certa)
PAIF	Comprehensive Family Care Program (Programa de Atenção Integral à Família)
PASEC	Program for the Analysis of Education Systems
PBF/BFP	Family Aid Program (Programa Bolsa Família)
PCF	Happy Children Program (Programa Criança Feliz)
PCSVDF	Socioeconomic Conditions and Domestic and Family Violence against Women Survey (Pesquisa de Condições Socioeconômicas e Violência Doméstica e Familiar contra a Mulher)
PDDE	Direct Cash for Schools Program (Programa Dinheiro Direto na Escola)
PHC	Primary Healthcare
PILNA	Pacific Island Learning and Numeracy Assessment
PIM	Early Childhood Better (Primeira Infância Melhor)
PIRLS	Progress in International Reading Literacy Study
PISA	Programme for International Student Assessment
PNAD	National Household Sample Survey (Pesquisa Nacional por Amostra de Domicílio)
PNADC	Continuous National Household Sample Survey (Pesquisa Nacional por Amostra de Domicílio Contínua)
PNAE	National School Feeding Program (Programa Nacional de Alimentação Escolar)
PNAS	National Social Assistance Policy (Plano Nacional de Assistência Social)
PNLD	National Textbook Program (Programa Nacional do Livro Didático)
PNPM	National Plans of Policies for Women (Plano Nacional de Políticas para Mulheres)
PPP	Purchasing power parity
ProBNCC	Support Program for the Implementation of the National Curricular Common Base (Programa de Apoio à Implementação da Base Nacional Comum Curricular)
PSC	Provision of Services to the Community (Prestação de Serviços à Comunidade)
PWDs	Persons with Disabilities
NEM	New High School (Novo Ensino Médio)
RAIS	Annual Report on Social Information (Relação Anual de Informações Sociais)
RSE	Relationship and Sex Education

SACMEQ	Southern and Eastern Africa Consortium for Monitoring Educational Quality
SAEB	National Basic Education Assessment System (Sistema de Avaliação da Educação Básica)
SDI	Socio-demographic-index
SEPPIR	Special Secretariat for the Promotion of Racial Equality (Secretaria Nacional de Políticas de Promoção da Igualdade Racial)
SES	Socioeconomic Status
SIM	Mortality Information System (Sistema de Informação sobre Mortalidade)
SINASC	Live Birth Information System (Sistema de Informações sobre Nascidos Vivos)
SNAS	National Secretariat of Social Assistance (Secretaria Nacional de Assistência Social)
SNPM	National Women Policy Secretariat (Secretaria Nacional de Políticas para as Mulheres)
SRAG	Severe Acute Respiratory Syndrome Surveillance
STEM	Science, Technology, Engineering, and Mathematics
STI	Sexually transmitted infections
SUAS	Unified Social Assistance System (Sistema Único de Assistência Social)
SUS	Unified Health System (Sistema Único de Saúde)
TaRL	Teaching at the Right Level
TIC Domicílios	Information Communication Technology (Tecnologia da Informação e Comunicação)
TCU	Federal General Accounting Office (Tribunal de Contas da União)
TIMSS	Trends in International Mathematics and Science Study
TJDFT	Court of Justice of the Federal District and Territories (Tribunal de Justiça do Distrito Federal e dos Territórios)
UHCI	Utilized Human Capital Index
UHC	Universal Health Coverage
US	United States
UN Women	United Nations Women
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNHCR	United Nations High Commissioner for Refugees
UNODC	United Nations Office on Drugs and Crime
UNICEF	United Nations International Children's Emergency Fund
WG-SS	Washington Group Short Set on Functioning
WHO	World Health Organization

Executive Summary

Investing in People

João has lived on the streets for as long as he can recall. Throughout his childhood, he never went to school, never had a proper roof over his head, nor anyone to call family: *"Streets are my classroom, my shelter, and my comfort."* The generosity of strangers sometimes brings relief to his hunger, but only sometimes. The rest of the time, João uses his talent as a means to survive. Using half-broken materials in his usual strategic spot, he needs to be perfect: the portrait must be ready precisely when his unwitting model is walking past; a few seconds too late and all is lost. Alert, curious, and resilient, João never misses a detail. *"This looks exactly like me!"* says an old pedestrian beholding his new portrait. *"But where does all this skill come from?"* João is constantly asked. *"From an empty belly,"* is his typical answer. *"Imagine if you had the opportunity to develop this talent, child..."*

Not far away, Bela leaves her fourth job interview with a disappointing response. Once again,

How much talent is lost in Brazil?

she is left with the same feeling: *"I could have contributed so much!"* The first of her family to go to college, the last to leave the study room, Bela was the most talented student of her cohort. She had excellent grades, glowing references, and even learned a foreign language on her own. *"It seems so easy for others."* At home, she is the role model for her two little brothers. At school, she proved to her classmates that a Black woman can be an engineer. But when looking for jobs, she hears, *"You do not have the profile we are looking for."* Flexible, Bela does not mind working long hours or travelling if necessary, but still she finds nothing. Sometimes she wonders if she should be listening to advice of others, *"Maybe this is not for you, Bela."* But she has difficulty accepting this, *"What if you are all wrong?"*

The *Brazil Human Capital Review* (BHCR) is a story about lost talent in Brazil. It discusses the anecdotal "ifs" in the lives of João and Bela by analyzing the circumstances in which children are unable to realize their full potential. It poses the question: what would happen to labor productivity if Brazil were to offer quality education and health to every child, in every part of the country? It also asks: how can the gap between ideal circumstances and what is actually achieved be reconciled?

The BHCR was undertaken as a part of the Human Capital Project, a global initiative of the World Bank Group that aims to alert governments to the importance of investing in people. *Evidence justifies this approach.* For example, shocks in human capital a century ago due to settlement policies continue to have significant impacts on current development in Brazil. Analyzing trends in human capital accumulation also helps to explain why income inequality is historically high and points to why the average Brazilian remains in poverty over multiple generations.¹

The HCI estimates the future productivity of the next generation of workers.

Measurement as a first step of action. The story of lost talent starts by using a new indicator to track progress towards human capital accumulation in Brazil at the municipal level: the Human Capital Index (HCI). The HCI estimates the expected productivity of a child

born today by the age of 18 in a context where education and health conditions remain the same. This framework contributes to policy dialogue in fundamental ways. First, the HCI is a prospective measure. It calculates the expected productivity of the next generation of workers if current circumstances persist.

Higher HCIs today mean higher labor productivity in the future. Secondly, it is straightforward: only key aspects of skills formation are considered. Third, the HCI has a clear narrative around lifecycle: at birth, children need to survive; during childhood, they need to be well-nourished; at school age, they must complete all schooling and active adequate learning levels; and in adulthood, they need to stay in good health. Fourth, the HCI is output-oriented. It combines mortality and stunting rates, expected years of school (EYS), harmonized learning outcomes (HLO),² and adult survival rates in a single index to emphasize outputs rather than inputs. Fifth, the HCI has a clear and simple objective. It does not intend to measure social welfare or to summarize any intrinsic value in human life, but rather proposes an estimate of future productivity if current conditions persist.

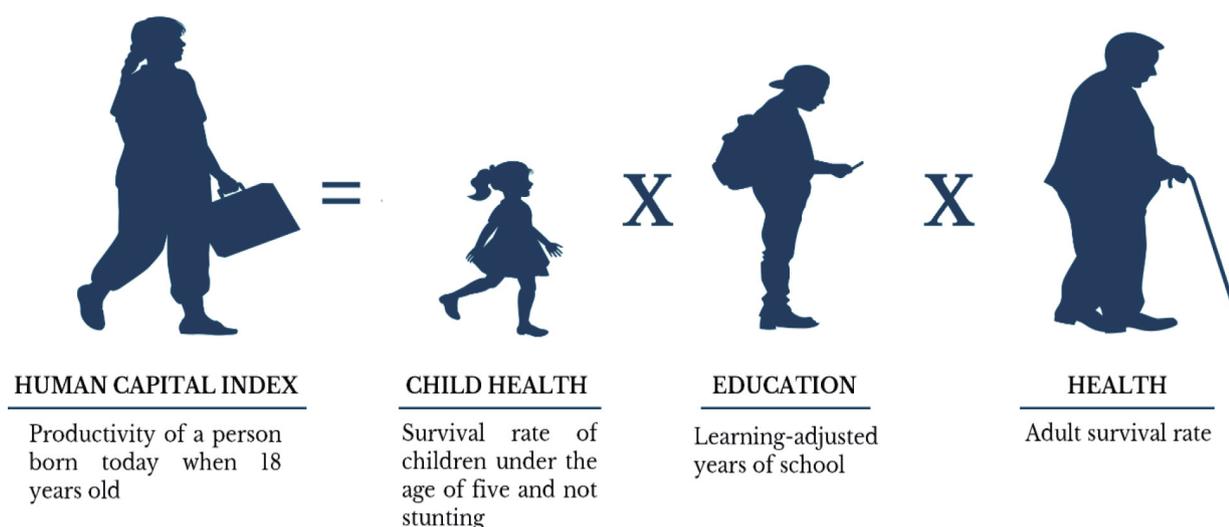


Figure ES.1 The Human Capital Index

The estimates produce a simple final result: the HCI ranges between 0 and 1. A location where an average child has no risk of being stunted or dying before the age of five, receives high-quality education, and becomes a healthy adult, would have an HCI close to 1. Conversely, when the risk of being ill-nourished or prematurely dying is high, access to education is limited, and quality of learning is low, the HCI would approach zero. *Measurement as a first step of action.* The first key message of this report is that an average Brazilian born in 2019 achieved 60 percent (HCI of 0.60) of their potential human capital by the age 18. *Forty percent of all talent in Brazil is undeveloped and invisible to society.*

A Brazilian child born in 2019 achieved only 60% of their full potential.

¹ Rocha et al., 2017; Souza, 2018; Hanushek, Ludger, and Woessmann, 2012; OECD, 2018.

² The expected years of school (EYS) is the expected number of years in school that a child achieves by age 18 if repetition and dropout rates remain unaltered across basic education. The harmonized learning outcomes (HLO) averages the fraction of students scoring above advanced thresholds in mathematics and Portuguese using *Sistema de Avaliação da Educação Básica* (SAEB) data.

Many Brazils. However, the national average only tells us a minor part of the whole story. An HCI equal to 60 percent hides local and regional inequalities in human capital accumulation. Disaggregating the HCI at the municipal level reveals a second key message: *many Brazils coexist inside Brazil*. Mapping the HCIs produces a clear snapshot of regional inequality in Brazil: children born in municipalities in North and Northeast Brazil develop approximately half of their full potential talent – or 10 percentage points (0.1 HCI points) less than an average child in a municipality in the Southeast.³

One illustration of “many Brazils” can be found in Rio Grande do Sul (South). In this state, 250 kilometers and 0.3 HCI points separate Santa Tereza (HCI 0.767) and Engenho Velho (HCI 0.472). *Relatively close geographically but far apart in terms of human capital formation*. Similarly, in the Northeast, the city of Ibirataia in Bahia has an HCI equivalent to Gabon, while Cocal dos Alves (HCI 0.74) in Piauí topped the national rank 2019 with an HCI comparable to Italy. The education component explains two-thirds of this variation in municipal HCIs, 77.3 percent only in the Northeast.

Many Brazils

The Geography of Human Capital in Brazil, 2019

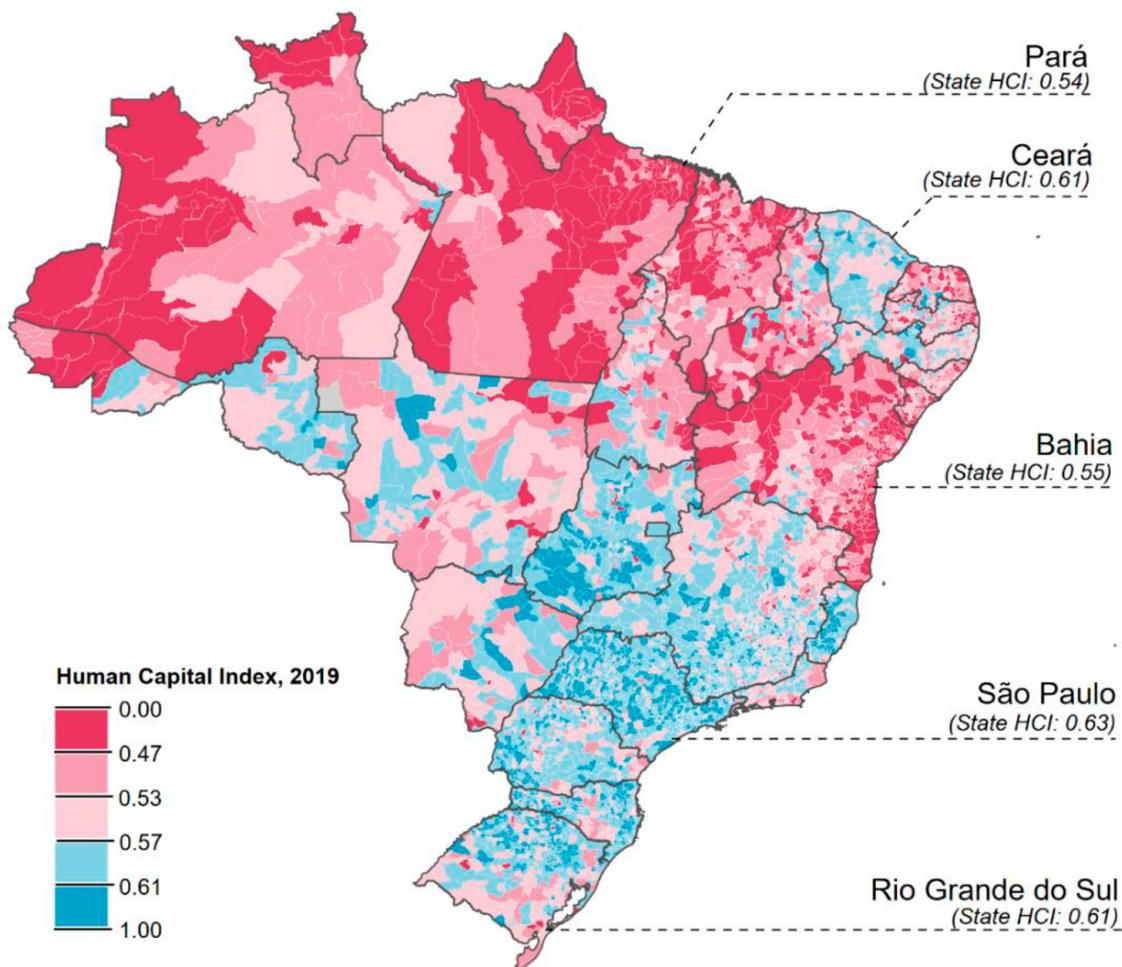


Figure ES.2 Many Brazils

Better but Unequal. While the idea of “many Brazils” captures the disparities in future productivity at a given point in time, a missing part of our story relates to the evolution of human capital formation in Brazil. Investigating this aspect brings us to the BHCR’s third key message, which is that even if the HCI of Brazil continues on the same trajectory of growth seen between 2007 and 2019, it would take 60 years to reach the 2019 HCI scores of developed countries. *There is no time to waste*. Data shows

³ In 2007, the expected years of schooling was the main factor explaining HCI variation, losing importance to harmonized learning outcomes in the following years (2013-2019).

that human capital progress has been slow, unbalanced, and unequal. This leaves the question: does the map of “many Brazils” represent an improvement or deterioration of human capital in recent years? The following three questions expand the issue in an attempt to map the characteristics of HCI growth in Brazil.

Brazil would need 60 years to achieve the current HCI of developed countries.

Are low-performing regions catching up to regions with higher HCI levels? The short answer is, in general, no. Gains have been limited, and regional inequality persists. For example, the average 2019 HCI in the North and Northeast regions is similar to the average 2007 HCI in the South, Southeast, and Center-West, which represents a 12-year regional gap. *Better but unequal.* At the municipal level, the situation is slightly better. Municipalities that were originally behind in 2007 tended to improve more quickly. To be precise, an HCI score that was one percent lower in 2007 correlated with a 0.5 percent higher gain in HCI between 2007 and 2019. This pattern was also found in state capitals. State capitals at the bottom of HCI rankings in 2007 tended to have higher gains in the following 12 years compared to those that were ranked at the top. *Starting behind but improving faster.*

Better but Unequal

Human Capital Indexes by Region from 2007 to 2019

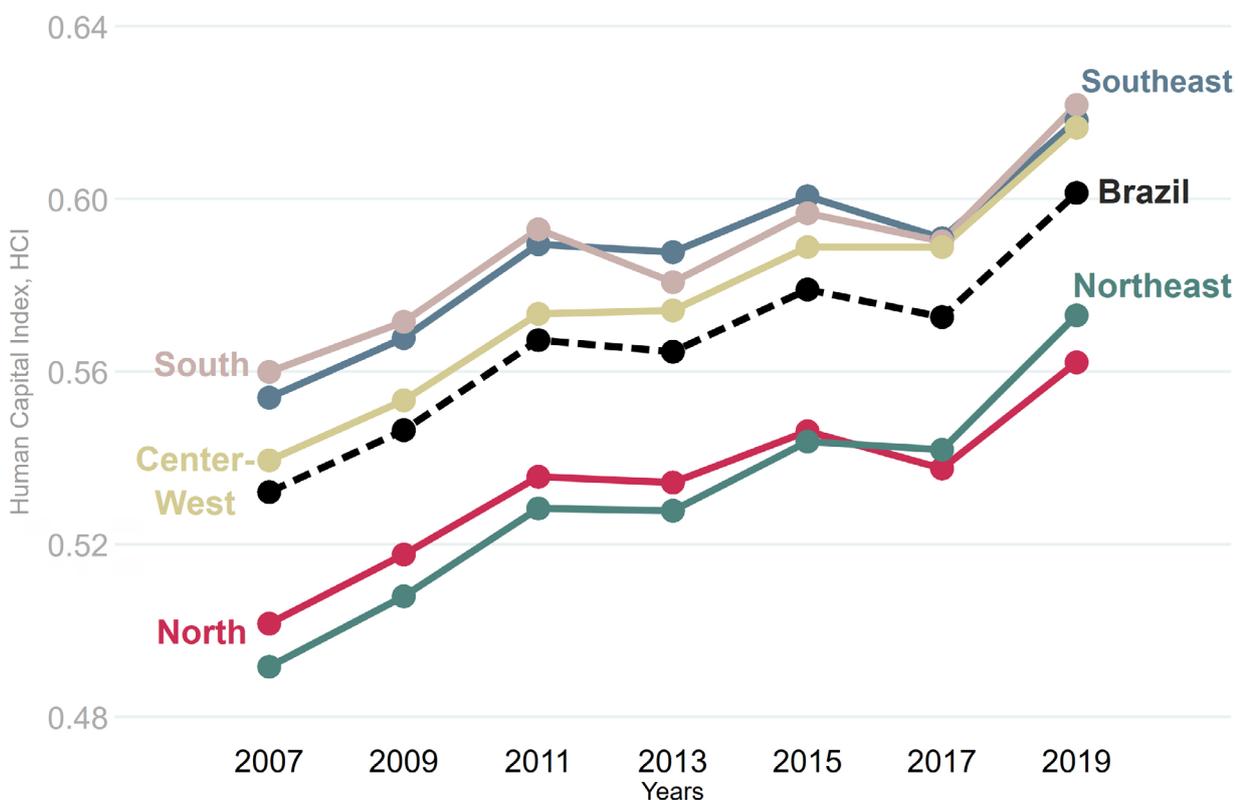


Figure ES.3 Better but Unequal

Are these HCI gains in Figure ES.3 geographically concentrated? The most notable HCI growth was concentrated among municipalities in the Northeast, particularly in the states of Pernambuco (25.6 percent gain), Alagoas (20.9 percent gain), and Ceará (20.9 percent gain). Very few areas in the South and Southeast witnessed similar growth. The North was the lowest performer, and municipalities located in Amapá, Roraima, and Tocantins in particular showed the lowest improvements in HCI scores. *Children in the North are not only behind but are accumulating human capital at a slower pace.*

The Geography of Human Capital Gain in Brazil

% Change in the HCI, 2007-2019

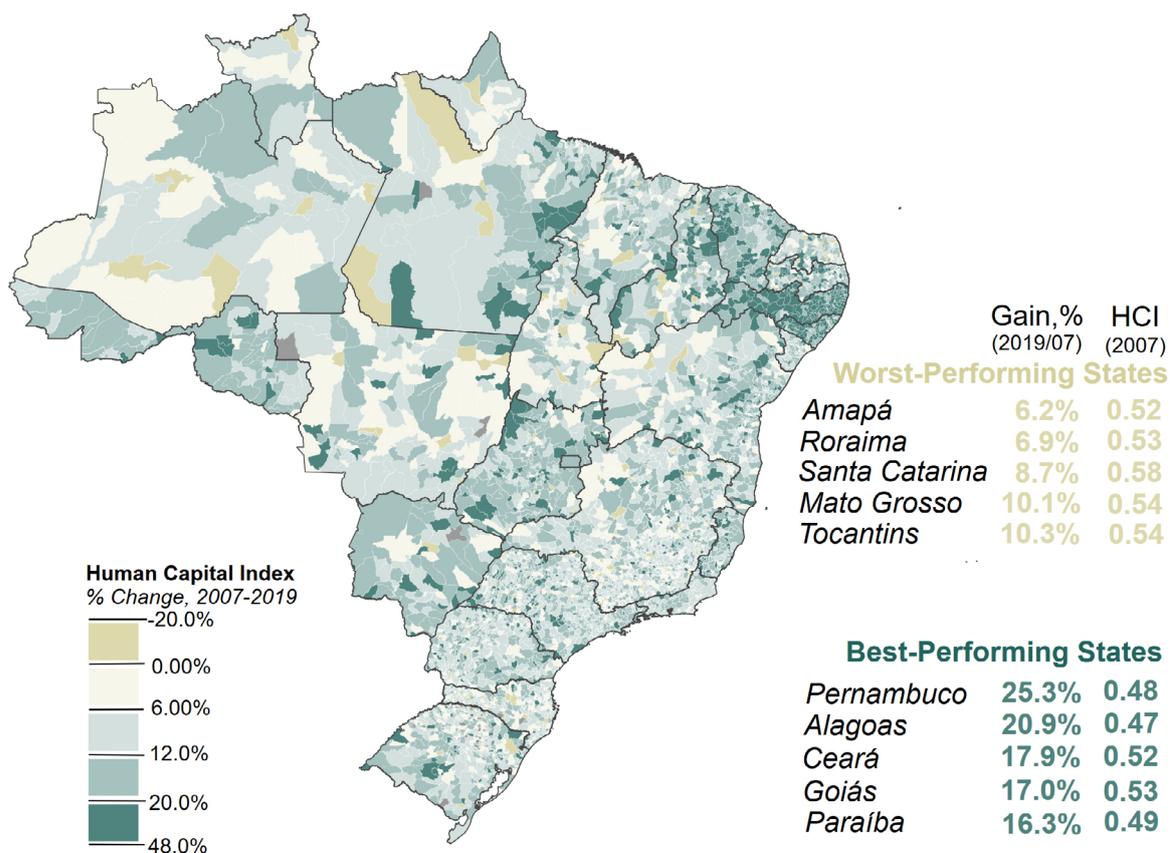


Figure ES.4 The Geography of Human Capital Gain in Brazil

Do top-ranking municipalities remain at the top 12 years later? The last question addresses HCI mobility. Data shows that at least 40 percent of all 5,570 municipalities in Brazil stayed in the same HCI quintile between 2007 and 2019. Additionally, less than 0.5 percent of the municipalities climbed from the bottom to the top or fell from the top to the bottom quintiles. *Once at the top, almost always at the top.* Of all the municipalities, 11.3 percent (of a 20 percent maximum) of those in the top quintile in 2007 remained at the top in 2019. Similarly, 10.9 percent of the municipalities (of a 20 percent maximum) that were in the lowest quintile in 2007 remained at the bottom in 2019. These results indicate that most of the human capital mobility in Brazil occurs in the middle of the HCI distribution.

Many Inequalities. *Geography and time give a rough outline of the face of the “many Brazils.”* Understanding the underlying barriers to human capital formation in Brazil requires further investigation. Therefore, the next part of the BHCRC looks at gender, race, and race-gender inequality. *Many Inequalities.* The positive trajectory in HCI accumulation loses significance if the opportunities to flourish are significantly unequal among different groups of people and if inequalities are widening over time.

The first inequality examined is gender. Here, the key message is that women accumulate more human capital than men by the age of 18. On average, women’s HCI is 7 percentage points higher than men’s (0.60 vs. 0.53). While men’s expected productivity at age 18 in 2017 was 54 percent of their full potential, women’s HCI had already reached 56 percent ten years earlier (2007). *Women are at least a decade ahead of men.* This is not an isolated finding: women have higher HCIs than men in virtually all municipalities in Brazil. *Not just better, better everywhere.*

Women reach the labor market with higher human capital than men.

Once at the Top, Almost Always at the Top

100 x (Number of Municipalities in Each Quintile/Total Number of Municipalities)

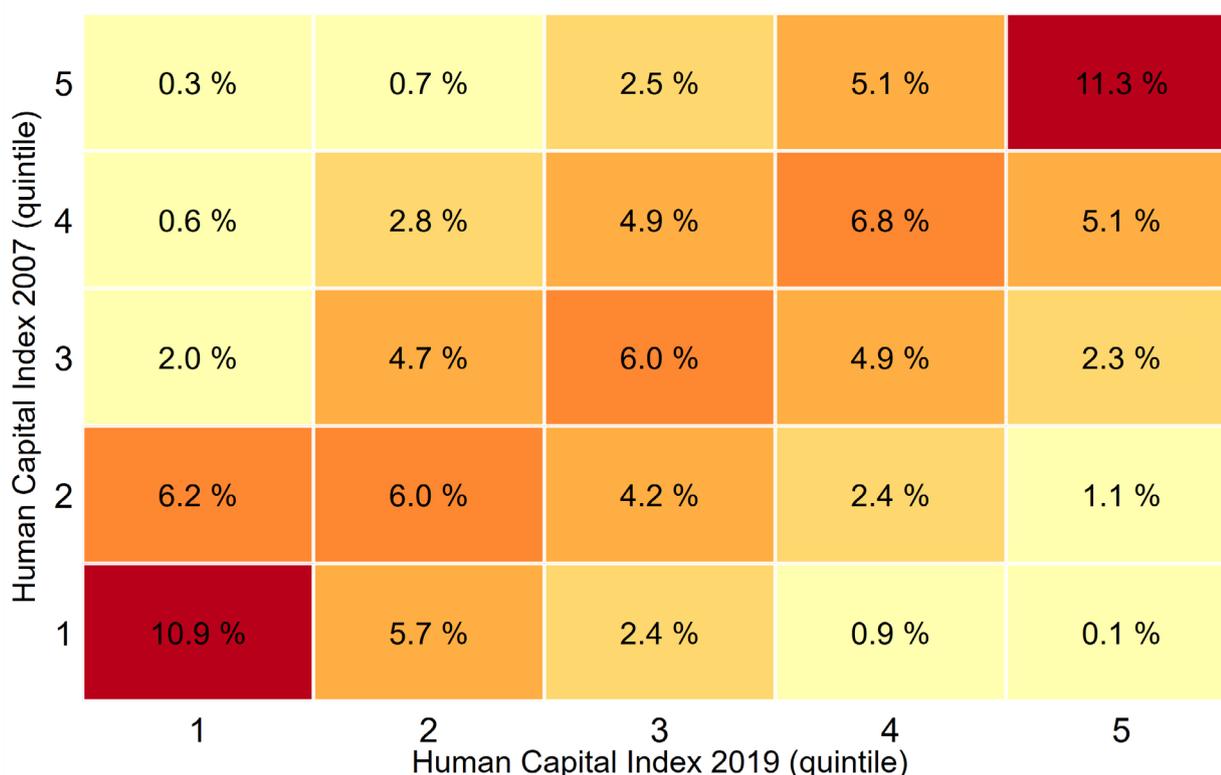


Figure ES.5 Once at the Top, Almost Always at the Top

The second inequality investigated is race. A narrative about unshared prosperity breaks racial HCI disparities into three parts. Part 1 measures the racial differences in HCI levels between 2007 and 2019. The expected productivity of an Afro-descendant child born in 2019 was found to be 56 percent of their full potential, or 7 percentage points less than a white child (63 percent) on average. For the Indigenous population, the HCI was even lower at 52 percent in 2019.

Part 2 relates to the rate of HCI gains. The fourth key finding of the BHCR is that the Human Capital Index for white people increased at a faster pace than for any other race group in Brazil. **Unshared Prosperity.** The average increase in HCI for white people between 2007 and 2019 reached 14.6 percent. The improvements among Afro-descendants and Indigenous, on the other hand, were substantially less pronounced. Black people's HCI increased by 10.2 percent and Indigenous' remained virtually unchanged with a slight growth rate of 0.97 percent over the same period. *While white people continue to prosper, Black and Indigenous people are falling behind.*

The different baseline levels and diverging improvements lead this narrative to Part 3: the overall widening of HCI inequality. The HCI gap between white and Black people, which was 0.04 HCI points, almost doubled in size 12 years later. Gaps that were already large are becoming larger. This was not the most critical finding, however. Between white and Indigenous people, the HCI gap nearly tripled over the same period, representing a gap that increased by 0.06 HCI points every year. This three-part narrative of unshared prosperity should transform into a narrative of successful inclusion.

Talent at Work. The story of human capital begins a new phase when it reaches the labor market where it is utilized, put into action, and absorbed. The Utilized Human Capital Index (UHCI) is an adjusted index that weights the HCI by employment rates in the formal and informal labor markets. The goal is to show how much human capital is actually utilized by the labor market. *Talent at Work.* The UHCI in 2019 was estimated at 38 percent in Brazil. In other words: Brazil loses 22 percentage points of all productivity achieved when human capital reaches the labor market.

White-Black HCI inequality doubled from 2007 to 2019.

Unshared Prosperity

HCI by Race, 2007 to 2019

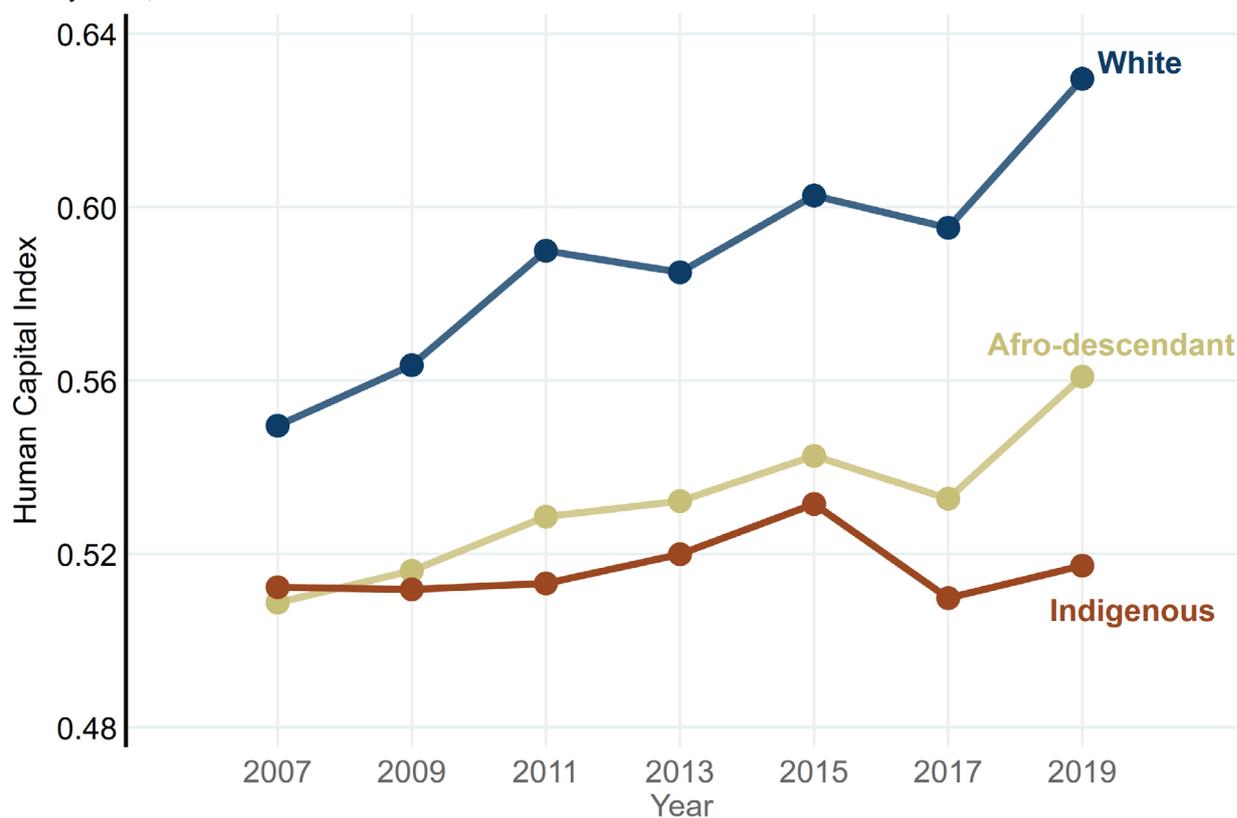


Figure ES.6 Unshared Prosperity

The labor market deepens the inequalities observed in HCI.

Geographic disparities enlarge, intensifying *many Brazils*. In the North and Northeast regions, two-thirds of all accumulated potential is unutilized after weighting the HCI by employment rates. Gender gaps also expand, and the *many inequalities* widen. The fifth key finding of the BHCR relates to gender gaps: the seven-point HCI advantage for women becomes an eight-point advantage for men in the UHCI. *The labor market reverses women's advantage over men in human capital formation.* In this context, Afro-descendant women are penalized twice due to their gender and their race. Afro-descendant women score 15.7 percentage points lower in the UHCI than white men. *The labor market has a significant negative effect on human capital utilization, especially for Afro-descendant women.*

After considering employment rates, Brazilians are able to achieve only 38% of their potential human capital.

"Today, February 26th, 2020, Brazil confirms its first case of COVID-19..." João sneaked into a TV shop to hear about the new virus everyone was talking about. "An unknown virus has arrived..." He only fully understood the news when the effects of the virus became visible to him: "there are no people on the streets," he thought to himself. As his usual spot for drawing was now deserted, João felt for the very first time, hopeless. "At least I am not alone." João met Raoni at a traffic light holding a sign that said, "Hungry." Since then, João holds one that says, "Me too." Unconfident, unmotivated, and insecure, Raoni barely speaks. All João knows is that Raoni's mother and older brother left home coughing and never returned. "I feel invisible, like the virus," Raoni once said. Always together, the two come up with the perfect plan that will solve all their problems: when the traffic light turns red, João will reveal his most profound drawing that reads, "Use it!" while Raoni distributes donated masks to all drivers that pass by for free.

When schools closed, Bela made a decision: she would never let the pandemic interrupt the education of her little brothers. "Studying is the only option they have for a better life," she thought. Bela is a dedicated sister: she used all of the teaching materials she could find, prepared creative classes on her own, and

searched for extra exercises. Determined, she crafted new toys, used her own phone for their online classes, and tried innovative ways to engage her brothers. “But schools have been closed for so long...” Bela said to herself. One brother does not want to return to school and the other is uninterested, never opening his books by himself. He turned 10 last month and is still unable to read a simple paragraph without her help. “If nothing is done, this pandemic will have long-lasting consequences on their lives.”

(Not All) Talent at Work

UHCI by Gender, 2017

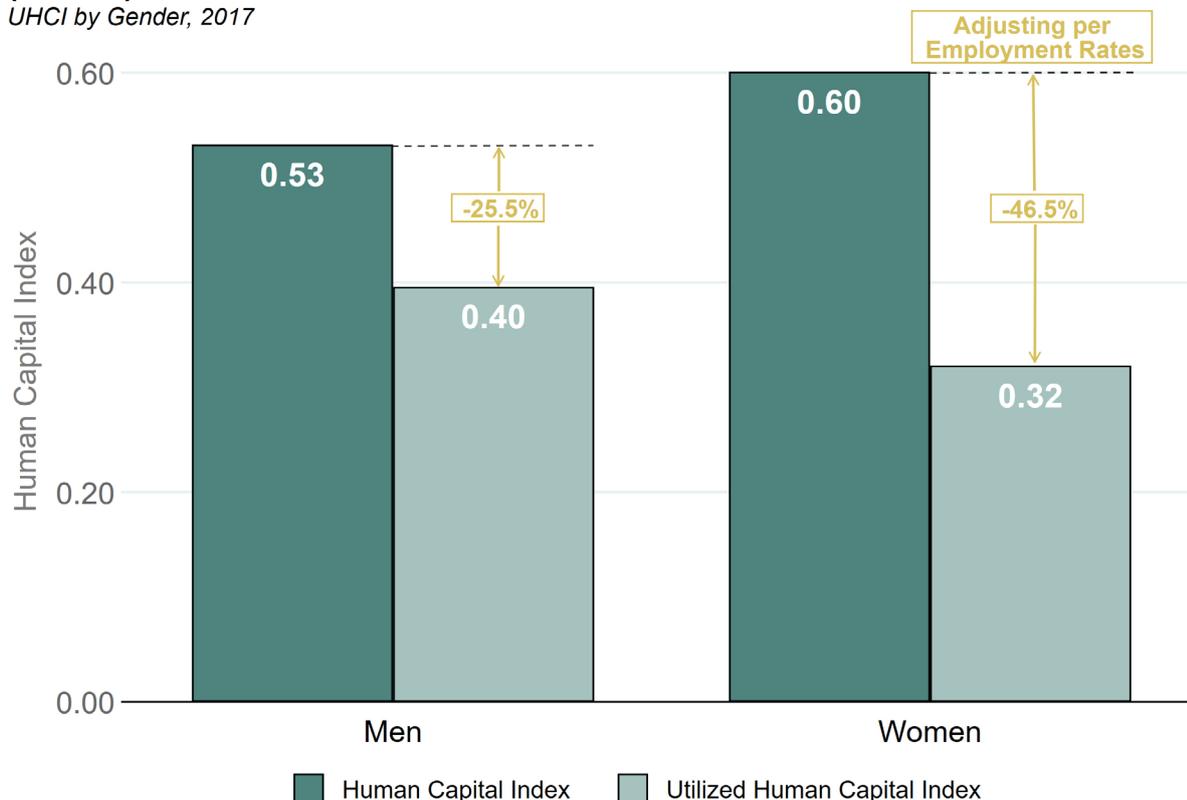


Figure ES.7 (Not All) Talent at Work

An Interrupted Story. The story of human capital accumulation in Brazil stops abruptly in 2020. The ongoing COVID-19 pandemic has had devastating impacts at every stage of skills formation. The future outlook of HCI in Brazil is beyond alarming. In terms of child health for example, more 3.5 out of 10,000 children did not survive to the age of five in 2021 compared to 2019 in Southeast Brazil. In the Northeast, the child survival rates are now stagnant whereas before the pandemic they had been the fastest growing. Additionally, about 80,000 children might become stunted in Brazil.

If no action is taken, the pandemic will have long-term impacts on human capital accumulation.

In terms of education, schools remained closed for 78 weeks during the pandemic, which was one of the longest closures in the world. Consequently, the proportion of children who do not read and write jumped 15 percentage points between 2019 and 2021. *It is estimated that nearly one million more children do not have basic literacy skills in Brazil.* Scores on state tests have also suffered. In the state of São Paulo, the 2021 scores of fifth graders in Portuguese and math were equivalent to test scores recorded 10 and 14 years ago, respectively. School dropout is yet another major area of concern as it is expected to increase by 365 percent (Lichand, 2020). *Significant impacts for an entire generation.*

The Lost Decade. In two years, the COVID-19 pandemic reversed a decade’s worth of HCI progress in Brazil. According to simulations, the Brazilian human capital index fell from 60 to 54 percent between 2019 and 2021, which is equivalent to pre-2009 HCI levels. *The Lost Decade.* The two largest contributing factors to this setback were: (i) education, as 50 percent of this decrease was related to expected years

of school; and (ii) adult health, as another 30 percent was due to decreases in adult survival rates. These impacts varied per region. The worst decreases were estimated in Roraima, Goiás, São Paulo, and Pernambuco where the HCI fell by 11 percent, and 13 states (out of 27) in Brazil returned to their 2007 HCI levels. Shocks in employment rates inflicted by the pandemic have aggravated this already concerning situation. The national UHCI fell from 0.38 in 2019 to 0.32 in 2021, which is a drop of more than 17 percent. These effects were even greater for Afro-descendants and women. *Many inequalities, many pandemics.*

The Lost Decade

Estimated Impacts of COVID-19 Pandemic on the HCI in Brazil

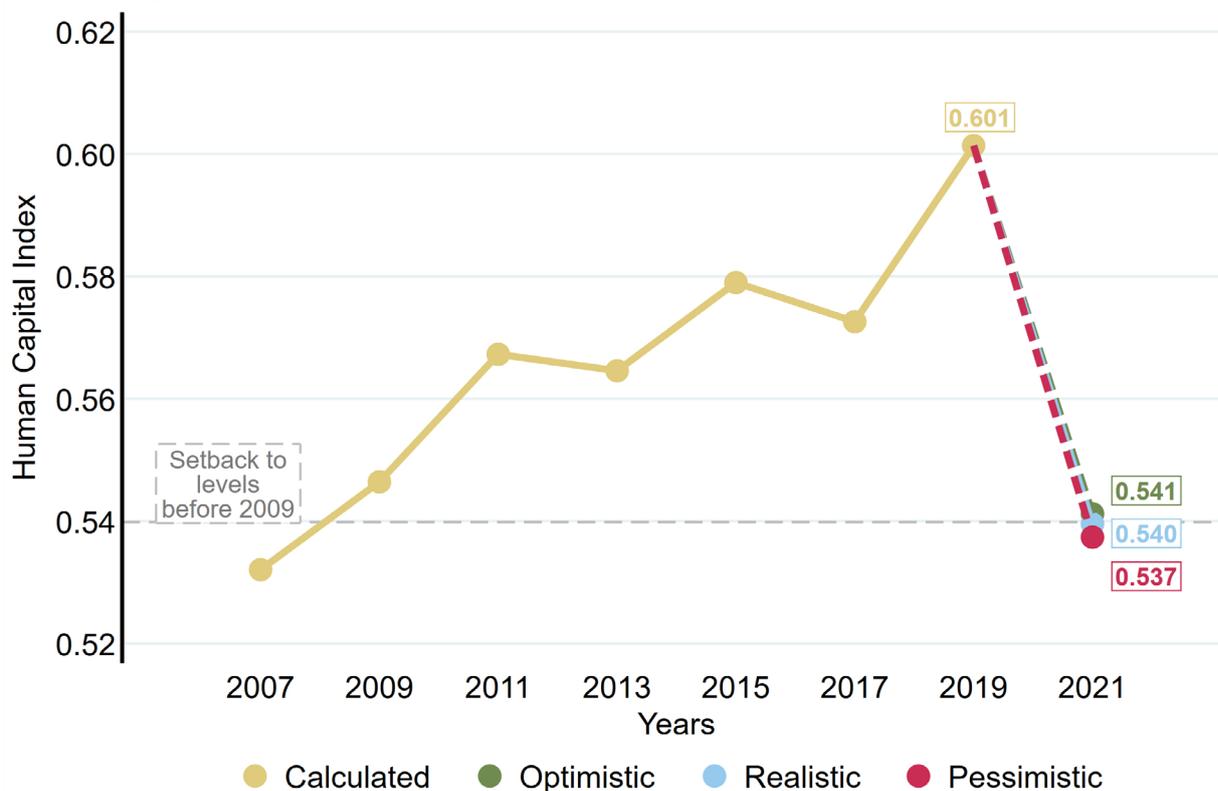


Figure ES.8 The Lost Decade

There is a long road to recovery. If the pre-pandemic rate of HCI growth were to be maintained, it would take Brazil 10 to 13 years to return to 2019 HCI levels. In other words, Brazil would only reach the 2019 HCI level in 2035. *Action, more than ever, cannot be postponed.* In the short-term, current human capital policies that have proven to be effective should be revisited, adapted, and strengthened to recover from this crisis. Brazil's national health service (*Sistema Único de Saúde, SUS*), for example, must shield children and teenagers from health and socioemotional consequences of the pandemic. Because preexisting inequalities have tended to worsen with the pandemic, the Brazilian conditional cash transfer program, known to be one of the most successful in the world, should be strengthened to support the groups of people who were more heavily affected by the COVID-19 pandemic.⁴ Recent national reforms in education financing⁵ and in the curriculum⁶ should be maintained and reinforced. *Successful policies must be leveraged.*

If the pre-pandemic HCI growth rate were to be maintained, Brazil would need 10 to 13 years to return to 2019 HCI levels.

⁴ The BHCR shows that conditional cash transfer programs can play a significant role in improving expected years of school and not-stunting rates.

⁵ Fundo Nacional de Desenvolvimento da Educação Básica (FUNDEB)

⁶ Base Nacional Curricular Comum (BNCC) and Novo Ensino Médio.

If the impacts of COVID-19 on human capital in Brazil have been largely through education, learning recovery and acceleration should be a priority in the coming years. First, and foremost, **all students must return to school**. For that, Brazil should take advantage of its rich administrative data available to: (i) monitor missing students that dropped out during the pandemic, (ii) provide scholarships to entice students to return to school, and (iii) expand active search programs to bring students back to school. Because vulnerable children are more likely to drop out again, schools can implement early warning systems in order to identify high-risk students and undertake preventive measures while they are still at school.

Learning recovery and acceleration should be the highest priority in the coming years.

Once back in school, students must (re)learn effectively. *Learning recovery and acceleration should be the highest priority.* Evidence has shown that personalized tutoring and adaptive learning platforms are strong short-term strategies for a solid recovery. However, the legacy of the COVID-19 pandemic has an extra element: students' and teachers' mental health. *Unmotivated students rarely learn well or*

stay in school for long. For this reason, socioemotional strategies should be articulated at the school-network level as they produce benefits for students, families, and teachers alike. Finally, strengthening hybrid learning, expanding internet connectivity, providing computing devices for vulnerable students, and enhancing digital skills should be on the same list of priorities.

Table ES.1 Areas That Need Special Attention in Education

<p>Short-Term Recovery</p> 	<p>Student active search: Active search of missing students</p> <p>Early warning system: Identifying students at high risk of dropping out</p>	<p>Personalized tutoring programs: Learning recovery and acceleration</p> <p>Emotional programs: Reduce the emotional shocks of the pandemic</p>	<p>Creches: Expanding early childhood education</p>
<p>Conditional cash transfer programs: Immediate poverty relief</p>			
<p>Long-Term Recovery</p> 	<p>FUNDEB: Education financing with focus on equity</p> <p>Family health strategy: Primary healthcare provision</p>	<p>Upper secondary reform: Flexibility and support to vulnerable regions</p> <p>Conditional cash transfer: Additional focus on heavily affected groups</p>	<p>BNCC reforms: Educational curricula</p>
<p>Equitable Recovery</p> 	<p>Geographic focus: Most vulnerable areas (North and Northeast)</p> <p>Group focus: Afro-descendant women and people with disability</p> <p>Inclusion: Access to internet and computing devices; inclusive education</p> <p>Labor market: Access for women, Afro-descendants</p>		
<p>Replicating Successful Cases</p> 	<p>Collaborative planning</p> <p>Government and team engagement</p>	<p>The state of Ceará and the city of Sobral are examples for learning recovery</p> <p>Federal programs: Pro-Infância and PDDE</p>	<p>Monitoring and follow-up</p>

Some interventions have the potential to improve human capital in the mid and long term. To identify policy drivers associated with human capital accumulation across years, the BHCR analyzed municipal HCIs in relation to their local characteristics and policies. Policies that expanded full-time schooling and reduced teenage pregnancy seemed to be associated with higher education component scores in the HCI. Likewise, anti-violence policies, particularly those focused on reducing homicide rates, seem to be a promising means of improving adult survival rates. Moreover, the exercise showed that adult educational attainment is linked to improvements in child health indicators and learning outcomes.

To emerge stronger from this human capital crisis, Brazil needs to learn from itself.

Solid long-term recovery entails replicating good practices. “Many Brazils” can be seen as an opportunity to identify different means of promoting human capital as municipalities have a level of autonomy to pursue their own solutions for improvement. Understanding why some municipalities have been consistently improving human capital and attempting to replicate their success will be vital in the following years. The state of Ceará⁷ and the municipality of Sobral⁸ are well-known examples of success in primary and lower secondary education. Pernambuco and Cocal dos Alves are yet another two models for upper secondary education policies. Brazil should take advantage of the diversity of effective policies among states and municipalities.

To emerge stronger, Brazil needs to learn from successful cases.

Sustainable recovery and acceleration require resilient public systems. Governments must always be prepared to overcome unexpected challenges or face upcoming health and climate crises. Resilient public systems are able to quickly adapt their programs, design better policies, and make better-informed decisions. With this idea in mind, the BHCR surveyed positive outliers among Brazilian municipalities to screen for cost-effective interventions. This survey identified five good practices at the local level. First, these municipalities all used collaborative planning with working groups or thematic councils to address local problems. Second, public consultations were used to monitor and follow-up on activities that were planned over multiple years. Third, staff were hired for data entry and monitoring. Fourth, governments established and widely disseminated clear goals on health, education among others. Fifth, there was a wide implementation of federal programs that contributed to monitoring service delivery.

Human capital is the engine for change. It is the key that unlocks equitable and inclusive prosperity. The BHCR is a story in which children are the protagonists. João and Raoni in the streets and Bela and her brothers at home exemplify the enormous amount talent that has been historically undeveloped and unutilized in Brazil. *Many Brazils, unshared prosperity, many inequalities, and talent at work* are parts of this story that Brazil cannot afford to ignore. Mitigating the effects of *the lost decade* must be a priority in the political agenda and should be seen as an opportunity to make Brazil an equal and prosperous country. This will be a whole-of-government endeavor and society must be on the same page so that immediate progress can be made. *The future starts today.*

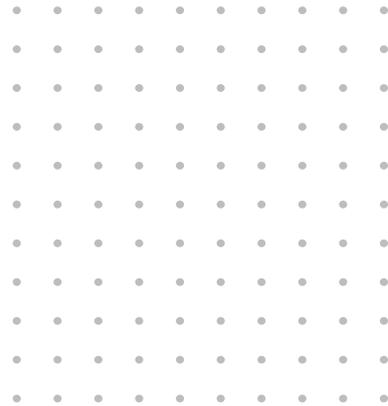
⁷ For a brief overview see: <https://blogs.worldbank.org/education/there-no-magic-formula-brazils-ceara-and-sobral-success-reduce-learning-poverty>. For a more technical and detailed discussion see: <https://documents1.worldbank.org/curated/en/200981594196175640/pdf/The-State-of-Ceara-in-Brazil-is-a-Role-Model-for-Reducing-Learning-Poverty.pdf>.

⁸ Loureiro, Andre; Cruz, Louisee. 2020. Achieving World-Class Education in Adverse Socioeconomic Conditions: The Case of Sobral in Brazil. World Bank, Washington, DC., World Bank. <https://openknowledge.worldbank.org/handle/10986/34150>.

Chapter 1

Measuring Human Capital

Measurement as a first step for action



Main Messages

- ❖ The human capital index is the product of three components: child survival, health, and education indexes.
- ❖ Child survival rate refers to the probability that a child born today will not die before age five if current age-specific mortality rates prevail.
- ❖ Health encompasses “not stunting rate” (the fraction of children under five whose height is at least two standard deviations below the reference median) and “adult survival rate” (the fraction of people who reach age 15 who will survive until the age 60).
- ❖ Education adjusts the average number years of schooling (expected years of school, EYS) by learning quality (harmonized learning outcomes, HLO).
- ❖ An average Brazilian born in 2019 will achieve 60% of their full potential by age 18. This rate is similar to that of Argentina (0.602) and Uruguay (0.599).

The Human Capital Project is a global initiative at the World Bank Group that advocates the importance of investing in skills formation. At the heart of this initiative, the human capital index (HCI) is a proposed measure to estimate the labor productivity of the next generation of workers.¹ *Measurement as a first step for action.*

The HCI is a generalizable, outcome-based index that considers the stages of life at which knowledge and skills formation are most critical. The HCI represents the expected productivity of a child born today by the age of 18, assuming that the current conditions of education and health persist. Stated differently, the HCI is a prospective measure of the level of human capital that children born today will bring to the labor market as workers of tomorrow.

The first conclusion of this report is that an average Brazilian born in 2019 will achieve 60 percent of their full potential by age 18. This chapter discusses this result and explains how the human capital index is calculated for Brazil. Figure 1.1 presents the global HCI estimates for 2020 (World Bank, 2020d) and puts Brazil into international perspective. As can be seen, the Brazilian HCI for 2019 (0.601) is similar to that of Argentina (0.602) and Uruguay (0.599) but is 10 HCI points below United States of America (0.702).

In 2019, the human capital index in Brazil was 60 percent.

As can be seen, the Brazilian HCI for 2019 (0.601) is similar to that of Argentina (0.602) and Uruguay (0.599) but is 10 HCI points below United States of America (0.702).

The goal of the human capital index is to capture the conditions of skills formation during the life cycle. Because young children who die before reaching school age cannot develop the most fundamental skills, the starting point of the HCI is child survival. Here, the child survival rate is defined as the probability that a child born today will not die before age five if current age-specific mortality rates prevail (see box 1.1 for details). Mortality rate in the early years of life is widely used as a proxy for future human capital and the HCI takes advantage of this evidence (Case & Paxson, 2009).



Box 1.1 Child Survival Rates

Child survival is the probability that a child will survive until the age of five in relation to the benchmark of all children surviving. The child survival formula equals one minus the under-five mortality rate divided by one (when 100% of children survive).

Formula: The Child Survival Rate for city c is measured by

$$Child\ Survival_c = \frac{1 - U5\ Mortality\ rate_c}{1},$$

where the $U5\ Mortality\ rate_c$ represents the under-5 child mortality rate for city c and is calculated from the Brazilian life table.

Source: For mortality information, the microdata is from Brazil's Sistema de Informação sobre Mortalidade (Mortality Information System, SIM). For city population, age-specific projections at city level come from DATASUS and are estimated per year. Birth data is from the Sistema de Informações sobre Nascidos Vivos (Live Birth Information System (SINASC)).

Children need to be well-nourished during childhood. A large body of research has consistently shown that undernourishment during critical periods in life impairs future skills accumulation (Adair et al., 2013; Case & Paxson, 2008, 2010). Using this logic, the next HCI component considers the percentage of children under the age of five who are not stunted for their age (see box 1.2 for details).

Brazil performs relatively well in child survival and stunting. In 2019, for example, more than 98 out of 100 children survived until the age of five, which is higher than the average in Latin America and

¹ This report used the index defined by Kraay (2018) to calculate the "global HCI" for 170 countries.

The Human Capital Index Across the World

The Global Human Capital Index (2020), and the Brazilian Human Capital Index (2019)*

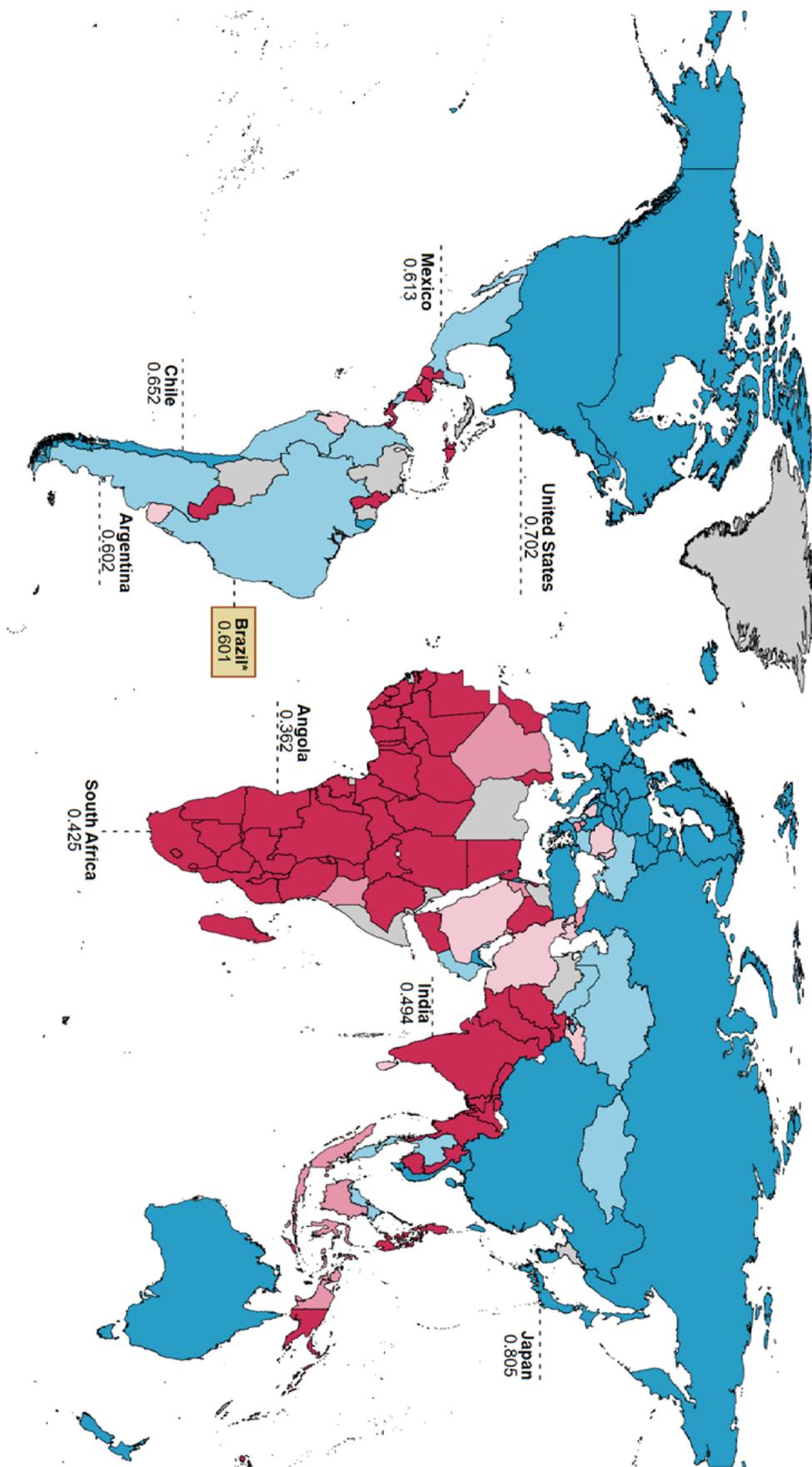


Figure 1.1
The Human Capital Index across the World

the Caribbean (UNICEF et al., 2021). Surprisingly, there are small differences across states, as shown in figure 1.2. While in some areas only 80 to 90 children survive out of 100, the large majority of municipalities (4,181 out of 5,570) had child survival rates of more than 98 percent in 2019, including 1,230 cities where all children survived.² For stunting rates, the variations within and across states are similarly small.



Box 1.2

Not Stunting Rates

Stunting refers to the fraction of children under five whose height is two standard deviations or more below the reference median in the height growth curve for their age.

Formula: The not stunting rate for city c is measured by:

$$\text{Not Stunting}_c = 1 - \text{Stunting Rate}_c,$$

where the Stunting Rate_c is the stunting rate for city c .

Source: Subnational data on stunting rates were obtained through the Institute of Health Metrics and Evaluation (IHME) as published by Kinyoki et al. (2020).

Note: The subnational level estimates were obtained from IHME on an annual basis between 2007 and 2017. National country-level estimates are available from the UNICEF/WHO/World Bank Group joint child malnutrition estimates (JME) on an annual basis between 2007 and 2020. For Brazil, the latest available survey datapoint for malnutrition is dated from 2006. According to these estimates, stunting was around 6.1% between 2014-2020. Because of that, and since the JME and IHME stunting estimates are largely correlated across countries (correlation of 0.957), this report used the same stunting estimates for 2017 and 2019.

The HCI focuses on quantity and quality of education.

If children are able to survive and experience good health through childhood, they are ready to go to school. Consequently, the second stage in the HCI relates to schooling, namely learning-adjusted years of school (LAYS). “Adjusted” refers to how much students actually learn relative to the number of years they attend

school. *Quantity and quality of education should be the focus of human capital formation.* Thus, LAYS is divided into two parts: quantity of education (the expected years of school (EYS) that a child achieves by age 18) and quality of education (reflected in harmonized learning outcomes).

There are important differences between Brazilian and global LAYS measurement strategies.

First, quantity of education will be considered. The global HCI defines the expected years of school (EYS) by adding up enrollment rates from the age of 4 to 17, considering data availability. In Brazil, however, compulsory education starts when children are 6 years old, and the school system has 12 grades: five years of primary education, four years of lower secondary education, and three years of upper secondary education.³ An additional difference shown in box 1.3 is that the EYS for Brazil discounts grade-specific repetition and dropout rates for every grade of basic education.⁴

² The under-five mortality rate decreased by 67.6 percent between 1990 and 2015 as a result of the decline in prematurity and diarrheal disease, which decreased by 72 percent and 95 percent, respectively. These reductions can be attributed to improvements in sanitation, nutrition, health access, and vaccination campaigns (França et al., 2017).

³ Comparing municipalities within the same region, the difference in EYS can reach up to 5 years of education. This means that while all children in some areas complete upper secondary education, in other municipalities, the average child does not finish lower secondary school.

⁴ The Brazilian HCI uses repetition and dropout rates for two main reasons: i) the repetition and dropout rates are available for every municipality in Brazil, which allows for a calculation of HCI at the municipal level (see Chapter 2); and ii) repetition and dropout rates are available from 2007 until 2019, which makes it possible to estimate the HCI over 12 years at the municipal level.

State Gaps in Child Survival Rates

Max and Min Child Survival Rates by States, 2019

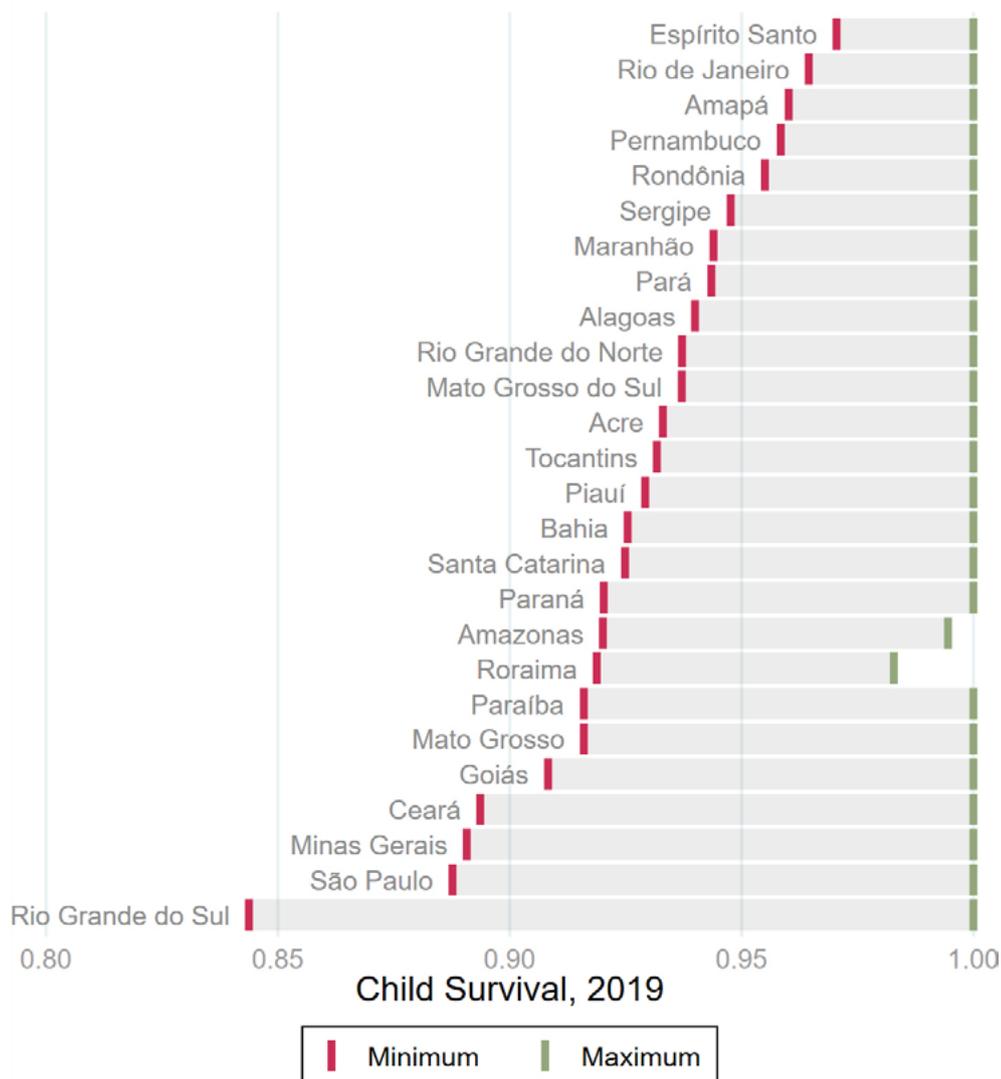


Figure 1.2
State Gaps in Child Survival Rates

However, quantity of education is only half of the story. Being at school hardly translates accurately into quality of education (Filmer et al., 2020). Because the quality of learning is heterogeneous, and generally low, an additional year of schooling in Brazil generates distinct productivity gains.⁵ The reason is straightforward: one year at school promotes much more learning in particular school settings than in others, even after controlling for demographic variables. So, while two groups of individuals may have the same quantity of education, they might present different human capital if their quality of learning varies significantly.

⁵ Such differences become more meaningful after considering the wage returns of schooling. Estimates suggest that the average wage return of one year of schooling in Brazil is from 12 to 15 percent (Griffin & Edwards, 1993) – the largest returns in all countries analyzed by the OECD (OECD, 2020). This rate of return translates into 60 to 75 percent accumulated gains in future wages.



Box 1.3

Expected Years of School (EYS)

The expected years of school (EYS) is the expected number of years in school that a child achieves by age 18 if repetition and dropout rates remain unaltered across basic education.

Formula: EYS for children living in city c is measured by:

$$EYS_c = \sum_{g=1}^{12} (1 - R_c^g - D_c^g),$$

where EYS_c is the expected years of school in city c ; R_c^g is the repetition rate at grade g in city c ; D_c^g is the dropout rate at grade g in city c .

Source: Situação do Aluno, 2007–2019 (INEP).

Note: The definition of school dropout is the equivalent of abandono escolar (short-term school dropout), which is when students stop attending classes during the school year. Note that this concept is different from evasão (long-term school dropout), when the student drops out of school in a given school year and does not enroll in the following year. Because it is not possible to disaggregate evasão and because data is not available between 2007 and 2019, this report only used abandono escolar data.

Based on this logic, the HCI adjusts the quantity of education for the quality of learning. In order to do so, rather than using international assessments⁶ as the main data source, the Brazilian HCI uses the Sistema Nacional de Avaliação da Educação Básica (SAEB), a national assessment that measures quality of learning. There are several advantages associated with this choice.

SAEB offers several opportunities to disaggregate the HCI.

First, SAEB covers all municipalities in Brazil. This is an important advantage given that one of the main objectives of this report is to disaggregate the HCI at the municipal level.⁷ Second, SAEB has been collecting granular data over the last 12 years. This characteristic allows in-depth investigating human capital formation in the last decade. Third, SAEB is applied at the end of

every education cycle and covers students in the 5th, 9th, and 12th grades in private and public schools every two years. Fourth, SAEB allows for data disaggregation by race (including Indigenous peoples), gender, race-gender, and socioeconomic status.

According to SAEB, quality of learning is measured by the fraction of students with adequate learning levels in mathematics and Portuguese. The thresholds delineating what is adequate learning are established by the Ministry of Education for each grade and subject. For example, for 12th grade the thresholds are 450 (mathematics) and 400 (Portuguese) on the SAEB proficiency scale. PISA and SAEB have

⁶ The global index dataset harmonizes scores from three major international assessments: Trends in International Mathematics and Science Study (TIMSS), Progress in International Reading Literacy Study (PIRLS), and the Programme for International Student Assessment (PISA). It also includes four regional testing programs: the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ), the Program for the Analysis of Education Systems (PASEC), the Latin American Laboratory for Assessment of the Quality of Education (LLECE), and the Pacific Island Learning and Numeracy Assessment (PILNA). For an explanation of how PISA relates to SAEB, see Appendix II.

⁷ In SAEB, the sample of test takers is representative at municipal level (Instituto Nacional de Estudos e Pesquisas Educacionais, 2018). This reflects an advantage over international assessments that are only nationally representative, obscuring discrepancies in learning across municipalities.



Box 1.4

Harmonized Learning Outcomes (HLO)

The harmonized learning outcomes averages the fraction of students scoring above advanced thresholds in mathematics and Portuguese using data from SAEB.

Formula: The HLO for 12th grade and city c is calculated as follows:

$$HLO_c = \frac{\frac{\overline{S_{m,c}}}{450} + \frac{\overline{S_{p,c}}}{400}}{2},$$

where $\overline{S_{m,c}}$ is the average SAEB in mathematics and $\overline{S_{p,c}}$ is the average SAEB in Portuguese. Thresholds are established by the proficiency scale of the Ministry of Education National Research Institute, INEP.

Source: SAEB and Prova Brasil, 2007 to 2019.

Considering quality of learning reduces years of school by four years.

compatible proficiency scales, despite limitations in comparability (INEP, 2008).⁸ To be congruent with the *Global Human Capital Review*, this measure of quality of learning is labeled harmonized learning outcomes (HLO). Box 1.4 gives details on how the HLO is calculated using these definitions.

Figure 1.3 highlights the importance of weighting the expected years of school by quality of learning. The larger the gap between the EYS and LAYS, the poorer the learning performance. Note that in the ideal case, when learning for all students is above advanced thresholds, both bars would overlap perfectly (i.e., EYS = LAYS). Far from that case, figure 1.3 uncovers significant differences in learning quality among Brazilian states. The states of Espírito Santo and Maranhão, for example, have the same EYS, but have a one-year difference in learning after adjusting for the quality of learning. On average, states lose about three to four years of schooling when learning quality is taken into account.⁹

Box 1.5

Education Component

Formula: The education component combines HLO and EYS:

$$School_c = e^{\phi(EYS_c \times HLO_c - 12)}$$

where, $School_c$ assumes $\phi=0.08$, which means that one additional year of education results in an 8 percent increase in future earnings. See Kraay (2018) for more details.

Actual levels of quantity and quality of education are not informative without a credible benchmark. The education component uses as a reference complete, high-quality education for all, that is, every student goes through all school years and learns what they are supposed to learn. In Brazil, this

⁸ For example, only 3.08% of Brazilians score above 549.43 in mathematics on the PISA scale (2003). On the SAEB scale (2003), 3.08% of 12th grade students score above 402.89 in mathematics. Thus, 549.43 on the PISA scale corresponds to 402.89 on the SAEB scale (for 2003) (INEP, 2008).

⁹ The global average of expected years of school is 11.2. When adjusted for learning, this becomes 7.8 years, representing a loss of 3.4 years (World Bank, 2020d).

Losses after Adjusting for Learning Quality

LAYS and EYS in 2019

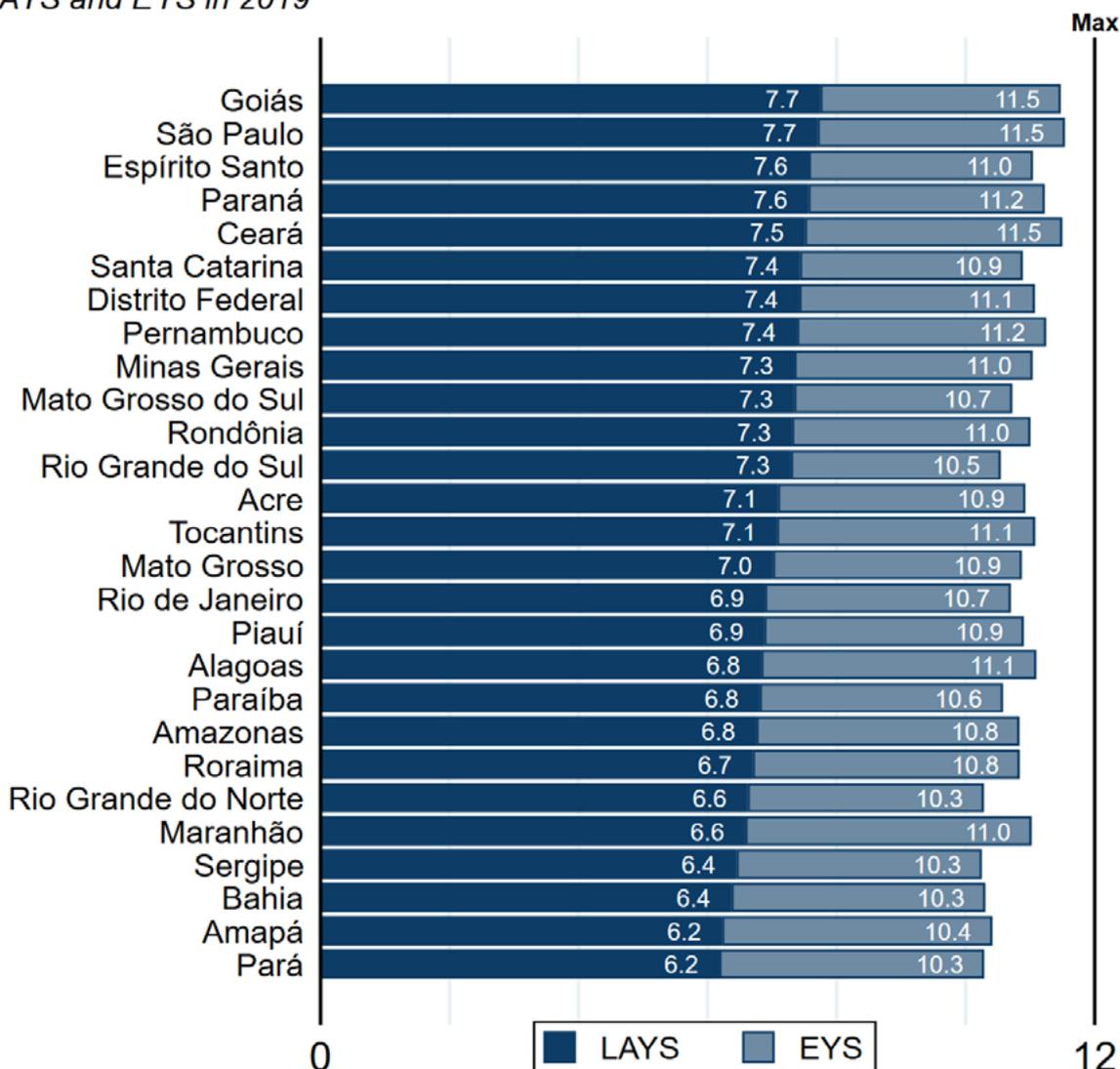


Figure 1.3
Losses after Adjusting for Learning Quality

benchmark is 12 learning-adjusted years of school (or EYS = 12 and HLO = 1). This rationale is illustrated by the formula $School_c = e^{\phi(EYS_c \times HLO_c - 12)}$, the education component in the HCI formula. The parameter ϕ is the average return of one additional year of education on productivity. Here, the Brazilian HCI maintains $\phi = 0.08$ to follow the global HCI and the relative consensus in the literature estimating that one year of school increases earnings by 8 percent.¹⁰ The intention behind using this rate is to avoid arbitrary weights (Caselli, 2005).

After completing education, a person needs to be able to remain in good health in the years ahead. To reflect this stage, the third component in the HCI is adult survival. Similar to the child survival indicator, the adult survival rate measures the probability that a child born today will survive until the age of 60 if current age-specific mortality rates remain unaltered (see box 1.6). Its contribution to the HCI is expressed in relation to the benchmark of 100 percent adult survival during these years.

¹⁰ In Brazil, the microeconomic literature estimates slightly higher returns to education. Some studies point to a 12 percent increase in productivity for every year of education, on average (Griffin & Edwards, 1993). Others argue that there are even higher returns (Psacharopoulos, 1989).



Box 1.6

Adult Survival Rate

The adult survival rate is the fraction of people who reach age 15 who survive until the age of 60, assuming current age-specific mortality rates. This rate represents a proxy for the probability that a child born today will die before age 60 if present health conditions are maintained.

Formula:

$$\text{Adult Survival Rate} = \prod (1 - q_x)$$

where q_x is the probability of dying at each age between 15 to 60 years old.

Source: Mortality information is from the Mortality Information System (SIM), and the age-specific population estimates are from DATASUS.

Similar to the education indicators, health variables show significant geographic discrepancies.

Figure 1.4 presents the minimum and maximum adult survival and not-stunting rates from 2019 at the municipal level for each state in Brazil. At least three conclusions can be drawn. First, gaps in adult survival rates are significantly larger than in not-stunting rates for all states. Secondly, the gaps of not-stunting are three times smaller in the South, Southeast, and Center-West regions compared to North and Northeast regions. Third, the Southeast region presents the highest gaps in adult survival, followed by the South. Chapter 2 analyses this evidence in more detail.

Box 1.7

Health Component

The health component combines adult survival and not stunting rates using the following formula:

$$\text{Health}_c = e^{(\gamma_{ASR} \times (\text{Adult Survival} - 1) + \gamma_{STU} \times (\text{Not Stunting} - 1))}$$

The HCI assumes: $\gamma_{ASR} = 0.65$ and $\gamma_{STU} = 0.35$.

Child Survival

On average, **98.6 percent** of children survive until the age of five in Brazil. This rate is virtually the same in **Peru**.

The Brazilian child survival rate is above many LAC countries, including Dominican Republic and Guatemala.



However, Brazil still lags behind most European and Central Asian countries. Almost 90 percent of countries in these regions have higher child survival rates than Brazil (e.g., Spain, Portugal, Italy).

Not Stunting

91.1 percent of children under five in Brazil are not stunted. This rate is similar to **Argentina**

(92.1 percent) and above most LAC countries. This rate is similar to the world's most populated country, China (91.9 percent).



The not stunted rate in Brazil is higher than all countries in South Asia. In India, the not stunted rate is 65.3 percent and in Pakistan it is 62.4 percent.

Adult Survival

87.4 percent of 15-year-old adults survive until the age of 60 in Brazil. This rate is below many other upper-middle-income countries in the LAC region: Peru (88.6 percent), Colombia (88.7 percent), and Argentina (88.8 percent).

The adult survival rate in Brazil is similar to Ecuador and **Thailand**. It is very distant from that of the high-income countries: Italy (95.3 percent), Switzerland (95.4 percent), Iceland (95.5 percent).



Learning-Adjusted Years of School

On average, Brazilian's study for **7.20** years after adjusting for quality of education. This rate is similar to **India** (7.10) and Jamaica (7.06).

More than 60 percent of LAC countries have higher LAYS rates than Brazil, including its neighboring countries, Chile (9.41), Peru (8.63), Colombia (8.62), and Uruguay (8.55).



Adjusted learning in Brazil is higher than South Africa (5.60) and Lebanon (6.33).

International rates are from the Global Human Capital Index, 2020 and Brazilian rates are from the Brazilian Human Capital Index, 2019.

Measurement as a first step for action

Like any measurement tool, the human capital index has limitations. First, the HCI health components only encompass the measure of mortality and child stunting. In that sense, morbidity, which also affects human capital accumulation, is only captured through the final mortality outcome. One can argue, however, that morbidity can have short-term effects on productivity by preventing people from working, for example. Second, the education component only encompasses learning and does not capture socioemotional skills, which are fundamental to accumulating human capital.

Despite these limitations, the HCI has several desirable characteristics. First, it has a straightforward interpretation. It estimates the average of future labor productivity. The HCI is a snapshot of particular conditions that shows policymakers what would happen to labor productivity if no action is undertaken. Secondly, it is calculated in a simple manner: the HCI avoids intricate formulas and unnecessary assumptions to be as straightforward as possible. Instead, it uses three components summarized in figure 1.5.

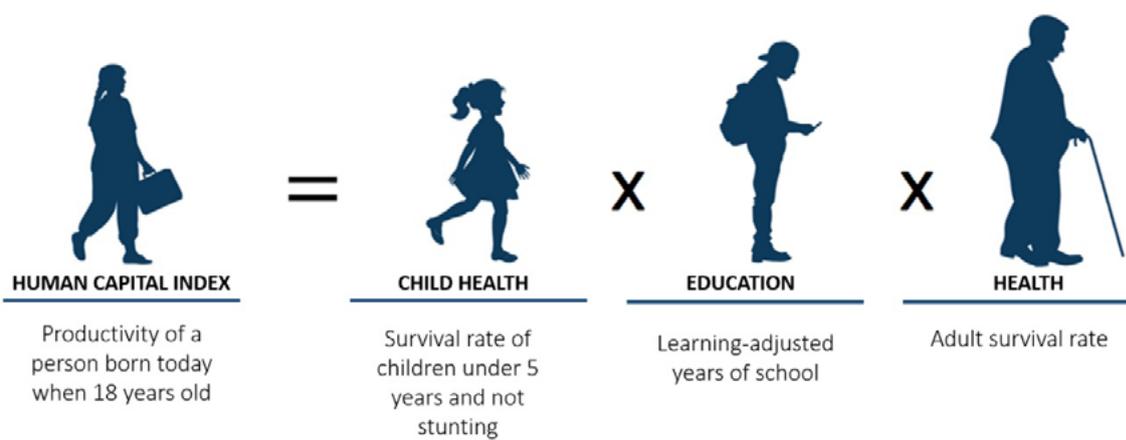


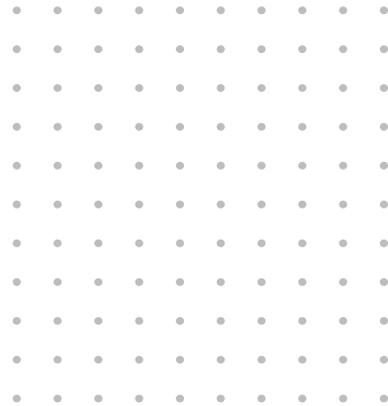
Figure 1.5
The Human Capital Index

Third, the HCI produces a simple result as its range is between 0 and 1. A municipality where an average child has: no risk of being stunted or dying before the age of five; receives 12 years of high-quality education; and becomes a healthy adult would have an HCI close to one. The HCI approaches zero when: the risk of being ill-nourished or prematurely dying is high; access to education is limited; and quality of learning is low. Fourth, HCI is output oriented. The emphasis on results encourages governments to not only to invest more but to invest well in policies built on credible evidence. This brings us to the fourth point: the HCI has a clear purpose. The HCI does not intend to measure the level of welfare in a society or to summarize any intrinsic values of health and education in human life (World Bank, 2020d), but rather it simply estimates the expected productivity of the next generation of workers.

Chapter 2

The Geography of Human Capital in Brazil

"Many Brazils"



Main Messages

- ❖ Many “Brazils” coexist within Brazil.
- ❖ Out of 16 states capitals in the North and Northeast regions, 12 have HCIs below the national average.
- ❖ Ceará (Northeast) and Cocal dos Alves (Piauí) are examples of positive state and municipality outliers in HCI performance, respectively. In both cases this is explained by their outstanding performance in the education component.
- ❖ Two-thirds of the variation in the 2019 municipal HCI is due to education.
- ❖ A large part of the variation in HCI is explained by factors other than income.
- ❖ The highest HCI performance was found in cities with small populations.

The human capital index maps how children develop their talent given their educational and health conditions. In this context, the main result is that a Brazilian born in 2019 will only achieve 60 percent of their full potential by the age of 18, or in other words, 40 percent of all potential human capital in Brazil will be unfulfilled on average. *A great deal of talent remains untapped, undiscovered by the society.* Talent is essential in promoting inclusive growth, building a competitive economy, and generating human development in the long term (Rocha et al., 2017; Valencia Caicedo, 2019).

However, the national HCI of 60 percent paints the broad picture of a representative Brazilian – an incomplete photo of a country marked by large inequalities. Because income inequality has been historically high and Brazilians tend to remain in poverty for many generations on average (Souza, 2018; Narayan et al., 2018), there is no reason to believe that with human capital formation the level of inequality will be different.¹¹This chapter, therefore, investigates how HCI varies across Brazil. It focuses on the geographic aspect of human capital formation by: mapping HCI by municipality; presenting within-region inequalities; and identifying the top- and bottom-ranked municipalities in terms of HCI. The chapter closes by comparing the HCI among Brazil’s state capitals.¹²

Many Brazils coexist within Brazil. Figure 2.1 maps the HCI 2019 by municipality. As expected, *there are sharp geographic disparities in human capital formation within Brazil.* The municipalities in blue indicate HCIs above the national average. Areas in dark blue indicate HCIs above 0.64 points, and light blue refers to those just above the national average, from 0.60 to 0.64 points. Municipalities in red have HCIs below 60 percent. The darker the red, the lower the municipal HCI relative to the national average. *The geographic contrast in HCI is clear.*

Many “Brazils” coexist within Brazil.

The Geography of Human Capital in Brazil
The Human Capital Index at municipal level, 2019

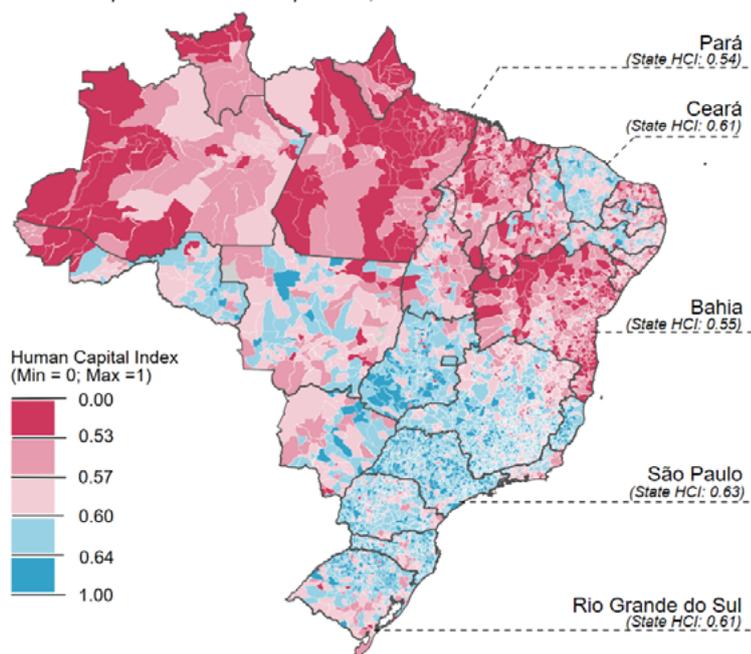


Figure 2.1
The Geography of Human Capital in Brazil

¹¹ A report entitled Insights from Disaggregating the Human Capital Index (World Bank, 2020c) presents the varying HCI among different regions in a selection of countries (referred to as GEO-HCI). In Romania, for example, the capital city’s HCI is around 0.80, while some of the country’s counties have an HCI around 0.50. In Peru, there are provinces with an HCI greater than 0.60, and others with an HCI around 0.50 (World Bank, 2020c).

¹² Brazil has five regions (North, Northeast, South, Southeast, and Center-West). These regions are divided into 26 states and the Federal District (Distrito Federal). In turn, states are subdivided into 5,570 municipalities, which is the lowest level of political administration.

Because HCI is a prospective measure, Figure 2.1 can also be seen as a map of future productivity in Brazil. The clearest conclusion that can be drawn from looking at this map is that municipalities where the human capital is below the national average are concentrated in the North and Northeast regions. That is, a child born in the North or Northeast is only able to achieve around half of their full potential and are 6 HCI percentage points below the richest children in the Southeast. Two examples that illustrate this point are Pará where the HCI is 54.3 percent and Bahia where the HCI is 55.0 percent. These HCIs are similar to those of Kenya (54.7 percent) and El Salvador (54.6 percent). In contrast, São Paulo, which has an HCI of 63.4 percent is comparable to Montenegro (63.3 percent) and Costa Rica (62.9 percent).

Figure 2.1 also shows that there are unusually high-performing areas in highly vulnerable regions. In the Northeast, the most notable example is the state of Ceará, which clearly stands out from its neighboring states with an HCI of 61 percent. This performance is in contrast with the fact that Ceará has one of the lowest per capita incomes in Brazil. Ceará notably had the same HCI as Rio Grande do Sul in 2019, despite the significant differences in per capita income (see box 2.1). *Better education is the key to Ceará's success.* One reason for its success is the well-documented reduction in learning poverty in recent years (Cruz & Loureiro, 2020; Lautharte et al., 2021; Loureiro et al., 2020).

Areas in need of urgent, targeted policy should be identified

Policy makers should learn from positive examples. Disaggregating HCI at the municipal level is important for at least two reasons. First, it flags high

performing areas where disadvantaged economic and social conditions could impair human capital accumulation. Second, mapping the municipal HCI makes it possible to identify areas where targeted policies are urgently needed. According to figure 2.1, gains in productivity can be achieved by focusing on the coast of Bahia, in the states of Maranhão and in Pará. Relatively richer states should set policies targeting their most vulnerable areas, namely: the south of Rio Grande do Sul, the north of Minas Gerais, and the north of Rio de Janeiro. *Action should be taken where it is most needed.*

Box 2.1 Human Capital Index & Per Capita Income

Gross Domestic Product per Capita
The Gross Domestic Product Per Capita at Municipal Level, 2017

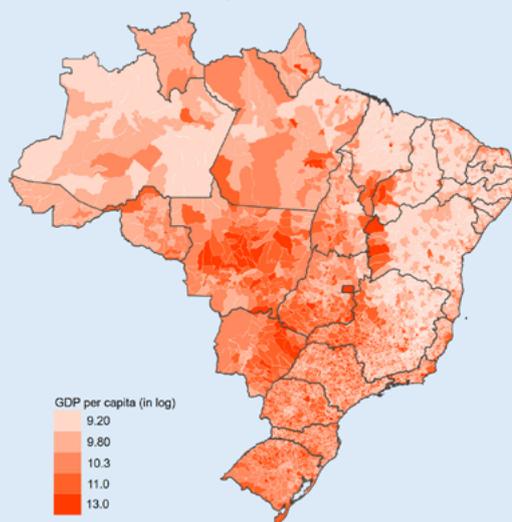


Figure B.2.1
Gross Domestic Product per Capita

The inequality of income in Brazil can be observed when mapping GDP per capita at the municipal level as seen in Figure B.2.1.a. A comparison with figure 2.1 shows that the South and Southeast have the highest HCIs and greatest number of municipalities with high GDP per capita. The North and Northeast, on the other hand, are home to the cities with the lowest HCIs and the lowest GDP per capita. As discussed, an exception is Ceará, which is dominant red in the GDP map (low GDP), but blue in Figure 2.1 (high HCI)

Box 2.1 (continued)

The HCI does not include income in its formula (see chapter 1). It is, however, an output-based index with components that correlate with income. Figure B.2.1.b shows the correlation between HCI and GDP per capita in 2017 (the last year data is available). A variation of one point in log GDP is associated with a change of around one-fifth in the HCI. This indicates that a large part of HCI variation is associated with factors other than income.

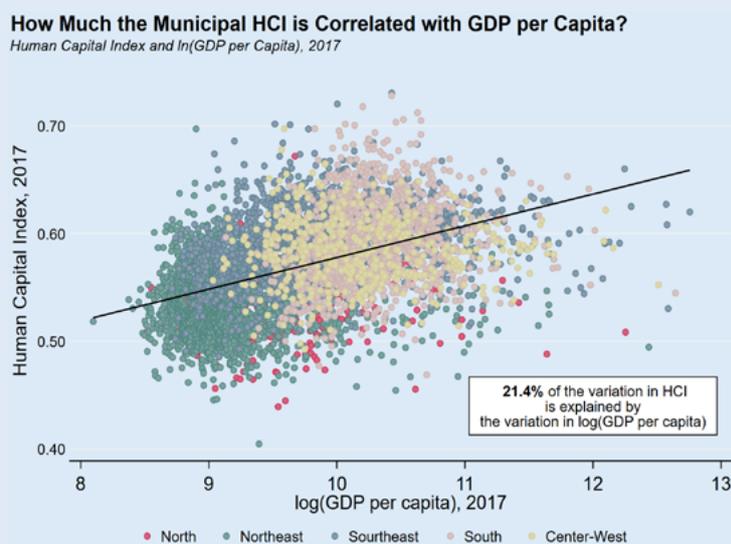


Figure B.2.2
How Much the Municipal HCI is Correlated with GDP per Capita

Figure 2.2 reinforces the idea of “many Brazils.” Figure 2.2 plots the municipal HCI for each region in Brazil.¹³ Dot represent municipalities and colors identify their region. Vertical bars show the average regional HCI. Cities with the highest and lowest HCIs are named. *Extreme HCIs are often found in the same region.*

On the two extremes, around 250 km and 30 HCI percentage points separate Santa Tereza (76.7 percent) and Engenho Velho (47.2 percent) in the state of Rio Grande do Sul. *Despite close geographically, far apart in human capital formation.* Disparities in HCI within the same region can also be observed in the Northeast. The city of Ibirataia in Bahia has one of the lowest HCIs in Brazil at 44.9 percent, which is similar to that of Ghana (45.0 percent) and Gabon (45.8 percent). Cocal dos Alves in Piauí, on the other hand, has one of the highest HCIs (74.0 percent), similar to that of Italy (72.8 percent) and Austria (74.7 percent) (World Bank, 2020d). Largely different realities in the same region.

Overall, Figure 2.2 illustrates the scale of inequality within regions as opposed to between regions in terms of human capital accumulation. It shows that in 2019, inequality within the same region was 50 to 70 percent greater than inequality between regions in

Inequality within regions is 50 to 70 percent greater than inequality between regions

¹³ There is a methodological issue regarding the population size of one municipality. The 2010 Census estimates the population of Jacareacanga (in Pará) as approximately 7,000 habitants. However, local authorities argue that the actual number is 41,000. As the adult survival rates uses the census population, this issue negatively impacts Jacareacanga's HCI. Given this ambiguity, this municipality was not included in Figure 2.2 and Figure 2.3.

Brazil.¹⁴ This was measured by calculating the HCI gap between the North-Northeast and the South-Southeast-Center-West and comparing it with the gaps between municipalities at the top and bottom percentile of the HCI distribution within the same region. Chapter 3 will look at these inequalities within and between regions in more detail.

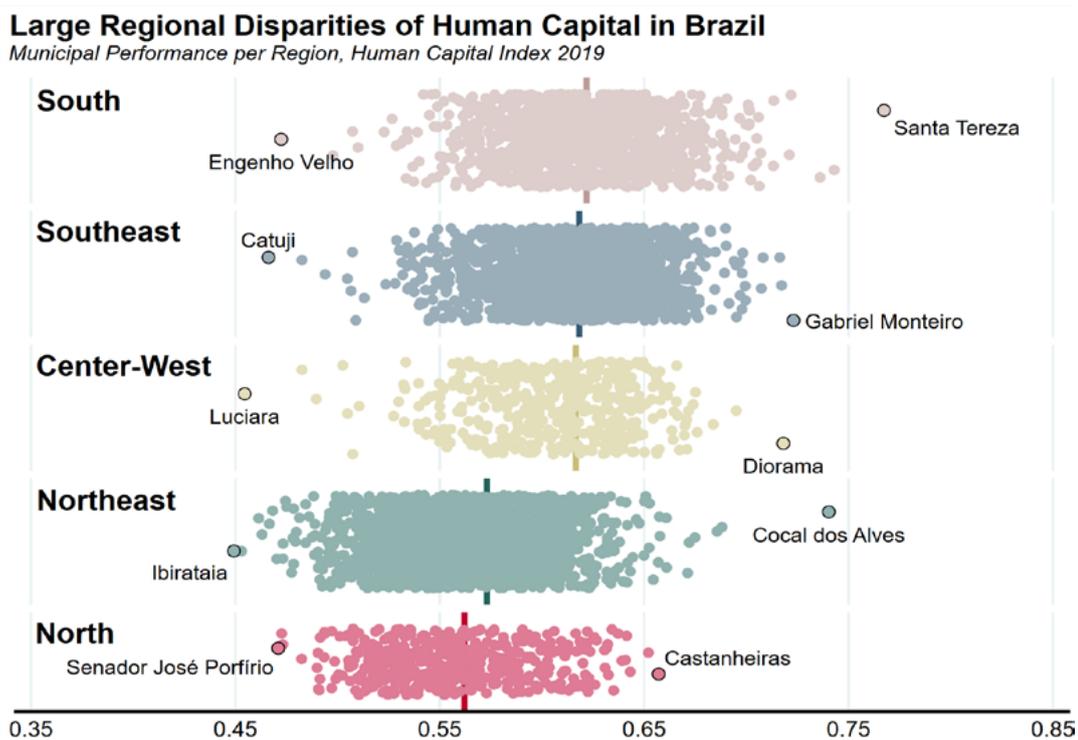


Figure 2.2
Large Regional Disparities of Human Capital in Brazil

There is also significant variability among “small” municipalities (outside metropolitan areas).

The fact that low-performance cities such as Ibirataia, Luciara, and Catuji have less than 20,000 inhabitants and that of high-performance cities including Castanheiras, Cocal dos Alves, and Santa Tereza have populations less than 4,000 shows that small municipalities populate the two extremes of the HCI distribution.

**Box 2.2
Is Brazil’s Human Capital Index Spatially Correlated**

What is the spatial correlation between a municipal HCI and its immediate neighbors? To answer this question, Figure B.2.2.a plots the spatial correlation using the Moran Index. The Global Moran Index for HCI in Brazil is 0.62, indicating a high positive spatial correlation: municipalities with high HCI tend to “attract” neighbors with high HCI. The same reasoning applies to cities with low HCI.

¹⁴ In 2019, the weighted average of the HCI in the North and Northeast was 56.2 percent and 57.3 percent, respectively. In the South, Center-West, and Southeast it ranged 61.6 to 62.2 percent. The difference between these “two Brazils” is 4–6 HCI points. Yet, the difference between the 90th and 10th percentile in the North was 8.54 HCI points (60.7 percent – 52.1 percent). In the Northeast, this difference was 8.58 HCI points (61.4 percent – 52.8 percent); in the Southeast it was 7.16 HCI points (65.2 percent – 58.0 percent); in the South it was 7.27 HCI points (65.4 percent – 58.2 percent); and in the Center-West it was 7 HCI points (64.4 percent – 57.6 percent). These differences average to 7 HCI points. Consequently, inequality within the same region is 50 to 70 percent greater than inequality between regions. A regression showed that 63 percent of all inequality in HCI (2019) comes from within regions.

Box 2.2 (continued)

Spatial Clustering of the Human Capital Index (2019)

Lisa Spatial Correlation



Figure B.2.3
Spatial Clustering of the HCI

The North and Northeast regions constitute a large spatial cluster of municipalities with low HCIs. Note that municipalities in the state of Ceará (Northeast) are in the high-high category. There are exceptional cases where municipalities are classified as high-low. For example, Cocal do Alves (Piauí), Ibimirim (Pernambuco), and Guarabira (Paraíba) are high-performing municipalities surrounded by municipalities with low HCIs. In the South, the results are mixed, especially in Rio Grande do Sul where there is a low-performing cluster next to the southern border. In the Southeast, the wealthiest region, there is a large cluster of high HCI performance.

Note: The cluster analysis depends on what is defined as “neighbors” and on the weight matrix. For example, if a municipality is classified as a low-high, one should not assume that all neighbors have high HCIs. Methodological points: (i) the estimates use the queen matrix, which considers neighbors as continuous territories; (ii) the significance level used is 1 percent; (iii) Grey regions are municipalities in which spatial correlation is insignificant or where data is missing.

Several factors explain why small municipalities have larger HCI dispersion.¹⁵ Small municipalities might have less complex school and health systems. With fewer students and patients, smaller cities can more easily implement personalized policies and close monitoring. For this reason, they tend to have greater health coverage, at least for basic health services. Another explanation is that high dispersion reflects cohort effects, which are more pronounced in small areas.

To further investigate this point, figure 2.3 geolocates the best- and worst- ranked municipalities in relation to the human capital index in 2019. Red dots represent the five worse-ranked municipalities in Brazil while the blue dots show the location of the five best-ranked. Their respective population sizes

¹⁵ If the municipalities are divided into groups with similar populations, the group’s HCI gaps are higher in those with a smaller population. Among the 270 municipalities with fewer than 2,500 habitants, HCIs range from 54.6 percent (10th percentile) to 68.2 percent (90th percentile), or a 13.6 HCI point difference. For municipalities between 2,500 and 10,000 habitants, the gap remains high but slightly smaller at 11.6 HCI points. The gap for municipalities with populations between 100,000 and 500,000 decreases to a 9.9 HCI point difference and this decrease is even greater in municipalities with populations of more than 500,000, which have a gap of 7.8 HCI points.

(in thousands) are presented. All best- and worst-ranked municipalities have populations smaller than 20,000 inhabitants. *Smaller municipalities occupy the extremes of HCI distribution.*

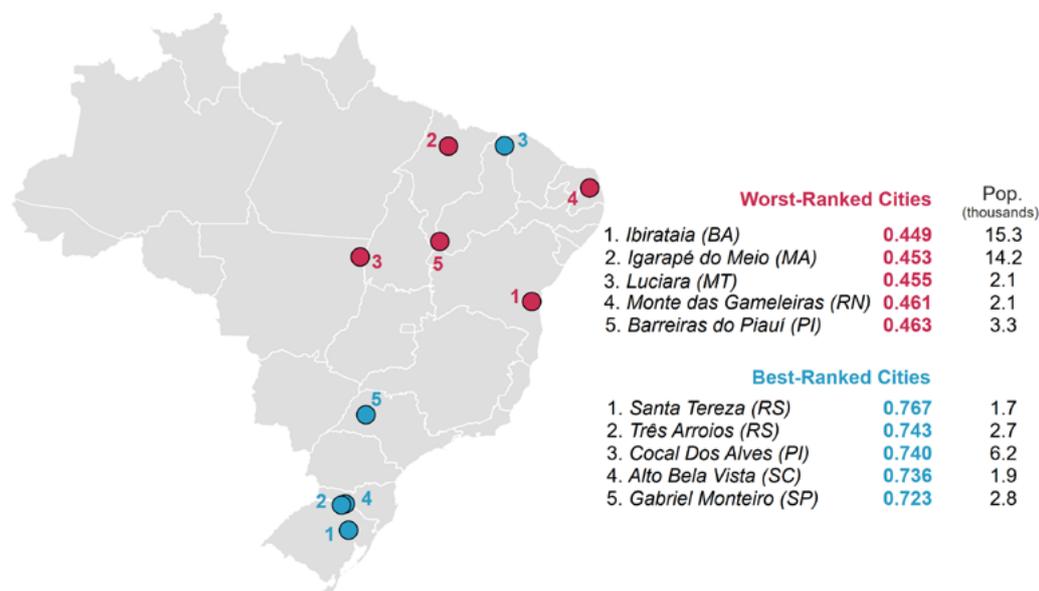


Figure 2.3
Best- and Worst-Ranked Municipalities in Brazil

Four out of five of the best-ranked municipalities are located in the South and the Southeast.

The two best-ranked municipalities in 2019 are in the countryside of Rio Grande do Sul. They are Santa Tereza with an HCI of 76.7 percent and Três Arroios with an HCI of 74.3 percent. Alto Bela Vista in Santa Catarina and Gabriel Monteiro in São Paulo are also in the top five municipalities ranking fourth and fifth, respectively. The performance of these municipalities rival those of countries like Croatia (71.0 percent), Cyprus (75.6 percent), Lithuania (70.6 percent), and Spain (72.8 percent) (World Bank, 2020d).

A noteworthy case in the best-ranked list is Cocal dos Alves in Piauí, which has an HCI of 74 percent and ranks third, stands out in the list of the best municipalities as it is located in the Northeast.

Its performance is especially remarkable given the fact that Piauí is one of the most economically vulnerable states in Brazil. The HCI of Cocal dos Alves was notably 11 points ahead of São Paulo in 2019. This is not an isolated incident: Cocal dos Alves has consistently ranked among the top performers and a great part of this is a result of having a strong education system. In 2019, Cocal dos Alves had a LAYS equal to 9.75 years compared to the average of the state of Piauí at 6.88 years and Brazil at 7.20 years.¹⁶ No equivalent outperformance was observed in other HCI components.¹⁷ Chapter 8 details the public policies implemented by Cocal dos Alves that have been so effective in creating human capital.

Cocal dos Alves is an outperformer in Brazil

Municipalities in the worst-ranked list in figure 2.3 are concentrated in North and Northeast regions.

These municipalities share important characteristics. First, the quality of education is low, which is a significant impediment in human capital formation. Performance on national learning assessments in the worst-ranked municipalities is significantly below average.¹⁸ Second, while Cocal dos Alves is 2.5 years above the national LAYS, these municipalities are all 2.5 years below the national LAYS. Third, a

¹⁶ When looking at the Índice de Desenvolvimento da Educação Básica (IDEB), an index normalized between 0 and 10 that combines student performance in Portuguese and mathematics and school repetition rates, Cocal dos Alves has one of the best upper secondary results in Brazil with an IDEB of 6.5 in 2019, well above the national average of 4.2.

¹⁷ Looking at other HCI components, Cocal dos Alves presented a health component of 0.925, which was better than that of the Northeast region at 0.877. In terms of child survival, its performance is only slightly better than the Northeast: 0.958 against 0.984.

¹⁸ In 2019, all worst-ranked municipalities had an IDEB lower than 3.5 at the end of secondary school, below the national average of 4.9.

significant share of their population lives below poverty rates. Apart from Luciara (in Mato Grosso), at least 60 percent of the population of these municipalities receive conditional cash transfers (Bolsa Família e Cadastro Único No Seu Município, n.d.).¹⁹

The discussion thus far on “many Brazils” has emphasized the variability in HCI performance among small municipalities. However, these cities only represent a small fraction of the Brazilian population. Figure 2.4 extends the analysis of HCI gaps to include the HCI of state capitals (large cities) in 2019. Blue dots show cities with HCIs above the national average, while red dots represent cities below the national average. The vertical solid line represents the national average (0.601). According to Figure 2.4 shows that there are ten HCI points separating the best and the worst performing capitals. The best-performing capitals are Vitória, Curitiba, and Campo Grande, with HCIs similar to Chile (0.652 percent), China (0.653 percent), and Turkey (0.649 percent) (World Bank, 2020d). Macapá, Belém, Salvador, and Maceió are among the bottom performers.

Ten Points Apart: Best- and Worst-Performing State Capitals

Human Capital Index by State Capitals, 2019

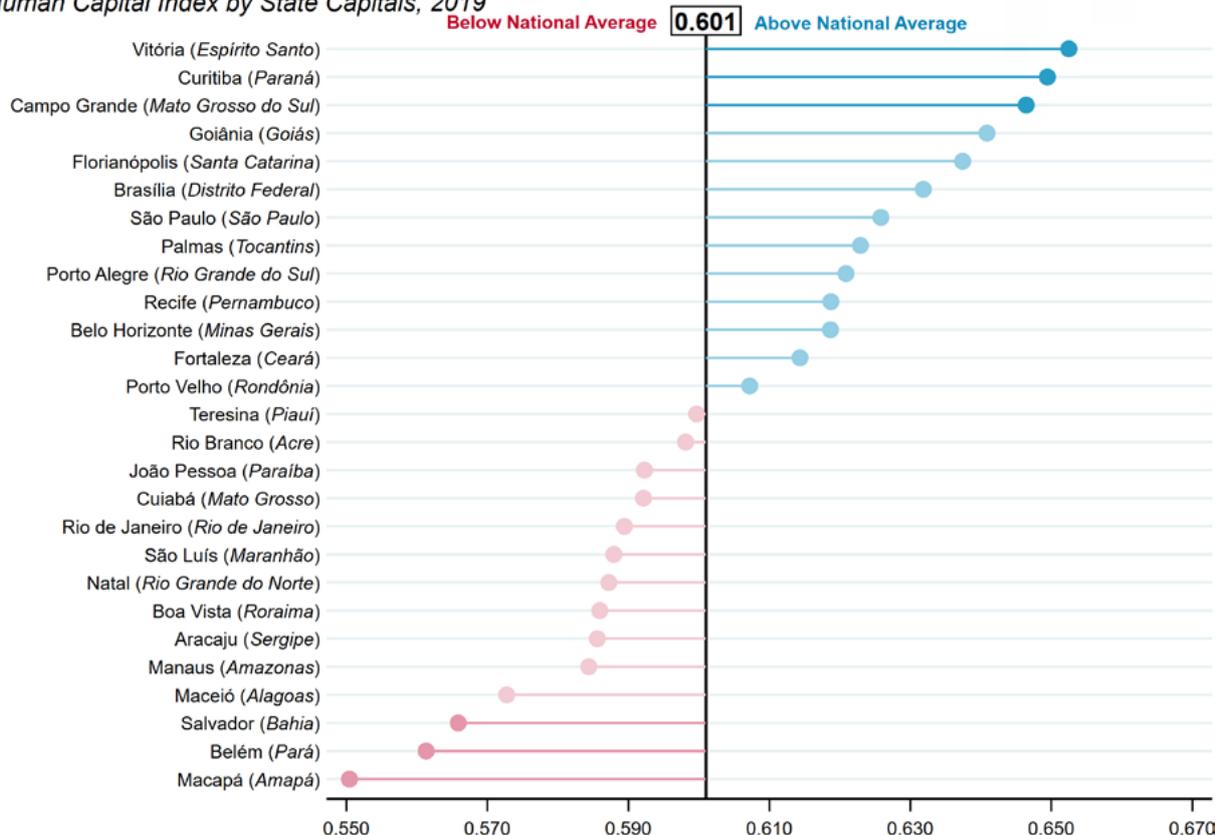


Figure 2.4

Ten Points Apart: Best- Worst-Performing State Capitals

The HCI of state capitals mirrors the previous conclusions: the North and Northeast are home to the majority of state capitals performing below the national average. Twelve state capitals in the North and Northeast have HCIs lower than 60.1 percent. The only exceptions to this are Fortaleza and Recife in the Northeast and Palmas and Porto Velho in the North. Another important outlier in this figure is Rio de Janeiro, which is the only capital in the Southeast with an HCI below the national average.

¹⁹ In 2021, 38 percent of the population in Luciara was receiving Bolsa Família (Bolsa Família e Cadastro Único No Seu Município, n.d.).

— Many Brazils

But what HCI component explains the “many Brazils” phenomenon?

One way to approach this question is by disaggregating the data for HCI components at the municipal level. Figure 2.5²⁰ shows that more than two-thirds of all of the variation in the municipal HCI from 2019 was due to education. Variation in HCI in different countries around the world show similar results: 65 to 85 percent of the difference between the HCIs of high- and low-income countries is explained by education (World Bank, 2020d).

Education explains two-thirds of the variation in municipal HCIs

Education has the highest share in the HCI variation and fluctuates modestly from region to region (from 61.8 percent in the South to 77.3 percent in the Northeast).

Figure 2.5 also shows that adult health is more relevant in the Southeast and South, where it explains approximately 30 percent of all the variance in the municipal HCI. In the North and Northeast, the influence of adult health on HCI variation decreases to 18 percent. Therefore, the level of human capital in a given municipality in Brazil is predicted largely by its quality and quantity of education, followed by adult health and lastly, child survival.

Education as Leverage

What predicts the variation in Human Capital Index (2019) within regions?

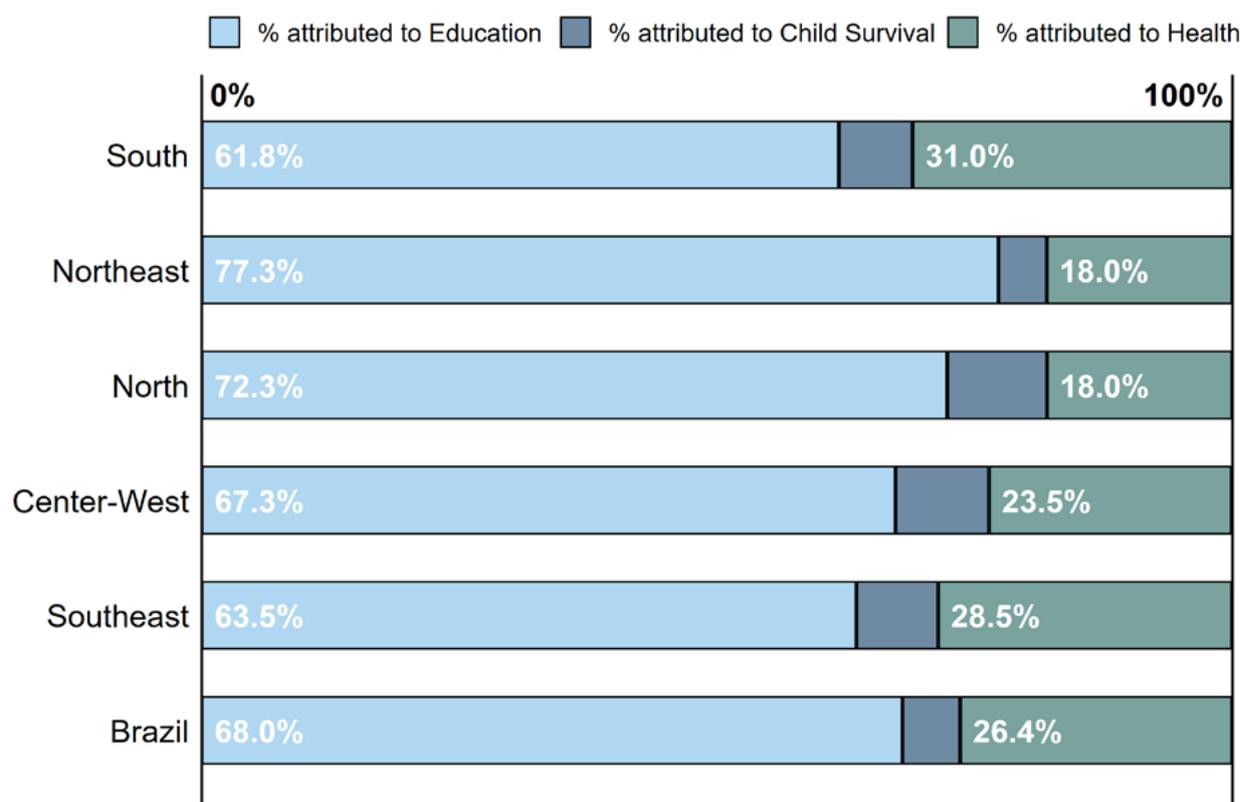


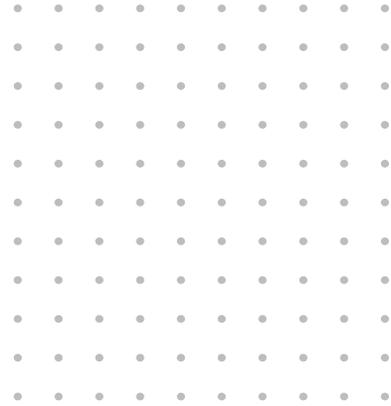
Figure 2.5
Education as Leverage

²⁰ The contribution of each outcome was calculated using Shapley R² decomposition. First, the compound HCI was regressed with health, education, and child survival components as regressors (using population as weights). This was followed by a calculation of how much each regressor contributes to the HCI variation. For further details, see Azevedo et al. (2012).

Chapter 3

Human Capital Formation in the Pre-Pandemic Years

"Better but Unequal"



Main Messages

- ❖ Although there has been a large improvement in HCI, the reduction in inequalities has been small between 2007 and 2019.
- ❖ States improved their human capital at the expense of greater inequality.
- ❖ The North and Northeast regions are approximately 12 years behind in terms of human capital formation compared to the South and Southeast.
- ❖ Human capital in the North is increasing at a slower rate than other regions in Brazil.
- ❖ Most of the observed inequalities between municipalities in 2019 are driven by differences within regions.
- ❖ The worst- and best-performing municipalities in 2007 were likely to remain in the same position in 2019.

The previous chapter focused on the fact that 40 percent of Brazil's talent is unachieved, left unused by society. This chapter investigates the evolution of Brazil's HCI before the COVID-19 pandemic. A central question of this chapter is whether originally low-performing regions in 2007 are catching up to regions with relatively higher HCI levels. In other words, are municipalities in Brazil converging in terms of human capital accumulation? To investigate this issue, this chapter: (i) analyzes the time trends of municipal HCIs from 2007 to 2019,²¹ (ii) checks for heterogeneous gains, (iii) maps areas where improvement has been stagnant, and (iv) discusses the state capitals.

The analysis starts by showing that despite of a great loss of talent and persistent inequalities, Brazil saw notable human capital improvements before the pandemic. Figure 3.1 illustrates this point by mapping HCI growth at municipal level between 2007 and 2019. *Widespread but geographically concentrated gains.* Figure 3.2 complements this evidence by showing that inequality among municipal HCIs has slightly decreased between 2007 and 2019 in Brazil (black arrow). Between regions, there are two clusters of convergence: (1) the Northeast and North (red and green arrows), where inequality has slightly increased or remained the same, and (2) the South and Southeast (grey and blue arrows), where inequality has decreased.

An alternative way to illustrate the recent HCI gains is shown in figure 3.3. Each regional index is an average of municipal HCIs using their respective population sizes as weights.²² In general, three observations can be made. First, there appears to be two distinct "Brazils": one that scores above the national HCI average, which is composed of the South, Southeast, and Center-West; the other falls below the national HCI average and is composed of the North and Northeast regions. The first group of regions had HCIs of approximately 55 percent in 2007 and reached 62 percent in 2019, which represents a gain of seven HCI points. Among these regions, the Center-West (yellow solid line) showed the most remarkable improvement. Starting at 54 percent, or two HCI points below average, the region was able to catch up to the HCI of the South and Southeast in 2017 (62 percent).

The Evolution of Human Capital in Brazil

Human Capital Index at Municipal Level from 2007 to 2019

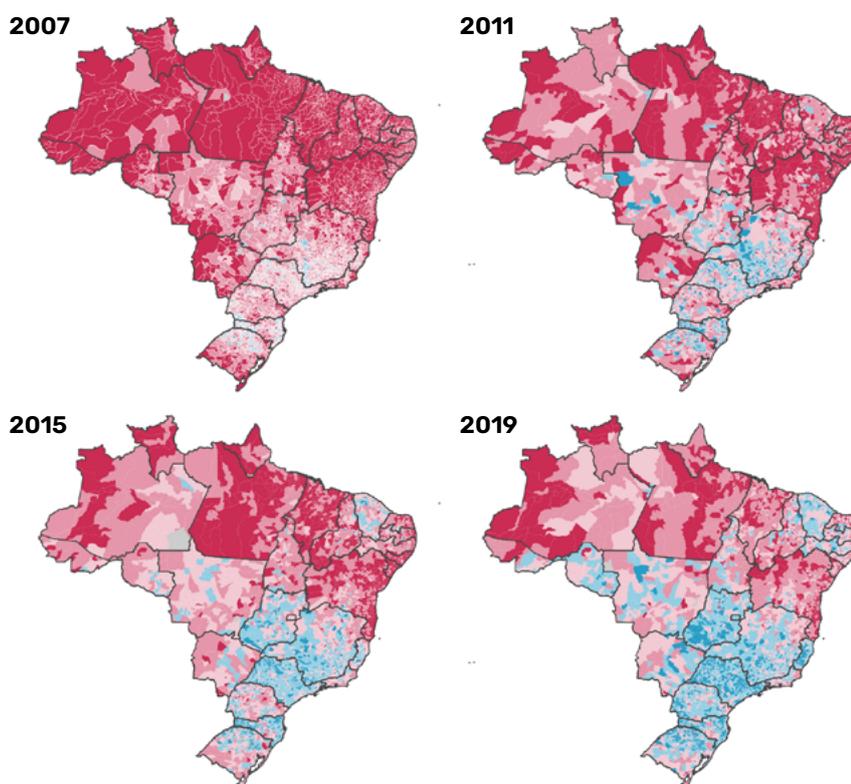


Figure 3.1
The Evolution of Human Capital in Brazil

²¹ The same administrative data for education and health are available across years.

²² Using weights reflects the idea that populated municipalities are more representative of the national or regional averages.

A Comparison of 2007 and 2019 HCI Inequality by Region

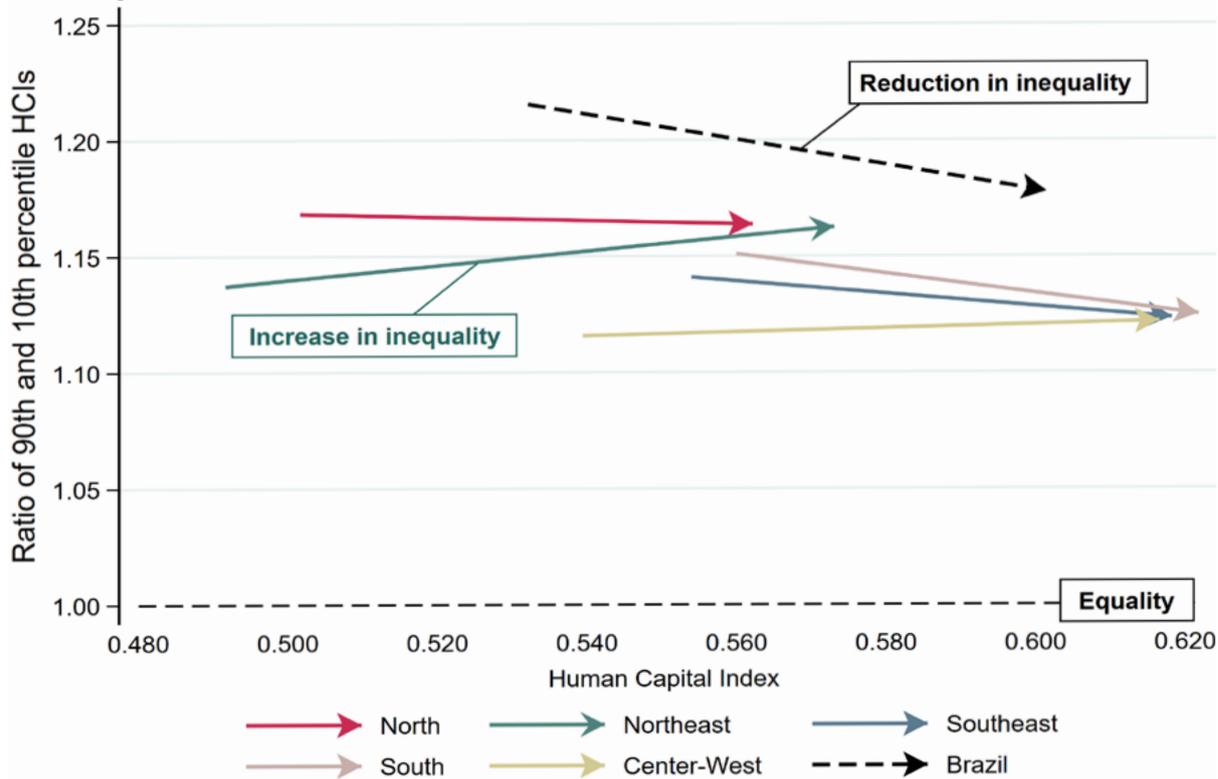


Figure 3.2
A Comparison of 2007 and 2019 HCI Inequality by Region

Better but Unequal

Human Capital Indexes by Region from 2007 to 2019

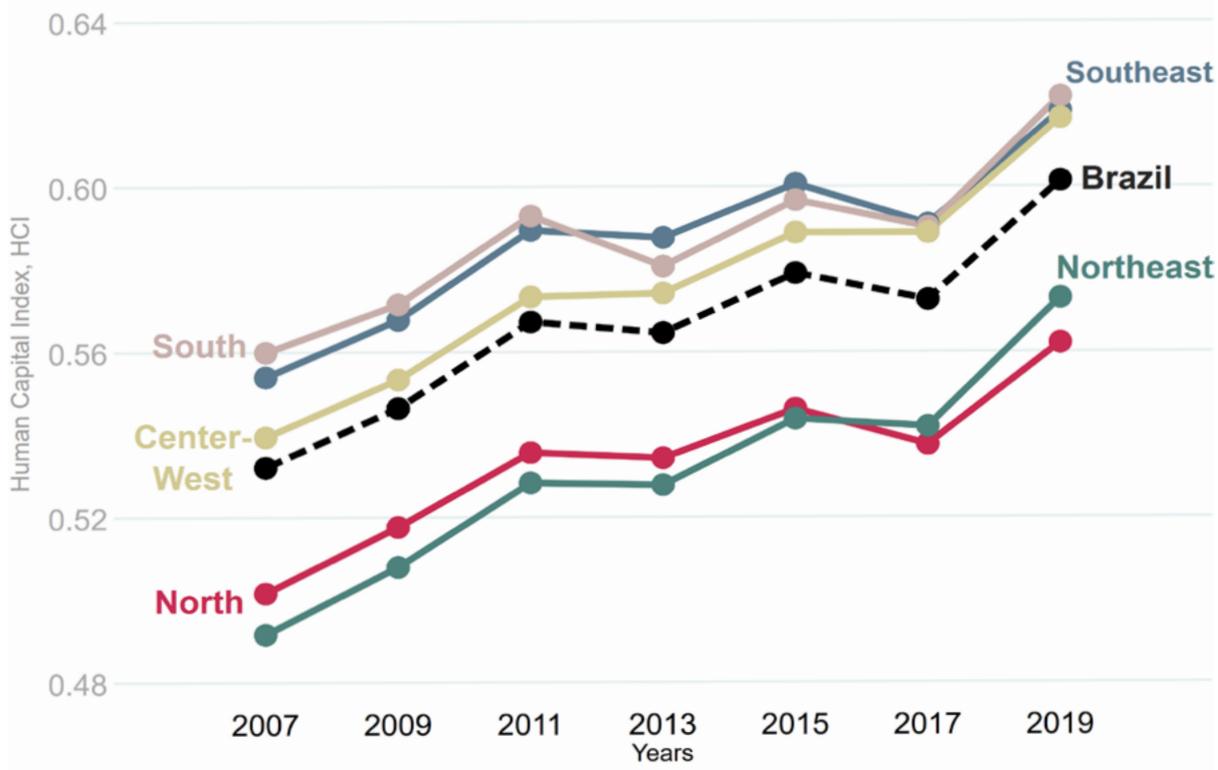


Figure 3.3
Better but Unequal

The North and Northeast regions are approximately 12 years behind in terms of human capital formation compared to the rest of Brazil. This conclusion originates from the fact that in 2019 the HCI in these regions was 57 percent, which is only slightly above the HCI of 55 percent achieved by the South and Southeast in 2007. The gap in performance is compounded by the fact that progress has been slow in these regions: for example, the average HCI of a child born in the North in 2019 was only 6 points higher on average than that of a child born in the same region 12 years earlier. *The pace of progress is slow.* In order to rapidly improve the human capital of children in vulnerable regions, governments should augment evidence-based policies in priority regions (see chapter 8). *The North is not just behind; its human capital is increasing more slowly than any other region in Brazil.*

There is weak indication that HCI gaps are narrowing.

The second conclusion from Figure 3.3 reveals that the difference between the HCI in the South–Southeast and North–Northeast was 6.2 HCI points in 2007 and 4.9 HCI points in 2019, looking at regional gains separately makes it clear that this reduction relies on the improvements made in the Northeast. While the South and Southeast had an average yearly increase of around 0.53 HCI points, the increases seen in the Northeast were much higher at an average of 0.68 HCI points per year. The North, on the other hand, had an average yearly increase of 0.50 HCI points, the lowest regional rate in Brazil. Still on this point, the Center-West deserves particular mention: it had the second highest rate of improvement among regions averaging a gain of 0.64 HCI points per year, only behind the Northeast. The notable HCI improvements in the Center-West and Northeast were, however, observed before the COVID-19 pandemic (see chapter 6).

Human capital in the North is improving slower than in any other region.

**Box 3.1
What explains the evolution in human capital?**

Chapter 2 explains that education is responsible for two-thirds of the variation in the Human Capital Index within Brazil in 2019. This result does not indicate, however, whether education has always had this prominent role in HCI scores. Figure B.3.1 uses data from 2007 to 2019 to examine the degree to which each component of HCI explains its variation.

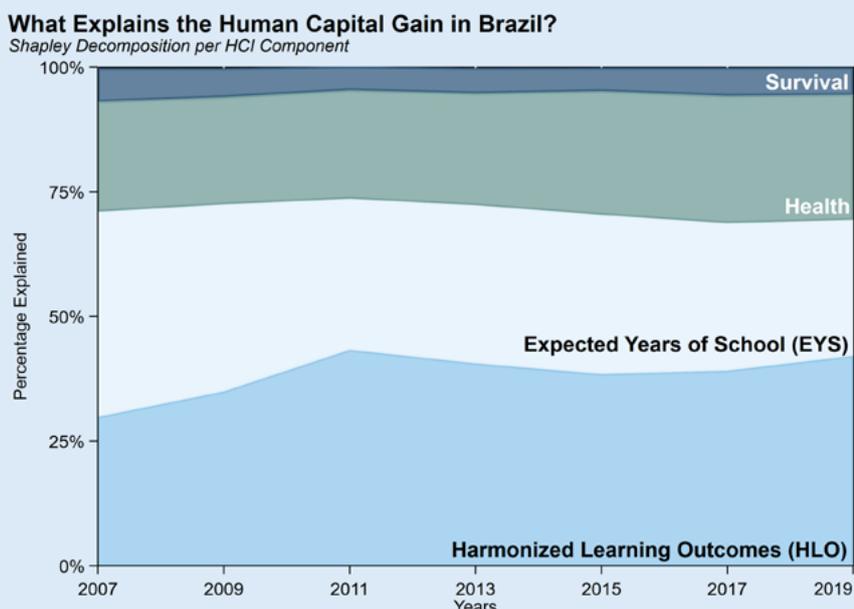


Figure B.3.1
Explaining Human Capital Evolution, 2007–2019

In 2007, the expected years of schooling was the main factor explaining HCI variation, losing importance to harmonized learning outcomes in the following years. These two factors explain around 70 percent of all HCI variation. Child survival was recorded as being between five to seven percent during these years, while health gained importance over the years, increasing from 22 to 26 percent.

Because figure 3.3 shows the evolution of the HCI over a period of more than a decade, it is important to contextualize these gains. The national HCI growth rate from 2007 to 2019 was 0.861 percent on average per year.²³ Assuming that this pace continues, it would take approximately 18 years for Brazil to increase its HCI by 10 points. Relative to the HCI of developed countries, Brazil would need around 10 years to reach the HCI level of Chile whose HCI is 65.2 percent, 30 years to achieve the HCI of Portugal (76.9 percent), and more than 35 years to reach that of Japan (80.5 percent).

Brazil may take 30 years to reach the HCI of developed countries.

In addition to projecting how long it would take Brazil to reach the HCI of developed countries, a similarly critical discussion relates to the dynamics of human capital accumulation.

The question is: What characterizes the dynamics of human capital accumulation in Brazil? It is still unclear whether the modest growth rate observed in each region between 2007 and 2019 was led by municipalities that were originally behind (characterizing a catching up), or if the increase is concentrated in specific regions (intensifying geographic disparities), or if there was any mobility among municipalities in the HCI distribution (deepening the idea of many Brazils). This chapter investigates each point separately.

Figure 3.4 plots the gains of HCI at the municipal level to investigate the first point—whether municipalities with lower HCIs in 2007 present higher growth rates. The vertical axis is the percentage gain in the HCI between 2007 and 2019. The horizontal axis is the HCI in 2007, the baseline period. Each point represents a municipality, while colors illustrate different regions in Brazil. The solid black horizontal line indicates the national percentage gain on the HCI as reference.

Starting Behind but Improving Faster

Relative % Gains in Municipal HCIs between 2007 and 2019

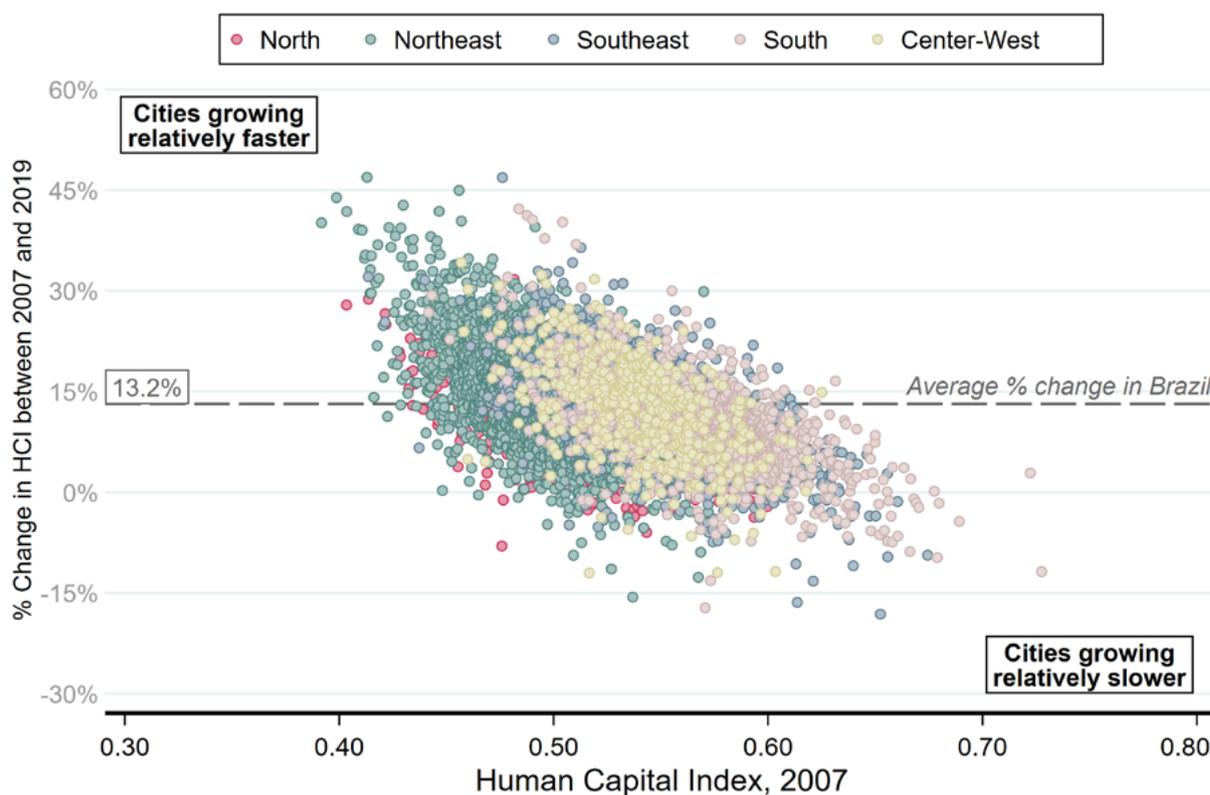


Figure 3.4
Starting Behind but Improving Faster

²³ The Northeast had the highest growth rate among all regions at 1.10 percent on average per year. The region with the second highest growth rate was the Center-West, with a 0.98 percent increase per year from 2007 and 2019. Next, the Southeast and the Northern regions presented similar rates, at 0.762 and 0.769 percent per year, respectively. The South had the lowest rate at 0.687 percent. Growth rates were calculated using weighted regressions of municipal HCIs (in logs) against a time variable (biannually) and with a set of municipal level controls (state fixed-effects and dummies for state capitals and rural areas).

Higher gains were shown mostly to occur in municipalities with lower HCI levels in 2007. Figure 3.4 shows that municipalities that started at lower levels in 2007 improved faster than municipalities starting at higher HCI levels. This evidence indicates that municipalities in Brazil were converging in terms of human capital between 2007 and 2019. In fact, municipal HCIs that were one percent lower in 2007 correlated with an average increase of 0.535 percent between 2007 and 2019. *That is, the lower the baseline HCI, the higher the average gains were over 12 years.*

Municipalities originally behind had a higher increase in HCI between 2007 and 2019.

This evidence of municipalities “catching up” is reinforced by a defined regional pattern. Municipalities in the Northeast (in green) present the highest gains and the lowest baseline levels in the country. On the opposite end are municipalities in the Southeast (in light blue) and South (in beige) presenting that had higher HCIs in 2007 but had lower changes in HCI over the years. While figure 3.4 reveals this convergence between municipalities, figure 3.3 does not suggest that catching up is occurring between regions. Therefore, the overall slight improvement in inequalities between 2007 and 2019 was mostly driven by municipalities within regions.

Most of the observed inequality between municipalities in 2019 is driven by differences within regions. Table 3.1 summarizes measures of a decomposition of inequalities between and within regions in Brazil between 2007 and 2019. The share of total inequalities resulting from differences between regions decreased from 53.5 percent in 2007 to 37.3 percent in 2019, while within-region differences accounted for less than 50 percent in 2007 and increased to more than 62 percent in 2019.

TABLE 3.1 Increase in Within-Region Inequality

	2007	2013	2019
HCI inequality indexes			
Gini ²⁴	0.043	0.038	0.036
Theil ²⁵	0.003	0.002	0.002
HCI inequality decomposition			
% between regions	53.5	50.0	37.3
% within regions	46.5	50.0	62.7

Though it was found that municipalities that were behind are improving faster it is worth investigating whether this conclusion holds for state capitals. Figure 3.5 plots the HCI for state capitals in 2007 (in maroon), 2013 (in yellow), and 2019 (in green), and shows that. State capitals are sorted from the lowest to the highest HCI in 2007. The percentage change between 2007 and 2019 is shown. The answer to the above question is at the bottom: state capitals with the lowest HCIs in 2007 tended to present higher gains over the 12 year period when compared to those with the highest baseline HCIs. The HCI of the bottom five municipalities in figure 3.5, for example, increased by 18.9 percent while the top five increased by 11.4 percent over the same period. *Lower gains for capitals in the top.* This shows that like smaller municipalities, state capitals originally behind improved their HCI faster over the 12 years before the COVID-19 pandemic.

²⁴ Gini index calculates the extent to which the distribution of income among individuals, households or municipalities deviates from a perfectly equal distribution. The Gini index is the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. A Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality.

²⁵ Theil index measures the distance that a population is away from the equal distribution. Differently from Gini Index, it is additive across different regions, but does not have a straightforward interpretation as the Gini coefficient.

Larger Gains for those Originally Behind

Increases in the Human Capital Index by State Capital from 2007 to 2019

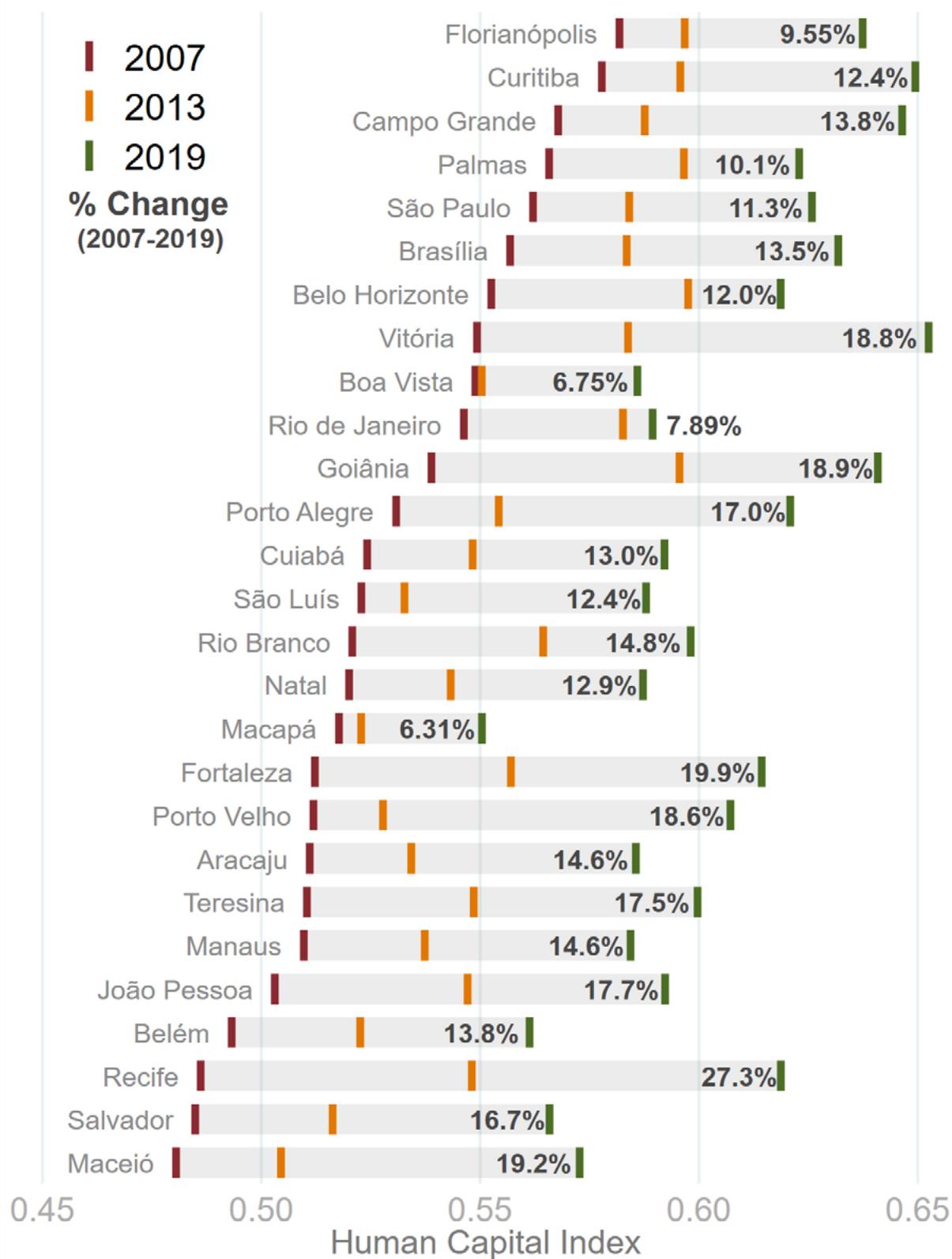


Figure 3.5
Larger Gains for Capitals Originally Behind

Two notable cases that can be made from figure 3.5 that are worth mentioning. The first is concerning the city of Rio de Janeiro, which saw the smallest improvements in human capital accumulation between 2013 and 2019. Rio de Janeiro's HCI in 2019 was only 1.16 percent higher than 2013. Additionally, Rio de Janeiro's HCI gain was one-third the size of Belo Horizonte's gain, which recorded the second lowest HCI gains. Despite performing relatively well among state capitals in 2007, Rio de Janeiro also presented the third lowest percentage gain for the period 2007 to 2019 (7.89 percent) – only ahead of Boa Vista and Macapá in the North. After comparing with counterparts, the numbers become even more stark: the percentage gain in Rio de Janeiro is about half of the improvements recorded in Salvador and Porto Alegre.

The second case relates to two cities in the North: Macapá (in Amapá) and Boa Vista (in Roraima).

In 2007, only five out of 15 capitals in the North and Northeast had HCIs higher than Macapá's. Similarly, only Palmas was ahead of Boa Vista. The comparatively good performance in both cities, however, saw virtually no improvement between 2007 and 2013. Boa Vista had a similar HCI to Vitória in 2007, but while Boa Vista had improved by 6.75 percent by 2019, Vitória's improvements were nearly three times higher (18.8 percent). Macapá and Boa Vista had both lower baseline levels of human capital in 2007 with gains 2.5 times smaller than the national average of 13.2 percent. *The worst of both worlds.*

Rio de Janeiro, Macapá, and Boa Vista saw the smallest gains between 2007 and 2012.

The Geography of Human Capital Gain in Brazil

% Change in the HCI, 2007-2019

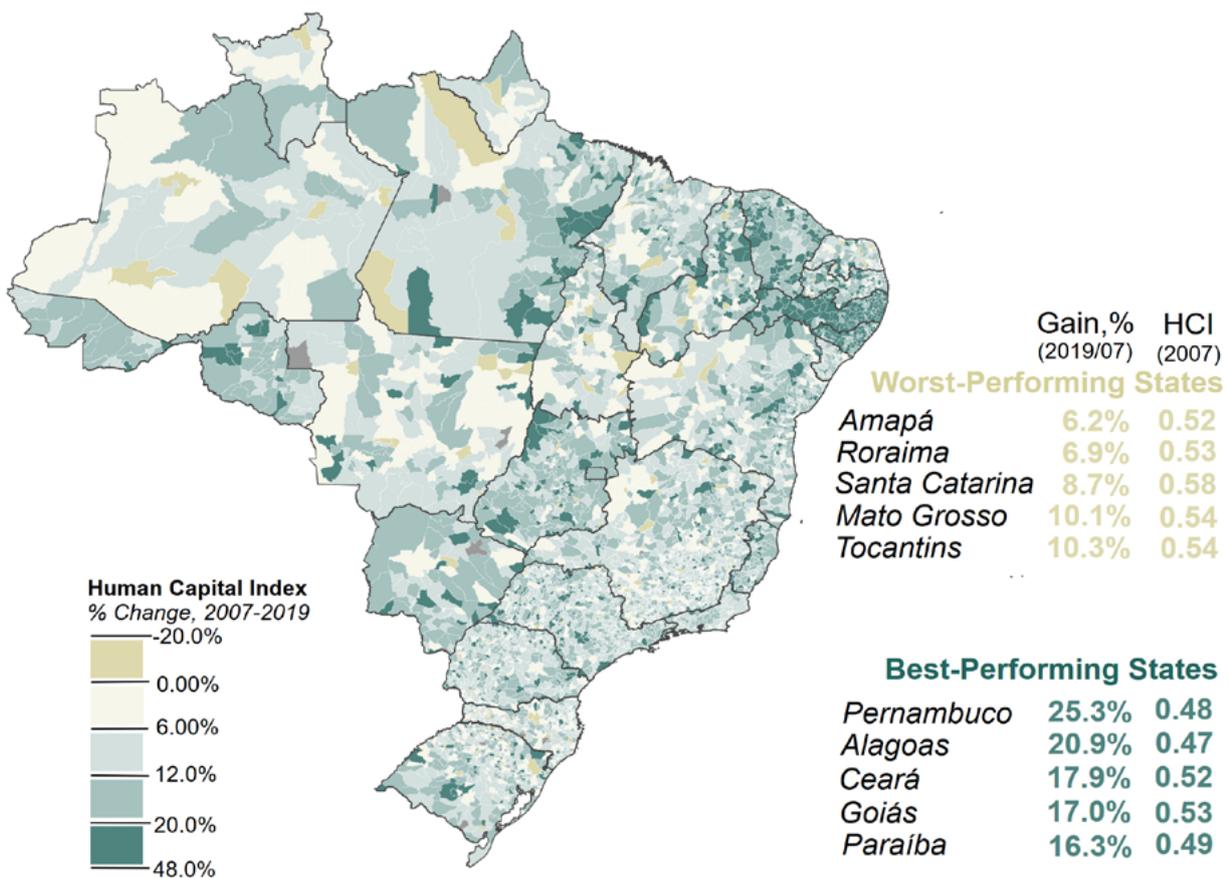


Figure 3.6
The Geography of Human Capital Gain in Brazil

The fact that the state capitals initially behind tended to improve their HCI faster leads to yet another question: *is the increase in HCI between 2007 and 2019 geographically concentrated?* This is relevant because the data in figures 3.1 to 3.3 do not show whether improvements in the Northeast, North, and Center-West regions resulted from the out-performance of a specific area, or a few municipalities, or if it comes exclusively from state capitals. Figure 3.6 takes this concern into account by mapping the percentage change in HCI at the municipal level between 2007 and 2019. The greener the municipality the higher its percentage gains between 2007 and 2019.

The main conclusion from figure 3.6 is that pre-pandemic HCI gains in Brazil were geographically concentrated. While figure 3.3 showed that some regions improved faster than others, figure 3.6 qualifies this discussion in important ways. It shows that the countryside of Pernambuco (25.3 percent gain), Alagoas (20.9 percent gain), Ceará (17.9 percent gain) and, with less intensity, Paraíba (16.3 percent) are in a large part responsible for the increase in the national human capital index. Notably, these states had relatively lower HCIs in 2007 – *starting behind but improving faster*. Other states in the Northeast, such as Maranhão, Bahia, Rio Grande do Norte, and Piauí, did not record similar gains.²⁶ *The geography of human capital gains is greener in the Northeast region of Brazil.*

Figure 3.6 also reveals the areas in which advances in the HCI in the Center-West occurred. Within this region, the countryside of Goiás (17 percent gain), particularly in the areas closer to the state border, was largely responsible for HCI improvement in the region since 2013. Goiás is the only state outside the Northeast region included in the list of fastest increasing states. Mato Grosso do Sul, which is also in the Center-West, was another state that showed significant gains between 2007 and 2019, comparable to the national average (13.6 percent gain).

Three states in the North are among the five slowest improving states in Brazil between 2007 and 2019. While the Northeast is greener, the predominant color of municipalities in the North is yellow or light yellow, which represents the lowest gains. Municipalities in Amapá improved their HCI by only 6.2 percent on average. Roraima improved by 6.9 percent. And Tocantins's HCI growth was only 10.3 percent. *Starting behind did not mean faster improvement for municipalities in the North.*²⁷

Have states improved their human capital at the expense of greater inequality? This next exercise investigates this point by dividing the distribution of the HCI into percentiles. Two points in time were used: 2007 and 2019, the first and the last years for which data was available. With this information, figure 3.7 plots the HCI gaps between municipalities in the lowest (10th

percentile, darker colors) and highest (90th percentile, lighter colors) for each state. Maroon bars refer to states where inequality increased from 2007 to 2019. Orange bars relate to states in which inequality remained relatively unchanged, while green bars denote states where inequality decreased. Brazil is shown in the blue bars.²⁸

States in the North had the slowest improvement in HCI.

The North and Northeast regions have the largest number of states where within-state inequality in the HCI has increased. Figure 3.7 expands on this in two ways. First, it relates the geographic concentration of states where HCI gaps widened between 2007 to 2019. The figure shows that six out of nine states in the “inequality increased” category (maroon bars) are located in the Northeast and two are in the North. The Northeast is home to the state of Rio Grande do Norte, which saw the highest HCI gap increases at 3.1 HCI points and, and Piauí, the second highest increase (2.7 HCI points). In these two states, while in 2007 the bottom ranking municipalities were 12 years of progress behind the HCI compared to the top municipalities, they were 16 years behind in 2019. *No state in the Northeast reduced its HCI gap during the 2007–2019 period.*

Finally, inequality in HCI has increased in states that improved faster between 2007 and 2019. The second point emerging from Figure 3.7 is that the states that have already been identified as improving

²⁶ In Bahia and Piauí, there was a 14 percent change between 2007 and 2019. In Maranhão, Sergipe, and Rio Grande do Norte, it was approximately 12 percent.

²⁷ As one of the richest states in per capita income and with the best HCI in 2007, Santa Catarina is the only state from South and Southeast regions on the list of slowly improving states. This case reflects that, for those at the top, keeping the pace of improvement is increasingly challenging. Additionally, Mato Grosso, with an increase of 10.1 percent between 2007 and 2019, reinforces the argument that HCI improvements are concentrated in Goiás for the Center-West. Better but unequal.

²⁸ The Distrito Federal is not included in the analysis because it is a single unity in our sample.

Some States are Becoming More Equal than Others

HCI Gaps between Municipalities in the 10th and 90th percentile, 2007 and 2019

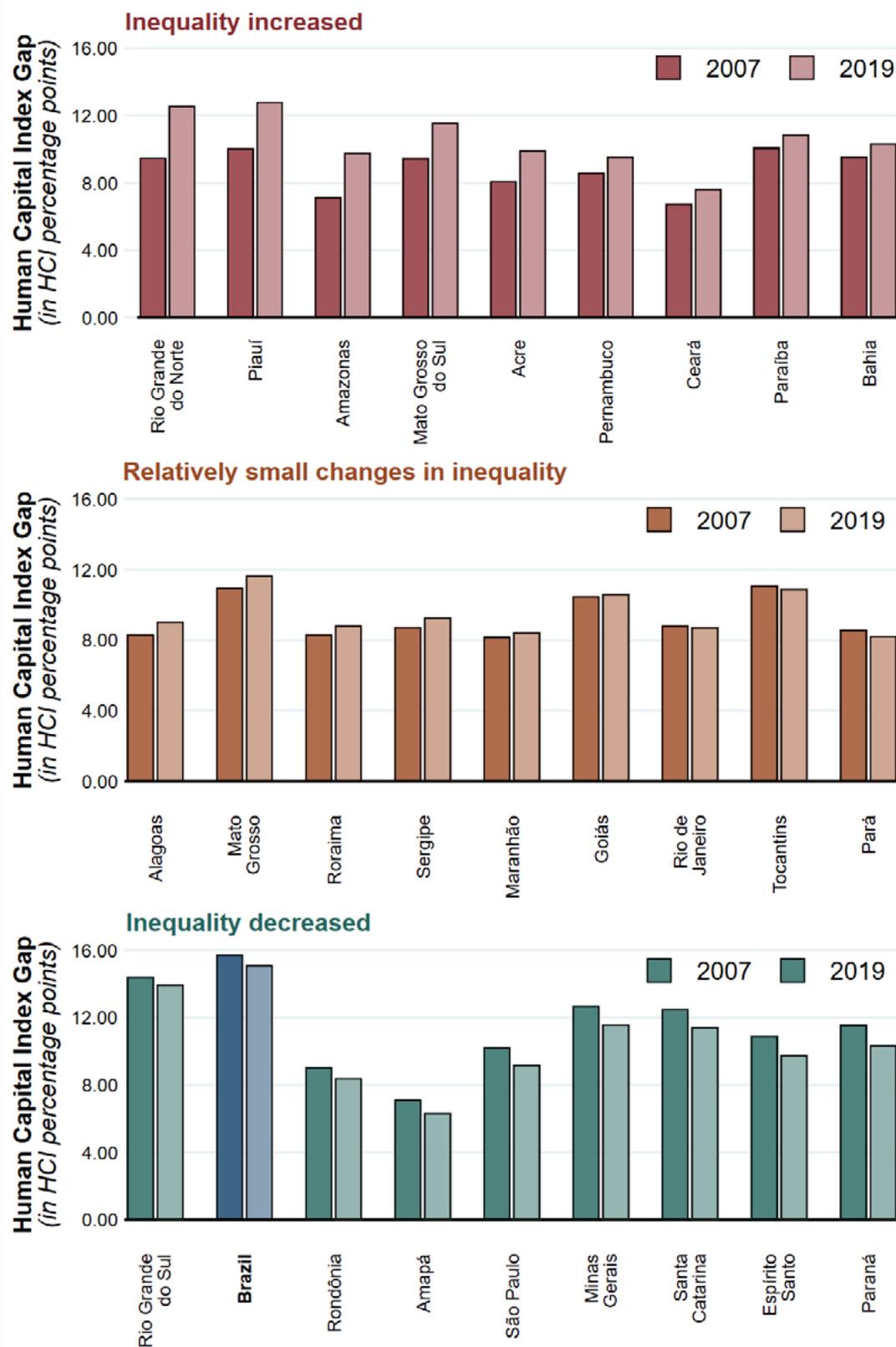


Figure 3.7
Some States are Becoming More Equal than Others

at the fastest rate (Pernambuco, Ceará, Alagoas, and Paraíba) tend to have larger HCI gaps in 2019. In Pernambuco, for example, the HCI gap between the 90th percentile and 10th percentile increased by one HCI point. In Ceará, it increased by 0.87 HCI points and in Paraíba by 0.77 points. This translates to 10 to 12 percent greater inequality compared to the baseline difference in the Northeast. *Larger the HCI gains, the greater the inequality.*

HCI inequality tends to be greater in states that show faster improvement.

The third and final point relates to HCI mobility. Most of the HCI mobility among Brazilian municipalities occurs in the middle of the HCI distribution. Municipalities at both ends of the distribution in 2007 (the worst- and best-performing) are more likely to remain in the same position in 2019. *Once at the top always at the top.* A transition matrix was made to illustrate this point (figure 3.8). The figure shows the percentage of municipalities in each HCI quintile in 2007 and in 2019. Of the municipalities that were in the top quintile in 2007, 11.3 percent (of a 20 percent maximum) remained at the top in 2019. Similarly, 10.9 percent of the municipalities that were in the lowest quintile in 2007 remained at the bottom in 2019. Overall, about 41 percent of all municipalities remained in the same relative position in 2019 compared to 2007 (secondary diagonal), but 59 percent either improved or decreased their relative rank. Upward and downward mobility in HCI among Brazilian municipalities was relatively even, with about 30 percent of all municipalities moving upward (right of secondary diagonal) and 29 percent moving downward (left of secondary diagonal).

Once at the Top, Almost Always at the Top

100 x (Number of the municipalities in each quintile/Total of municipalities)

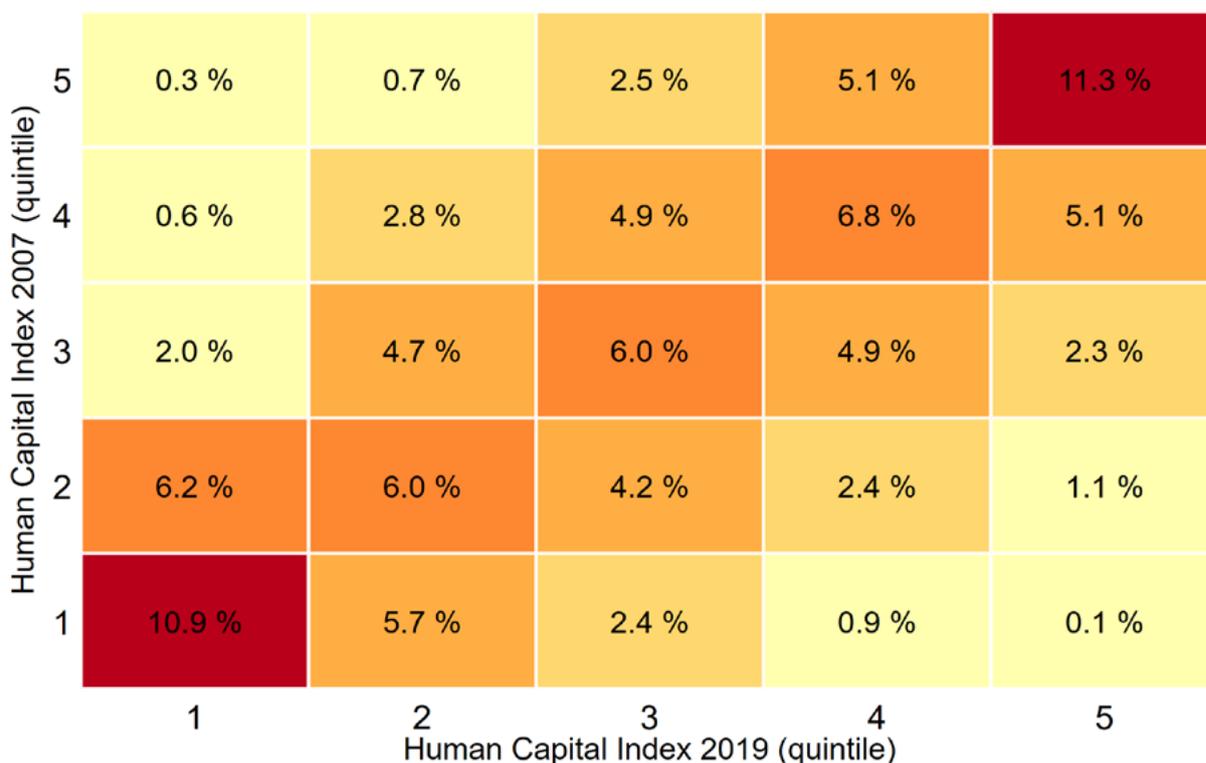


Figure 3.8
Once at the Top, Almost Always at the Top

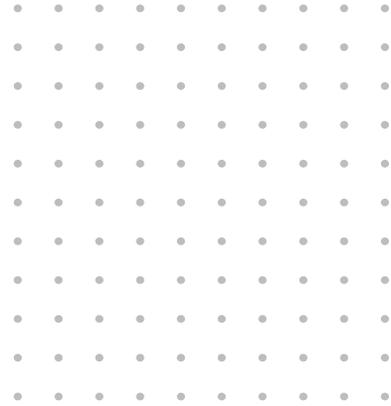
Better But Unequal

This chapter shows that despite HCI progress between 2007 and 2019, there was a small reduction in inequality. Moreover, most of these inequalities are driven by differences within regions, suggesting that *policies designed to reduce human capital inequalities should target municipalities.*

Chapter 4

Disaggregating the Human Capital Index

"Many Inequalities"



Main Messages

- ❖ “Many Brazils” not only reflects geographical inequality, but also gender and race inequalities.
- ❖ Women accumulate 7 percentage points more human capital than men.
- ❖ Women have a better human capital index than men mostly as a result of better adult survival rates.
- ❖ On average, a white child born in 2019 in Brazil is able to achieve 63 percent of their potential human capital by age 18, while an Afro-descendant born in the same year is able to achieve 56 percent in 2019.
- ❖ While white people are prospering, Black and Indigenous people are largely being left behind.
- ❖ Both Afro-descendant men and women lag behind white men and women in harmonized learning outcomes and child survival. Afro-descendant men are critically lagging behind in HCI, which is around 25 percentage points below that of white women.
- ❖ The expected productivity of a child born in a high-SES family is 69.5 percent by the age of 18, while it is 58.1 percent for a child born living in a low-SES family.

The evidence presented thus far has shown that municipalities with high or low labor productivity, stagnant or thriving in terms of human capital index, are clustered in Brazil. Chapter 2 sets the debate by mapping the geographic disparities: Brazil has areas where the HCI approaches *Italy* or *France* coexisting with areas equivalent to *Gabon* or *Kenya*. *Far in terms of HCI, but close geographically*. In turn, Chapter 3 describes *widespread*, but *dissimilar*, improvements between 2007 and 2019; widespread, since all states improved to some extent, and dissimilar, given that municipalities relatively behind in 2007 progressed faster on average. Yet, larger gains didn't bring a widespread reduction in inequality. *Geography and time outline the face of the many Brazils*.

Chapter 4 expands this discussion by looking at the “many inequalities” that exist within Brazil by disaggregating the HCI by gender, race, race-gender, and socioeconomic status to identify the productivity level of these groups. Many inequalities within many Brazils. Disaggregating the HCI is critical in revealing the skills development barriers faced by different groups. Vast evidence points to significant gender gaps in school enrollment and learning²⁹, serious racial gaps³⁰, and differences in learning and health outcomes according to socioeconomic status.³¹ Disaggregating the HCI can also be useful in creating focused policy for a more inclusive human capital agenda.

— First Inequality: Human Capital Index by Gender

The first inequality analyzed in this chapter calculates gender gaps in the HCI. It reaches one main conclusion: at the age of 18, women are expected to achieve higher labor productivity than men. HCI results from 2017 show that, on average, a Brazilian girl born in that year will reach the labor market with 60 percent of her full potential productivity, while a boy will only reach 53 percent of his full potential.³² Figure 4.1 shows the evolution of the HCI for women (maroon) and men (green) from 2007 to 2017.³³ *Over this time period, women achieved an HCI that was, on average, 7 percentage points higher than men in Brazil.*

Women reach the labor market with higher productivity than men.

Six facts describe this 7-point gap. First, it translates into an HCI for women 12 percent higher than the HCI for men. Second, at the national level, there is no indication that men

are catching up. Third, the data shows a deceleration in women's HCI after consistent gains between 2007 until 2011. Fourth, since then, women's HCI has been stagnant. Because of such stability, women's HCI in 2017 is virtually the same as it was in 2011. Fifth, men's expected productivity in 2017 (54 percent) is below that of women in 2007 (56 percent), 10 years earlier; *women are at least a decade ahead in terms of productivity*. Sixth, this evidence is similar in other countries.³⁴

It is important to note that a higher HCI for women does not suggest that they face advantages in Brazil's labor market. Quite the opposite. By definition, the HCI estimates the expected productivity

²⁹ Niederle & Vesterlund, 2010; Almás et al., 2016; Fryer & Levitt, 2010; Nollenberger et al., 2016; Barcellos et al., 2014; Jayachandran & Pande, 2017.

³⁰ Botelho et al., 2015; Card & Rothstein, 2007; Nyarko et al., 2013.

³¹ Ferreira et al., 2022; Yahmed, 2018.

³² There are some important limitations in disaggregating the HCI for gender and race. Not-stunting rates cannot be disaggregated by gender or race, for example. For this reason, the health component only included adult survival when computing gender and race HCIs.

³³ It is impossible to disaggregate the HCI by gender in 2019 because the Sistema de Avaliação da Educação Básica (SAEB), which was used to calculate HLO, did not include the question about students' gender. For this reason, the last HCI-gender data available is for 2017.

³⁴ According to global estimates, in 2020, the human capital index for women was 59 percent, while for men it was 56 percent (World Bank, 2020b).

of an average person by the age of 18 if health and education conditions remain the same – i.e., their expected productivity before entering the labor market. Therefore, the index results shows that women in Brazil supply, on average, more human capital than men to the labor market when searching for work. Chapter 5 shows that after calculating how much of such productivity is actually utilized, women’s productivity is disproportionately harmed in the labor market relative to that of men.

It is also important to clarify that the higher HCI among women does not arise due to an aggregation of disparate scores at the national level. Women accumulate more human capital than men in virtually all municipalities in Brazil. Not just better, better everywhere. While the discussion on the relationship between geography and the evolution of human capital formation in Brazil in chapters 2 and 3 showed that using an aggregated HCI can be misleading, this was not the case for gender HCI gaps. In 2017, women have better HCIs than men in 95 percent of Brazilian municipalities.

While women’s lead in terms of HCI is indisputable, it has been diminishing over time. Figure the gender gaps in the HCI for state capitals in three points in time: 2007, 2013, and 2017. Women’s expected productivity was 6 to 9 HCI points higher than men over these years. *Without exception, women performed better in all state capitals.* The highest performance recorded was in Belo Horizonte (Southeast), followed by Maceió (Northeast), and Curitiba (South). In all three cities, women’s HCI was approximately 9 points higher than men. While there is not much regional concentration among capitals with the highest gender gaps, the smallest gaps seem to occur in state capitals in the North or Northeast regions.

Women Reach the Labor Market with Higher Human Capital Than Men

Human Capital Index by Gender in Brazil, 2007 to 2019

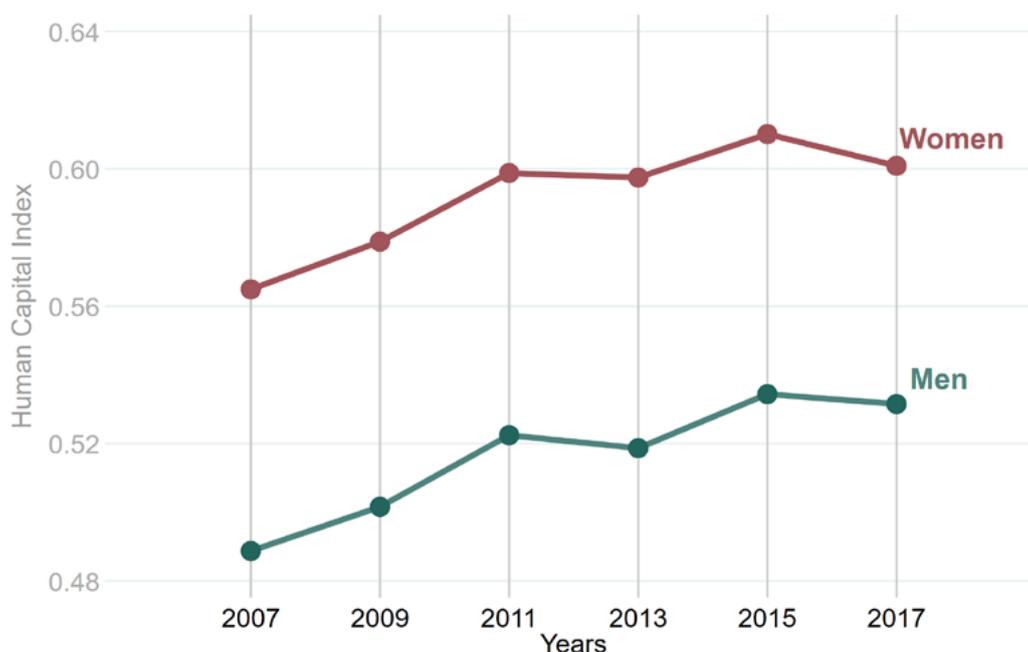


Figure 4.1

Women Reach the Labor Market with Higher Human Capital Than Men

Observing the dynamics of women-men gaps reveals that while the HCI gender gaps generally decreased in state capitals between 2007 to 2017, five capitals stand out by showing increasing inequality.

Porto Alegre, the capital of Rio Grande do Sul (South), had a 2 point increase in its gender gap, the largest increase amongst all state capitals. No other capital increased as much or presented a gap as high in 2017.³⁵ The second most notable

The gender gap increased in five capitals between 2007 to 2017.

³⁵ Porto Alegre was considered one of the most violent cities in 2016, according to the Atlas da Violência 2018, with a homicide rate

increase occurred in Belém (North), but by only a fraction of what was observed in Porto Alegre. São Luís (Northeast), Macapá (North), and Fortaleza (Northeast) are the other three state capitals where gender gaps increased between 2007 and 2017.

The Evolution of Gender Gaps in Human Capital

HCI Gender Gaps by State Capital in 2007, 2013 and 2017

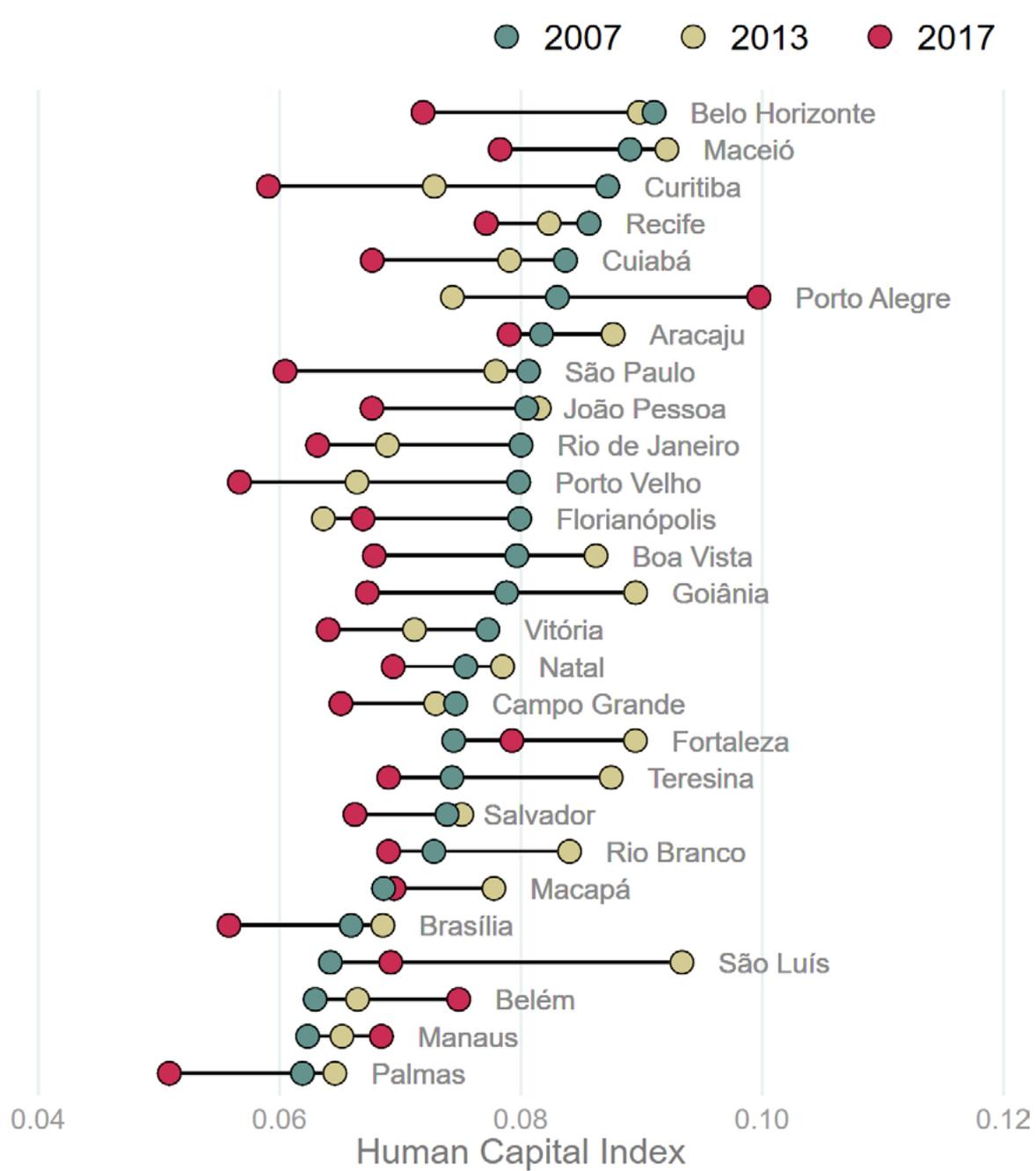


Figure 4.2
The Evolution of Gender Gaps in Human Capital

of 55.6 per 100,000 inhabitants (Cerqueira et al., 2018). Although this rate has been reducing since then, it sheds light on how mortality rates could have been influencing HCI gender gap.

But why do women have a better Human Capital Index than men? What explains the fact that in virtually all municipalities in Brazil, women accumulate more HCI or expected labor productivity than men by the age of 18? Figure 4.3 aims to answer these questions by separately plotting each of the HCI components (using their respective scale) for men and women in 2017. The points refer to state averages, and the dashed diagonal lines delineate equality between women and men. Above this line, women perform better; below it, men are ahead.

Why Do Women Have Higher Human Capital Index Than Men?

HCI components by gender, State averages in 2017

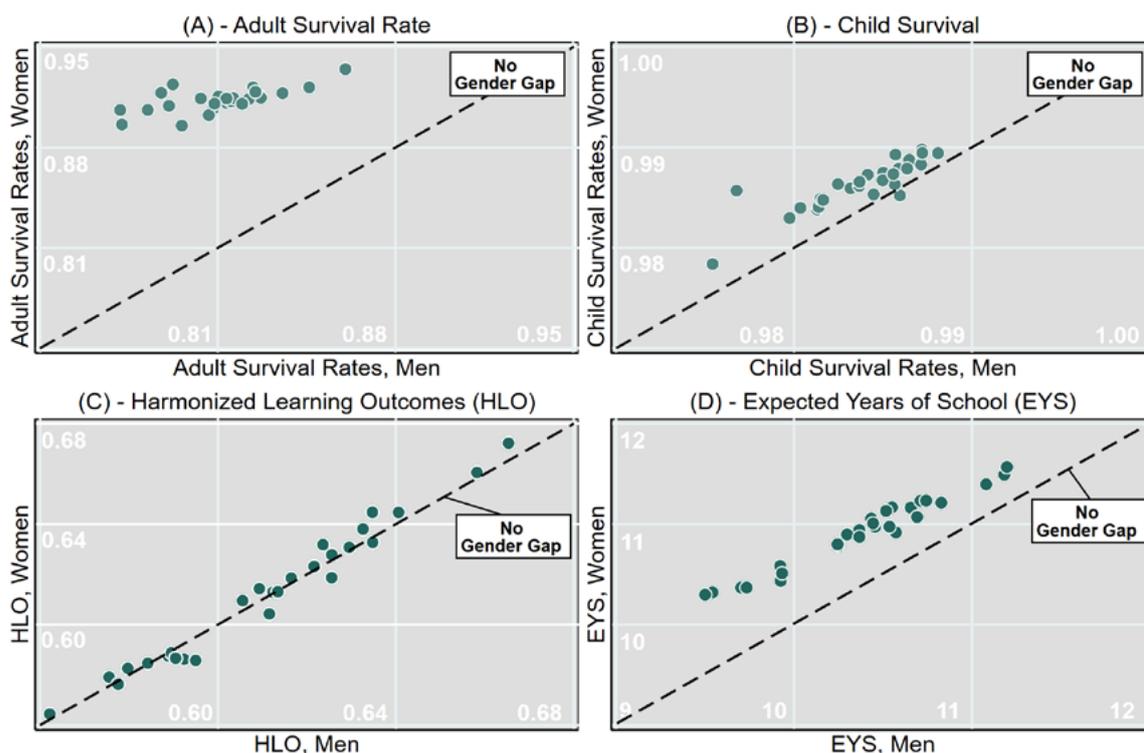


Figure 4.3

Why Do Women Have Higher Human Capital Index Than Men?

Adult Survival and EYS explain most of the higher expected productivity of women.

A comparison of the graphs in figure 4.3 show that adult survival rates and EYS explain a great part of women’s HCI lead over men.

Three conclusions emerge from figure 4.3. The first, and most striking, is that the largest differences between genders are observed for adult survival rates. *All points lie above the dashed line.* Specifically, where the gender gap in this component reaches, on average, 9 percentage points (figure 4.3.A). No other HCI component has a gender gap as significant in Brazil as this.³⁶

Men died seven times more often from external factors than women in 2019. Figure 4.4 showcases the rate of deaths per 100,000 people considering six external factors (considering data availability). Green bars refer to men and maroon bars denote women. *Deaths by aggression and traffic accidents are disproportionately male* (Moura et al., 2016; Souza et al., 2012; Bacchieri & Barros, 2011; INEP, 2020a). Aggression was the cause of death for 54.9 out of 100,000 men died in 2019 as a consequence of

³⁶ Several points may explain this finding. Women have been improving their health indicators more consistently than men over the last decades in Brazil. In the 1950s, for example, women had a life expectancy three years higher than that of men at birth. By 2018, it was approximately seven years higher (Yahmed, 2018). A second reason relates to causes of death. According to DATASUS (2019), there are three main causes of deaths among people from 15 to 59 years old: external factors (28 percent), circulatory system diseases (19 percent), and tumor cancer (18 percent). Men are overrepresented in deaths occurring by external factors.

aggression. Among women, this rate was 4.6 out of 100,000. In the case of traffic accidents, statistics show that women died almost 6 times less frequently in traffic accidents than men in 2019. For “other accidents,” “voluntary self-inflicted injuries,” “event with undetermined intention,” and “other external causes,” the death rate among men declines but remains two to three times higher than women. *Significant male talent perishes due to deaths caused by external factors.*

The second reason why women have higher HCI than men is the expected years of school (EYS) component. Women have, on average, a half-year more EYS than men (figure 4.3.D). *Access to education does not explain this difference.* According to the 2019 School Census, enrollment rates for boys and girls in primary education were statistically the same at around 96 percent. Research also shows small gender differences in school attendance rates (Cardoso & Souza, 2004; Emerson & Souza, 2008). Dropout rates are, however, different between boys and girls. At the beginning of primary education, the rate of boys and girls enrolled is 48.6 percent and 51.4 percent, respectively. By the end of high school this relationship was inverted: 53.9 percent of girls were enrolled versus 48.3 percent of boys. This gender gap becomes more evident at the university level, where 60.5 percent of all students graduating are women (INEP, 2020a).³⁷

Adult Men Die Seven Times More Than Women by External Factors
Mortality Rates by External Factors of Brazilian 15 to 59 Year-Olds (per 100,000 inhabitants), 2019



Figure 4.4
Adult Men Die Seven Times More Than Women by External Factors

Yet another factor contributing to the HCI gender gap is that boys start lagging behind girls in primary school. Figure 4.5 presents the fraction of students at least two years above the right age for their grade (i.e., an age-grade distortion). The information is shown by grade and gender, where green bars refer to boys and maroon bars to girls. Darker bars show students in the right age group; lighter bars are for students in age-grade distortion.

It shows that the in the first years of primary school rate of age-grade distortion is similar for both genders. *In the first years of primary school, virtually all boys and girls are the right age for their*

³⁷ According to the OECD (2019), Brazilian women are 34 percent more likely than men to complete tertiary education, representing the widest gender gap across OECD countries.

grade. However, a gender gap emerges in the third grade, where 15 percent of boys are already at least two years older than the expected age compared to 9 percent of girls. This difference widens as school years progress, reaching its peak at 12 percentage points in the sixth grade. Between third grade and the last year of basic education (12th grade), the gender gap in age-grade distortion is never lower than 5 percentage points. *Boys start falling behind in the third grade of primary education.*

Gender roles might be a reason explaining this evidence. Data from PNAD Continua 2019 for men and women between 14 and 29 years old supports this argument showing that 50 percent of men who did not complete upper secondary school dropped out because they had to work. Only 23.8 percent of women selected “having to work” as a reason to dropout. In the same survey, 23.8 percent of women dropped out because of pregnancy and 11.5 percent due to housework. For men, these categories showed no significant numbers.

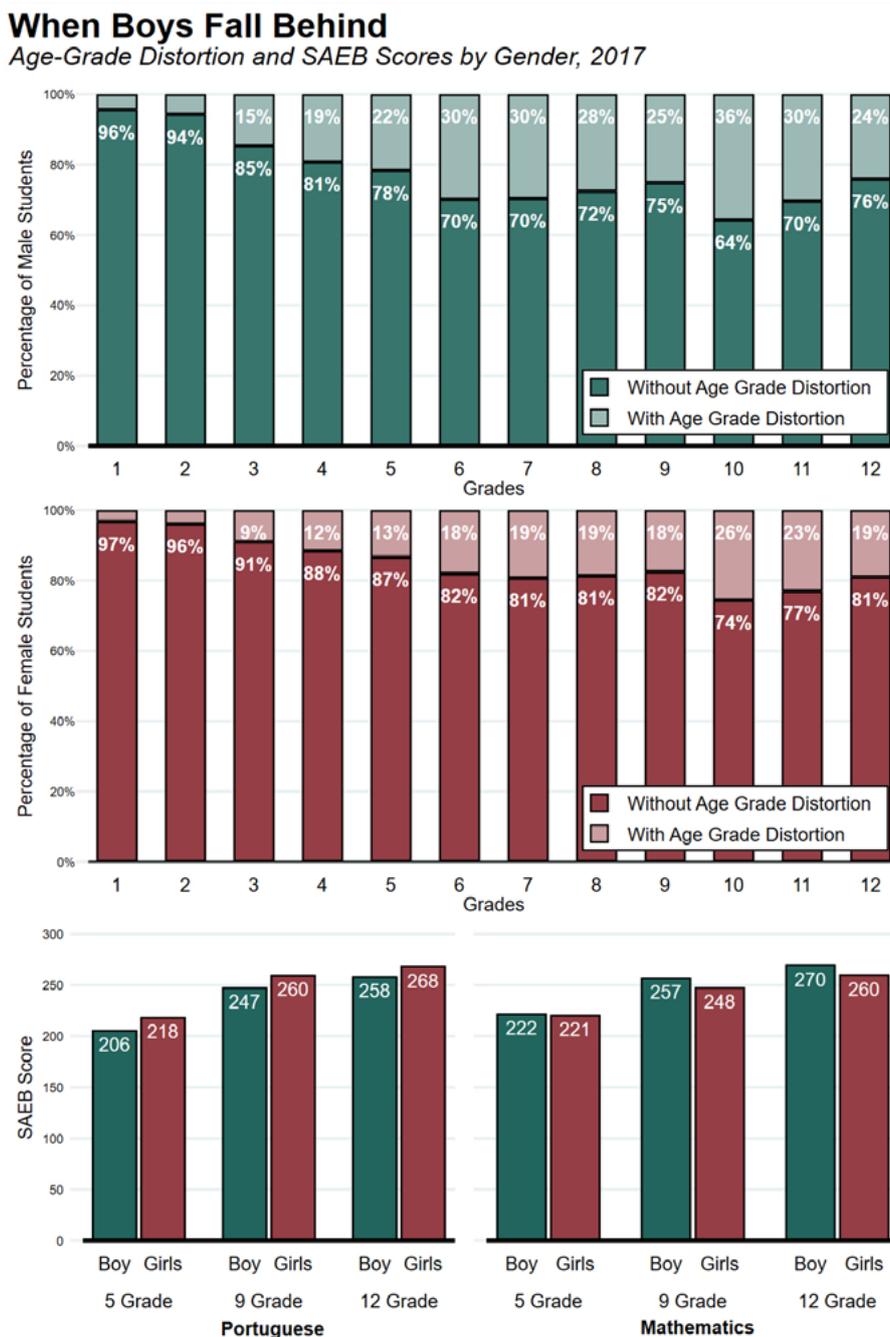


Figure 4.5
When Boys Fall Behind

Harmonized learning outcomes, the third reason explaining women’s lead in HCI, plays a relatively smaller role in creating gender differences. While in terms of quantity of education girls are significantly ahead, the gender gap is only 0.4 percentage points in terms of quality. In this context, figure 4.5 mirrors international findings that *girls outperform boys in reading, but boys do better in mathematics*.³⁸ According to figure 4.5, girls in Brazil perform at least 10 SAEB points (equivalent to 4 months of schooling) better than boys in Portuguese. In mathematics, learning scores are, on average, similar in the 5th grade, but widen in the 9th and 12th grades with boys scoring to the same 10 SAEB points better than girls. *Gender test score gaps in Brazil mirror international findings*.³⁹

There is a great deal of research that outlines the mechanisms underlying these gender learning gaps. One contributing factor is culture. In broad terms, this literature states that girls whose parents come from countries where women are more emancipated tend to perform better than boys on standardized tests.⁴⁰ *Beliefs about women’s role in society affect girls’ test performance*. Additionally, other studies argue that girls raised in families where parents demonstrate a preference for boys score lower compared to girls from “gender-unbiased” families (Dossi et al., 2021). Yet another set of evidence stresses the importance of school environment through competitiveness,⁴¹ teacher stereotypes against girls (Carlana, 2019), and peer effects (Lavy & Schlosser, 2011). Some studies also argue that girls enjoy reading more than boys (Muriel & Vesterlund, 2011).⁴²

Box 4.1. The Challenges of Disentangling the HCI by Race and Gender

This box discusses the caveats and challenges of disaggregating the HCI by race and gender.

1. Race

Brazil has five official race categories: Pretos, Pardos, Brancos (white), Índigenas (Indigenous), and Amarelos. The first two are usually gathered in a group named Negros. This grouping occurs because of their common socioeconomic characteristics, as well as their history of segregation (Osório, 2003). This report translates Negros as Afro-descendants. The category of Amarelos represents 1.5 percent of the Brazilian population (Census, 2010) and comprises the Asian population (Osório, 2013).

Although Brazil has a wealth of administrative data, datasets covering race present inconsistencies. In particular, there are two problems. First, some databases are missing racial information. Second, in other cases race is self-identified and or reported by a third person.

Education: Data used to assess the quantity of education is provided by the School Census, a database organized by the Brazilian National Institute of Educational Research and Studies (INEP). For students over 16 years old, race is self-identified in this census, while for younger students it is reported by their parents. Due to the large amount of missing data on race, INEP launched a campaign in 2015 to not only raise awareness on the importance of declaring race,

³⁸ In PISA (2018), girls outperform boys in reading by 26 points, but boys perform better in mathematics by 9 points (OECD, 2018).

³⁹ Guiso et al., 2008; Pope & Sydnor, 2010; Bedard & Cho, 2010; Fryer & Levitt, 2010.

⁴⁰ Guiso et al., 2008; Giuliano, 2020; Rodríguez-Planas & Nollenberger, 2018.

⁴¹ Niederle & Vesterlund, 2010; Muriel & Vesterlund, 2011

⁴² The fact that women are better educated and in better health is not coincidental. It is known that education and health are strongly associated. The debate is over causality: does better education improve health or does health improve education? On one side, researchers claim that an additional year of education affects mortality rates, arguing that education provokes changes in health behavior (Lleras-Muney, 2005; Cutler & Lleras-Muney, 2010; Oreopoulos & Salvanes, 2011; McCrary & Royer, 2011). In contrast, others find no effects of education on health, despite large (exogenous) increases in education levels (Albouy & Lequien, 2009; Clark & Royer, 2013).

Box 4.1. (continued)

but to encourage school staff to collect and provide better data (INEP, 2015). As shown in figure B.4.1 below, the efforts have proven effective as the share of non-declared students reduced over time. In the School Census, the percentage of non-declared students has decreased from 64 percent to 26 percent between 2007 and 2019. Meanwhile, the proportion of declared Afro-descendants has increased from 17 percent to 33 percent.

Share of Students According to Declared Race
School Census, 1st to 12th Grade of Basic Education, 2007-2019

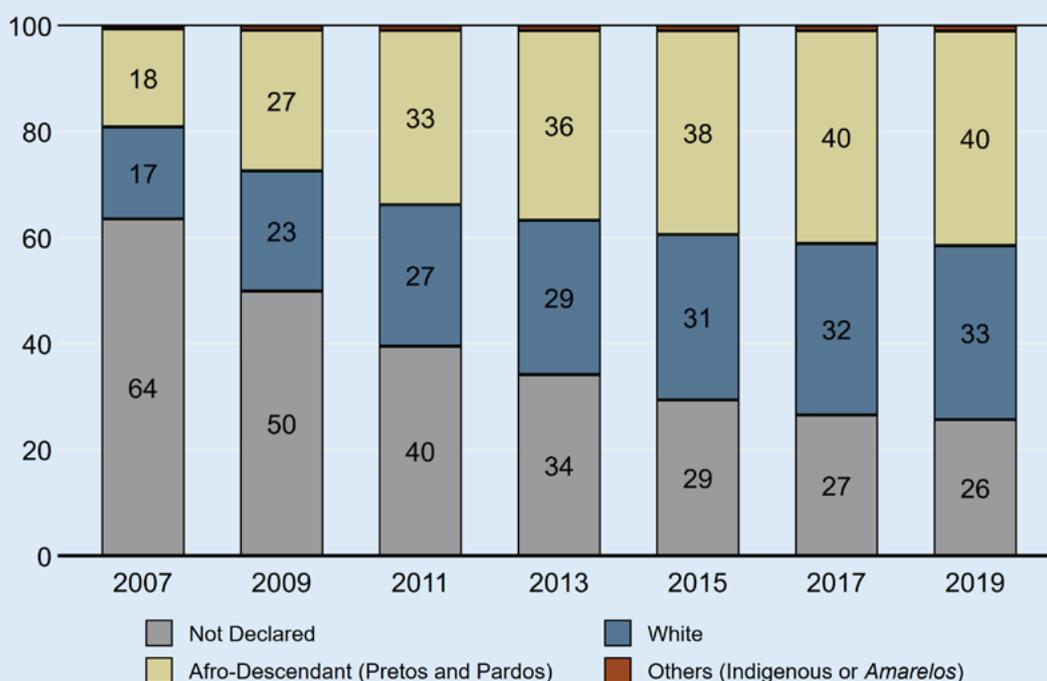


Figure B.4.1
The Share of Students according to the race declaration

Data on the quality of education is provided by the Brazilian System of Assessment for Basic Education (SAEB), where race is also reported through self-identification. The missing information on race is similar to that of the 2013 School Census where it is missing for 24 and 28 percent for fifth and ninth-grade students and 42 percent for students in grade 12 (Senkevics et al., 2016).

Health and child survival: The data for these components comes from the Mortality Information System (SIM) and population projections per municipality. SIM has a relatively complete database in terms of race. More than 90 percent of the cases include information on race (Da Cunha, 2012). However, physicians fill the race of the deceased person registered in SIM (Senna, 2009), which is inconsistent with the education databases, where race is self-reported.

The population projections for each municipality are not race-specific. In order to make predictions, this report uses the share of each race in the population according to the 2010 National Census (where race is self-reported). We assume that the relative size of the population of each race group remains constant across all years.

Box 4.1. (continued)

2. Gender and Sex

For a long time, discussions on development and policy generalized the impacts of the issue for both men and women. However, a gender lens allows for a deeper understanding on the different ways in which gender permeates institutions, structures, interpersonal relationships, and culture, or in simpler words, the lives and opportunities available to men and women.

With gender analyses becoming more common, gender statistics often rely on sex-disaggregated data to draw attention to social and economic differences between both of them. But gender and sex are two different concepts. Sex is understood as a biological categorization based on physical and physiological features related to genes and chromosomes determined by birth. On the other hand, gender concerns the identities of female, male and gender-diverse people, and as such, can be understood as a spectrum of gender identities that describes how individuals identify, perform and express themselves (Heidari et al., 2016).

In that way, gender-disaggregated data may entail other information such as sexual orientation and gender identity, being a wide and encompassing term that this report, unfortunately, cannot capture. The reason for that is that there is great difficulty in generating data that includes all of the dimensions of gender. In the case of Brazil, the administrative datasets (School census, SAEB, SIM and SINASC) include information only on sex, often asking the question “What is your sex?” and providing only two options for responses: “Male” and “Female.”

Thus, for the sake of this work, gender will refer strictly to the social, behavioral and cultural attributes, expectations, and norms associated with being a woman or a man and will seek to address how women and men relate to each other, as well as the power imbalances between them (World Development Report, 2012). Similarly, in terms of statistics, data on gender will include exclusively sex-disaggregated data only. Despite this limitation, this work hopes to provide at least a glimpse into gender inequality and human capital losses and gains related to gender in Brazil.

— Second Inequality: Human Capital Index by Race

The second inequality in HCI considered in this chapter that defined by race. In Brazil, race has a more prominent role in explaining income inequality than in many other countries in Latin America.⁴³ In fact, race inequality starts to manifest itself early in life. National data from SINASC (2019) shows that an Afro-descendant woman is 6 percentage points more likely than a white woman to be a teenage mother. Also, Afro-descendant pregnancies are 13.8 percentage points more likely to have fewer than six prenatal visits.⁴⁴ *Race matters.* At school, non-white students have significant disadvantages: (i) illiteracy rates three times greater, (ii) the rate of graduation from basic education is 15 percentage points lower (IBGE, 2019a), and (iii) there is considerable evidence of racial discrimination in grading (Botelho et al., 2015).

This subsection tells a story about unshared prosperity. It starts at figure 4.6. Specifically, it analyzes the evolution of the human capital index for whites people (in navy), Afro-descendants (in yellow), and Indigenous peoples (in brown) between 2007 and 2019.⁴⁵ *Over time, HCI race inequality widens.*

⁴³ Race explains five percent to seven percent of overall income inequality in Brazil, which is higher than Colombia, Panama, Peru, Ecuador, and Guatemala (World Bank, 2020b).

⁴⁴ The Brazilian government recommends at least six visits for low-risk pregnancies (Biblioteca Virtual em Saúde, 2022).

⁴⁵ The race HCI was calculated using the following data sources: SAEB, School Census, SIM, and SINASC. More details about how race was declared can be found in box 4.1.

HCI inequality between the white and Black populations almost doubled from 2007 to 2019.

This story has three parts. Part 1 is the racial difference in HCI levels. The navy line in Figure 4.6 demonstrates that, on average, the white population scored the highest on the HCI (63 percent) in 2019. The HCI of Afro-descendants was 56 percent in the same year or 7 HCI points less than white people while the HCI of the Indigenous population was even lower at 52 percent.

Part 2 relates to the rate of progress in HCI scores preceding the COVID-19 pandemic was racially unequal. Here, the trends are clear: the human capital index for white people increased at a faster pace than for any other racial group in Brazil. *Unshared Prosperity.* Between 2007 and 2019 their HCI increased overall by roughly 14.2 percent. For Afro-descendants, productivity gains were less observable. The HCI for the Black population increased by 10.2 percent, reflecting a five HCI point gain between 2007 and 2019. The same calculations for the Indigenous population show a mere 0.97 percent increase over the entire 12 pre-pandemic years. *While white people continue to prosper, Black and Indigenous people are left behind.*

Different baseline levels of HCI and divergent progress indicate that racial inequality in HCI is widening. In 2007, the HCI gap between white and Black people were four points. The gap almost doubled in size to seven points 12 years later. These numbers indicate that the gap between the white and Black populations increased by an average 0.25 percentage points per year. Yet, there is a more critical finding. This gap was even more critical between white and Indigenous people, where it nearly tripled from four points in 2007 to 11 points in 2019, which is the equivalent of a 0.63-point annual increase in the HCI gap. *What was large became even larger.* When it comes to differences in average income, the income of white employed individuals in 2019 was on average 73.4 percent higher than that of Black employed individuals. This reveals a structural income inequality between both groups persistent across time, which impacts the ability of Afro-Brazilians to achieve higher productivity and prosperity.

Unshared prosperity is the unequal labor productivity between race groups, the concentration of HCI growth, and the widening of HCI inequality. Narrowing the gaps in HCI and HCI growth must

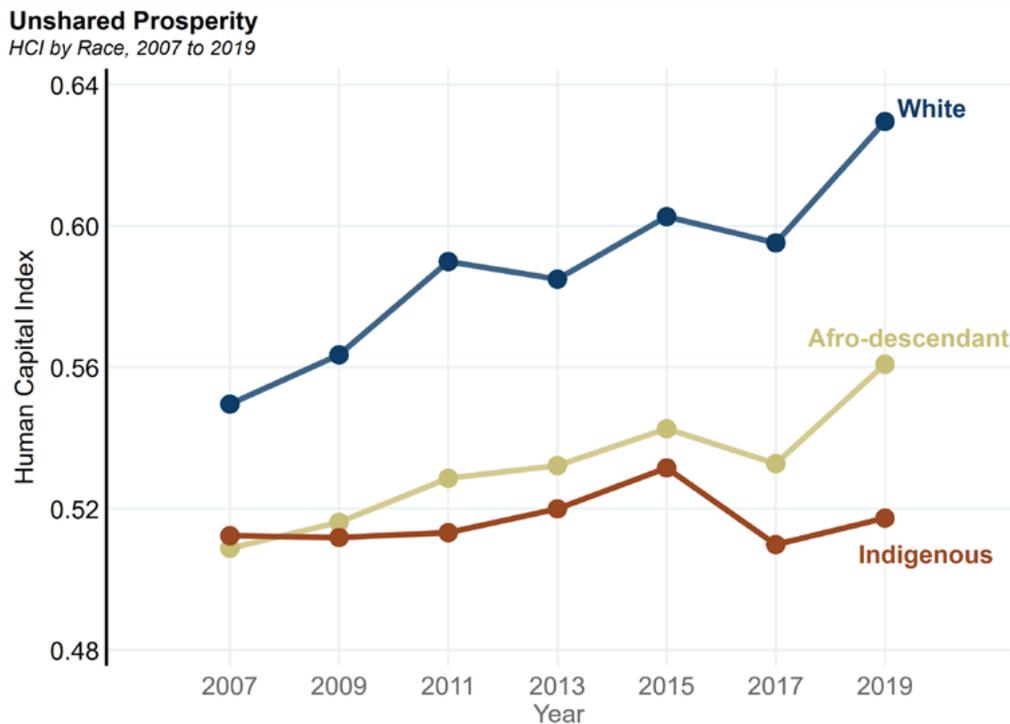


Figure 4.6
Unshared Prosperity

be a priority in Brazil. Given the human capital gaps already discussed, it is likely that an even wider race gap in human capital formation will emerge with recent data as the COVID-19 pandemic hit Afro-descendant and Indigenous populations more severely. *The story of unshared prosperity should end with an act of inclusive success.*

Having established racial inequality at the national level, it is worth investigating whether race gaps are smaller in state capitals. Figure 4.7 plots the HCI for white people (navy dots) and Afro-descendant people (yellow dots) by state capital in 2019. The boxes between each dot highlight the race gap in percentages, considering the HCI among Afro-descendants as the baseline. State capitals are sorted by percentual differences. The HCI for the Indigenous population was not included because of its uneven distribution across capitals.

A large fraction of state capitals had race gaps in human capital above 10 percent. The capitals with the largest race gaps in Brazil are Florianópolis (South, 19.2 percent), João Pessoa (Northeast, 17.6 percent),

HCI Gaps between Afro-Descendant and White Populations

State Capital HCI by Race, 2019

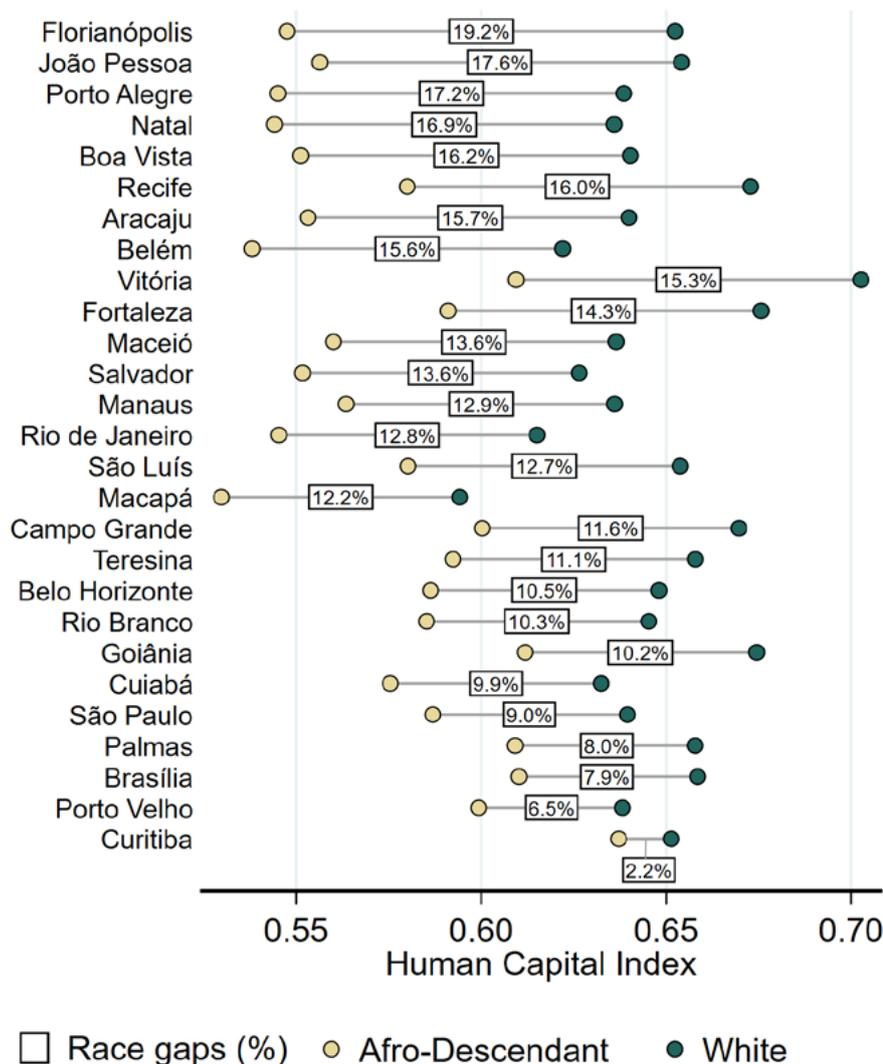


Figure 4.7
HCI Gaps between Afro-Descendant and White Populations

and Porto Alegre (South, 17.2 percent). It is worth noting that Porto Alegre also populates the list of state capitals with the highest gender HCI gaps in 2017 (see figure 4.2). The smallest white-Black gaps in HCI, on the other hand, are found in Curitiba (South, 2.2 percent), Porto Velho (North, 6.5 percent), and Brasília (Center-West, 7.9 percent). *From top to bottom, no regional pattern is found in race gaps.*

There is no regional pattern in the white-Black HCI gap.

Figure 4.7 also shows that state capitals where race gaps are smaller tend to have a higher HCI among Afro-descendants rather than a lower index among whites. For example, the HCI among whites is the same in Curitiba and Florianópolis at 65 percent. However, the HCI for Black people is 10 points higher in Curitiba than in Florianópolis. This performance explains why Florianópolis has greater, and Curitiba has lower HCI inequality. *More equal, more productive.* Vitória (Southeast) is an exception to this trend. Although it shows one of the highest HCIs among Afro-descendants, it still presents significant race inequality.

A final observation from figure 4.7 relates to expected productivity levels. Apart from Macapá (North), the HCI in 2019 for white people was above the national average (60.1 percent) in all state capitals. The highest HCIs for white populations were observed in Vitória, Fortaleza, and Recife; the lowest in Macapá, Rio de Janeiro, and Belém. Among Afro-descendants, the lowest HCIs were observed in Macapá, Belém, and Natal. For both Black and white people, Macapá has the lowest projected labor productivity for the next generation of workers. Comparing the highest and the lowest HCI among white people reveals an 11-point HCI difference—Macapá (HCI = 59 percent) vs. Vitória (HCI = 71 percent)—, slightly below that of Afro-descendants (12 HCI points).

Box 4.2. The Human Capital of Indigenous Peoples

According to the 2010 National Census, there are 896,000 people self-identified as Indigenous, representing 0.5 percent of the total population in Brazil. More than half of them (58 percent) live on Indigenous land and almost one-fifth (18 percent) do not speak Portuguese as their first language. Overall, there are around 305 different Indigenous ethnicities, speaking about 274 languages (IBGE, n.d.b.).

Education: In Brazil, there are 3,345 Indigenous schools. Their infrastructure is poor: 59 percent do not have filtered water, 32 percent do not have electricity, and 49 percent do not have sewage sanitation. Almost none have a library or high-bandwidth internet (92 percent) and nearly half of them lack inclusive textbooks that incorporate Indigenous education (Ministério da Educação, 2019). There are also difficulties in access to schools, particularly high schools, and many students must travel to neighboring communities to access education.

Child survival: The inexistence of basic sanitation, safe water, and waste collection in many Indigenous villages (Coimbra et al., 2013) results in poorer conditions for child development. In the Indigenous population, there is a high prevalence of anemia and low height-for-age. It is also common for Indigenous children to be hospitalized for diarrhea, exposing another disparity: while Brazil made considerable improvements to sanitation systems in the 1990s that significantly reduced hospitalizations due to diarrhea, Indigenous communities continue to suffer from this problem (Coimbra et al., 2013).

Adult survival: Several studies point to a higher prevalence of infectious and parasitic diseases such as malaria, tuberculosis, diarrhea, and pneumonia, among Indigenous people than in the overall Brazilian population. Obesity, hypertension, and diabetes rates are also growing in Indigenous communities (Coimbra et al., 2013). These conditions result in poorer adult health.

Box 4.2. (continued)

Indigenous Peoples Have Disadvantages in All HCI Components

HCI Components in States with the Largest Indigenous Populations, 2019



Figure B.4.2

Indigenous peoples have disadvantages in all HCI components

It is clear that state capitals in Brazil present substantial racial gaps in HCI performance. For instance, a recurrent resulting question is what explains this fact. However, it is unclear why some capitals have a smaller gap than others. Why, for example, do Florianópolis and Curitiba, which are both in the South and have equivalent socioeconomic indicators, occupy opposite positions in the rankings of HCI racial gaps as seen in figure 4.7? Figure 4.8 attempts to answer this question by disaggregating data and comparing the HCI components of whites and Afro-descendants by state capital in 2019.

All points of figure 4.8 lie above the dashed line, indicating that for every HCI component the white population outperforms Afro-descendants, on average. This advantage is reflected, in some cases, by a large margin, as with adult survival rates or by a small margin, as in harmonized learning outcomes. Regardless of its magnitude, the fact remains: *the race gap in human capital is reflected in all HCI components and is present in all states.*

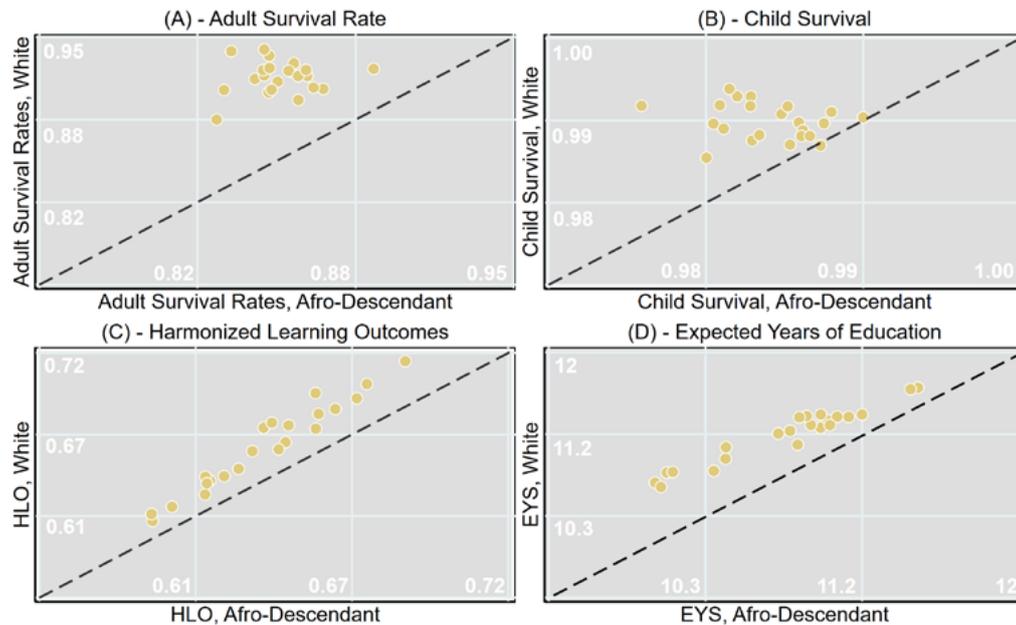
Disadvantages among Afro-descendants emerge in infancy and persist through their life cycle. Signs of these disadvantages appear as early as the child survival stage (figure 4.8.B). National statistics and specialized literature (Caldas et al., 2017; Cardoso et al., 2005) point to the same conclusion that Black children are more likely than white children to die by age five. *Race inequality starts much earlier.*

Figure 4.9 illustrates racial gaps in prenatal care in Northeast Brazil. Figure 4.9.A maps the percentage point difference between white and Black pregnancies beginning with prenatal care (no later than the second month of gestation). Figure 4.9.B. refers to the race gap in pregnancies with fewer than six prenatal visits. Blue areas indicate where white mothers outperform their Afro-descendant counterparts. Yellow areas refer to where Black mothers have higher rates than white mothers. Pregnancy data is drawn from SINASC 2019.

Figure 4.9 shows that Afro-descendant mothers start prenatal care later and attend fewer prenatal visits than white mothers on average during pregnancy. The fact that Figure 4.9 (A) is mostly blue reveals that white mothers, despite living in the same municipality, start prenatal care earlier. Figure 4.9 (B) is mostly yellow, indicating that white mothers are likely to have more prenatal visits. *Unequal in the womb.*

Why Do Whites Have Higher HCI than Afro-Descendants?

State HCI Component Scores per Race, 2019



Note: States which have less than 50% of black population according to Census 2010 were excluded from the analysis because of data limitations (Paraná, Santa Catarina, Rio Grande do Sul, São Paulo, Mato Grosso do Sul)

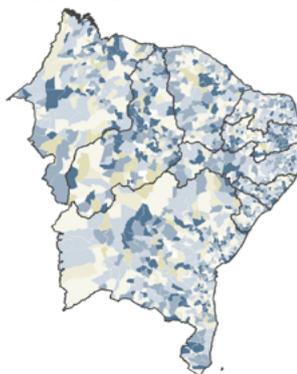
Figure 4.8

Why do White People Have a Higher HCI than Afro-Descendants?⁴⁶

Race Inequality Starts Before Birth

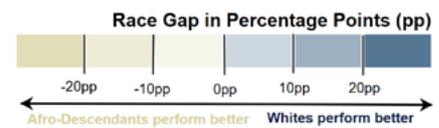
Race Gap in the Number and Month of First Prenatal Visit, SINASC 2019

(A) Early Prenatal Care



Afro-descendant women start prenatal care later

The prevalence of blue areas in Figure (A) indicate that white pregnancies tend to start prenatal care sooner (first visit before the second month of gestation) than Afro-descendant pregnancies (first visit after the second month of gestation or later). For dark blue areas, this difference reaches more than 20 percentage points.



Afro-descendant pregnancies have fewer prenatal visits

Figure (B) indicates that Afro-descendant pregnancies are more likely to have less than six prenatal visits than white pregnancies in the Northeast region of Brazil. In this case, the predominance of municipalities on the map marked in yellow suggest a general disadvantage for white pregnancies in terms of access and number of prenatal visits.

(B) Low Prenatal Visits

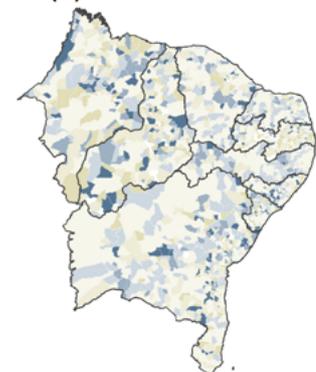


Figure 4.9

Race Inequality Starts Before Birth

⁴⁶ The reason for excluding the states with Black populations of less than 50 percent from this analysis is because the child survival component is susceptible to the size of the population. This means that estimations for a relatively small population (in comparison to the white population) can generate the misleading conclusions.

One inequality leads to another. The next stage in the life cycle is when children go to school. *There is well-documented that race inequality in terms of quantity and quality of education.* National data from 2019 indicates that Black students attain 8.6 years of education on average while white students attain 10.4 years. In 2019, more than 70 percent of the children who did not complete basic education in Brazil were Black or 7.2 million out of 10.1 million out-of-school children (PNAD, 2019). *Race matters.* It is worth noting that these gaps persist even after controlling for parental education (Almås et al., 2016) or comparing twins from mixed-race families (Marteleto & Dondero, 2016). According to this research, a non-white twin has 0.308 fewer years of schooling relative *to* their white twin. That is, even after considering family structure, neighborhood, and school characteristics, race gaps in school completion do not change.

The problem of completing basic education rivals the challenge of low-quality learning. Data from the learning assessment (SAEB) from 2019 suggests that white-Black gaps in proficiency scores in 5th grade are 14.4 points in Portuguese and 12.9 points in mathematics. *This marks the beginning of much wider learning gaps.* At the end of upper secondary (12th grade), white students perform 21.5 points higher in mathematics and 25.7 points higher in Portuguese than Black students. There are many explanations for this learning gap (see box 4.3). Research in São Paulo, for example, suggests that teachers assign biased math grades to Black students (Botelho, Madeira, Rangel, 2015). Other research argues that teacher expectations and representativeness affect student performance (Gershenson et al., 2016; Dee, 2004; Egalite et al., 2015; Dee, 2005), or that negative peer influence is a hurdle for minority students (Austen-Smith & Fryer Jr, 2005; Fryer Jr & Torelli, 2009).

In addition to school outcomes, racial inequality affects adult survival rates. As discussed earlier, adult survival relates significantly to violence and homicide rates. Figure 4.10 presents the number of homicides per 100,000 inhabitants by race and gender from 2007 to 2019. Two major conclusions can be drawn from this figure. First, there is a large homicide rate gap between men (dark colors) and women (light colors). Second, race-based violence is prevalent in Brazil, especially in the North and the Northeast regions (Truzzi et al., 2021; Cerqueira & Coelho, 2017).

Box 4.3

How to Tackle Racial Disparities in Human Capital

Sergio Firpo and Michael França

Núcleo de Estudos Raciais do Insper

To advance the racial equality agenda, it is essential to make progress on fighting discrimination and creating conditions to improve social mobility. This is not a trivial task; it requires a wide range of targeted initiatives and public policies.

A central assumption in the racial debate is that physiognomy causes a differentiation in people's perception, leading to discriminatory treatment (Adams et al., 2016; Sergio & França, 2021). Anti-Black bias arose through a historical process that has devalued Black skin color (Gomes, 2019; Telles, 2004). There is a social construction that makes people believe, consciously or not, that white skin has greater intrinsic value (Adams et al., 2016; França, 2020). Thus, Black people, in addition to living in a worse socioeconomic context, also face discrimination throughout their lives, directly affecting the process of human capital accumulation (Firpo et al., 2021; Firpo et al., 2020).

To cope with this situation, families might, for example, anticipate racial discrimination in the labor market and invest more in their light-skinned children, expecting greater returns in the future. Rangel (2015) finds that Black parents in Brazil invest more in their light-skinned children than their dark-skinned children. Light-skinned children are 0.6 percentage points more likely

Box 4.3 (continued)

to be enrolled in school or preschool and 2.1 percentage points more likely to attend private school. Furthermore, the primary school graduation differential is 5.7 percent in favor of white children.

Parents can be seen as their children's first teachers. They have a strong influence on the learning process. Due to the historical process of social exclusion, Black parents tend to have low education levels and, therefore, limited formal knowledge to teach their children. Studies show, for example, a negative effect on vocabulary acquisition. In addition, low-income families tend to encourage their children less in the learning process (Heckman & Mosso, 2014).

At school, the impact of racism, which hinders Black children's progress, helps explain gaps in attainment. Botelho, Madeira, and Rangel (2015) find that Black students have lower teacher-assigned math grades, even with the same proficiency score in blindly-score tests. White students, on the other hand, are less likely to have grades below what is required to pass.

In addition to the potential effect of racial discrimination, social conditions also play an important role in human capital accumulation. Studies show that disadvantaged environments will negatively impact children's development and, consequently, will have profound repercussions on school performance (Heckman & Mosso, 2014). This is because the environment in early childhood helps shape the skill base that will be important for a lifetime. In the absence of intervention, in certain vulnerable contexts the social circle of Black children may have a high proportion of people with low education. Schools could be a solution to that problem. However, schools are also a source of segregation. The most disadvantaged children go to public schools, which tend to be of poorer quality, while the rich attend private schools.

This scenario has significant consequences for the social mobility of racial groups. As seen in Table 1, which uses data from the 1996 and 2014 National Household Sample Survey (PNAD) of the Brazilian Institute of Geography and Statistics, the probability that a Black child will attend higher education is about half that of a white child, regardless the level of their father's education.

TABLE B.4.1 Chance of Students Completing Higher Education in Relation to Their Father's Education

% CHILDREN WITH HIGHER EDUCATION				
Father's education level	1996		2014	
	White	Black	White	Black
Unschooling	1.80%	0.5%	6.2%	3.7%
Incomplete elementary	9.10%	3.4%	17.9%	11.2%
Complete elementary	28.4%	13.0%	31.6%	17.8%
Incomplete high school	36.5%	20.7%	34.5%	24.1%
Complete high school or incomplete higher education	40.5%	19.3%	49.7%	28.3%
Complete higher education or more	59.8%	39.2%	71.7%	58.8%

Source: Authors' elaboration based on data provided by the Mobility and Social Development Institute (IMDS)

Box 4.3 (continued)

After Brazil adopted affirmative action policies in the early 2000s, there was a significant increase in access to higher education for the Black population. However, the racial balance index methodology of Firpo et al. (2021) estimated that it will take 27 years to achieve racial equity in higher education if the current convergence trend is maintained. Despite this advance in human capital accumulation, the study suggests that there is no convergence in terms of racial equity at the top of the income distribution (Firpo et al., 2021).

These racial inequities demonstrate the importance of racial studies. Empirical research has the potential to provide guidance on initiatives that will promote progress towards greater racial equity. In the United States, some research shows that improving the educational performance of Black students has significant potential to reduce several racial disparities. Recognizing this challenge, Americans have created several interventions over the past few decades to reduce educational disparities (Fryer, 2010). In Brazil, the expansion of the discussion on racial inequality is relatively recent, and there are many opportunities to use data and to do empirical work on racial issues.

As shown in figure 4.10, Afro-Brazilians, especially Black males, are much more likely to be victimized than the other groups illustrated. Brazil observed a 20.3 percent reduction of homicide rates between 2009 and 2019 (Cerqueira et al., 2021). However, while the decrease in homicides was 30.5 percent for the non-Black population, it was only 15.5 percent or 50 percent less, for the Black population. It is also worth noting that homicides of Afro-descendants are under-reported in Brazil. It is believed that official statistics have underestimated murders of Black youth by 50 percent and that underestimates may have been more common in smaller cities and rural areas. Moreover, many of the deaths may have been misreported as suicides or traffic accidents (Isfeld, n.d.).

The Race and Gender Gap in Homicide Rates

Brazilian Homicide Rate per 100,000 Inhabitants

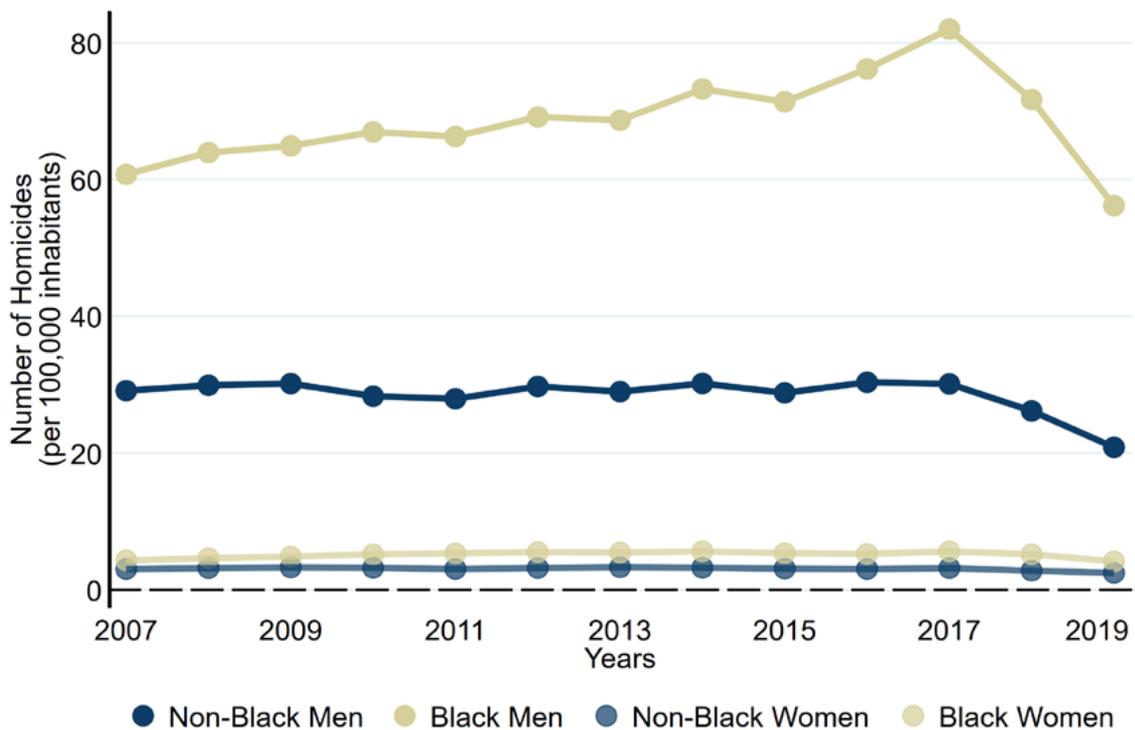


Figure 4.10
The Race and Gender Gap in Homicides

Black male homicide, specifically, is intrinsically tied to racism and racial profiling in law enforcement. Recent data from the Forum Brasileiro de Segurança (Brazilian Forum on Public Safety) shows that Afro-Brazilians represent 78.9 percent of all victims that die in police interventions. Stigmas and stereotypes also reinforce this behavior (Willis, 2015) and lead to uneven levels of arrests and incarceration, and even more drastically, fatal encounters with law enforcement officers (Rinaldi in Zaluar & Alvito, 1998; German Institute for Global and Area Studies, 2020). Race matters. These facts tend to be aggravated because Afro-descendants live in vulnerable areas such as favelas that often lack access to basic needs and services, and are not integrated into the city, such as *favelas* (Penglase, 2014). This has been corroborated by extensive quantitative and qualitative evidence (Inter-American Commission on Human Rights, 2021; Magaloni et al., 2019; German Institute for Global and Area Studies, 2020). *Immense talent is prematurely lost due to race-based violence.*

Box 4.4 Disability and Visibility

About 85 million persons with disabilities (PWDs) live in Latin America and the Caribbean, which is equivalent to one in three households. In Brazil, 24 percent of the population have some type of disability (IBGE, n.d.). In the last decade, the region has made significant efforts to improve statistical visibility of PWDs, although official data has yet to be fully representative of all types of disability. Brazil, for instance, has only partially adopted a standard international questionnaire that offers a comprehensive and inclusive definition of disability in its national census and household surveys (Garcia Mora et al., 2021).

Considering the data available data, poverty and disability are mutually reinforcing. In Latin America, about 1 in 5 people living in extreme poverty has a disability, and nearly 7 out of 10 households with PWDs are vulnerable to falling into poverty. Poverty persists in a large part due to constraints that prevent PWDs from accessing good education, employment, housing, and public life. In terms of education, for example, 12.6 percent of children with disabilities aged 6-12 are not attending school in Brazil. Moreover, there is a 24 percent lower probability of completing primary education for disabled children when compared to their peers. For secondary education the probability is 23 percent lower, while for tertiary education it is 11 percent lower. For PWDs who identify as Indigenous or Afro-descendants in Brazil, the chances of dropping out are even higher (around 35 percent) (Garcia Mora et al., 2021).

PWDs also fare worse in the labor market. In Latin America, one in two household heads with disabilities is inactive (neither working nor looking for a job). In 1991, Brazil implemented the “Quotas Law,” which mandated that private companies with more than one hundred employees allocated between 2 and 5 percent of job vacancies for PWDs. However, recent data from RAIS shows that only 1 percent of all jobs in the formal sector (496,000 thousand jobs) were filled by PWDs in 2020. Moreover, the average income of five out of the six categories of disability considered in the study were below the average annual income by 19 percent (Ministério do Trabalho e Previdência, 2020).

Discrimination is also a challenge according to a 2020 study commissioned by the Labor Public Ministry in Sao Paulo, which found that 69 percent of PWDs have suffered from discrimination in their workplace (IBOPE, 2020).

Disability distinctively impacts vulnerable groups. Afro-descendants have a higher prevalence of disabilities as they suffer more frequently from noncommunicable and chronic diseases. While 71.4 percent of Afro-Brazilians reported having a disability, only 65.1 percent of non-Afro-descendants did (IBGE, n.d.). Since Afro-descendants are overrepresented in informal jobs (47.4 percent) and in *favelas* (72 percent), they are also more prone to experiencing unhealthy

Box 4.4 (continued)

living conditions and being victims of gun violence and work-related injuries (IBGE, 2020b; Meirelles & Athayde, 2016). Similarly, women have higher prevalence of disability compared to men. Since they also have a longer life expectancy, they are at greater risk of accumulating health conditions and injuries over time (Garcia Mora et al., 2021).

The last decades have seen progressive and institutional changes for PWDs, such as the Continuous Cash Benefit Program (*Benefício de Prestação Continuada* or BPC), which has been in effect since 1993. BPC is an unconditional cash transfer program for the elderly or extremely poor individuals with disabilities whose household per capita income is less than one quarter of the minimum wage. Another example is the approval of the Law for the Inclusion of Persons with Disabilities (13.146) in 2015, which aims to ensure and promote, on an equal basis, the fundamental rights and freedoms of PWDs.

Moving forward, it is important to reverse the statistical invisibility of PWDs and invest in strategies that promote their accumulation of human capital. In terms of education, designing inclusive learning environments can help keep PWD students enrolled and maximize their potential. Labor market participation can also be stimulated by addressing inactivity rates, promoting inclusive workplaces, and transforming the conditions of the informal sector where workers with disabilities are concentrated. Needless to say, policies must also take into account the risks that certain PWD subgroups experience, especially those that have historically suffered from exclusion and discrimination.

— Third Inequality: The Human Capital Index by Gender and Race

The third inequality this chapter addresses looks at the first two inequalities of gender and race together. This is done by undertaking a cross disaggregation for race and gender to estimate the expected productivity of the next generation of workers. Despite the data limitations already discussed (see box 4.1), this section builds HCIs for four groups: white women, white men, Afro-descendant women, and Afro-descendant men, and plots their evolution. The discussion starts by presenting the evolution of HCI by race and gender between 2007 to 2017 (figure 4.11).⁴⁷ Navy lines denote the HCI for white people and yellow lines refer to Afro-descendants. Darker colors refer to men and lighter colors indicate women.

Figure 4.11 reinforces the evidence already given on gender and race. It confirms that white women consistently have the highest HCI on average and that Afro-descendant men have the lowest, and that persistent inequalities in labor productivity by gender and race do not seem to narrow over time. Slightly better but still unequal.

Also notable in figure 4.11 is the line pattern. On one hand, Figure 4.11 also clearly shows that women tend to perform better than men regardless of their race. Light colors

White women have the highest HCI. Afro-descendant men, the lowest.

⁴⁷ Note that data by gender is not available for 2019.

always at the top. Another observation that can be made is that while the human capital evolution of these four groups is relatively similar in the 10 years analyzed, the HCI increase for white mean was greater, having gained practically 5 HCI points in 10 years. These gains are not seen in other subgroups. This gain narrowed the gap between white men and Afro-descendant women, who gained 4 HCI points in the same period.

Slightly Better but Still Unequal

Human Capital Indexes by Race and Gender from 2007 to 2017

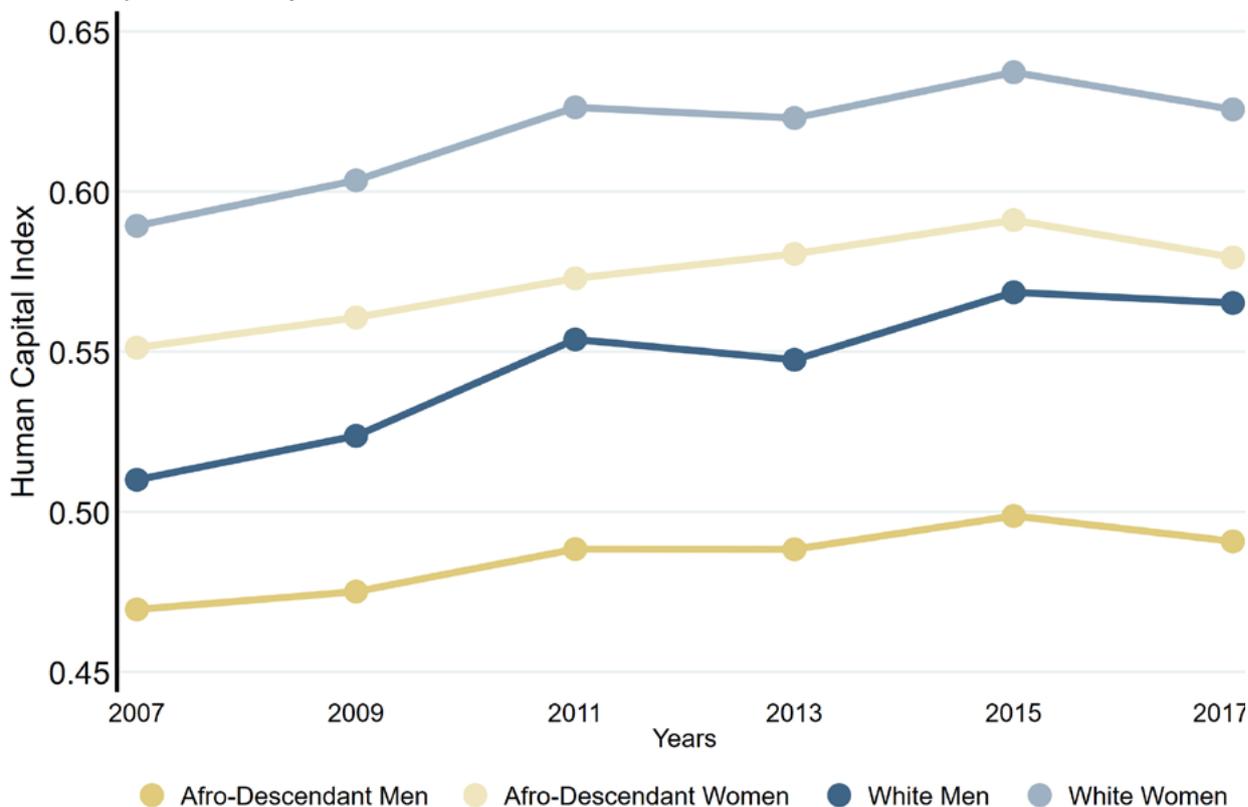


Figure 4.11
Slightly Better but Still Unequal

Some inequalities in HCI components are more accentuated between races, and others between genders. Figure 4.12 shows that harmonized learning outcomes (HLO), for example, is marked by a substantial gap between Afro-descendants and white people. *Race largely explains gaps in learning quality.* The role of race is clear when one considers that women only obtain a slightly higher HLO relative to men of the same race, but that white women have significantly higher HLO when compared to Afro-descendants (both women and men).

White women have one year of school more than Afro-descendant men.

For Expected Years of Education (EYS), figure 4.12.B shows a different scenario. *Gender inequality is more significant than racial inequality for the expected years of education (EYS) component of HCI.* White women also outrank the other groups with regard to EYS having one more year of school

than Afro-descendant men, on average. The figure also shows that Afro-descendant women reach an EYS equivalent to white men (10.8 years of school). To further analyze this apparent gender inequality in learning outcomes, figure 4.13 presents two graphs: one that shows dropout rates and another that shows repetition rates by grade, race, and gender.

Race gaps are more salient for school dropout rates. Figure 4.13.A presents school dropout rates by race-gender across the 12 years of basic education in Brazil. It shows that Afro-descendants students are more likely to drop out of school than white people for all grades. The barriers contribute to an increase

in school dropout rates for Afro-descendants include: greater social barriers to accessing education, experiencing racial discrimination in class, and being more susceptible to joining the (informal) job market.

Two moments in the education cycle make these gaps more perceptible. The first is when students transition from primary to lower secondary education, that is, from 5th to 6th grade. In this transition, the probability that Afro-descendant students will drop out increases more abruptly than that of white students. *In 6th grade, the race gap widens and never returns to previous levels.* The second moment occurs when students transition from lower secondary (9th grade) to upper secondary education (10th grade). At this stage, the probability that an Afro-descendant student will drop out is twice as large as that of white students (or 4 percentage points higher). National data reinforces these conclusions: of the 605,000 teenagers who were out of school in 2019, 39.5 percent were Afro-descendant men and 32.6 percent were Afro-descendant women while only 10.6 percent were white women.⁴⁸ *Transitions from one stage to another pushes Afro-descendant students out of school.*

Looking Deeper: Gender and Race Disaggregation

Brazilian HCI by Race and Gender, 2017

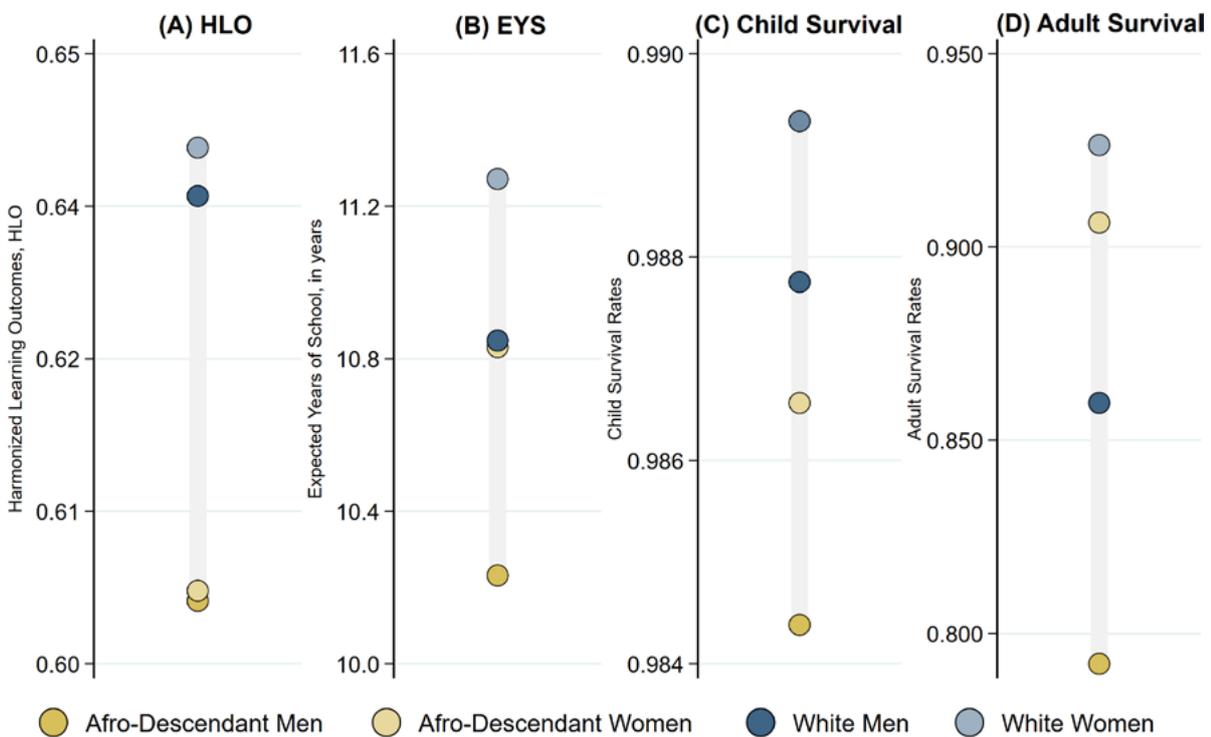


Figure 4.12
Looking Deeper: Gender and Race Disaggregation

Grade repetition rates are more noticeable among Afro-descendant men. As has already been discussed, grade repetition starts very early for boys. Figure 4.13.B, however, shows that this increase concentrates on Afro-descendant boys. Three stages corroborate this argument. At third grade, the repetition rates for Afro-descendant boys jumps from 3 percent to around 12 percent. It jumps again to above 16 percent between the end of primary school (5th grade) and the beginning of lower secondary school (6th grade). In the final transition from lower secondary (9th grade) to upper secondary (10th grade), the repetition rates peak at almost 18 percent among Afro-descendants.

It is worth noting that the repetition rates of white boys also increase to a large extent, surpassing Afro-

⁴⁸That data is from PNADC (2019). The analysis includes teenagers between 15 and 17 years old that did not declare that they had completed high school.

descendant women and showing that, in general, *Boys are falling behind*. In 2019, of the 2.1 million students in Brazil held back, 64.2 percent were boys whereas only 35.85 percent were girls (UNICEF et al., 2021).

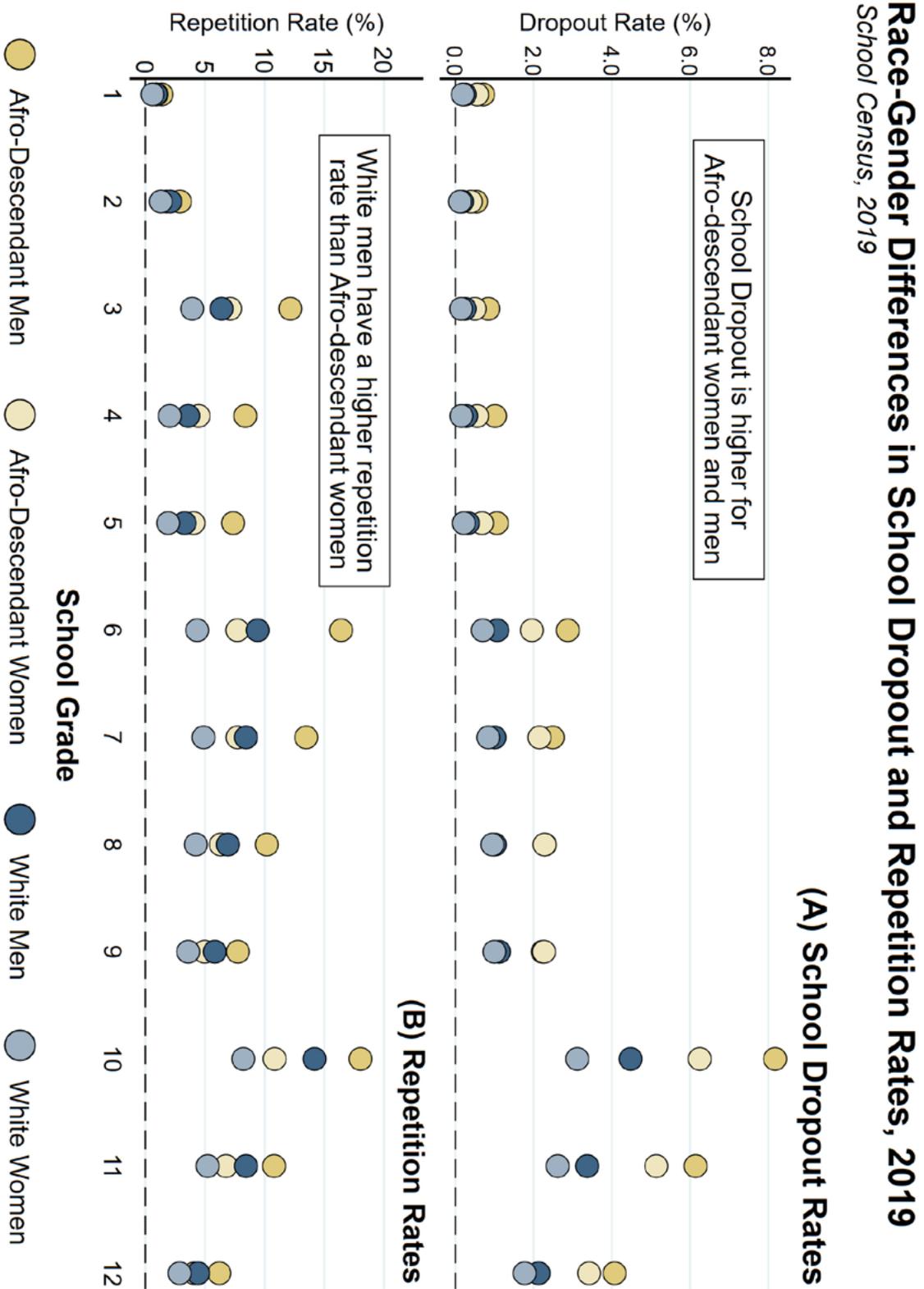


Figure 4.13
Race-Gender Differences in School Dropout and Repetition Rates

Returning to Figure 4.12, the next HCI subcomponent that is analyzed for race-gender inequality is child survival. Figure 4.12.C shows minimal differences between race-gender groups (less than 0.05 HCI points). Despite these small gaps, the message is clear: Afro-descendants lag behind the white population and men lag behind women in child survival rates. Yet, the story is more informative in the last component: adult survival rates.

White women are 17pp more likely to survive to age 60 than Afro-descendant men.

Figure 4.12.D shows that gender explains most of the variation in adult survival, the last HCI component analyzed. The largest gaps in adult survival are by gender rather than by race. That is: white and Afro-descendant women perform better than white and Afro-descendant men by a margin of at least 6 percentage points. Afro-descendant men perform critically low on this subcomponent, the reasons for which were described in the first two sections of this chapter.

It is also important to note that white women have a higher probability of survival than Afro-descendant women. When looking at data, this asymmetry becomes even more explicit. Between 2009 and 2019, the number of Black women who were victims of homicides increased by 2 percent, while the number decreased by 26.9 percent for non-Black women.⁴⁹ In 2020, Black women represented 61.8 percent of the 1,350 cases of femicide in the country.⁵⁰ While femicide is defined as a “gender-motivated” crime, racism and racial disparities certainly contribute to it. Race and gender matter. Black women are more prone to living in a context of social vulnerability, and because of this face barriers to accessing legal and institutional resources when suffering from violence that is a result of processes that have normalized racism (Silva & Lima, 2021).

— Fourth Inequality: The HCI by Socioeconomic Level

The last inequality examined is that based on socioeconomic status. Brazil is known as one of the most unequal countries in the world (World Bank, 2004). Socioeconomic conditions during infancy are associated with many factors hindering the capacity of a person to accumulate human capital throughout life. Children in poorer households, for example, have low access to health services (Szwarcwald et al., 2002; Szwarcwald, et al., 2000; Wagstaff, 2002), and lack of sanitation and food insecurity make stunting and infant mortality more frequent (Monteiro et al., 2010; Adair, et al., 2013). Poorer children also generally receive low-quality education and are more likely to drop out of school. *Socioeconomic inequality is a historical scar in Brazil.*

In this section of the report the influence of socioeconomic status (SES) on HCI has been investigated by disaggregating HCI data, which poses several challenges (see appendix III for details). One challenge is that variables proxying for socioeconomic status must be present in all data sources (i.e., health, education, and population). Because direct measure of household income is unavailable, mothers or individuals who completed tertiary education are classified as high-socioeconomic status while mothers or individuals outside this category are classified as low-socioeconomic status. Figure 4.14 shows the result of disaggregating HCI by SES in Brazil and in each region.

The expected productivity of a child born in a high-SES family is 69.5 percent while for a child born living in a low-SES family expected productivity is 58.1 percent, which is a disparity of 11.4 HCI points. This low-high SES gap in human capital in Brazil is equal to the HCI inequality between Vitória and Macapá (the best and worse-ranked capitals). Similar HCI-SES inequality is observed across regions, varying from 11.7 HCI points in the Northeast to 9.93 HCI points in the Center-West.

⁴⁹ Atlas da violência (Cerqueira et al., 2021).

⁵⁰ ABrazilian Forum of Public Safety (Fórum Brasileiro De Segurança Pública, 2021).

Lower Socioeconomic Status, Lower HCI
Differences in HCI between Lower and Higher SES by Region, 2019

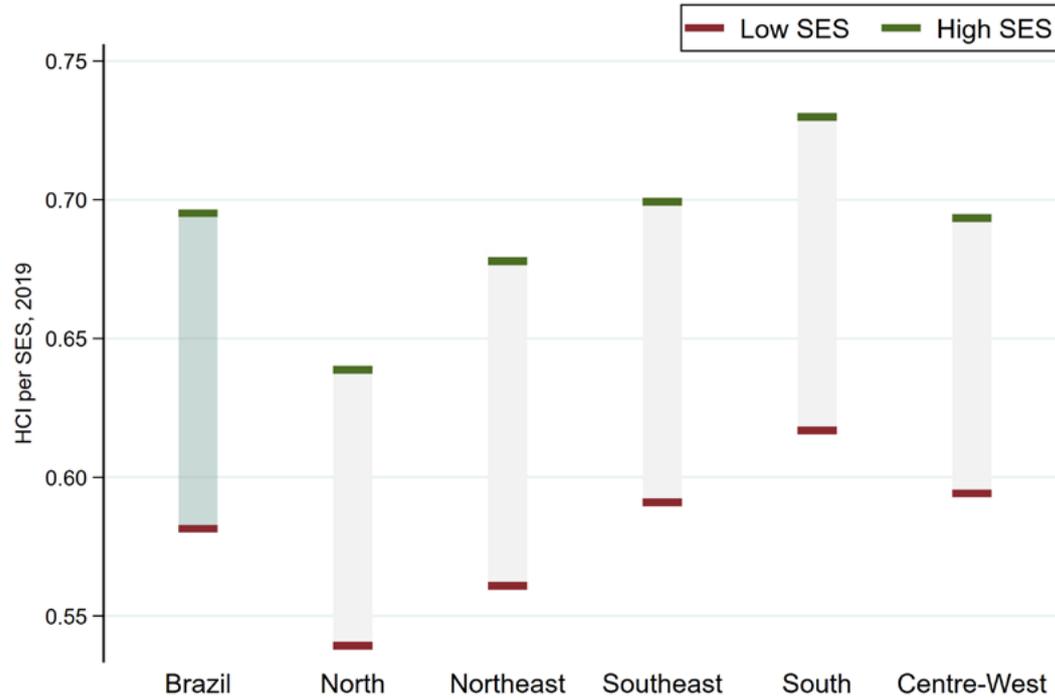


Figure 4.14
 Lower Socioeconomic Status, Lower HCI

Why Do Those with High-SES Have Higher HCIs than Those with Low-SES?

State HCI Components by SES, 2019

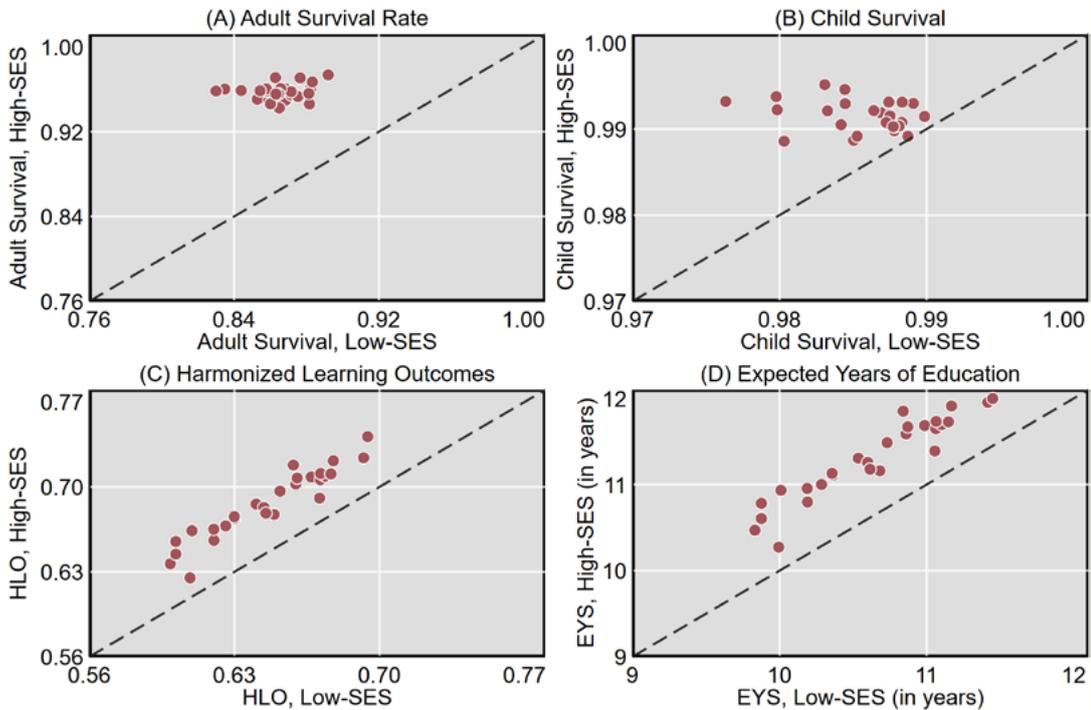


Figure 4.15
 Why Do Those with High-SES have Higher HCIs than Those with Low-SES?

What explains the high-low SES HCI gap? According to figure 4.15, one of the most important differences is in adult survival. On average, the probability of a 15-year-old reaching age 60 is 96.0 percent if they have a high SES, while this probability is only 86.4 percent for those with a low-SES. The difference in child survival (figure 4.15.B) is small but still significant: a child born in a wealthy family has a 99.2 percent chance of reaching age five, while this probability is 98.6 percent for a poor child, on average. In terms of education quality (figure 4.15.C), the gap is wider: on average, the harmonized learning outcomes are 6.6 percent higher for the high SES group, and this gap reaches around 9 percent in Pernambuco, Amazonas, and Roraima. Finally, figure 4.15 (D) shows that a child born in a high-SES family studies almost nine months more than children in a low-SES family. This difference is higher for Pernambuco and Amazonas, where it reaches almost one year.

— Many Inequalities

“Many inequalities” is a chapter about unshared prosperity. It discusses the many facets of human capital formation according to gender, race, race-gender, and socioeconomic status in Brazil. It reveals that women are expected to accumulate more human capital than men by the age of 18 – for all 12 years and across most areas. *Not simply better, better almost everywhere.* Further analysis shows that substantial male talent is lost due to violence and premature school dropout.

Non-white people fare worse off in terms of productivity. While a white child born in 2019 in Brazil is able to achieve, on average, 63 percent of their potential human capital by the age of 18, Afro-descendants and Indigenous people were only expected to achieve 56 and 52 percent, respectively. This represents a doubling in the HCI gap between white and Afro-descendant people over 12 years. *While the white population prospers, Afro-descendant and Indigenous people lag behind.*

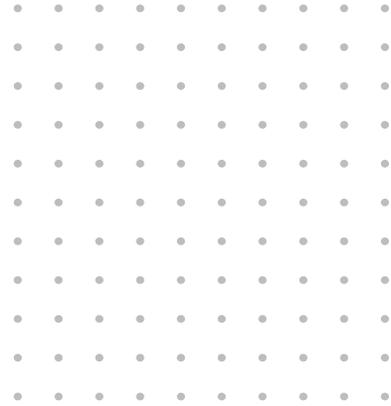
When merging race and gender, the prospects are not much better. Both Afro-descendant men and women lag behind white men and women in harmonized learning outcomes and child survival rates. Afro-descendant men are critically lagging behind, with HCIs around 25 percent lower than white women.

Lastly, in terms of socioeconomics, the analysis demonstrates that children with high SES have better HCIs. The productivity of a child born in a high-SES family is 69.5 percent, while a child born in a low-SES family only reaches 58.1 percent of their productivity.

Chapter 5

Human Capital in the Labor Market

Talent at Work



Main Messages

- ❖ The utilized human capital index (UHCI) adapts the HCI by considering the employment rates.
- ❖ Brazil only achieves 38.7 percent of its potential when considering the labor market in the HCI formula.
- ❖ Inequalities observed in the HCI are heightened in UHCI.
- ❖ The labor market amplifies race inequality when it comes to the utilization of human capital.
- ❖ While women have a clear advantage over men in terms of HCI, men have a clear advantage over women in terms of UHCI.
- ❖ Afro-descendant women face a harsh reality: they achieve only 28.6 percent of their potential when utilizing their human capital.

How much human capital is absorbed by the labor market? After examining the conditions in which Brazilians accumulate only 60 percent of their full potential productivity from birth to adulthood (chapter 2), a new question arises: how much of this productivity is utilized in the labor market? This question becomes more significant when one considers the fact that in some regions, half of the talent remained unused before reaching for the labor market. In Brazil, unemployment rates are 10 to 15 percent,⁵¹ and job informality, in some cases, reaches 40 percent. Additionally, the many inequalities seen amongst gender, race, and socioeconomic status (chapters 3 and 4) may either be offset or reinforced by employment rates. Including labor market data in HCI formula helps to answer to these questions.

Box 5.1

Utilized Human Capital Index

Formula: The UHCI for state s is measured by:

$$UHCI_s = HCI_s * Employment Rate_s$$

where the HCI_s is the average human capital index of state s . The $Employment Rate_s$ is measured by:

$$Employment Rate_s = \frac{No. of 18 - 64 year olds employed}{Total no. 18 - 64 year olds population}$$

Data Source: The employment rate is from Pesquisa Nacional por Amostra de Domicílios Contínua (PNAD). The first quarter of the year was used as a reference. A person was considered employed if they worked at least one hour in the week of reference or if they had a job that was temporarily withdrawn (IBGE, 2014).

How much human capital is utilized in the labor market?

This chapter builds on the previous chapters by estimating the human capital utilized by the labor market. It challenges the assumption that, by the age of 18, productivity will necessarily find a place in the labor market. The utilized human capital index (UHCI) adjusts the human capital index by incorporating weights

based on the participation in the formal and informal labor market. This chapter looks at UHCI across the “many Brazils” and across the “many inequalities” and discusses the implications of weighting the HCI by employment rates.

— The Utilized Human Capital Index (UHCI)

The UHCI measures the expected productivity of a child born today by the age of 18, assuming that the current employment rates, quality and quantity of education, and health conditions remain the same. Now productivity reaches the labor market. Figure 5.1 illustrates the UHCI formula: UHCI simply multiplies the HCI by a utilization rate. Utilization rate refers to the employment rate of the working-age population from 18 to 64 years old (see box 5.1 for details).⁵²

⁵¹ The lowest unemployment rate since 2012 was recorded in the last quarter of 2013 at 6.3 percent. After the first quarter of 2016, the unemployment rate was consistently above 10 percent, reaching its highest level at 14.9 percent in the third quarter of 2020, which was during the COVID-19 pandemic (IBGE, 2021).

⁵² The Global HCI uses the employment rate of people between the ages of 15 and 64 (World Bank, 2020d). In Brazil, compulsory schooling ends at age of 17, but individuals can legally work from 14 to 18 years old, subject to restricted laws. As such, the employment rate used in this report considers higher than 18.

UHCI can be considered from two different perspectives. First, it can be seen as a measure of the expected productivity lost when individuals face barriers to use their human capital in the labor market. Productivity loss that depends on employment rates. For example, a utilization rate where there was no loss would be equal to one meaning that all individuals between 18 and 64 years old were employed or that the HCI equals to the UHCI. *Talent at work*. Second, the UHCI can be considered a measure of expected productivity relative to the benchmark where individuals enjoy full health, education, and full employment. This chapter shows how low jeopardized productivity gains and amplified inequality in Brazil.

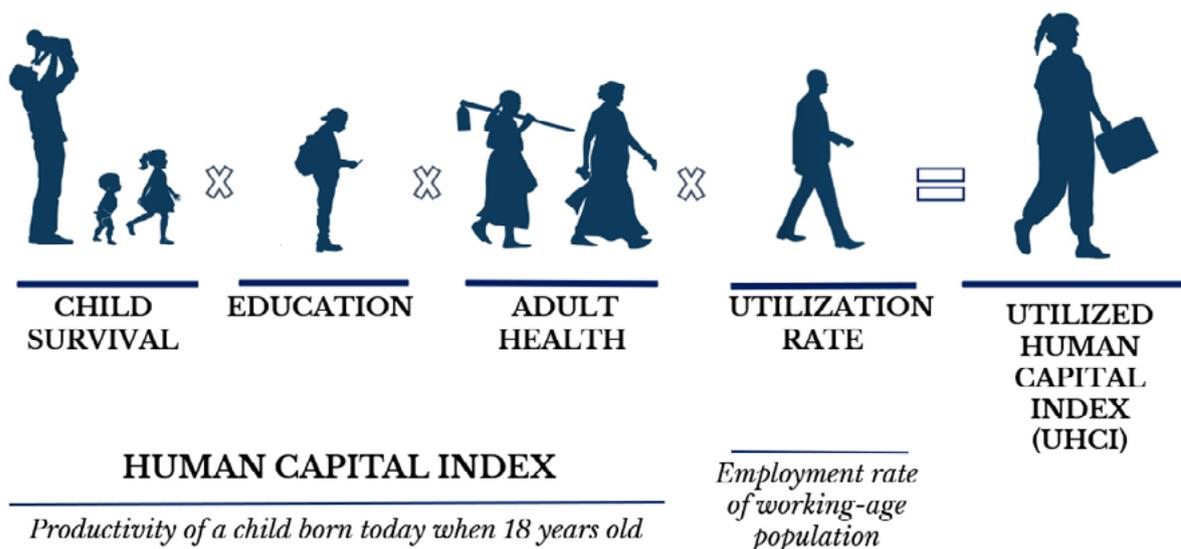


Figure 5.1
Utilized Human Capital Index Methodology

The UHCI indicates that a Brazilian born in 2019 is expected to use only 38.7 percent of their potential productivity by the age of 18. From an HCI of 60.1 percent, weighted for employment rates leads to a national UHCI 21.4 points lower. This means that 35.6 percent of Brazil’s talent is lost due to underutilization in the labor market. *Low employment rates leave a deep mark*. Failing to promote all potential talent has obvious implications for Brazilian society, in particular to the economy. Figure 5.2 shows impacts of underutilized HCI on the GDP. The HCI suggests that adequate education and proper health for every child would lead Brazil to a 66 percent higher GDP per capita. Low utilization rates would, on the other hand, create a significant shock to GDP per capita.⁵³ Figure 5.2 shows that the potential gain associated with full human capital and full employment of all working age population would reach 158 percent, that is, 2.5 times higher GDP per capita than in 2019.

The labor market amplifies the idea of “many Brazils.” Introducing the labor market through the UHCI formula enlarges regional gaps mapped in previous chapters. For example, the North-South gap increases from 6 HCI points to 10 UHCI points, or an increase of more than 60 percent. Such an increase reflects that a lower share of the working-age population of the North and Northeast is in the labor market when compared to other regions. The conclusion is worrisome: the North and Northeast regions waste two-thirds of their potential talent due to unideal conditions for human capital formation and underuse of the working-age population. *Two barriers: one in the accumulation and another in the use of human capital*.

Figure 5.3 clearly illustrates how the UHCI amplifies the geographic inequalities in Brazil by plotting the UHCI by state.⁵⁴ Figure 5.3 plots the UHCI by state in Brazil. Blue sections indicate states with a UHCI above the national average (38.7 percent), while red sections refer to states below the UHCI national average. Dark red and blue show areas where UHCI is significantly below or above the national average. Boxes present the estimated UHCI by state, and the dashed lines show the regional UHCIs. *The*

⁵³ The UHCI can be interpreted as the ratio between the future GDP per capita under status-quo policies and the future GDP per capita in an alternative world with full human capital and utilization. The mathematical derivation of UHCI and its relationship with GDP per capita can be found in Pennings (2020).

⁵⁴ One way to interpret this evidence is by looking at the variance coefficient. For the HCI, the variance coefficient at the state level is 1.5 HCI points. For the UHCI, it reaches is 3.8 UHCI points. The UHCI has two times more variability than the HCI at state level.

Differences in UHCI and HCI

UHCI and HCI at the National Level, 2019

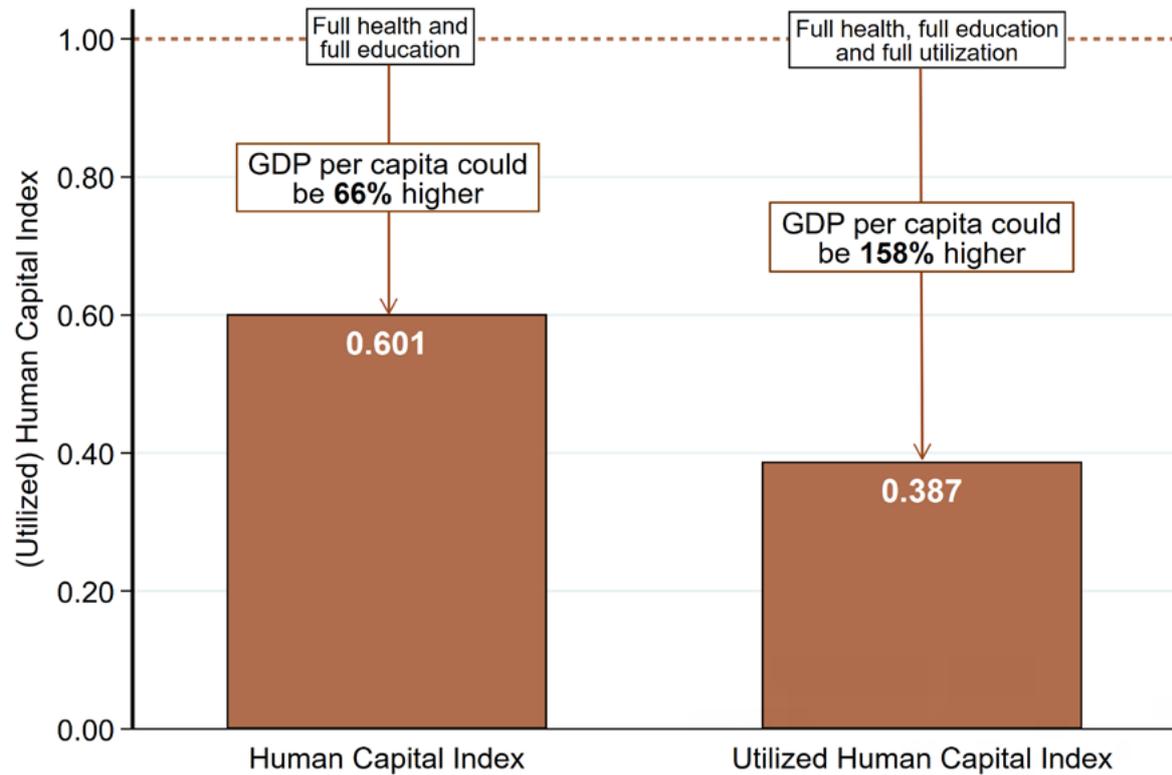


Figure 5.2

Differences in Utilized Human Capital Index and HCI

geographic contrast becomes even clearer.

Two states in the Northeast have the lowest UHCIs. Figure 5.3 shows that two states in the Northeast have the lowest UHCI. These states, Alagoas and Maranhão (colored in red), are both economically disadvantaged having low wages, low GDP per capita, and high poverty rates.⁵⁵ Their UHCIs are the lowest in Brazil, with Alagoas at 26.3 percent and Maranhão at 26.9 percent, which is around 17 UHCI points lower than the state of São Paulo. In chapter 2, Alagoas and Maranhão were shown to already be at the bottom of the 2019 HCI rankings (24th and 22nd positions, respectively), but what makes their expected productivity drop so substantially is the low proportion of human capital being utilized in the labor market (around 47 percent in 2019).

Alagoas and Maranhão have the lowest UHCIs.

In contrast to Alagoas and Maranhão, São Paulo and Santa Catarina have the highest ranking UHCIs. All states in the South and Southeast Brazil are above the national UHCI, as is Rondônia (North), with an UHCI of 0.392. This confirms the regional inequalities discussed in earlier chapters. São Paulo and Santa Catarina were already in the top three best-ranked states for HCI and have relatively high employment rates (69.3 percent and 71.9 percent, respectively).

The fact that São Paulo and Alagoas occupy different places in the UHCI ranks (Figure 5.4) hides an important detail: more than a half of Alagoas's human capital is lost after factoring in

⁵⁵ The state rankings of mean wage (PNAD 2019), shows that Maranhão and Alagoas occupy the 26th and 24th positions, with a mean wage of R\$1,287 and R\$1,455, respectively. In 2019, Maranhão had the lowest GDP per capita, and Alagoas was not in a better position: it occupied the 22nd position out of 26 states and the federal district (IBGE, 2019b). In Maranhão and Alagoas, around 37.3 percent and 30.8 percent of the population receives Bolsa Família (Bolsa Família e Cadastro Único no seu município, n.d.).

employment rates. Figure 5.4 illustrates these losses by presenting the differences between the HCI (light orange) and UHCI (dark orange) by state in Brazil. The lowest UHCI is in Alagoas, where the reduction is from an HCI of 57 percent to a UHCI of 26 percent, or a drop of 30.4 points. While Alagoas had a similar HCI to Paraíba and Rio Grande do Norte, its UHCI is 6 points smaller. Similarly, states in the North, such as Amapá and Pará had a smaller HCIs, but surpassed Alagoas after weighting for utilization rates. *Equally*

The Geography of UHCI by State, 2019

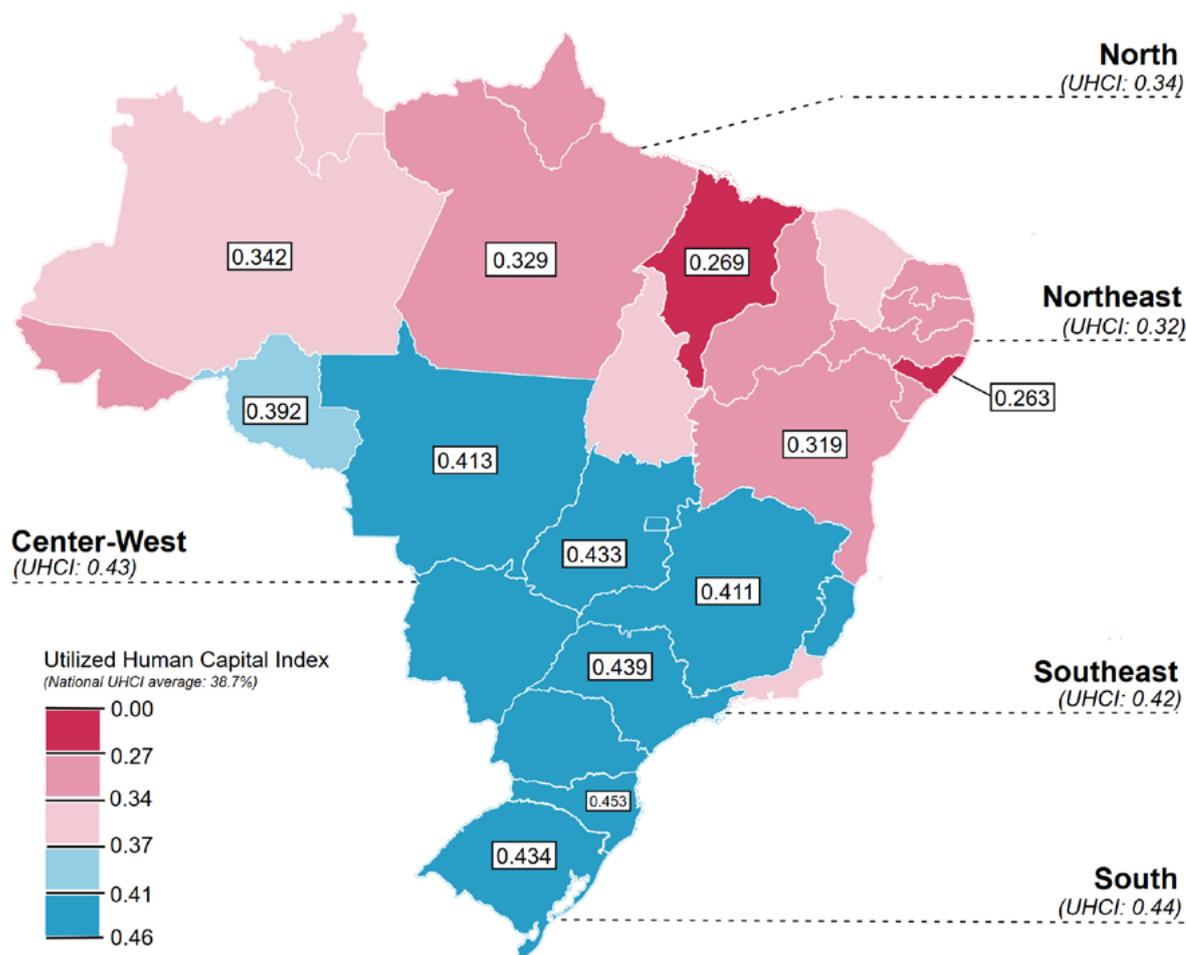


Figure 5.3
The Geography of Utilized Human Capital Index in Brazil

talented, uneven opportunities. Maranhão’s UHCI is comparable, with slightly less dramatic numbers (28.4 UHCI points drop). Overall, the Northeast is heavily hit: of the 10 states that lost the most productivity due to utilization rates, nine are in the Northeast.

Productivity and labor market opportunities are inherently linked.

One reason explaining these substantial decreases in productivity in the Northeast is that the HCI and employment rates are highly associated (correlation equal to 0.74). Productivity and labor market opportunities are inherently linked. An explanation for this association comes from the relationship between schooling and employment, as adequate schooling prepares individuals for the labor market. Ceará, which is a case of success in terms of education, has the highest UHCI in the Northeast (figure 5.4). In a location where students drop out of school prematurely or learning quality is low, people will both be able to acquire the necessary skills to reach the labor market, especially in the formal sector (World Bank, 2021d; De Hoyos et al., 2016). Box 5.2 discusses the differences in the formal and informal markets in Brazil and their relationship to the utilization of human capital.

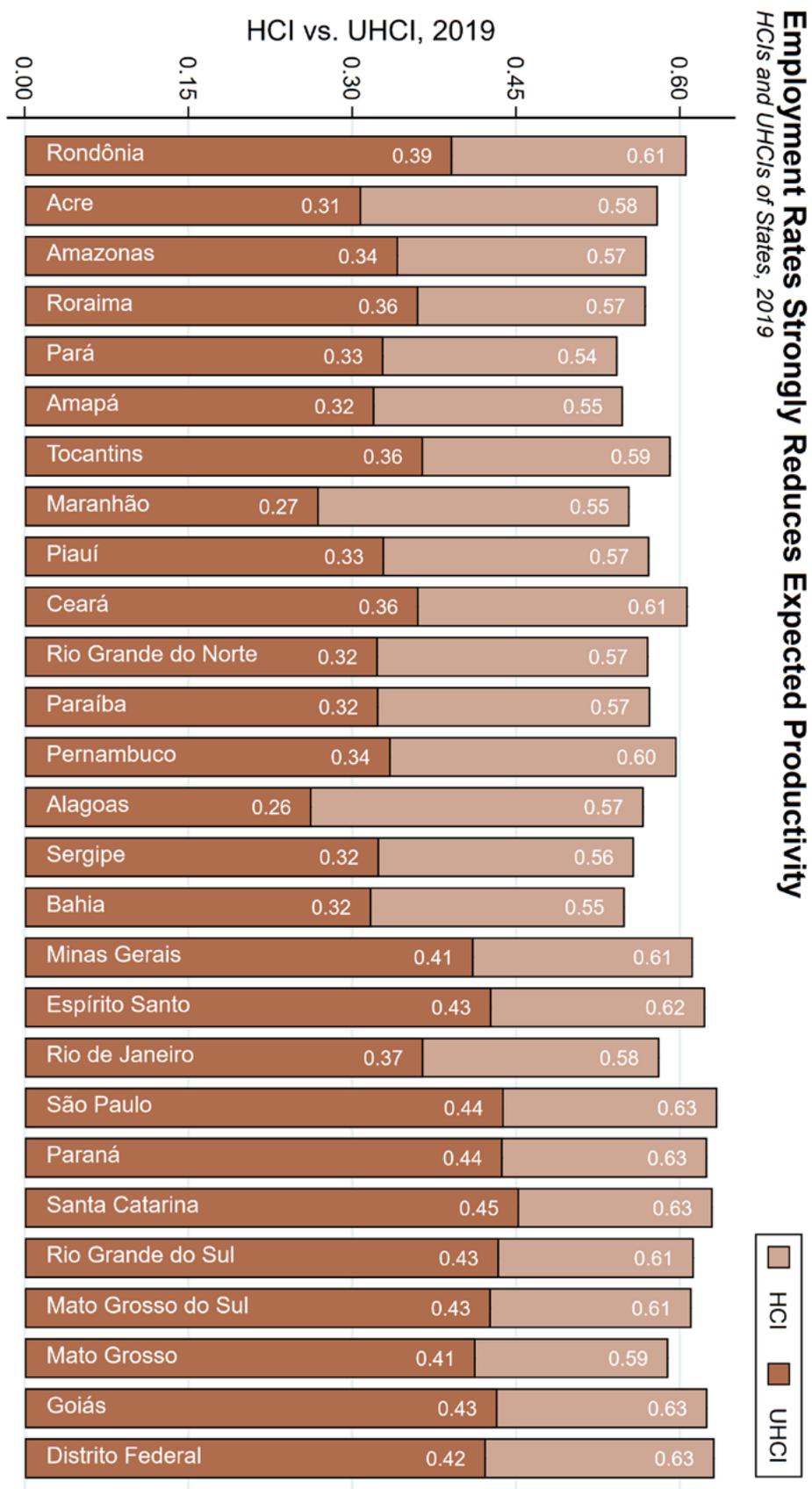


Figure 5.4
Employment Rates Strongly Reduces Expected Productivity

Box 5.2

Informal Labor Market and the Utilized Human Capital Index

What is informal labor market? In Brazil, informality is understood as a labor relation not subject to the national legislation, *Consolidação das Leis do Trabalho (CLT)*, a decree established in 1943 that governs labor relations in Brazil. Naturally, being in the formal labor market entails direct benefits, such as: (i) maximum weekly working hours and overtime, (ii) minimum wage, (iii) paid vacations, (iv) maternity leave, (v) due notice of dismissal, and (vi) thirteenth salaries per year. By contrast, informal workers are not legally bound to a labor contract and thus do not enjoy such benefits. Extensive research shows that countries with high informality also have lower growth and per capita income, and higher rates of poverty and inequality (Ohnsorge & Yu, 2022). Research also indicates that formal workers in the private sector had an average income of R\$2,148 in the second quarter of 2018, while informal workers made R\$1,259, or 41.4 percent less (Furtado, 2018).

What is the size of the informal labor market in Brazil? In 2019, 41.6 percent of all Brazilian workers were in the informal sector. In Brazil, informality is a fast means of generating income for vulnerable populations who struggle to join the formal sector. Since 2014, there has been an increase in informal jobs in areas such as transportation, warehousing and mail, lodging, the food industry, and construction (Etco, 2021). Typically, informal workers have lower levels of education and a specific profile: in 2019, almost half (47.4 percent) were Black (IBGE, 2020b). Between 2015 and 2019, informality increased by 4.8 percentage points among individuals with a higher education diploma, and 2.7 percentage points among general population (IDados, 2020). Given its size, the informal sector has been a major contributor to the Brazil's economy; it is estimated that it contributes 17.1 percent to Brazil's GDP (IDados, 2020).

What are the effects of formal and informal labor markets on the HCI? In developing countries like Brazil, participation in the formal labor market is restricted. In some regions, informality is the most common form of work. Given this scenario, this chapter includes the participation in formal and informal labor markets in the UHCI. Figure B.5.2 presents the implications of this choice by comparing different the UHCI of the formal labor market alone and comparing with that of the UHCI of the combined formal and informal markets.

As Figure B.5.2 shows the formal labor market (brown bars) leads to an average UHCI of 24 percent in Brazil. This result means that weighting by participation in formal market reduces the productivity of an average Brazilian from 60 percent (HCI) to 24 percent (UHCI) relative to their full potential. The other 76 percentage points are either not accumulated through adequate health and education (40 percentage points) or not employed in the formal market (36 percentage points).

In North and Northeast Brazil, this situation is even worse: only 14 percent of talent is utilized in the formal labor market. Informal jobs represent the means of employment for 61.6 percent of workers in the North and 56.9 percent of workers in the Northeast (IBGE 2020). Because the percentage of the working-age population in informality is typically large in Brazil, including the participation in formal and informal labor markets increases the UHCI by at least 60 percent or 15 UHCI points.

Box 5.2 (Continued)

Utilization of Human Capital in the Formal and Informal Labor Market

UHCI at Regional Level, 2019

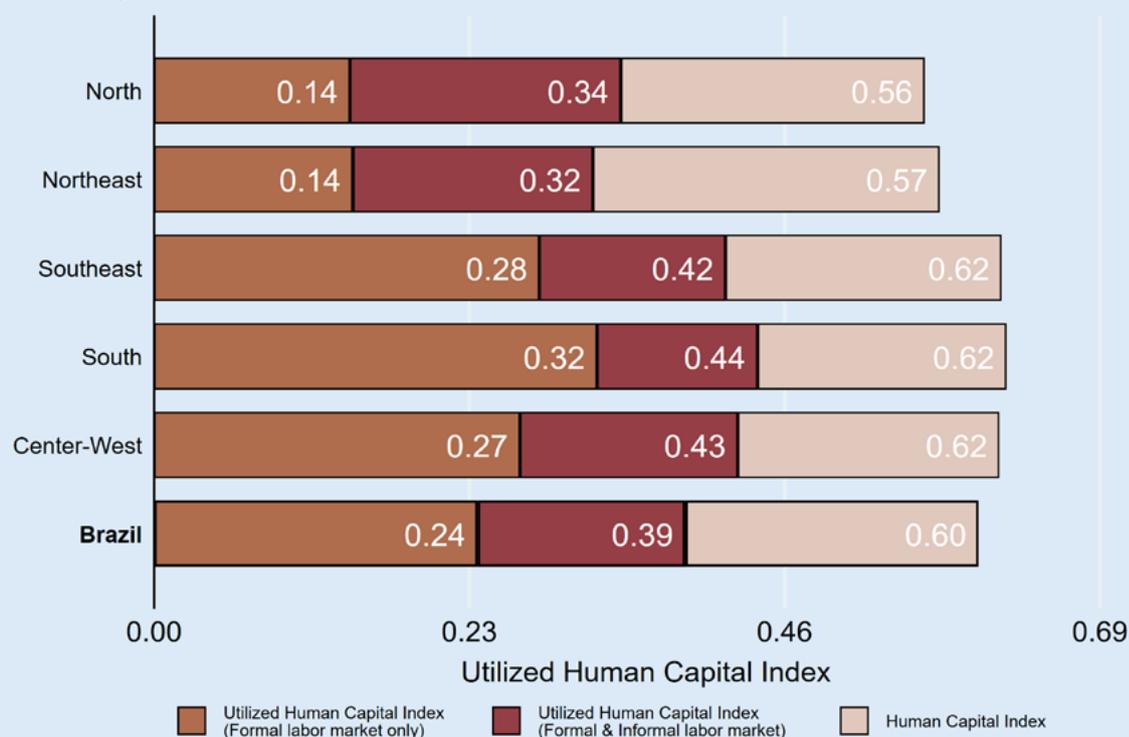


Figure B.5.1

Utilization of Human Capital in the Formal and Informal Labor Market

— Disaggregating the Utilized Human Capital Index

This section investigates the discrepancies in human capital accumulation across gender and race in the context of utilized human capital. It starts by disaggregating the UHCI by gender. Then, it presents the UHCI by race before concluding the analysis by a combination of race and gender.

Utilized Human Capital Index by Gender

Half of women's talent is not absorbed by the labor market.

participation in the labor market. However, figure 5.5 shows that it is not the case: weighting by utilization rates reverts women's advantage in the HCI into men's advantage in the UHCI. *Seven-point advantage women had in HCI became an eight-point disadvantage in UHCI due to lower employment rates.*

Women enter the labor market with higher productivity than men. Better adult health and to some extent education (lower repetition and school dropout rates) explains why women accumulate more human capital throughout their lifecycle. The prospects seem positive: having a higher HCI is expected to lead women to a higher

Figure 5.5 also shows that after taking workforce participation into account, the expected productivity of an average man is around two-fifths of their full potential (UHCI = 0.396). For women, it is only one-third (UHCI = 0.321). These results suggest that at least 60 percent of both men’s and women’s potential human capital is untapped.

Women face significant obstacles to entering in the labor market. The first obstacle relates to household responsibilities and childcare. The insufficient number of public daycares and preschools amplifies the effects of these issues, especially in the early years after childbirth. The second obstacle refers to gender-biased beliefs, which discourage women’s participation in the labor market. For example, almost half of Brazilians believe that being a housewife and working for pay are equally fulfilling; more than one-third of women see it as a problem if they earn more than their husbands; and one-fifth of women think that men make better executives or political leaders than women (Haerpffer et al., 2020).

Higher Human Capital, Lower Utilization Rate Among Women

UHCI by Gender, 2017

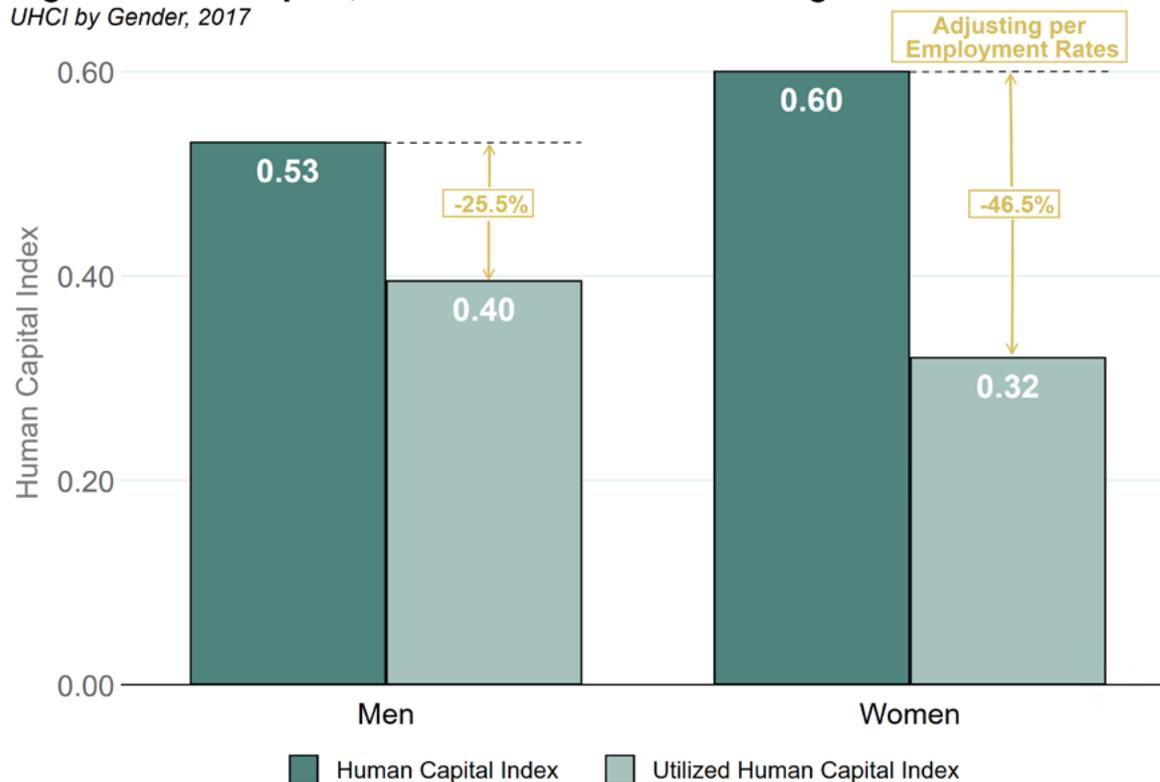


Figure 5.5
Higher Human Capital, Lower Utilization Rates Among Women

The third obstacle emerges in the workplace where women are treated unfavorably because of their gender. Pregnancy discrimination, persecution, sexual harassment, and dismissal due to maternity leave (despite a law guaranteeing the right to maternity leave), are common examples of gender inequality at the workplace (Oliveira Turatti & Moretti-Pires, 2017; Liguori et al., n.d.). When it comes to formal jobs, men and women work the same number of hours. However, despite being in the workforce, women continue to be responsible for a large amount of household responsibilities that are not usually accounted for (Andrade, 2016).⁵⁶ Box 5.3 discusses the disadvantages in women’s employment and wages after childbirth.

⁵⁶ In 2019, employed women worked almost twice the number of hours that employed men worked, dedicating 18.4 weekly hours to household chores and elder care in comparison to 10.4 hours for men (IBGE, 2020a).

Box 5.3

What Barriers Do Women Face in Utilizing Their Human Capital?

Lorena Hakak, PhD

Federal University of ABC and GeFam (Gender and Family Lab)

Brazil has been following the trend in developed countries and in Latin America in which women attend school longer than men (Barro & Lee, 2013; Chiappori et al., 2009; Madalozzo, 2010). In 1982, men and women in Brazil had, on average, four years of schooling. In 2015, this number had increased to 9 and 10 years, respectively. From 1982 to 2015, there was also a dramatic increase in the female labor market participation, as well as a reduction in wage gap.¹ The decrease in fertility rate, the postponement of pregnancy and postponement of marriage are factors that might explain the reductions in this gender gap. **Despite these advances, the participation of women in the labor market is still lower than that of men, especially among married women and those with children under six.**

The return to education is positive for both men and women, but it is greater for women.² Occupations in natural science, engineering, and physics explain higher wages, on average, for both men and women, although this effect is greater for women. However, the number of men working in these occupations are higher than women: in 2015 the proportion relative to the total workforce is 1.4% and 0.5%, respectively.

Married women earn, on average, 24% less than unmarried women. The lower wages seem to come, largely, from hours spent on domestic chores. Household work and care responsibilities reduce the amount of time available for paid labor. On average, women who spend more than 30 hours on domestic work earn 33% less than women who do not spend time on domestic chores. In addition, according to Folbre & Nelson (2000) “efforts to combine paid work and family responsibilities lead to stresses and strains.” On average, in 2015, married women spent 28 hours per week in household work, whereas married men spent 10 hours. Women spend almost three times more hours than men on unpaid work. Gender norms differ across countries and, according to Jayachandran (2021), they have important impacts on women’s participation and success in the paid labor market.

This result suggests that hours spent on housework and care is negative for women in the labor market. In addition, married women with children may have, on average, less experience in the labor market due to maternity leave or more time spent out of the market, which reduces their average earnings.³ For men, this pattern is not observed.

After considering for full time work, level of education, number of children, household work, and marital status, there is no wage gap between white and non-white women. However, for men the difference in earnings between white and non-white people persists, and white men earn, on average, 10% more than non-white men.

An analysis was also performed to identify the main variables that reduce women’s probability of participating in the labor market such as having children under five, being married, and spending more than 15 weekly hours on household work. The results indicate the the use of time for unpaid work affects the probability to enter in the labor workforce.

Although these results cannot be interpreted directly as causal effects, they highlight issues related to social norms. Seeking changes in social norms is difficult, but it would likely mitigate the negative effects found in the labor market for women. **An excessive number of hours spent on household work reduces women’s wages and their probability of being engaged in the workforce.**

Box 5.3 (Continued)

One of the obstacles for women in Brazil to accumulate human capital seems to have been overcome with an increase of schooling. There are still a great deal of improvement to be made, especially in terms of racial gaps. Furthermore, it is possible to develop public policies that increase the equal sharing of domestic work between men and women and mitigate the negative effects for women in the labor market. It is also important to increase efforts to attract more girls to science and engineering careers that generally have higher wages.

¹ For example, the proportion of married women who participated in the labor market in 1982 was 34 percent and increased to 66 percent in 2015. Also, in 1982 married men received a wage equivalent to 6.5 times their wives' wage. In 2015, this gap was 1.5 times (PNAD, 1982 and 2015).

² This may occur because of a selection bias that more productive women are in the labor market. The coefficient may be positively biased due to an omitted variable, which is the unobserved ability of women in the labor market.

³ Machado and Pinho Neto (2016) find that after the maternity leave there is a drop on employment among women.

The Toll of Labor Market on Women

Differences between the HCI and UHCI for Women Across Regions, 2017

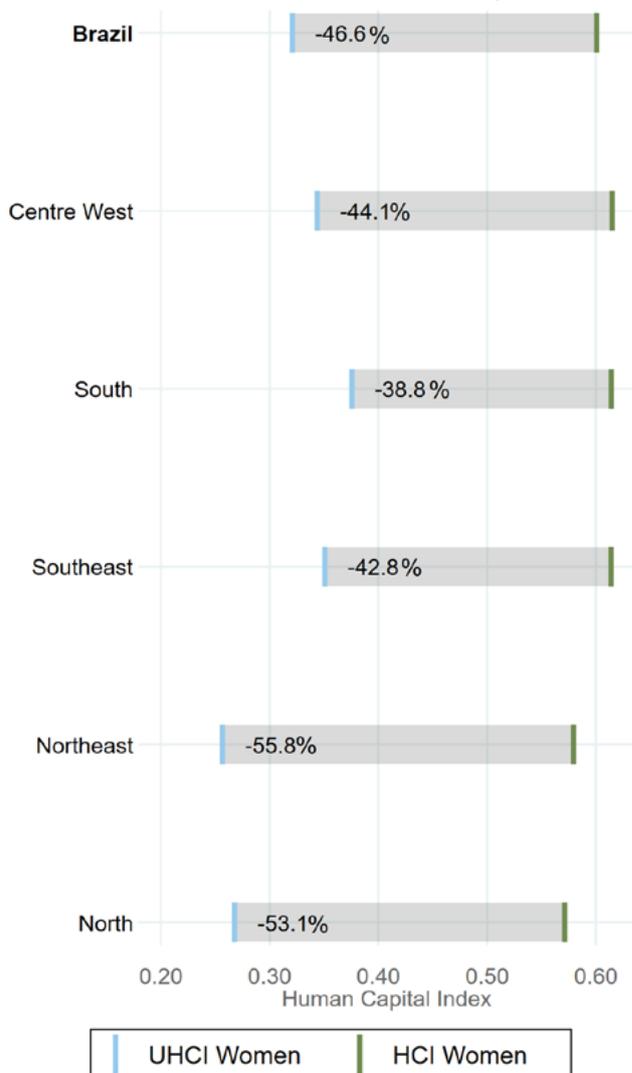


Figure 5.6

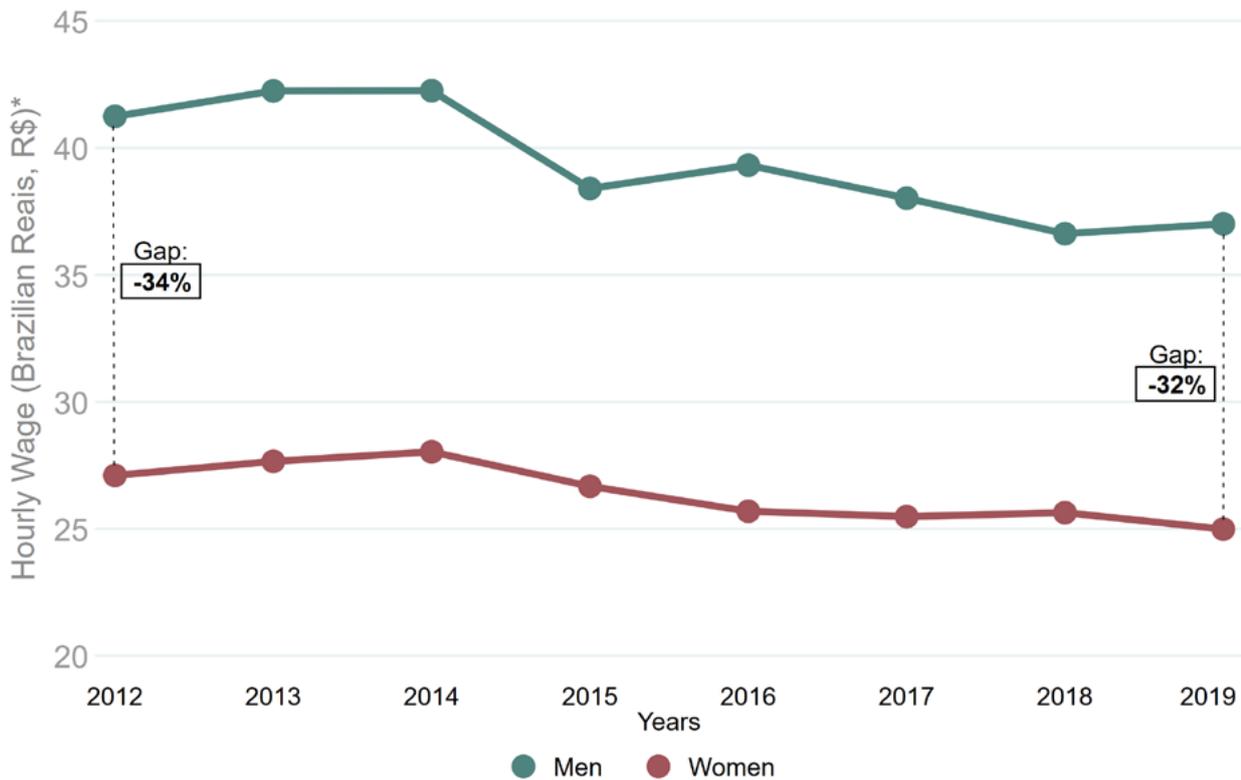
The Toll of Labor Market on Women

Despite these barriers being present across Brazil, there are regions where women's labor participation is more adversely affected. Figure 5.6 shows that the UHCI of women is more significantly reduced in the North and Northeast Brazil. In these regions, women's employment rates are 46.9 percent and 44.2 percent, respectively. These rates are much lower than those in the South (61.2 percent) and Southeast (57.2 percent). Unsurprisingly, these rates are much lower than men's rates, which range from 67.6 percent to 79.9 percent. In all states, women's HCI is higher than men's, but their UHCI is lower. More talented but fewer opportunities. The smallest gender gaps are found in Rio Grande do Sul and São Paulo.

Even though the UHCI accounts for employment rates, it does not address important gendered differences in the nature and pay of work. Women in Brazil typically occupy positions in public administration or related to domestic activities, while they represent a minority in industry and construction (IBGE, 2010). In 2019, women represented only 37.4 percent of managerial positions and 16 percent of elected council positions (IBGE, 2020a). Additionally, women are significantly underrepresented in science, technology, engineering, and mathematics (STEM): 11 percent of women enrolled in tertiary education are in STEM programs (World Bank, 2021d). *An underrepresentation that harms the whole society.* Such gaps lead to persistent wage inequality, as shown in figure 5.7.

Unchanged Gender Pay Gap Among Tertiary School Graduates

Hourly Wage by Gender (Tertiary School Graduates) from 2012 to 2019



Source: PNAD. * Values deflated for 2019 prices

Figure 5.7

Unchanged Gender Pay Gap Among Tertiary School Graduates

Figure 5.7 presents the gender wage gap between 2012 and 2019 among higher education graduates. Despite having the highest graduate completion rates in Brazil, women earned, on average, 77 percent of men’s wages in 2019. Additionally, there was no significant change in gender pay gap across years. While in 2012, women with tertiary education received R\$27.10 per hour, or 34 percent less than men with the same schooling (R\$ 41.20), this difference remained virtually unaltered seven years later (32 percent). Intact gender pay gap. The overall conclusion is simple: despite accumulating more human capital, women are disproportionately harmed by the labor market.

Box 5.4

Maternity Leave and Women’s Employment in Brazil

Prof. Cecilia Machado

Escola Brasileira de Economia e Finanças, FGV

Women’s participation in the labor market has notably increased worldwide in the past century. This achievement has pushed firms and governments to include women’s labor-related needs on their agendas, for instance, in the form of maternity leave policies. Policy designs vary across countries, but some common findings have emerged.

Even countries that are well known for their “generous family policies” are failing to provide an equitable labor environment for women. In Denmark, parents are offered 18 weeks of

Box 5.4 (Continued)

maternity paid leave and 32 of parental paid leave, with the parental leave allocation freely shared between mother and father. Still, Danish women face child-related penalties in their outcomes relative to men, as seen in earnings and in labor market participation rates when they return to work (Kleven et al., 2019a).

Children are the leading factor in women's decision-making around work. Child-related penalties have also been seen in countries other than Denmark, such as Sweden, Germany, Austria, United Kingdom, and the United States (Kleven et al., 2019b). While men are largely unaffected after the birth of the first child, women face a perverse path of persistent earning decreases from which they are unable to recover even 10 years later. The long-term effects of child penalties are smaller in Scandinavian countries, followed by English-speaking and German-speaking countries, indicating that other features – such as gender norms – could be an important driver of gender inequality.

In Brazil, leave policies entitle employed women to 120 days of fully-paid leave. Based on employer-employee data (RAIS), it is possible to estimate leave penalties for women in registered jobs in Brazil. Research shows a sizable employment drop right after the job-protected period, indicating that many women leave their jobs after childbirth (Machado & Pinho Neto, 2016). However, employment effects are lower for women with higher educational levels, indicating that parental may improve the under-utilization of women's human capital.

Findings show that employment drops by 41 percent 12 months after childbirth, and that by 48 months after childbirth, 50 percent of women leave the formal sector (Machado & Pinho Neto, 2016). For women working 24 months before childbirth, the drop is smaller but still sizable (32 percent and 39 percent, respectively). Regarding wages, the wage penalty is between R\$760 and R\$775 48 months after childbirth, which corresponds to a 36 percent decrease (wages at the time of leave-taking, or an average of R\$2,088). Employment effects are smaller for women with more than a high school diploma: only 27 percent leave the formal sector 24 months after childbirth, and this number remains relatively stable 48 months later (32 percent). As for low-educated women (high school diploma or less) the penalty is substantially higher, reaching 53 percent to 63 percent 48 months after childbirth.

There are many reasons why leave policies work better for higher-educated women. Education correlates with employment opportunities, firm characteristics, unobserved job benefits, and peer composition in the workforce, among many other characteristics that are embedded in an employment relationship, all of which work towards the higher effectiveness of leave policies for these women.

Research also investigates the role of leave policies fostering women's permanence by exploring a leave extension of 60 days (from 120 to 180) (Machado & Pinho Neto, 2021). The policy granted tax exemptions to firms of approximately the same wage cost of the maternity leave extension (the Empresa Cidadã program). The paper shows that even this sizable extension does not increase the rates of return to work for mothers in Brazil.

Utilized Human Capital Index by Race

It is already known that Afro-descendants accumulate significantly less human capital when compared to whites. Chapter 4 outlined numerous Black-white inequalities but omitted the race penalty in the labor market as a source of race gaps in human capital. This section discusses this additional point by first analyzing figure 5.8, which compares the average HCI and UHCI the white and Black populations in Brazil.

Larger Black-White Gaps after Considering Utilization Rates

UHCI by Race, 2019

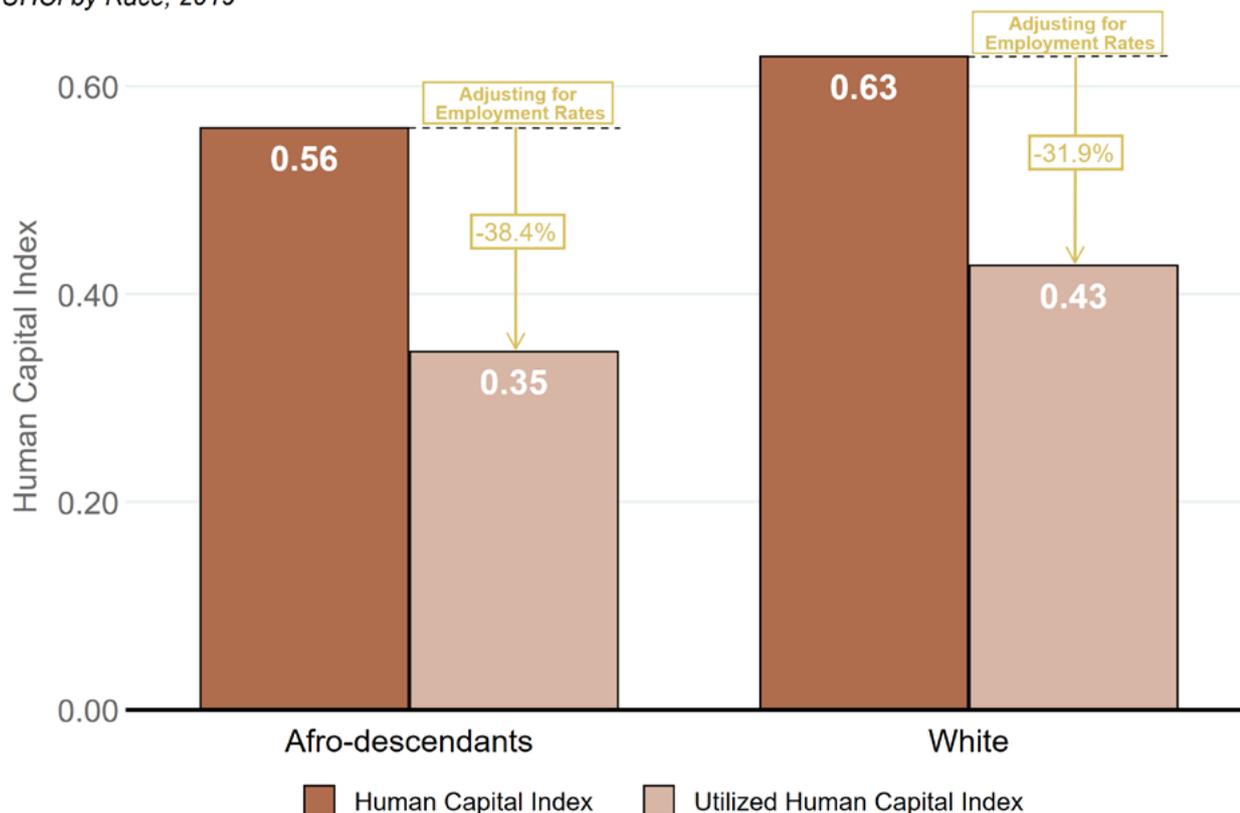


Figure 5.8

Large Black-White Gaps after Considering Utilization Rates

On average, adjusting for labor force participation had similar effects on the UHCI of whites and Afro-descendants. The evidence underpinning this statement comes from comparing the differences between dark and light brown bars in figure 5.8. While the expected productivity of an average white individual entering in the labor market falls to 43 percent (20 points less than the HCI), the UHCI of Afro-descendants in Brazil decreased to 35 percent of their full potential human capital, or 21 points less than the HCI. Because the UHCI only takes into account utilization rates and does not include job characteristics, the employment rates do not seem to be the origin of the race gap in human capital in Brazil. At first, the race gap was 7 HCI points and after the adjustment it became 8 UHCI points. This one-point increase corresponds to comparable utilization rates: 68.1 percent of 18- to 64-year-old whites are employed, and the rate for Afro-descendants is 61.2 percent.

Race-gaps in UHCI are more prominent in North and Northeast Brazil. Figure 5.9 details the average race gaps in UHCI by region in 2019. The lowest white-Black gap is found in the South (10.7 percent), followed by Center-West (12.8 percent) and Southeast (13.4 percent). In contrast, the Northeast is where Afro-descendants reach the lowest UHCI in Brazil (approximately 30 percent) and where the race gaps (19.3 percent) are twice larger than in the South. Figure 5.9 also shows that Afro-descendants in the South and Center-West are able to accumulate a UHCI that is higher than whites in North and Northeast Brazil.

The labor market accentuates race inequality in the utilization of human capital. Figure 5.10 plots the change in race gaps for each state in Brazil after introducing the employment rates in the HCI. As stated in chapter 4, no state is race-equal in terms of HCI, and this is no different for UHCI. In fact, the race gap widens for UHCI. If the HCI and the UHCI were equivalent for Black and white people, all dots in figure 5.10 would be close to the vertical line “no change.” However, there is a widespread deterioration in race gaps since all dots appear on the right side of the vertical line. *The far to the right, the larger is the increase in race gaps due to utilization rates.*

Race Gaps in Human Capital Utilization across Regions

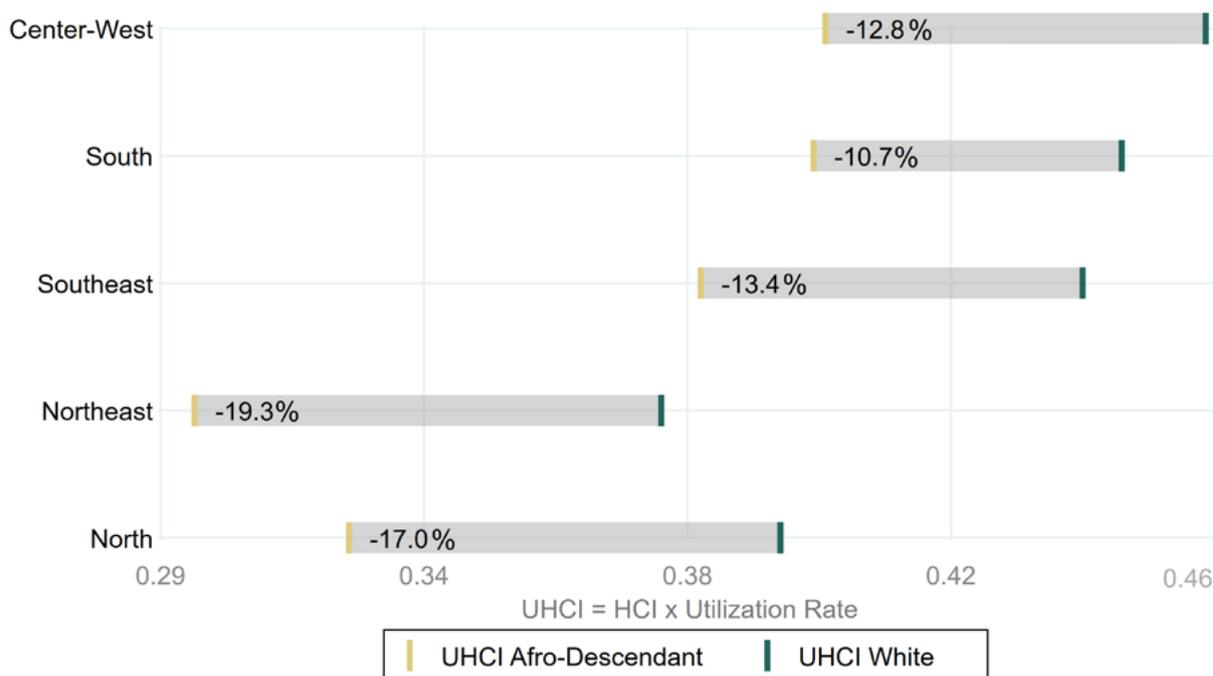


Figure 5.9

Race Gaps in Human Capital Utilization across Regions

Race gaps in UHCI increase in all states due to unequal labor force participation.

No state reduced their race gap in human capital after labor force participation was considered.

The fact that there are no dots on the left side of the “no change” vertical line in figure 5.10 demonstrates the idea that the labor market amplifies race inequality when it comes to the utilization of human capital. Having said that, dots on the “no change” line do not mean that race gaps do not exist but rather that the

gap of HCI and UHCI are the same. *No change in race gaps.* This almost occurs in Rondônia, where the utilization rate is virtually the same for the Black and white populations (64.5 percent). For most states, however, race gaps worsen by a large margin. The UHCI race gaps in Piauí, Alagoas, and Acre, all in North and Northeast, notably increased by at least 12 percent relative to their HCI race gaps.⁵⁷

If the UHCI had considered labor market composition, the race gaps shown in figure 5.10 would have likely been larger.

Data from 117 major companies in Brazil⁵⁸ revealed that despite the fact that Afro-Brazilians represent the majority in trainee programs (58.2 percent), only 6.3 percent held managerial positions and 4.7 percent held executive positions. When managers were asked why this was the case, 41.4 percent claimed a lack of corporate knowledge to deal with this imbalance.⁵⁹ *Systematic challenges prevent Afro-descendants from getting well-paying, stable jobs.* Apart from this, there is racial discrimination in the workplace, which often occurs in the shape of subtle verbal or behavioral actions against marginalized communities (Sue et al., 2007). A study showed that 76 percent of Afro-descendants witnessed cases of racial discrimination in their workplace, often in the form of “seemingly innocent jokes” (Locomotiva & Central Única das Favelas, 2020).

⁵⁷ The race gaps might be wider than what is shown in the UHCI. This is because the UHCI gap is larger if one considers only formal employment in the UHCI. The white population has a 55 percent higher UHCI than the Black population if only the formal market is considered. When both formal and informal markets are included, this difference is 24 percent.

⁵⁸ The data collection was conducted in 2015 and analyzed 117 of the 500 major companies in Brazil.

⁵⁹ In the same survey, 48.3 percent affirmed that Black candidates were not qualified enough, and 10.3 percent claimed that Black employees were not as interested in these positions (Ethos & Inter-American Development Bank, 2016).

The Labor Market Accentuates Race Inequality

UHCI-HCI race Gaps (in %), 2019

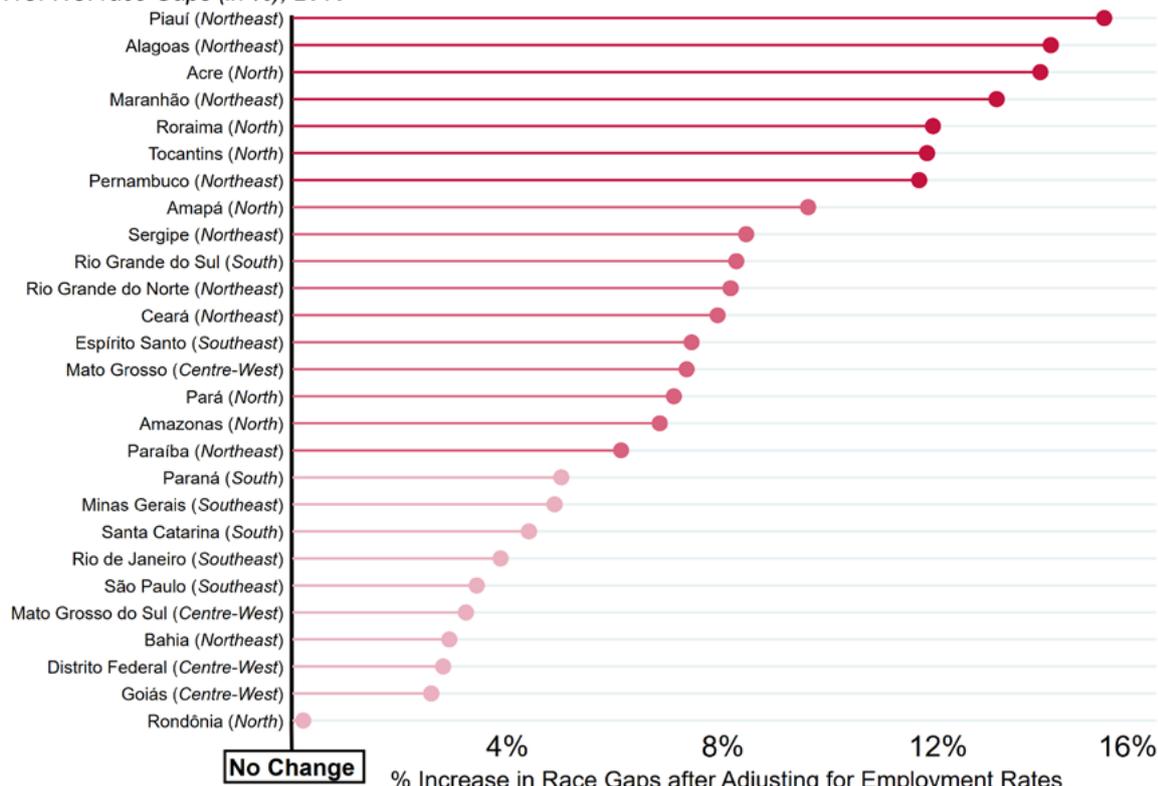


Figure 5.10

The Labor Market Accentuates Race Inequality

Another barrier is the race-pay gap: Black workers still earn less than their white counterparts.

In 2019, the average income for white workers was 73.4 percent higher than the average income of Afro-Brazilians (IBGE 2020b). The difference in the types of occupations held by the white and Black populations largely explain the wage gap between races. First, Black workers have lower participation rates in formal occupations that usually pay higher salaries. Second, even when Afro-descendants have formal work, they are mostly concentrated in low-paying sectors such as: agriculture (62.7 percent), civil construction (65.2 percent), and domestic work (66.8 percent) (IBGE, 2020b). On the other hand, white workers held the majority of positions in areas such as public administration, education, health, and social services, which provide higher wages (IBGE, 2020b). This phenomenon automatically segregates Afro-descendants and Indigenous workers⁶⁰ into low-paying jobs even when they have similar skills.

Utilized Human Capital Index by Race and Gender

The labor market reverses gender gaps and increases race inequality in human capital accumulation. The main message of this subsection is summarized in figure 5.11, which ranks the HCI and the UHCI of Afro-descendant men, Afro-descendant women, white men, and white women in 2017, the last year data disaggregated by gender is available. Afro-descendants are presented in yellow and whites in blue. Darker colors indicate men, and light colors refer to women. The combined impacts of employment rates by gender and race on human capital utilization become clearer here.

Afro-descendant women are penalized twice in terms of UHCI due to their gender and their race.

With regard to gender, Afro-descendant women faced a 15.7-point loss because of labor force participation

⁶⁰ A survey conducted in Roraima, the state with the largest share of the Indigenous population, showed that about half of the people over age 16 were working, while the large majority (86 percent) of this working group were not engaged in the formal market (UNHCR & FHF, 2021).

The Labor Market Reverses the Gender Gap in Human Capital

Utilized Human Capital Index at National Level, 2017

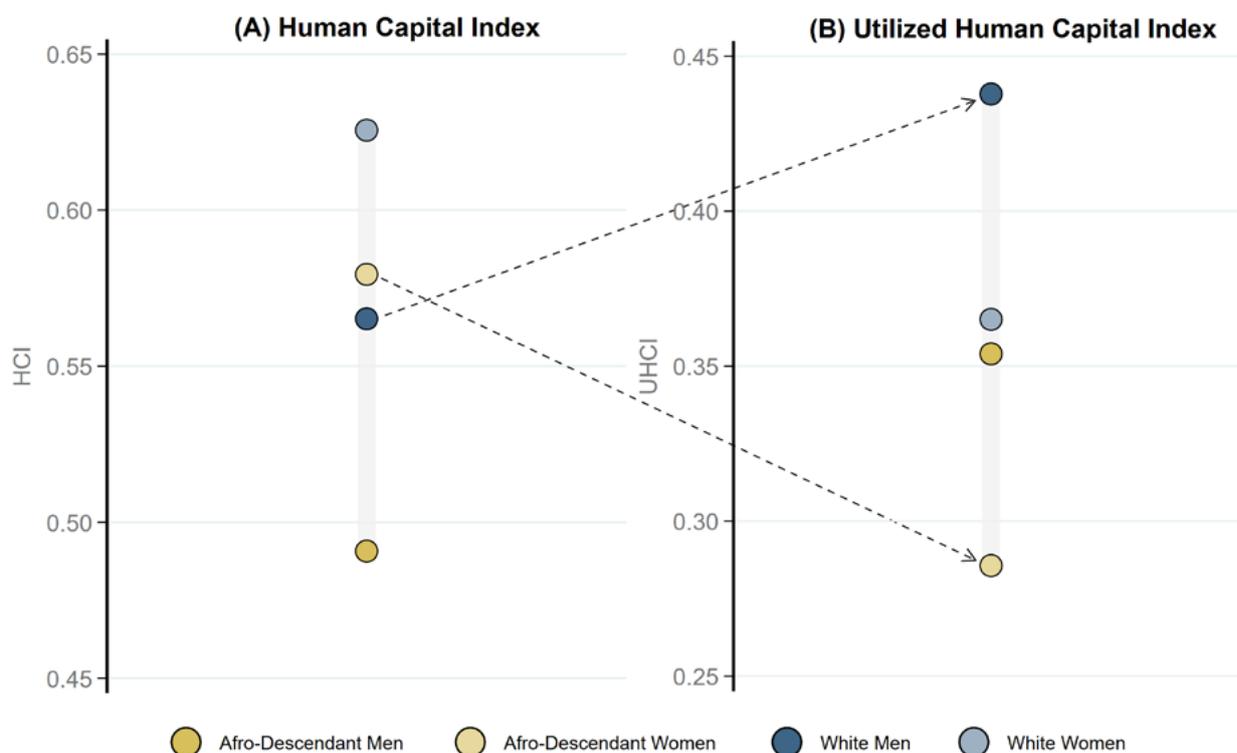


Figure 5.11

The Labor Market Reverses the Gender Gap in Human Capital

relative to Afro-descendant men. With regard to race, the gap in the HCI of white and Afro-descendant women increased by 3.3 points, from 4.6 HCI points to 7.9 UHCI points.

The positions of white men and women invert after factoring for utilized HCI. Figure 5.11 shows a clear movement. While the difference computed in the HCI between white and Afro-descendant men reaches 8 points, the gap in the UHCI is practically stable (8.4 points), which represents a small and relatively insignificant increase of 0.4 points. However, another scenario emerges when calculating the difference between white men and women. The HCI estimates show an average gap of 6 points meaning that women perform better accumulating human capital. However, the UHCI reveals a gap of 7.3 points in favor of men. The consequence of a positive movement shown in UHCI results among white men and a negative movement among Afro-descendant women is that white men end up with an expected productivity that is 50 percent higher than Afro-descendant women.

Gender and race gaps in the utilized human capital index tend to diminish at higher levels of education. Figure 5.12 reinforces one previously made argument and makes evident two persistent gaps. It first corroborates the argument that education might reduce gender and race disparities in the formation of human capital. As an example, the gap between white men and Afro-descendant women reduces from 49.5 percent among those with less than secondary education to 25.2 percent among those who have more than a high school education. Despite this decrease, two inequalities persist: (i) the utilized human capital of men is higher than women for both races and all levels of education; and (ii) the white population performs better compared to all counterparts. In the face of these disparities, this section finishes with the box 5.5, which discusses domestic work, which is predominantly relegated to Afro-descendant women.

The Gender and Race Inequalities in the Employment Rate per School Level

Employment Rate Among 18-64 Years Olds by Race, Gender and School Level, 2017

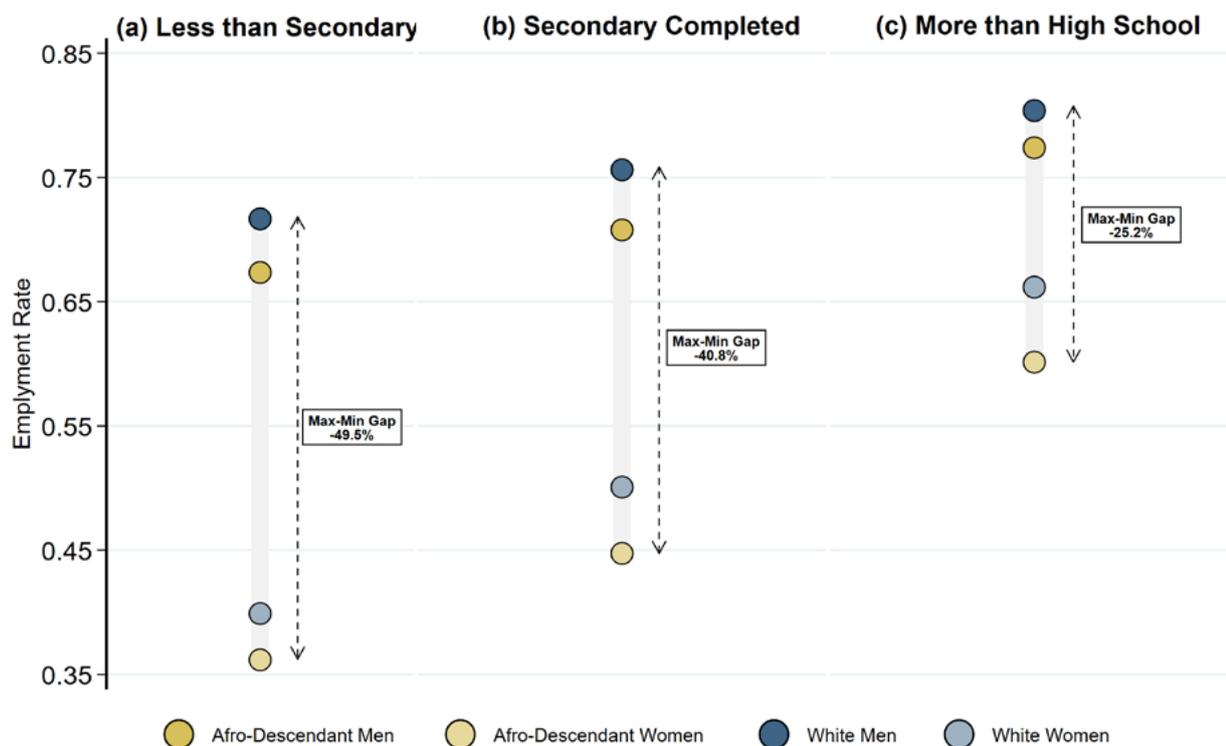


Figure 5.12

The Gender and Race Inequalities in the Employment Rate per School Level

Box 5.5 Race, Gender, and Domestic Work

Paid domestic work has, throughout Brazil's history, proven to be a gendered and racialized form of labor characterized by an overrepresentation of Afro-descendant women. In 2018, there were 6.2 million people performing domestic work in Brazil, working as housekeepers, nannies, caregivers, and gardeners; 92 percent were women and 68 percent were Afro-descendant women. Despite the fact that the number of domestic workers has been decreasing since 1995, Black women still represent the largest share of this sector's workforce in comparison to other race-gender groups (Agência Brasil, 2019).

The literature on this topic often regards domestic work as a form of labor tied to Brazil's colonial history and its racial division of labor. During the colonial periods, Afro-descendant women were often forced to work as house slaves, and the emergence of the republic did not bring new opportunities for formerly enslaved people. Thus, there was no attempt to subvert the places that had been assigned to Afro-Brazilians in society. On the contrary, the conditions of the past remained, but took on a different shape, as seen in the modern domestic service industry.

Domestic work often is categorized as an informal economic activity. In 1995, only two out of ten domestic workers were registered, while in 2018, this number reached 28.6 percent (Pinheiro et al., 2019). Not being registered means that domestic workers do not enjoy the

Box 5.5 (Continued)

same working conditions as formally employed workers, leaving them unprotected. This sector is, in fact, the only professional category excluded from the Labor Code (Law 150/2015, Article 1) (Acciari, 2019), and until 2015, there was no legislation to protect the rights of domestic workers. With Complementary Law 150, approved in 2015, domestic workers were finally afforded rights such as having a formal contract, a minimum wage, and maximum working hours. Despite the adoption of this regulation, most domestic workers continue to work informally, and Afro-descendant women continue to represent the majority of workers in the industry.

Talent at Work

The labor market absorbs around two-thirds of Brazils' human capital. After adjusting for employment rates, Brazil achieves 38.7 percent of its full potential productivity. This chapter is built upon the notion that future productivity depends not only on the conditions of human capital formation but also on its utilization in the labor market. In that sense, it proposes the analysis of the utilized human capital index.

Employment rates are inherently linked to the HCI. In comparison to other regions, the Northeast is heavily hit by low utilization rates. *The labor market deepens the divide of the "many Brazils"*. The utilization rates accentuate not only the geographic inequalities but also the race inequalities. Afro-descendants have an HCI 10.9 percent and a UHCI 19.4 percent lower than white people.

Regarding gender, the story of human capital reverses. Women accumulate more human capital than men, but they are not equally recognized in the labor market, which is why there is such a disparity in the observed HCI and the utilized HCI. The seven-point advantage in the HCI became an eight-point disadvantage in UHCI due to the employment rates.

When closely examining the UHCI in relation to race and gender and comparing it with the HCI, there is a clear shift. White men, who were previously behind Afro-descendant women, move to the top of the ordering, while Afro-descendant women are largely penalized and left behind. Afro-descendant women still face a harsher reality when trying to capitalize on their productivity: they achieve only 28.6 percent of their potential when utilizing their human capital, which is a consequence of the segregation and marginalization that Afro-descendant women have faced throughout history.

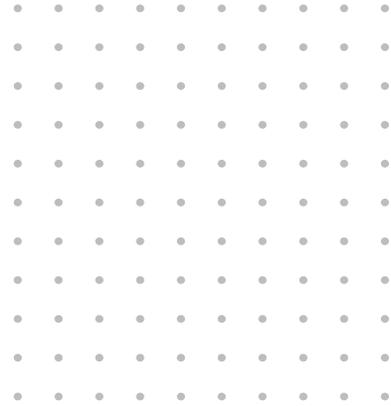
Overall, the effects of the labor market are greater for women and Afro-descendants. These groups are not only harmed in terms of employment rates but also in terms of wages and working conditions.

This chapter describes the utilization of human capital before the COVID-19 pandemic. Assuming that the COVID-19 pandemic had more severe impacts on vulnerable and marginalized groups, it is likely that an even wider geographic, gender, and race gap in human capital formation and utilization will emerge. Chapter 6 will look at the consequences of the COVID-19 pandemic on human capital in Brazil in further detail.

Chapter 6

Human Capital Accumulation Amidst the COVID-19 Pandemic

The Lost Decade



Main Messages

- ❖ COVID-19 inflicted a setback in Brazilian HCI to pre-2009 levels. Estimates show a drop from 0.601 in 2019 to 0.540 in 2021 (realistic scenario).
- ❖ The effects of the COVID-19 pandemic are being felt by people of all ages, particularly young children.
- ❖ Half of the HCI loss is driven by reductions in expected years of school.
- ❖ Thirty percent of the HCI loss comes from decreases in adult survival rates.
- ❖ There are many pandemics inside this pandemic. There were greater impacts on the HCI and UHCI of Afro-descendants and women, for example.
- ❖ If the HCI growth rate from 2007 to 2019 is maintained, Brazil would need between 10 and 13 years to recover the pre-pandemic levels of human capital.

The Brazilian Human Capital Review has thus far told a story about talent accumulation in Brazil during the decade before the COVID-19 pandemic. It discussed its multiple facets – *many Brazils and many inequalities* –, its progress – *better but unequal* –, and its use – *talent at work*. Now, the COVID-19 pandemic interrupts this narrative. The question becomes: what is the legacy of COVID-19 on human capital accumulation in Brazil? *How much is the pandemic changing the course?* This chapter provides the answer to this question in three interconnected parts. The first part, *The Interrupted Story*, presents the idea that recent HCI gains have indeed been compromised. The second part, *The Lost Decade*, simulates COVID-19 impacts on the HCI to measure the degree to which these gains have been compromised. The third and last part, *Many Pandemics*, demonstrates the consequences of the pandemic, which vary across different groups of people.

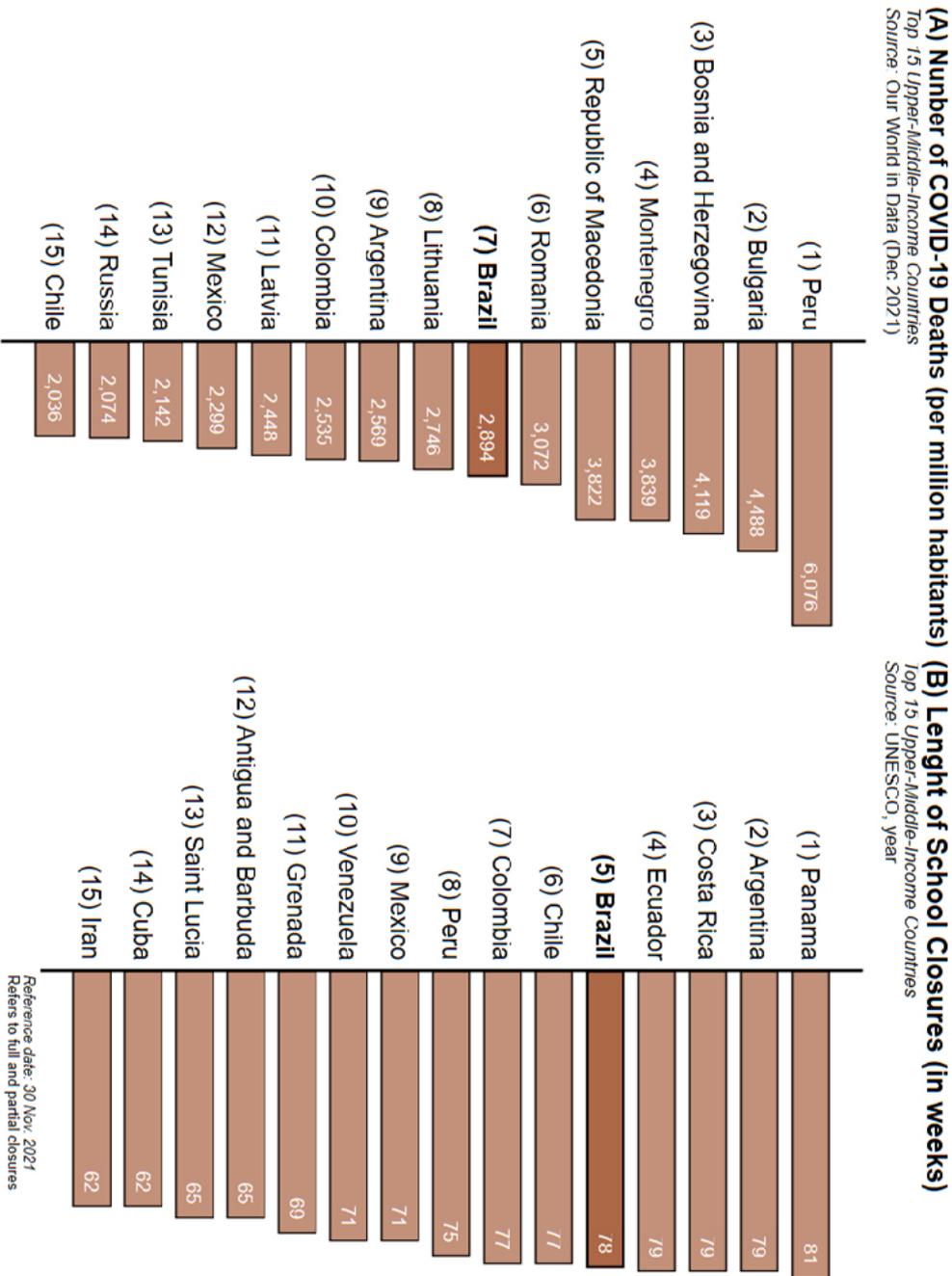


Figure 6.1
 Rankings of Upper-Middle-Income Countries by Number of COVID-19 Deaths and by Length of School Closures

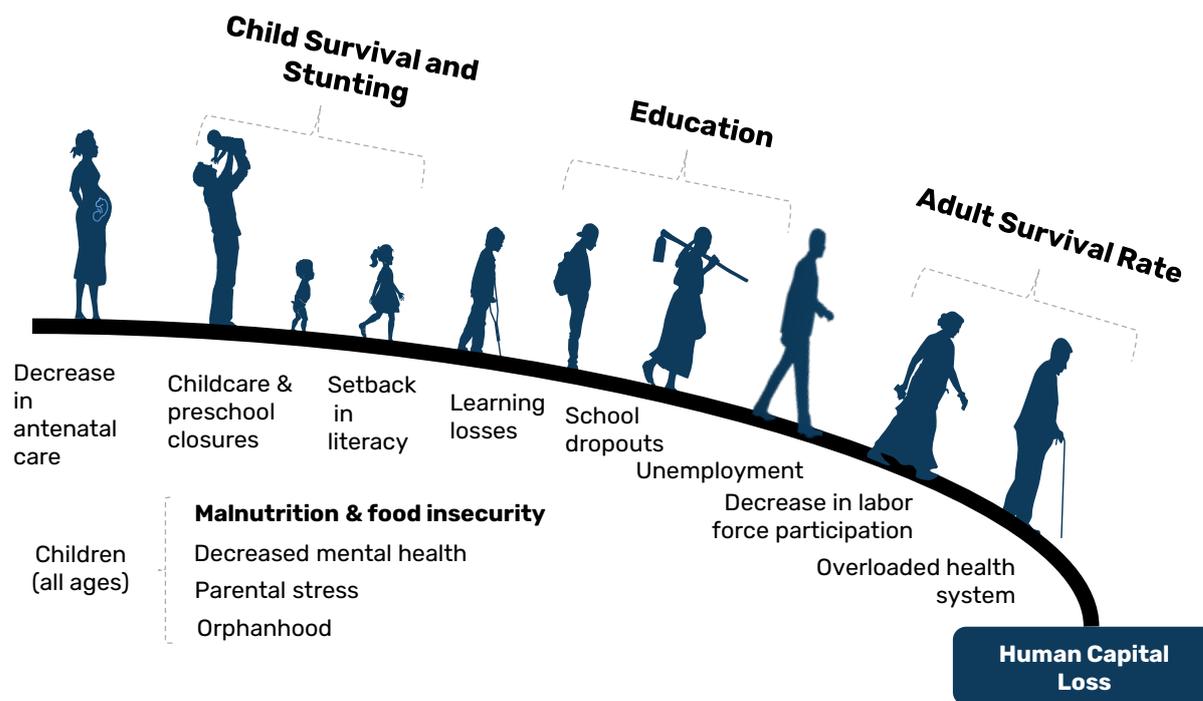


Figure 6.2
COVID-19 Pandemic Impacts across Life Cycle

The pandemic is leaving a profound mark on the landscape of human capital accumulation in Brazil.

The first case of COVID-19 in Brazil was registered on February 26, 2020. The virus spreaded rapidly: by the end of May 2022, there were around 665,000 deaths in Brazil. In terms of deaths per capita, Brazil ranks 7th place among upper-middle-income countries and 14th place, globally (see figure 6.1). Brazil also has the second most deaths per capita among Latin American countries (only after Peru).

The pandemic is leaving a profound mark on the landscape of human capital accumulation in Brazil.

The pandemic also affected education directly. Many schools closed as a result of the escalation of COVID-19 cases in Brazil. What was initially planned to be few weeks of distance learning became one of the longest school closures in the world (figure 6.1). While schools in countries such as France and Spain were closed for fewer than 15 weeks, in Brazil school closures were over five times longer, lasting 78 weeks, on average. Three interlinked impacts: on health, education and also on labor market. Figure 6.2 illustrates how COVID-19 might impacted at all life stages of human capital formation.

— The Interrupted Story

The pandemic's legacy in Brazil starts by interrupting the story of human capital accumulation observed over the last 12 years. This can be seen for each HCI subcomponent separately. This section analyzes how the pandemic may have impacted each component of HCI and simulates the size of these impacts. Simulations were made using specific methods for three different scenarios: pessimistic, realistic, and optimistic (see boxes 6.1, 6.2, 6.3, 6.4, and 6.6). The conclusions of the simulations converge: *Every stage in lifecycle has been affected by COVID-19.*



Children Under Five

Mapping the effects of the COVID-19 pandemic starts before birth. Evidence shows drastic reductions in the number of prenatal visits in Brazil since the onset of the pandemic. In May 2020, just over two months after the first recorded case of COVID in Brazil, there was already a drop of at least 65 percent (Chisini et al., 2021). This seems to be a recurrent finding during pandemics. In Sierra Leone, for example, antenatal care coverage decreased by 22 percentage points during the 2013–2016 Ebola epidemic (Sochas et al., 2017). Proper prenatal care, however, is indispensable for human capital accumulation. Studies show that few prenatal visits correlate with low birth weight, prematurity, stillbirths, and neonatal and infant deaths, all of which have an effect on future generations of workers (Gortmaker, 1979; Partridge et al., 2012). *From birth, one step behind.*

Being well-nourished in the first years of life is just as critical for human development.

Estimates indicate that an additional 2.6 million children under five will experience stunting in low- and middle-income countries in 2022 (Osendarp et al., 2021). *Children facing acute malnutrition.* This rise in stunting rates can be in part explained by the negative shock on household income as a result of the COVID pandemic: 43 percent of Brazilians from low-income households reported not having food, and no money to buy food (UNICEF, 2020). *No food on the plate.*



A total of 116.8 million Brazilians (55.2 percent) faced some degree of food insecurity during the COVID-19 pandemic (PENSSAN, 2021). Although food insecurity affects people of all ages, children under five experience it most intensely (Campbell et al., 2009).

Around 55 percent of Brazilians faced some degree of food insecurity during the pandemic.

Interrupted Gains in Child Survival Rates

Child Survival Rates by Region from 2007 to 2021

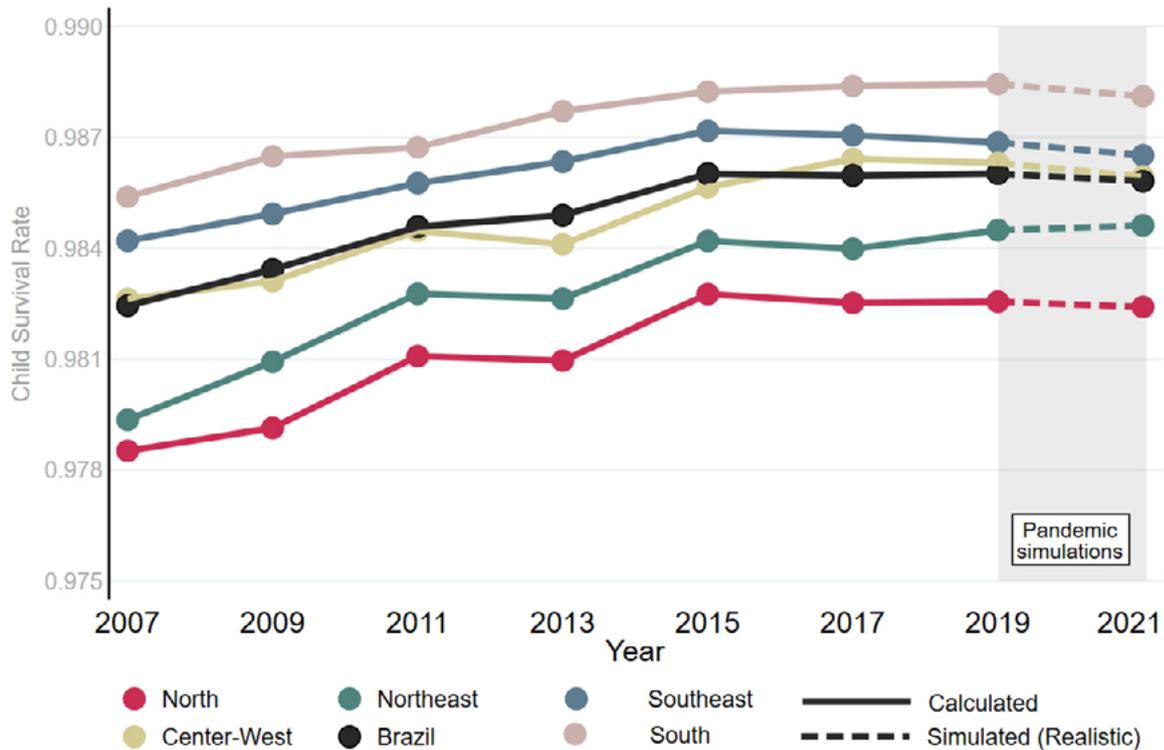


Figure 6.3
Interrupted Gains in Child Survival Rates

The pandemic may also affect under-five mortality through the reduction in access to healthcare. According to estimations, there will be an increase of 1,157,000⁶¹ under-five deaths in lower-middle-income countries as a result of the pandemic.

Lack of adequate prenatal care, food insecurity, and reductions in access to healthcare are some ways in which the pandemic may interrupt the recent increases in the probability of a child surviving to age five (also known as the child survival rate). Figure 6.3 depicts the measured child survival rates as well as the simulated impact of COVID-19 on child survival rates. The simulations (see box 6.1 for methodology) indicate that child survival rates in all regions have either decreased or remained virtually the same between 2019 to 2021.

There are some additional findings from these simulations that are important to highlight. For example, in the Southeast, a region where child survival rates are typically higher than other parts of the country, an additional 3.5 out of 10,000 children did not survive until age five in 2021 compared to 2019. Also, the Northeast, which experienced a sustained improvement in child survival rates between 2007 and 2019 stopped increasing. *Consistent improvements have been interrupted.* Rather than reflecting deaths caused by COVID-19, these decreases in child survival rates also reflect reductions in access to healthcare and the overloading of the health system.



COVID-19 also hindered improvements in not-stunting rates. The not-stunting rates since 2007 show the existence of *two different realities in Brazil*: one, which exists in the South, Southeast, and Center-West where not-stunting rates are high, and another reality, which exists in the North and Northeast regions where rates are eight percentage points lower.

In Brazil, 80,000 children under age five became stunted as a result of the pandemic.

The interrupted story is also observed for non-stunting. Figure 6.4 shows the COVID-19 impacts on stunting by region in Brazil. The simulations suggest that almost 60 out of 10,000 children became stunted because of the pandemic (see box 6.2). This translates into 80,000 additional children under age

five stunted.⁶² One limitation of these simulations to take into consideration is that the relative effects of not stunting are not necessarily the same for all regions.

Box 6.1 Simulations for Child Survival Rates

Child survival rates were simulated using the following three steps:

Step 1: Calculating the death rates for children aged 0 to 1 and children aged 1 to 4 by:

(a) **Projecting the number of deaths for 2021 in a scenario without COVID-19 for each age group.** This projection uses historical mortality rates data from the Sistema de Informação sobre Mortalidade (Mortality Information System, SIM) from the Ministry of Health (see Appendix IV).

(b) **Simulating the number of deaths due to COVID-19 for each age group.** Two types of COVID-related deaths were taken into account:

⁶¹ The number reflects the simulation results of the severe scenario with a pandemic lasting over six months. (Osendarp et al., 2021).

⁶² IBGE estimates that the 0-4 population in Brazil was 13,684,541 in 2021. Using the increase in stunting rate (0.59%) as the reference scenario in the simulations results in additional 80,739 children stunted.

Box 6.1 (continued)

a. Those caused directly by the virus. Data from the Vigilância de Síndrome Respiratória Aguda Grave (Severe Acute Respiratory Syndrome Surveillance, SRAG) from the Ministry of Health was used for these simulations.

b. Those caused indirectly by other complications in the health system. A proxy of indirect deaths rate was calculated based on estimations of excess mortality from the Institute for Health Metrics and Evaluation (IHME) (see Appendix IV).

(c) **Calculating “natural” COVID-related deaths.** Among people who died from COVID-19 in 2021, some would have died from similar, but other natural causes. For this reason, it was necessary to discount deaths that would have occurred naturally in the same year (see Appendix IV).

The age groups are divided according to data availability. In sum, the number of deaths in each age group is given by:

$$\begin{aligned} &\text{Number of deaths in 2021 in a scenario without COVID-19 (a)} \\ &+ \\ &\text{Number of deaths due to COVID-19 (direct and indirect) (b)} \\ &- \\ &\text{Number of natural COVID-19-related deaths (c)} \end{aligned}$$

Step 2: Mortality rates are calculated for each age group and then divided by the number of deaths calculated in step 1.

Step 3: Child survival rates are calculated using the same formula described in chapter 1, Box 1.1.

Scenarios: Three scenarios were constructed: pessimistic, realistic, and optimistic. All three use estimates of excess mortality rate from IHME. For the pessimistic scenario, the lower bound was used; for the realistic scenario, the mean estimate was used; and for the optimistic, the upper bound estimate was used.



The effects of the COVID-19 pandemic tend to be particularly severe for young children.

In terms of health, the pandemic directly changed daily routines critical to development. For example, a study in preschools of Rio de Janeiro found a decrease in children’s capacity to sit and stand without help. This was explained by weight gain caused by changes in their everyday routine during the pandemic. Mobility restrictions and preschool closures meant increased screen time and fewer physical activities. *When lack of activity impairs develop.*

In terms of education, the pandemic had unequal impacts in mathematics and Portuguese among very young children. In mathematics, five-year-old children in wealthier schools met 75 percent of non-pandemic learning expectations according to the curriculum, while only 48 percent students in lower-socioeconomic schools met the same standard (Fundação Maria Cecília Souto Vidigal, 2021). *A stronger pandemic for the most vulnerable.*

Although the HCI does not take into account the education of children under age five, it is sure to have long-term impacts on learning in later years.

Interrupted Gains in Non-Stunting Rates

Not-Stunting Rates by Region from 2007 to 2021

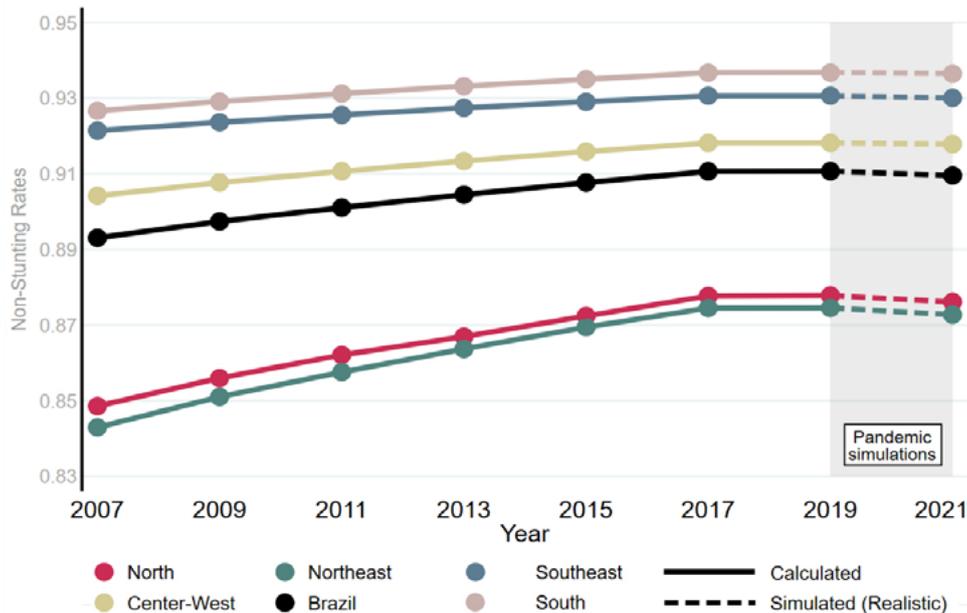


Figure 6.4
Interrupted Gains in Non-Stunting Rates

Box 6.2 Simulations for Not-Stunting Rates

The simulation for not-stunting rates uses national estimates from the 2020 Goalkeepers Report (Bill & Melinda Gates Foundation) for Brazil in which three scenarios were established:

- (a) **Worst scenario**, in which stunting would increase by 2.44 percent in comparison to the scenario without COVID-19.
- (b) **Reference scenario**, in which stunting would increase by 0.59 percent in comparison to the scenario without COVID-19.
- (c) **Best scenario**, in which stunting would decrease by 1.20 percent in comparison to the scenario without COVID-19.

In these projections, researchers used the socio-demographic index (SDI), which considers income, fertility, and education as key drivers of stunting. The “best” and “worst” scenarios were calculated using the 85th and 15th percentile in the SDI distribution and past rates of progress.

To simulate the not-stunting component in HCI, the scenario without COVID-19 used 2017 rates, as research indicates little to no variation in stunting rates between 2014 and 2020 in Brazil (United Nations Children’s Fund et al., 2021).

Scenarios: Three scenarios were constructed: pessimistic, realistic, and optimistic. The pessimistic uses the ‘worst’ estimates from the *Goalkeepers Report*, the realistic uses the ‘reference’ estimates, and the optimistic uses the ‘best’ scenario.

School-Age Children

Harmonized Learning Outcomes

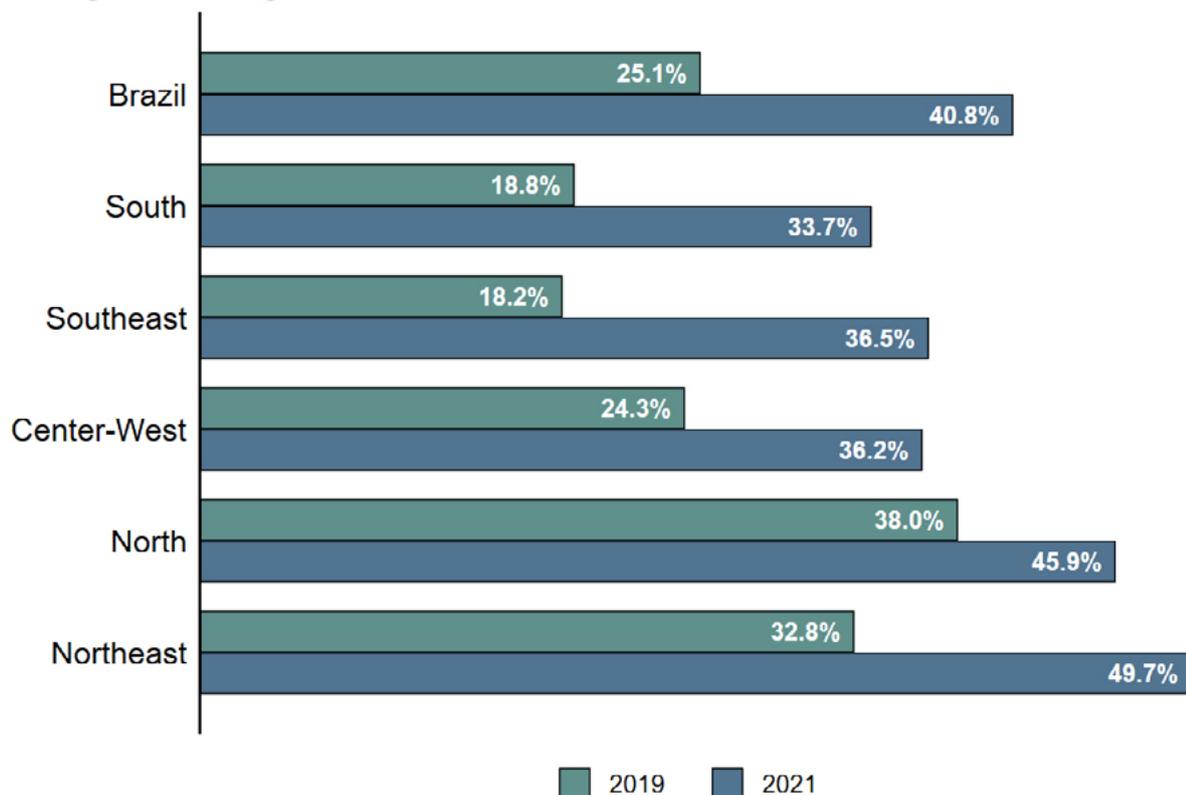


One of the most striking impacts of COVID-19 was on literacy skills. Recent data shows that the proportion of children that cannot read or write increased from 25.1 percent in 2019 to 40.8 percent in 2021, generating an additional 1 million children without literacy skills (figure 6.5). *Unable to read and write.* The relative increase was much higher in South Brazil, where the illiteracy rates increased by almost 80 percent. However, in absolute terms, illiteracy rates in the North and Northeast remain the most critical. This outcome is relatively unsurprising given that school closures lasted for almost 20 months in Brazil on average, and were even longer in the North and Northeast (see figure 6.8).

The pandemic generated an additional one million children without literacy skills.

Unable to Read and Write

Percentage of Children Aged 6 to 7 Who Cannot Read and Write



Source: PNAD-C (3rd Quarter)

Figure 6.5
Unable to Read and Write

The pandemic worsened the learning problem: in 2021, almost half of six- to seven-year-olds could not read or write in the North and Northeast. A test conducted with second graders confirmed this setback: the share of students who could not read at least ten words in a one-minute interval grew from 52 percent in 2019 to 73 percent in 2021 (Fundação Lemann, 2021).

Standardized test results of fifth and ninth graders in the state of São Paulo provide the clearest evidence regarding the extent of learning losses. In the beginning of 2021, the state of

São Paulo issued a standardized learning assessment to map the impacts of the pandemic. *Learning was gravely affected at all levels* (figure 6.6). Fifth grade student's scores in mathematics were the same as those from 14 years ago, and in Portuguese, their scores were the same as those from 10 years ago. For ninth grade students, the setback was smaller but still sizable. Scores were the same as those from 8 years ago in mathematics and 6 years ago in Portuguese. Altogether, two conclusions can be drawn. The first is that younger students may have been more affected by the pandemic. The second is that losses were higher in mathematics than in Portuguese, as was seen in other parts of the world including in Uganda and in Mexico (World Bank et al., 2021).

A variety of factors can be listed as causes of the learning losses in São Paulo: remote learning, health loss, socioemotional factors, household income shocks, teacher training, among others. *A long list of potential channels.* A study in São Paulo estimated the impacts of remote classes on learning during the pandemic using a causal framework and concluded that an average student attending school remotely only learned 27.5 percent of the in-person content over the same timeframe. *Computing devices were not substitutes for the school environment.* Learning loss under remote schooling conditions was also shown to be 60 percent or higher amongst sixth to twelfth graders in the state of São Paulo (Lichand et al., 2021). Because this data is from the state of São Paulo where students tend to have better access to internet and computing devices, and enjoy better school structure on average, the effectiveness of remote learning can be assumed to be even lower in the rest of Brazil. *The reality of students is quite different across the many Brazils.*

The Size of Learning Losses in São Paulo

State Learning Assessment (SARESP), Secretary of Education of São Paulo Estimates

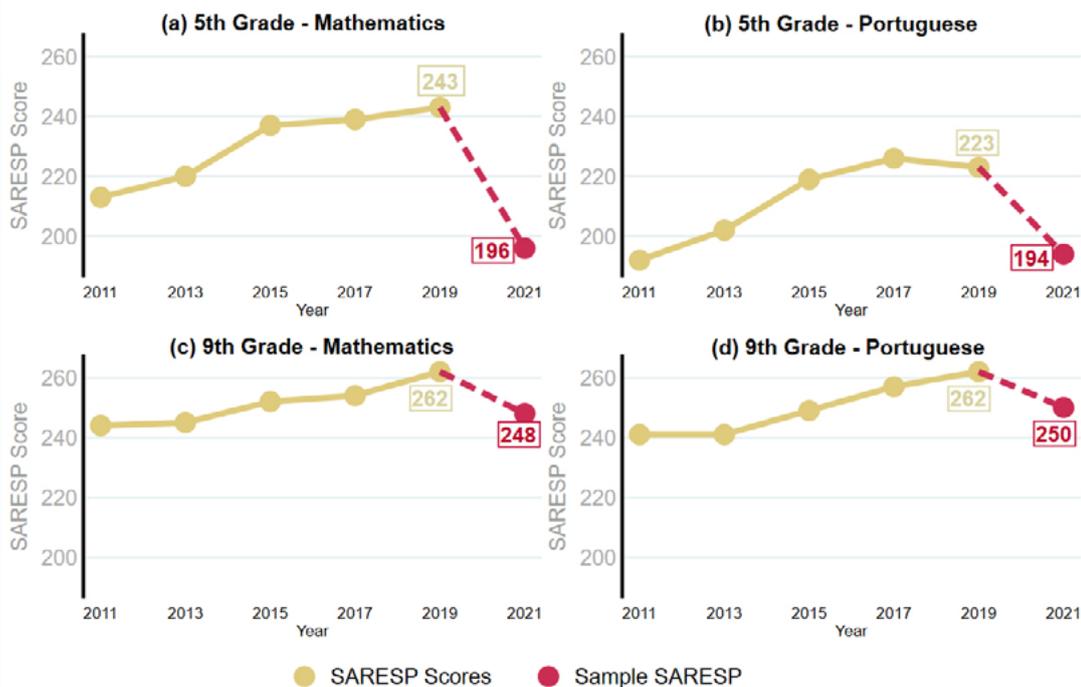


Figure 6.6
The Size of Learning Losses in São Paulo

Figure 6.7 demonstrates the difference across the many Brazils by showing the percentage of students in each state that went to school remotely for less than four days a week during school closures. While one-fifth of São Paulo students fit in this category, the proportion of students in Espírito Santo, Roraima, Alagoas, and Amazonas reached one-third, which is more than 10 percentage points higher. Acre is a clear outlier, where more than 52.8 percent of students spent less than four days a week studying remotely. *Out of school, studying less.* Eight out of 10 states with the highest percentages of students studying less than four days a week are located in the North and Northeast Brazil where these percentages are generally the highest.

Regional disparities in remote learning were also reflected in the length of school closures. While the state of São Paulo closed public schools for 262 days on average, Bahia and Roraima kept schools closed for roughly 100 days longer (365 and 355 days, respectively). Amazonas, 258 days. Figure 6.8 also shows that South and Southeast regions suspended school activities for fewer days on average compared to the rest of the country. *The pandemic may enlarge already existing learning inequalities.*

Poorer regions kept schools closed longer.

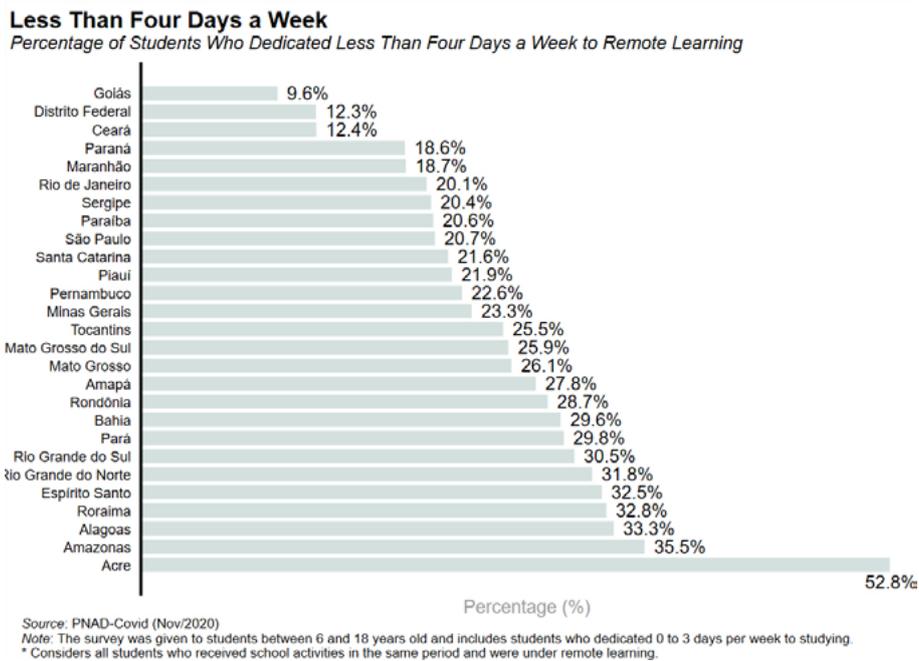


Figure 6.7
 Less Than Four Days a Week

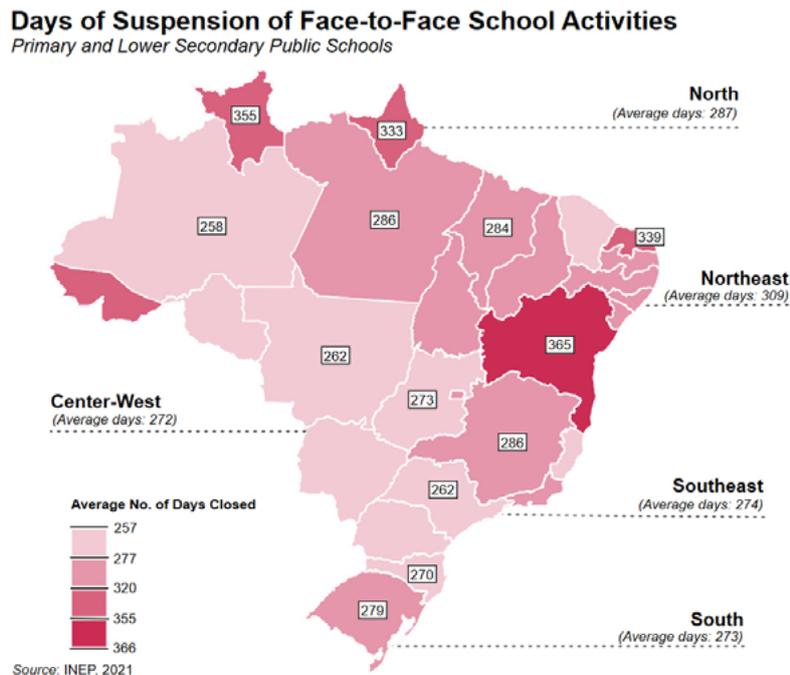


Figure 6.8
 Days of Suspension of Face-to-Face School Activities

The interrupted story also applies to harmonized learning outcomes. Between 2007 and 2019, the national HLO increased from 0.60 to 0.65 on average, however, a major part of this improvement has been lost because of COVID-19. In 2021, the Center-West and Northeast regions lost more than 75 percent of the gains in HLO from 2017 to 2019 (figure 6.9). *A learning crisis inside this crisis.* This decline encompasses two types of learning losses: one from not being in a classroom, otherwise known as opportunity cost and a second loss from deterioration, or the loss of previous knowledge (Angrist et al., 2021). Many studies find that a long period without classes not only prevents students from gaining new knowledge, but also incurs loss of previous knowledge (Atteberry & McEachin, 2021).

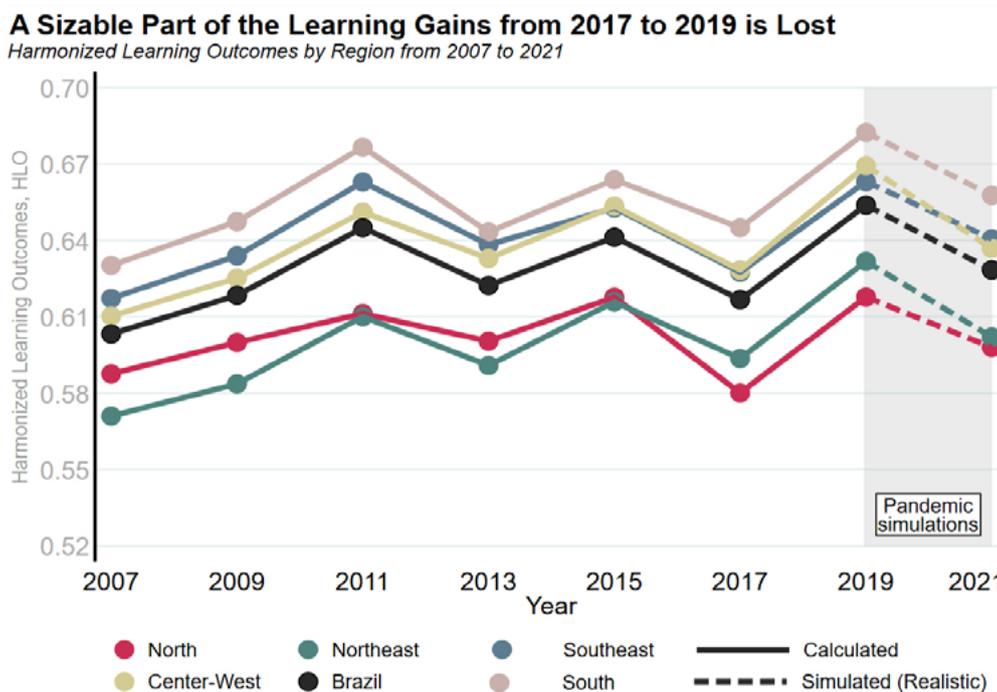


Figure 6.9
A Sizable Part of the Learning Gains from 2017 to 2019 Is Lost

Expected Years of School



One of the primary concerns after schools reopen is whether students, especially the most vulnerable, actually return to school. Pressure to enter in the job market, household responsibilities, changes in family structure, low engagement in remote learning, and mental health issues have been discussed as potential drivers (UNICEF & Cenpec Educação, 2021). In terms of mental health, school dropouts may have increased as a result of the loneliness and isolation experienced during the pandemic, which in turn generated anxiety and depression among students (Loades et al., 2020). Deteriorated mental health is commonly associated with a higher probability of school dropout (Quiroga et al., 2013).

Box 6.3 **Simulations for Harmonized Learning Outcomes**

The harmonized learning outcomes for 2021 were calculated using estimations for mathematics and Portuguese SAEB scores. To estimate this score, a learning loss rate was applied to the 2019 SAEB score.

This learning loss rate was defined in two ways:

Box 6.3 (continued)

- i. Where the learning loss rates of ninth graders in the state of São Paulo were used as a baseline: -5.34% in mathematics and -4.58% in Portuguese. Learning loss rates varied in a linear fashion, according to the number of days schools were closed during the pandemic. States that had longer school closures had higher learning loss rates that were proportional to the number of extra days closed. Each day out of school corresponds to the same amount of learning loss (constant marginal losses).
- ii. The learning loss rate for the state of São Paulo was used as a baseline.

Scenarios: Three scenarios were constructed: optimistic, realistic, and pessimistic.

- The optimistic scenario uses learning loss rate (i). The number of days closed is the first quartile of public school closure distribution for Grades 1-9.
- The realistic scenario uses learning loss rate (i). The number of days closed is equal to the average number of days of public school closure for Grades 1-9.
- The pessimistic scenario uses learning loss rate (ii). The number of days closed is the average number of days of public school closure for Grades 1-9.

Long school closures discourage students from returning to school.

Long school closures discourage students from returning to school. Increases in school dropout rates seem to be correlated with school closures as has been observed in other public health emergencies.

After the Ebola pandemic in Sierra Leone, for example, enrollment rates declined by 17 percentage points for girls (Bandiera et al., 2020). The problem of school dropout lies in its subsequent consequences as it is associated with a lower job market prospect, lower wages, and a higher incidence of crime (Adelman & Szekely, 2016; Cook & Kang, 2016). Evidence suggests that the risk of school dropout increased by 365 percent during the COVID-19 pandemic in the state of São Paulo (Lichand et al., 2021). In more vulnerable areas, school dropout is likely to be higher.

Box 6.4 Simulations for Expected Years of School

The quantity of education (EYS) correlates with the quality of education (HLO). This relationship can be seen in the figure on the right.

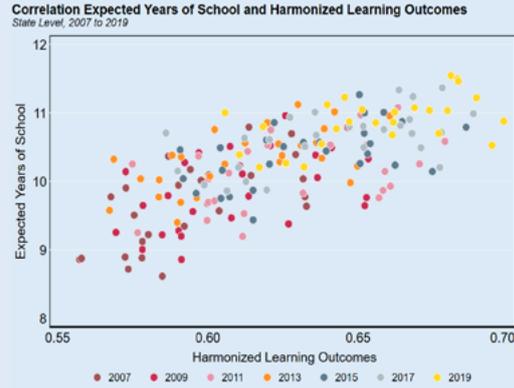
The EYS was estimated based on the HLO simulations, using a regression framework approach, as follows:

$$EYS = \alpha_s + \beta_{s,t}HLO + t + \varepsilon_{s,t}$$

Where s is the state and t is the dummy for time (2007-2019). The estimated EYS for each state is given by:

$$\widehat{EYS}_{s,2021}$$

Box 6.4 (continued)



The regression results are in Appendix IV.

Scenarios: Three scenarios were constructed.

Figure B.6.1 Correlation EYS and HLO

- The optimistic scenario uses the optimistic estimations from the HLO simulations (see Box 6.3).
- The realistic scenario uses the realistic estimations from the HLO simulations (see Box 6.3).
- The pessimistic scenario uses the pessimistic estimations from the HLO simulations (see Box 6.3).

One Year Lost

Expected Years of School by Region from 2007 to 2021

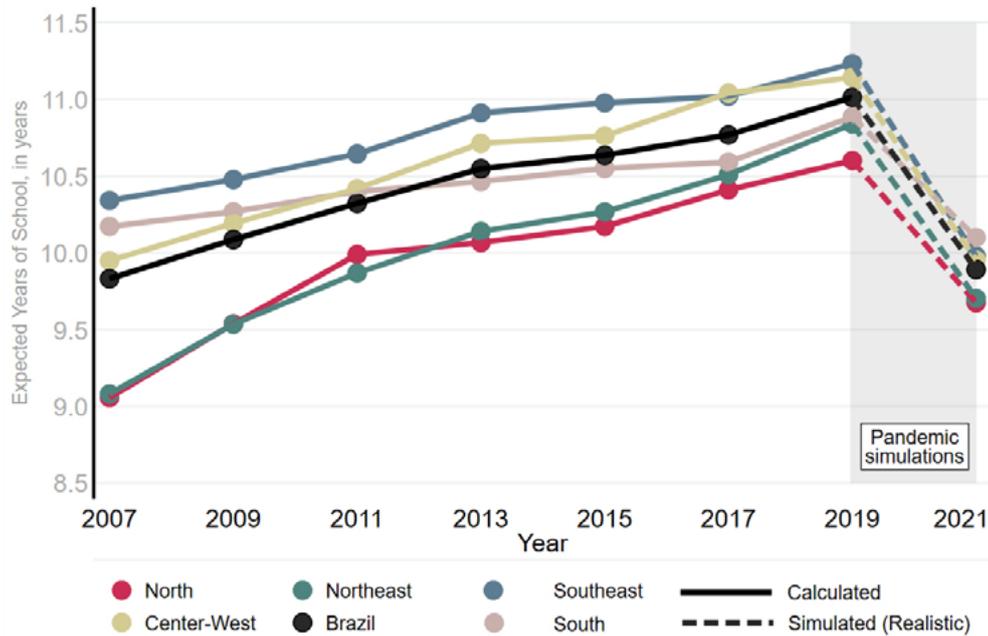


Figure 6.10
One Year Lost

The simulations of the impact of COVID-19 on expected years of school rely on simulations of HLO. This is because, no data for school dropout and repetition rates for 2021 was available when this report was written.

The simulations show that the Northeast, Center-West, and South have lost more

than one EYS.

than one year in the expected years of school (figure 6.10). While the Northeast had, on average, 10.8 EYS in 2019, in the realistic scenario simulation for 2021, the EYS decreased to 9.7. It is worth noting that EYS decreases in the Center-West, South, and Southeast were even greater and have returned to pre-2007 levels. *The pandemic has caused a 12-year setback in EYS.* The EYS in the North and Northeast where improvements were extensive have returned to 2009 and 2011 levels, respectively.

Box 6.5

The Impact of the Pandemic on Human Capital Accumulation

Prof. Imran Rasul

University College London and Institute of Fiscal Studies

Human capital is accumulated across many ages, and all stages of life have been impacted by the ongoing COVID-19 pandemic. Disruptions to family life, the schooling system, and labor markets will all have all influenced the ability of individuals to accumulate human capital over the life course. In each case, temporary disruptions caused by the pandemic have the possibility of manifesting into permanent impacts. It is vital that the right policy lessons are learned and responses put into place.

The foundations of human development start in early life. Disruptions to family and working lives has meant that many households have suffered large and sustained income losses. Such losses are likely to translate into worse economic conditions for children, stunting their physical growth and holding back cognitive development at preschool age (Josephson et al., 2021; Osendarp et al., 2021; Scientific Committee of the Núcleo Ciência Pela Infância, 2020). Absent intervention, these children will be less school ready in the near future.

For those children in the formal schooling system, pandemic-related human capital losses can be severe. Learning losses have now been well documented among rich and poor countries (Blundell et al., 2020; Azevedo et al., 2021). At the same time, evidence has also accumulated on the kinds of interventions that have proven effective in ameliorating such learning losses (UNESCO, 2020; Burgess, 2020).

The most severe impacts have been felt in the poorest parts of world, where school closures have meant that children received little or no instruction. In contexts where schools might offer a place where children access safety as well as learning, these short-term impacts can easily have gendered impacts and translate into long-term differentials.

School Closures around the world
Weeks fully closed until 31 July 2021

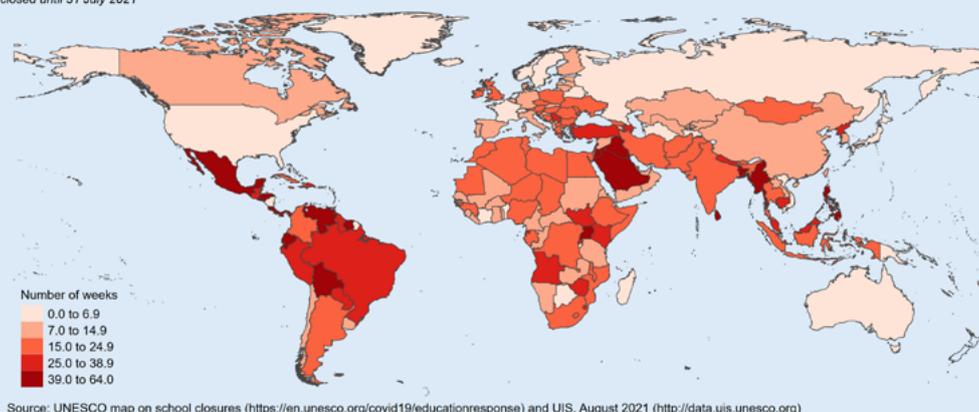


Figure B.6.2 School Closures around the World

Box 6.5 (continued)

School closures are a common short-term policy response to viral epidemics. Bandiera et al. (2020) study the persistent post-epidemic impacts of school closures on the economic lives of young women in Sierra Leone, a context where women frequently experience sexual violence and face multiple economic disadvantages. They do so by evaluating an intervention targeting young women that was implemented during the 2014-2015 Ebola epidemic in Sierra Leone. This intervention provided a protective space where young women could find support and receive information on health and reproductive issues. They documented the impacts of the intervention on 4,700 young girls and women between May 2014, on the eve of the Ebola crisis, and the post-epidemic period in 2016. In control villages, school closures led young girls to spend significantly more time with men, teen pregnancies rose sharply, and school enrollment among young girls dropped by 17 percentage points in the post-epidemic period, long after schools had reopened.

These adverse effects on enrollment were halved in treated villages because the intervention broke this causal chain: it enabled girls to have time away from men, reduced out-of-wedlock pregnancies by 7 percentage points, and increased re-enrollment rates post-epidemic. A long-term follow-up in 2019-2020 shows persistent positive impacts of the intervention on the human capital accumulation of young girls, the time they spend with men, and the quality of partners with whom they are matched. This analysis has important implications for school closures in response to the current COVID-19 pandemic in contexts where young women face sexual violence and highlights the protective and lasting role safe spaces can provide in such times.

The pandemic has also had impacts on those engaged in tertiary education. Among university students, the pandemic has led to student job losses, delayed graduation rates, and increased student anxiety about their future prospects (Aucejo et al. 2020, Wang & Zhao, 2020; Browning et al., 2021).

For those in the labor market, the early stages of work remain a critical opportunity to acquire human capital that has high labor market returns. The pandemic has led to job losses for many, or to experiencing temporary layoffs that make the future uncertain. The ability of young workers to rematch to the same firm (or even find a better match) is going to be critical in determining whether the short-term impacts of the pandemic translate into longer-term economic losses for these individuals (Alfonsi et al. 2020).

With the rollout of vaccine programs in many countries, at least in the most developed countries, there is the prospect that social distancing measures and lockdowns will end in 2022. Far more support is urgently needed to roll out vaccines in the poorest countries. While these measures might offer some good news, it is unlikely that circumstances in education and labor markets will quickly return to their pre-pandemic times. It is not just a year or two that has been lost during this pandemic. The right lessons need to be quickly learned, and effective policies need to be put into place.

Adulthood: Adult Survival Rate

The most obvious and direct consequence of the COVID-19 pandemic is the considerable number of deaths. In this respect, Brazil has been at the top of the list of countries with the highest mortality rates in the world. With a around 665,000 recorded deaths as of May 2022, the second highest number of deaths after the United States of America, Brazil's human capital has been seriously and significantly

affected. *High number of deaths, long school closures.* Data from 2021 shows that 129,644 deaths among 20- to 59-year-olds (as calculated in the HCI) were due to COVID-19 in Brazil, which represents one-third of all computed deaths for this age group.⁶³ Figure 6.11 shows COVID-19 deaths per age and gender.

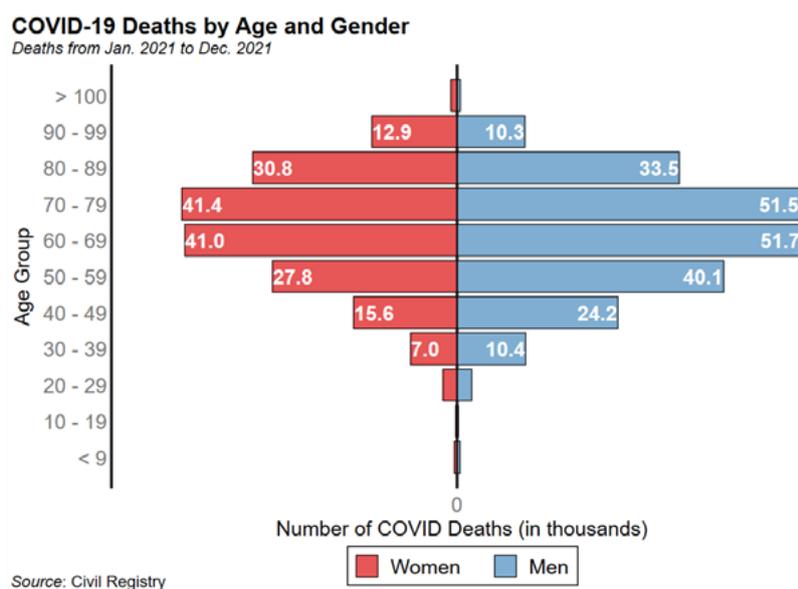


Figure 6.11
COVID-19 Deaths by Age Group and Gender

Box 6.6 Simulations for Adult Survival Rate

To calculate adult survival rate, first it is necessary to calculate the mortality rate per age group. Step 1. The first step is to simulate the number of deaths in each age groups, using the method described in Box 6.1.

In sum, the number of deaths for each age group is calculated by:

$$\begin{aligned}
 &\text{Number of deaths in 2021 in a scenario without COVID-19} \\
 &+ \\
 &\text{Number of deaths due to COVID-19 (direct and indirect)} \\
 &- \\
 &\text{Number of natural COVID-related deaths}
 \end{aligned}$$

Step 2. The second step calculates the mortality rate for each age group, dividing the number of deaths by the projected population for 2021 (IBGE).

Step 3. The third and last step calculates the adult survival rate using the same formula as in chapter 1.

Scenarios: See Box 6.1

⁶³ Because the data is only available in 10-year age groups, it is not possible to disaggregate for 15- to 59-year-olds.

⁶⁴ This is based on data from the beginning of the pandemic until February 2022, calculated by CONASS (n.d.). The number of COVID-19 deaths per 100,000 inhabitants are as follows: Center-West, 375.4; Southeast, 345.9; South, 335.9; North, 265.1; North-east, 217.9.

In general, underlying health conditions aggravate the risk of severe and fatal COVID-19 cases. Noncommunicable diseases (NCDs) including cardiovascular diseases, diabetes, and cancer are frequently listed as examples of such conditions (World Health Organization, 2020).

While direct deaths are the most evident part of this interrupted story, there are still hidden impacts that have not been accounted for. COVID-19 has also given rise to casualties indirectly through the overloading of the healthcare system, which postponed or interrupted critical health treatments. *Some people avoided hospitals because they were afraid of being infected by the virus.* Along with overburdened healthcare systems, the pandemic forced the reallocation of public resources to COVID-related treatment and preventive action, which disrupted other health services. For these reasons, the simulations of adult survival rate for 2021 account for both direct and indirect deaths.



Simulations indicate an expected large decrease in adult survival rates. The rates of all regions receded to pre-2007 levels, but the relative loss was highest in the Center-West (6.7 percent loss), the South (5.8 percent), and the Southeast (5.5 percent). This result is consistent with the fact that these states had the highest COVID-19 mortality rates.⁶⁵

An Enormous Loss in Adult Survival Rates

Losses in Adult Survival Rates by Region from 2007 to 2021

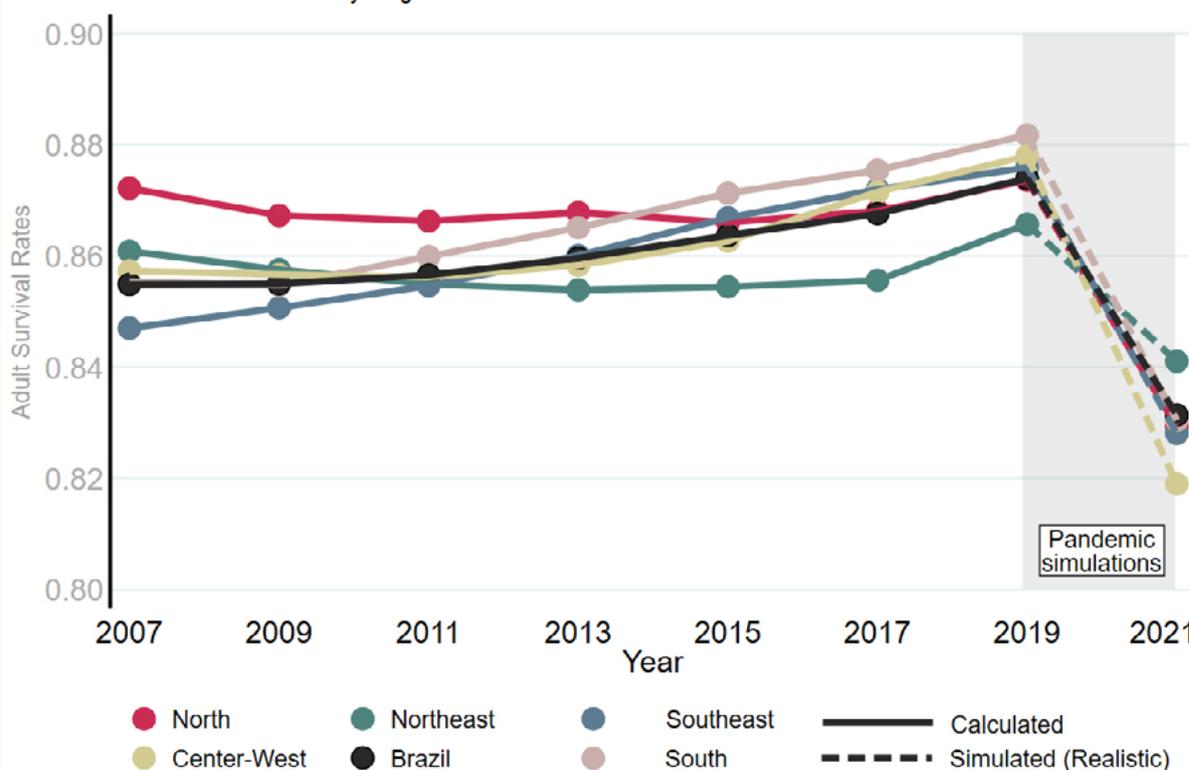


Figure 6.12
An Enormous Loss in Adult Survival Rates

The Lost Decade

The pandemic's legacy is also a story about the lost decade. A lost decade of improvement in human capital. While the last section showed significant losses in each HCI component, particularly in education

⁶⁵ This is based on data from the beginning of the pandemic until February 2022, calculated by CONASS (n.d.). The number of COVID-19 deaths per 100,000 inhabitants are as follows: Center-West, 375.4; Southeast, 345.9; South, 335.9; North, 265.1; Northeast, 217.9.

and adult survival, the focus turns to the impacts of COVID-19 on the HCI as a whole. Figure 6.13 presents the simulated 2021 HCI for Brazil.⁶⁶ Compared to 2019 levels, the index decreased around 6 percentage points, i.e., from 60 percent to 54 percent. *Ten years of progress lost in only two years.* The magnitude of this loss is equivalent to starting at an HCI level equivalent to that of Argentina and decreasing to that of Indonesia.⁶⁷

A Big Fall

Estimated Impacts of COVID-19 Pandemic on the HCI in Brazil

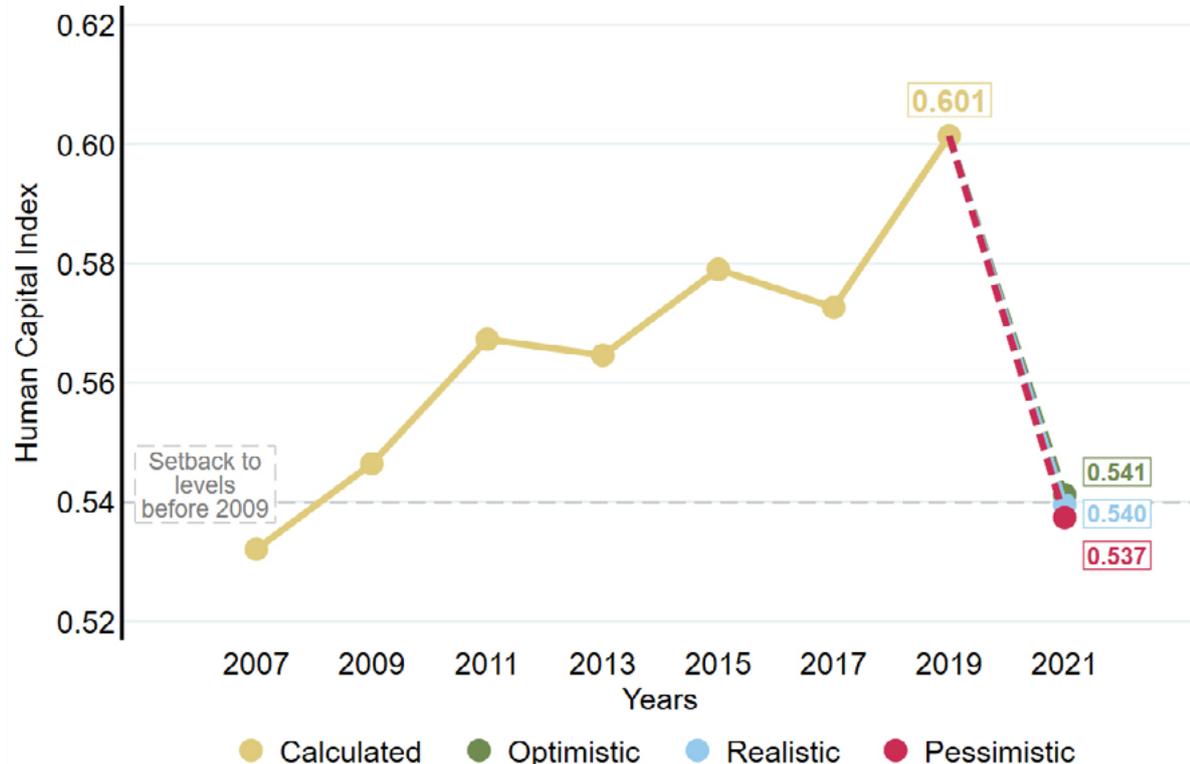


Figure 6.13
A Big Fall

Box 6.7 Vaccination Rollout

Vaccination has been the key measure to mitigate COVID-19 infections across the country. By March 22, 74.7 percent of the population in Brazil had received the complete vaccination (two shots or one full shot), and 34.8 percent had received three shots.¹ The vaccination rate in Brazil is similar to that of the European Union (73 percent), and higher than that of the United States (65.4 percent), where vaccination campaigns started earlier.²

Brazil has a long tradition of successful vaccination campaigns, which helped achieve high COVID-19 immunization rates. The National Immunization Program, established in 1973 and

⁶⁶ The small variation across the scenarios reflect that many parameters used in the simulations are known (observed). For child survival and adult survival rates, for example, the differences are in indirect deaths while the number of direct deaths from COVID-19 is known. For education, the method uses the learning losses of São Paulo as a baseline and the number of days closed is known.

⁶⁷ In 2020, Argentina had an HCI of 0.602 and Indonesia had an HCI from 0.540 (Global HCI in World Bank, 2020d).

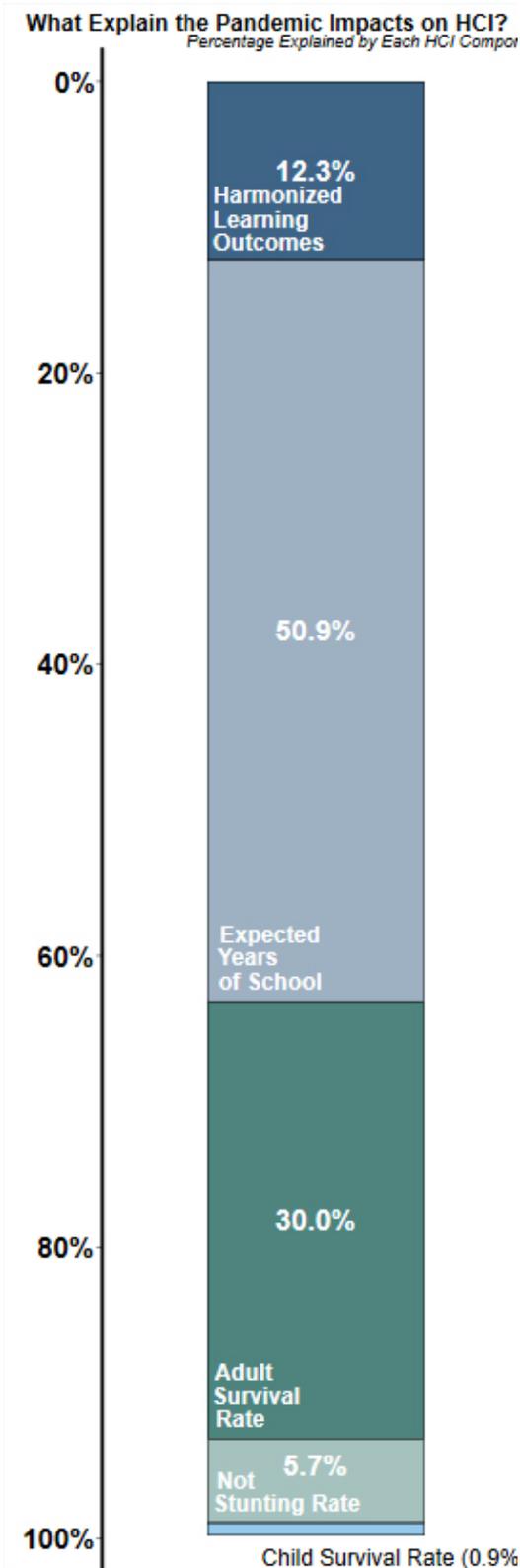


Figure 6.14

What Explains the Pandemic Impacts on the HCI?

The simulated HCI for 2021 as shown in figure 6.13 leads to three questions. The first question is: which HCI component was responsible for this big fall? Figure 6.14 aims to answer this question by showing how much each component explains the overall HCI drop.⁶⁸ As can be seen, the reduction in the EYS as a result of the pandemic was a major driver of the decline in HCI (50.9 percent). *Long and damaging school closures*. Adult health is the next most significant factor, explaining 30 percent of the overall decline in the human capital index due to the pandemic. This high percentage reflects the direct and indirect impacts of COVID-19 on the number of deaths. Finally, not-stunting and child survival rates account for less than 7 percent of the overall decline.

The second question is: which states suffered the greatest impacts? Figure 6.15 maps the loss in the human capital index per state. Darker red colors represent greater impacts of COVID-19 in HCI. The map shows that Roraima, Goiás, São Paulo, and Rondônia were the states in which the HCI was most affected by the pandemic where losses of human capital were more than 12 percent. Overall, figure 6.15 shows that losses varied from 6.5 percent (Pará) to 14.9 percent (Roraima).

Before moving on to the third question, it is important to understand the reasons for variation in the human capital loss across states by disaggregating the HCI. Figure 6.16 calculates the contribution of each HCI component to the COVID-19 impacts in each state. It shows education as the clear frontrunner in the reasons for human capital loss in Brazil. *Education was the channel through which the pandemic had the most impact in human capital across Brazil*. In absolute and in relative terms, the education component comprises the largest fraction of the overall impact of COVID-19 on HCI, reaching its peak in the states of Pernambuco (-11 percent) and Goiás (-10 percent).

⁶⁸The analysis used Shapley decomposition, where the R^2 of the following regression is decomposed: $\Delta HCI = \beta_0 + \beta_1 \Delta HLO + \beta_2 \Delta EYS + \beta_3 \Delta Adult\ Survival + \beta_4 \Delta Not\ Stunting + \beta_5 \Delta Child\ Survival + \mu$, where Δx stands for: $\Delta x = \frac{x_{2021} - x_{2019}}{x_{2019}}$.

The third and last question is: how many years Brazil will need to recover to 2019 levels, and what will happen if no urgent action is taken? Figure 6.17 plots the estimated number of years needed to recover to 2019 HCI levels. *The road to recovery is long.* If Brazil maintains the same pace of growth seen during pre-pandemic periods (2007-2019), the estimated time for recovery ranges between 10 and 13 years. In other words, Brazil will only reach the 2019 HCI levels in 2035. The status quo needs to be revisited, adapted, and reformulated to confront the effects of this crisis. *There is no time to waste.*

The Geography of COVID Impacts on Human Capital

Estimated Loss between 2019 and 2021, Realistic Scenario

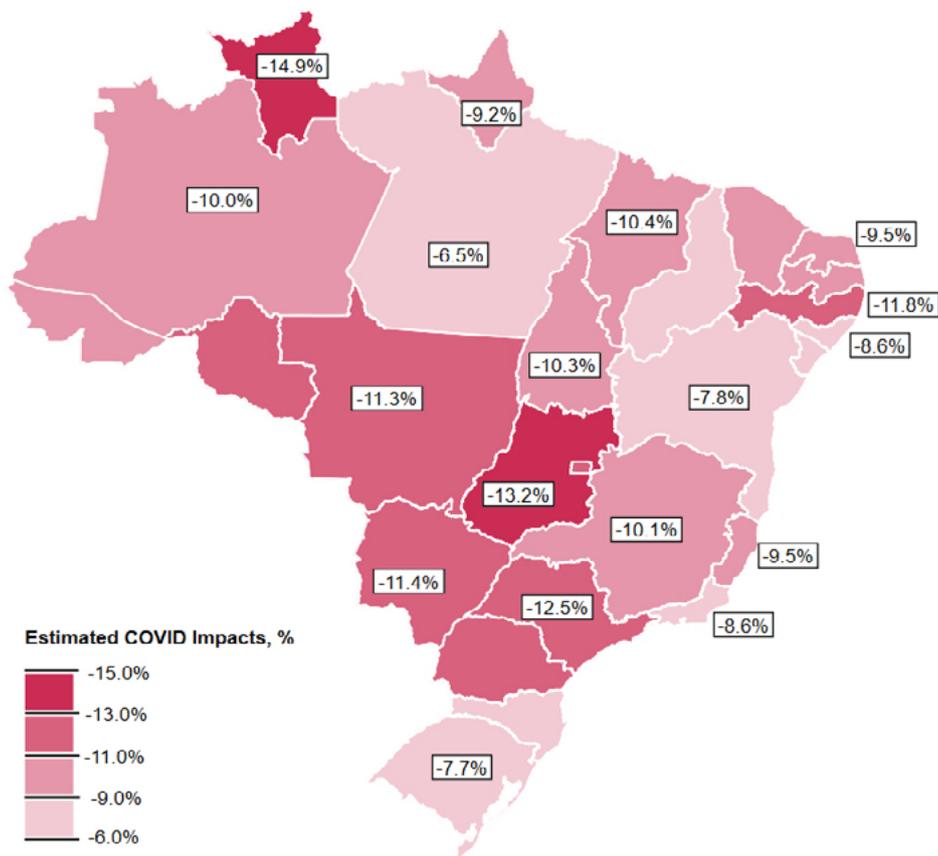


Figure 6.15
The Geography of COVID-19 Impacts on Human Capital

Losses by State and HCI Component

Estimated % Loss between 2019 and 2021, Realistic Scenario

State	HCI Education	HCI Health	HCI Child Survival
Roraima	-9%	-6%	-1%
Goiás	-10%	-4%	-0%
São Paulo	-9%	-4%	-0%
Rondônia	-8%	-4%	0%
Pernambuco	-11%	-1%	-0%
Distrito Federal	-9%	-3%	0%
Paraná	-7%	-4%	-0%
Mato Grosso do Sul	-7%	-4%	-0%
Mato Grosso	-8%	-4%	-0%
Acre	-8%	-3%	-0%
Tocantins	-8%	-2%	0%
Maranhão	-9%	-2%	0%
Minas Gerais	-8%	-3%	-0%
Amazonas	-6%	-4%	0%
Paraíba	-7%	-2%	0%
Espírito Santo	-8%	-1%	-0%
Ceará	-8%	-2%	0%
Rio Grande do Norte	-8%	-2%	0%
Amapá	-6%	-3%	0%
Alagoas	-7%	-1%	-0%
Rio de Janeiro	-6%	-3%	-0%
Santa Catarina	-6%	-3%	0%
Piauí	-6%	-2%	0%
Bahia	-6%	-2%	-0%
Rio Grande do Sul	-5%	-3%	-0%
Sergipe	-6%	-2%	-0%
Pará	-5%	-2%	0%

Figure 6.16
Losses by State and HCI Component

Figure 6.17 shows that even in a scenario where health and child survival immediately bounce back to pre-pandemic levels, 10 years would still be necessary for HCI recovery. This scenario, which reflects vaccination and social distancing measures, may represent the most optimistic scenario once the pandemic is over. The other simulated scenarios, however, are discouraging (see boxes 6.1 to box 6.4 for the definition of each scenario). As argued earlier, learning losses tend to have a long-lasting effect on HCI in Brazil as an entire generation has been gravely affected by long school closures.⁶⁹ *It will take a while for students to catch up.* Half of all COVID-19 impacts on HCI came from education making it a priority for future recovery that demands immediate attention.

If the pre-pandemic growth rate is maintained, Brazil will only recover to 2019 HCI levels in 2035.

The next phase in the lost decade story focuses on labor market. The pandemic directly affected employment rates and consequently, the UHCI. Although employment rates began to recover after July 2020, the labor market was only partially able to absorb newcomers, and unemployment continued to be higher than during pre-pandemic periods (World Bank, forthcoming). *One crisis inside another.* Job losses were concentrated in the informal sector and in sectors including agriculture, construction, and domestic occupations. Women, Afro-descendants, and young people had a higher chance of becoming unemployed in the pandemic (Costa et al., 2021).

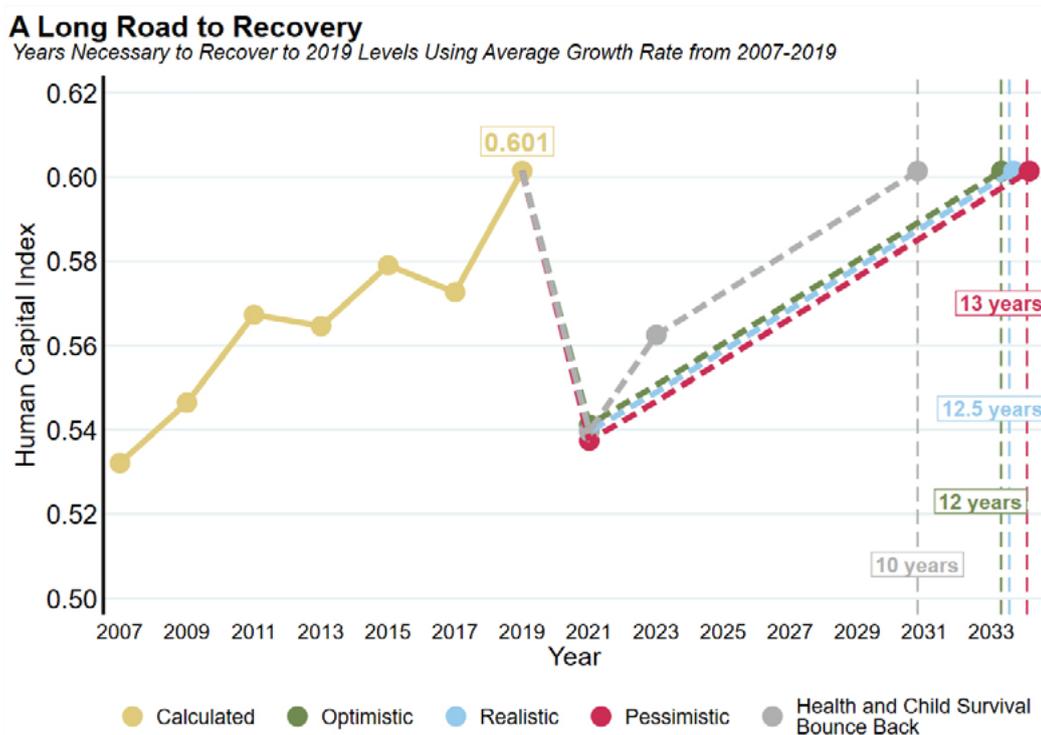


Figure 6.17
A Long Road to Recovery

Figure 6.18 shows a widespread decline in the employment rates of individuals between 18 and 64-years-old during the COVID-19 pandemic. The four largest declines in employment occurred in the Northeast. Ceará, Paraíba, Bahia, and Pernambuco all had decreases of more than 11 percent. Rio de Janeiro had the fifth largest decrease at 10.8 percent. Santa Catarina was the most resilient to the shocks of the pandemic, maintaining the highest employment rates in 2021 whereas Alagoas was the most vulnerable, registering the lowest employment rates.

⁶⁹ It is possible to consider two overlapping impacts on this cohort. One derives from the fact that 6- to 7-year-olds essentially started school in 3rd grade. The second comes from an earlier pandemic: students born in 2015 suffered from the effects of Zika during pregnancy. Many studies have shown the large impacts of birth outcomes for that generation of newborns (Lautharte & Rasul, 2020).

The Effects of the COVID-19 Pandemic on Employment Rates

Employment Rates of 18 to 64 Years Olds, 2019 and 2021

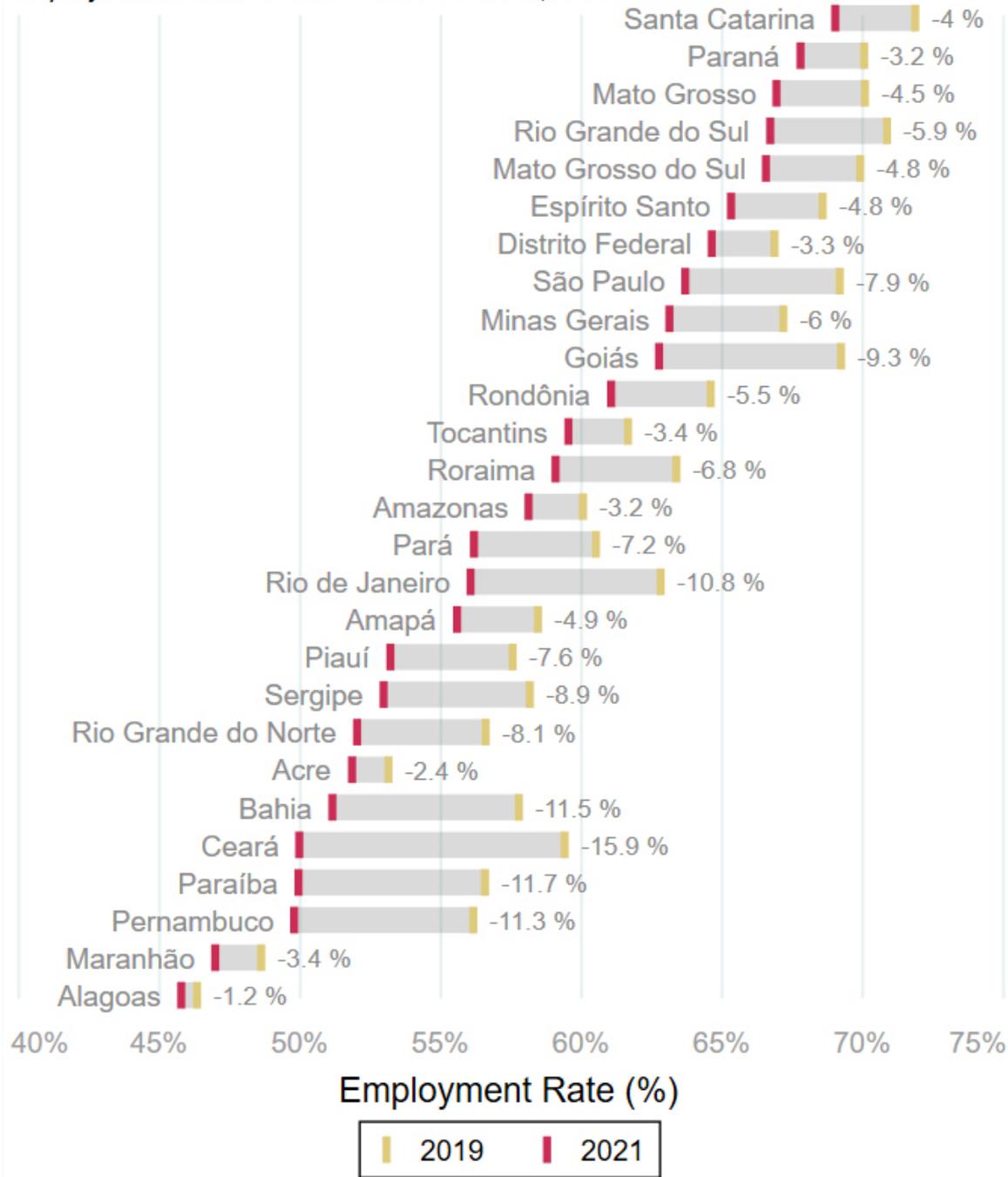


Figure 6.18
The Effects of the COVID-19 Pandemic on Employment Rates

After accounting for shocks in employment rates, the UHCI in Brazil fell from 0.387 in 2019 to 0.321 in 2021 (realistic scenario), which is equivalent to a drop of 17.1 percent. The realistic 2021 Utilized Human

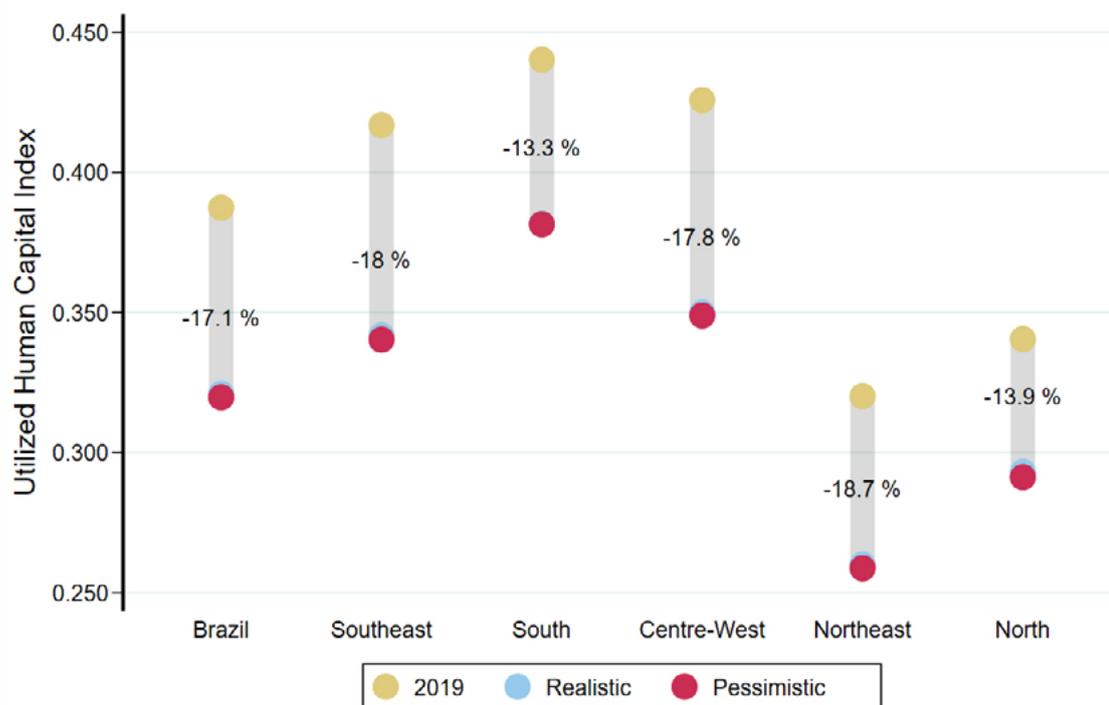
Capital Index (UHCI) combined the results of the simulated HCI with the employment rates from PNAD 2021 (first quarter). Once again, the findings are serious: a typical Brazilian born in 2021 will only utilize 32.1 percent of their full potential. Figure 6.19 breaks this decline down by region in Brazil. *Many Brazils, much*

The 2021 UHCI is equal to 32.1 percent.

loss. It shows that HCI loss was higher in the Northeast, Southeast, and Center-West. These HCI losses translate to sizable economic losses: if Brazil had full health, full education, and full utilization of HCI in 2021, its GDP per capita would be 211 percent higher.

Downturn in the Utilization of Human Capital

Utilized Human Capital Index per Regions, 2019 and 2021



Note: Percentage refers to the relative drop between 2021 (realistic scenario) and 2019

6.19 Figure
Downturn in the Utilization of Human Capital

__ Many Pandemics

There have been many divergent experiences of the pandemic for different populations. If it is unquestionable that the COVID-19 pandemic has had devastating impacts on human capital accumulation in Brazil, it may raise little doubt that it affected groups of people differently. *Many pandemics that may take decades to recover.* From the economic perspective, this crisis may push millions of Brazilians below (or further below) the poverty line in the short to mid term. In 2019, 4.9 percent of Brazilians lived below the poverty threshold⁷⁰ and in 2020, this number fell to 1.7 percent. However, it soared to 3.7 percent in 2021 once the short-term benefits of the cash transfer program, Auxílio Emergencial, were suspended (World Bank, 2022; Lara Ibarra & Vale, 2022).

Depending on the perspective, the pandemic can take new formats. It was shown earlier that there were different experiences of the pandemic based on geography, where some states suffered worse impacts than others. The interrupted story also indicated that the pandemic had different impacts depending on the stage in the life course. In this section, two new and particularly important viewpoints will be explored: that of gender and race. *Some groups of people had worse experiences of the pandemic.*

Some segments of the population experienced the pandemic more intensely.

⁷⁰ Measured as US\$1.90 per person per day in 2011 PPP (World Bank, 2022; Lara Ibarra & Vale, 2022).

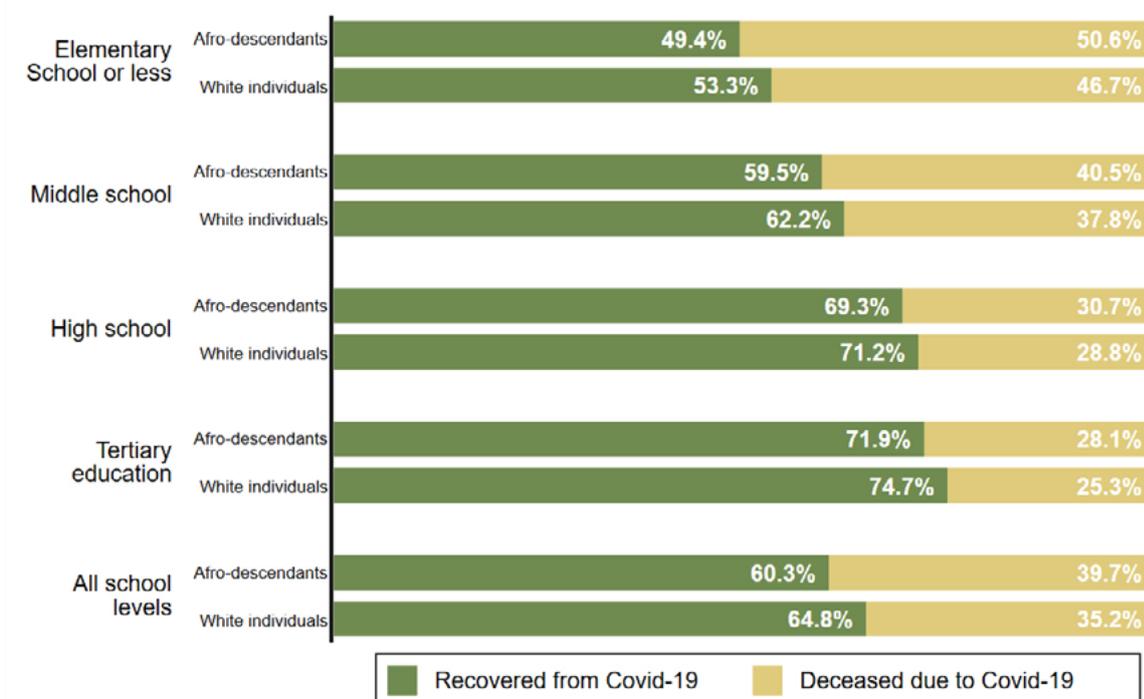
Race

A fundamental factor influencing the way the pandemic was experienced was race. The findings in previous sections showed significant inequalities in HCI between the white population and Afro-descendants. During the pandemic, these inequalities tended to widen. This is due to the fact that Afro-Brazilians are penalized twice: by their race and by their lower socioeconomic condition.

An analysis of figure 6.20 can help in understanding the effects of socioeconomic status and race in the context of the pandemic. In general, COVID-19 lethality rates decreased the higher the education level (a proxy for income). Afro-Brazilians, however, have a higher probability of dying from COVID-19 compared to white people regardless of educational attainment. For example, Black Brazilians who attended elementary school (or less) had a 50.6 percent COVID-19 lethality rate, while for same group of white people this rate was 46.7 percent. This pattern continues through high school education levels where Afro-descendants have a 30.7 percent COVID-19 lethality rate and white Brazilians at the same educational level have a rate of 28.8 percent. *The “many Pandemics” is more intense for Afro-Brazilians.*

Afro-Descendants Experience a Worse Pandemic

COVID-19 Survival and Lethality Rates by Race and Education Level, 2021



Note: Deaths until 31 Dec 2021. Source: SRAG/MS, 2021.
35% of observations were excluded due to missing in the schooling or race variable)

Figure 6.20
Afro-Descendants Experience a Worse Pandemic

Regardless of educational attainment, Black individuals are less likely to recover from COVID-19 compared to their white counterparts. At least four points can explain why Black populations are more likely to face greater COVID-19 impacts: (i) the nature of their occupations in the labor market, (ii) access to health care, (iii) food insecurity, and (iv) learning opportunities. These points are discussed below.

Black workers have lower participation in occupations with formal contracts compared to white workers in Brazil. As such, Black workers are, in general, more susceptible to unstable wages, unequal access to social security, and higher exposure to the pandemic. Between the first and second quarters of 2020, 8.9 million people left the workforce either because they lost their jobs or gave up on

finding one. Out of this number, 6.4 million were Black and 2.5 million were non-Black (Dieese, 2021). *The pandemic has taken a toll on Black workers.* In 2021, informal workers represented 38.6 million of the active work force, or almost 40.6 percent of all workers (Agência Brasil, 2022).

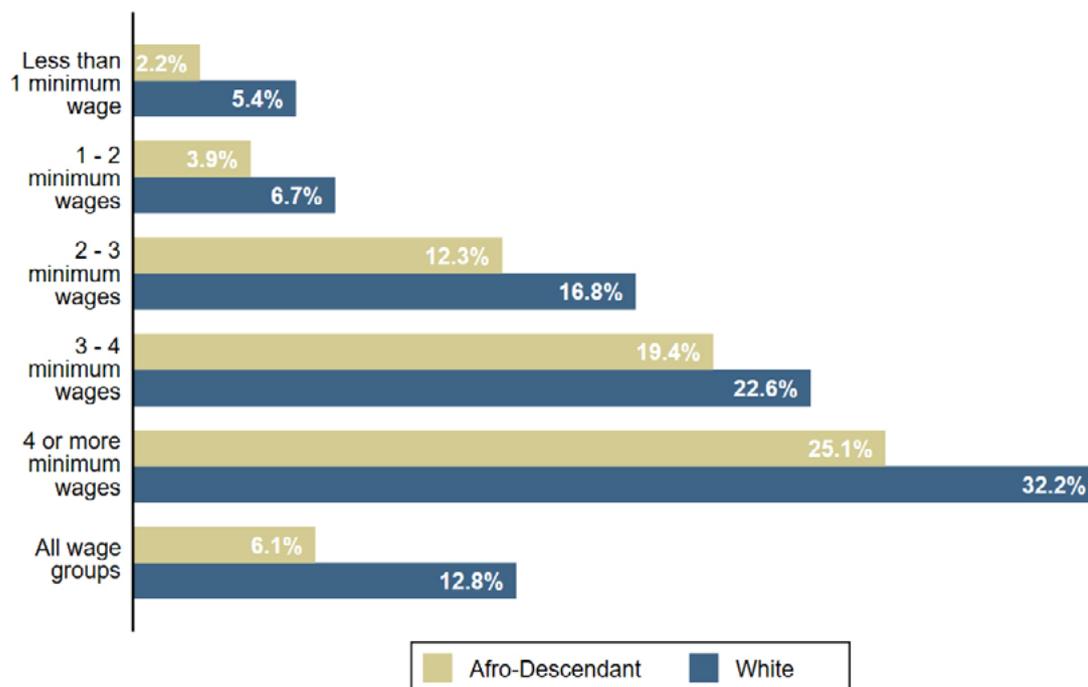
Moreover, between May and November 2020, only 7.3 million people worked remotely in Brazil. They were generally: female (57.8 percent), white (65.3 percent), with a college diploma (76 percent), and working in the private sector (61.1 percent) (Agência Brasil, 2021). Only 34 percent of remote workers were Black (Dieese, 2020). Working remotely is uncommon among Black people. Figure 6.21 highlights the fact that in all income brackets, white individuals represented the majority of remote workers in 2020. *Less remote work likely means higher exposure to COVID-19.*

Only 6.1 percent of Afro-descendants worked remotely.

The second point explaining the unequal impacts of COVID-19 on Afro-descendants relates to access to health care. COVID-19 deaths are often associated with lack of access to healthcare (Hone et al., 2021; de Azevedo Barros et al., 2016; Silva et al., 2019). While the Brazilian national health service (SUS) has significantly increased its coverage over the years, the distribution of healthcare remains unequal. Of the 150 million Brazilians who exclusively depend on SUS to receive healthcare, 80 percent are Black. Additionally, Afro-Brazilians disproportionately live-in regions where fewer healthcare services are available (UNA-SUS, 2021).

Working from Home Correlates with Race and Income

Percentage of People Working Remotely by Race and Income



Source: PNAD COVID, November 2020

Note: The minimum monthly wage was R\$1,045 in November 2020. The percentages in the graph represent the number of people working remotely divided by the total number of people working within each race group.

Figure 6.21
Working from Home Correlates with Race and Income

The third point is food insecurity. To get a sense of how the pandemic affected food supply in Brazil, a phone survey was conducted in 2021. Between July 26 and October 1, 2021, data was collected from 2,166 surveys across all states in Brazil. Results are nationally representative for adults (18 and older) that own a phone. The results of the surveys suggest racial disparities in food insecurity during the pandemic: 22.91 percent of Afro-descendant households reported that they had run out of food in the 30 days preceding the survey, while the rate for white households was only 11.87 percent (World Bank, 2021a).

Box 6.8 (continued)

However, the beneficiaries and benefits of the program decrease through the phases of the program. The first phase guaranteed five payments of R\$600 (US\$114.70) for up to two adults per household (the amount was doubled for single mothers). In the second phase, the individual benefit amount was reduced by 50 percent and the doubled amount for single mothers in households with two beneficiaries was discontinued. A permanence rule based on monthly reevaluation of eligibility was also introduced. The third phase limited the benefit to one person per household and reduced the monthly benefit value to R\$250 (US\$47.80), with an additional R\$125 (US\$23.90) for single mothers and a reduction of R\$100 (US\$19.10) for members of single-person households. Additionally, the income criteria became more restrictive, requiring both per capita family income and total family income to be below the program's income thresholds of R\$522.50 (US\$99.90) and R\$3,315.00 (US\$633.80) per month, respectively (Lara de Arruda et al., 2021b).

Although data available is insufficient to estimate the program's impact thus far, a reduction in the poverty rate and inequality rate using the Gini index was observed in 2020 (World Bank, 2022; Lara Ibarra & Vale, 2022b). Estimates from the World Bank¹ show that the poverty rate for 2020 was 1.7 percent,² and that in the absence of AE and without the expansions to the Bolsa Família program, the poverty rate could have reached about 24 percent (Lara de Arruda et al., 2022b). Despite these policies, the road to recovery from pandemic-induced human capital losses will be long.

¹ World Bank, 2022; Lara Ibarra & Vale, 2022.² US\$1.90 per person per day 2011 PPP.

Gender

The COVID-19 impacts are not gender neutral. *Women had their own, more intense pandemic.* One example that differentiates the experience of women is the increase of gender-based violence (GBV) in Brazil. Worldwide, one out of three women suffer either physical or sexual violence within their lifetime. Around 40 percent of all feminicides are committed by partners (World Health Organization, 2021b). Brazil follows this trend: pre-pandemic data shows that between 2009 and 2019, 50,000 women were murdered in Brazil (Cerqueira et al., 2021); Fórum Brasileiro de Segurança Pública, 2021). In 2015, Brazil ranked fifth among countries with the highest rates of femicide in the world, according to UN Women (Waiselfisz, 2015).

Social isolation and mandatory confinement during the pandemic exposed women to increased levels of abuse. *Data shows a clear increase in GBV during the pandemic.* In the first two months of the pandemic, femicide increased by 22.2 percent in Brazil and complaints received by a helpline for women increased by 27 percent compared to the same period in 2019 (World Bank, 2020a). The simultaneous decrease of in-person reporting indicates that women face barriers to reporting aggression and abuse while confined.⁷¹

Another example of the different experience of the pandemic among women is the high rates of maternal mortality by COVID-19 (Andreucci & Knobel, 2021; Gonçalves et al., 2021). Between January and April 2021, Brazil had the highest number of maternal deaths due to COVID-19 and a lethality

⁷¹ When looking at domestic violence complaints, 12 states reported having an average overall drop of 25.5 percent in the same period. Among the states, the greatest decrease was in Maranhão, where complaints fell by 97.3 percent. In Rio de Janeiro and Pará, complaints fell by 48.5 percent and 47.8 percent, respectively (World Bank, 2020a).

rate of 7.2 percent, which is almost three times the country's yearly lethality rate for this group (2.8 percent) (Fiocruz, 2021a; Organización Panamericana de la Salud, 2021). Likewise, early numbers from 2021 show that weekly maternal deaths almost quadrupled in comparison to 2020.⁷²

The pandemic has caused a setback of over a decade in employment rates for women. In Brazil, it is estimated that 8.5 million women exited the workforce in the third quarter of 2020, making their participation rate drop to 45.8 percent, which represents a 14 percent decrease compared to 2019 (Folha de São Paulo, 2021). *Women were significantly affected in the labor market.* Women in the domestic work sector were particularly affected. In Brazil, the number of people employed in the domestic service sector fell by 24.7 percent in the second quarter of 2020 (ECLAC, 2021).

Women were not simply out of the labor market but were also not seeking jobs. In the fourth quarter of 2021, 43 percent of inactive women reported that childcare, elder care, and housework were the main reasons that prevented them from seeking a job. In comparison, only 4 percent of men reported the same reasons for not seeking a job (PNAD, 2021).⁷³ Data from UN Women, which analyzed 16 countries including Brazil, reveal that before the pandemic, women spent approximately 26 hours per week on childcare. Since the onset of the pandemic, this number has increased to 31 hours. Men on the other hand, spent 20 hours on childcare before the outbreak, and 24 hours after the outbreak. In the case of Brazil, specifically, women spent 31.6 hours per week on childcare during the COVID-19 pandemic, while men spent only 25.7 hours on childcare (UN Women, 2020). As a consequence, the pandemic has been labeled by many as the "shecession" or the "momcession" (IMF Working Paper, 2021).

The pandemic also exposed gender differences in education. According to UNICEF, over 5 million girls and boys aged 6 to 17 did not have access to education in November 2020. This corresponds to 13.9 percent of the population in this age group in Brazil, over 40 percent of whom were children aged 6 to 10, an age group for which education was practically universalized before the pandemic (UNICEF, 2021). The disaggregation by sex of the 6 to 17 age group shows that boys have higher out-of-school rates (14.8 percent) compared to girls (12.9 percent).

Box 6.9 The Economic Cost of Learning Losses

Expected years of school and harmonized learning outcomes simulations predict a loss equivalent to one year of learning adjusted years of schooling (LAYS).¹ This loss in learning can be monetarily quantified as foregone earnings as an individual who is less educated is expected to be less productive and receive lower wages in the labor market.

Figure B.6.9 shows the economic costs using the realistic scenario. The estimations use the rate of return of one year of schooling, the average income of an individual who completed 12 years of education,² and the LAYS losses under the realistic scenario.



Figure B.6.9 – Economic Costs of COVID-19 Pandemic Impacts

⁷² The Brazilian COVID-19 Observatory of Obstetrics reported that the number of maternal deaths in 2021 has already surpassed that of 2020. In 2020, Brazil saw a total of 544 maternal deaths (pregnant and postpartum women), with a weekly average of 12.1 deaths. Note that the pandemic lasted 45 epidemiological weeks that year.

⁷³ Similarly, 50 percent of women out of the workforce who wanted to work listed childcare, elder care, and housework as activities impeding them from work, in comparison to only 7 percent of men in the same category.

Box 6.9 (continued)

A school-age individual in 2021 is expected to lose US\$794 per year (in 2017 PPP dollars) as a result of the decrease in learning-adjusted years of schooling. Assuming that this individual will stay in the labor market for 32 years,³ this loss is equivalent to US\$25,573 (in 2017 PPP) in lifetime earnings and 7.9% of projected lifetime earnings. If aggregated for all cohort-affected individuals,⁴ the losses add up to US\$495 billion (in 2017 PPP dollars), which corresponds to 16 percent of the country's 2019 GDP. Learning losses therefore translate into costs not only for individuals but also for society at large. In that sense, recovering from learning losses also implies restoring the economy.

¹ LAYS losses (comparing 2019 measurements with simulations for 2021) were equivalent to 0.960, 0.985, and 0.992 years under optimistic, realistic and pessimistic scenarios, respectively.

² The same rate of return of one year of schooling was used for the HCI education component (8 percent). The average income represents the average of the income of an individual with complete upper secondary school (from the quarterly PNAD, 2019).

³ Correa (2015) estimates that a Brazilian 15-year-old will spend 32.2 years working in the labor market.

⁴ This includes all individuals that are supposed to be in basic education (primary, lower secondary and, upper secondary school).

The reasons children drop out of school are gendered. Pre-pandemic data reveals that 13.9 percent of girls aged 11 to 14 left school due to pregnancy, 1.4 percent due to household chores and elder/disability care, and 7.7 percent due to work. On the other hand, no boys reported dropping out of school due to their partner being pregnant or household and elder/disability care, and only 4.1 percent mentioned work as their main reason. Instead, the majority reported dropping out due to a lack of interest in studying (43 percent) and chronic health conditions (29.8 percent) (Lichand et al., 2021). Thus, girls are more likely to be out-of-school because of unequal gender roles. UNESCO projects that 11 million girls around the world may never return to school after the pandemic (UNESCO in World Bank, 2021b).

— Targeted action is needed

The overall HCI in Brazil fell from 0.601 in 2019 to 0.540 in 2021 (realistic scenario). If adequate measures are not taken, it will take an estimated 10 to 13 years to recover to 2019 HCI levels.

The pandemic interrupted long-term improvements in the trajectory of child survival and not-stunting rates due to the decrease in pre- and postnatal care, reduction in household income, and food insecurity. The simulations show a considerable loss in the education component, above all in expected years of school, where we see losses up to the equivalent of one academic year (out of 12). Household income shocks and the lack of engagement in remote learning may have pressured school-age children to leave school. Moreover, the adult survival rate has decreased to levels never before observed⁷⁴ due to COVID-19 direct and indirect deaths.

States were differently affected by the pandemic, with Roraima, Goiás, São Paulo, and Rondônia suffering the largest

COVID-19 had the greatest impact on the education component of HCI.

⁷⁴ The time-period of analysis was from 2007 to 2019.

human capital losses at more than 12 percent. In all states, the education HCI component had a relatively higher decrease than the health and child survival components. In fact, 63 percent of the human capital loss in Brazil is explained by the education component, both in terms of EYS and HLO. The adult survival rate reduction accounts for 30 percent of the losses.

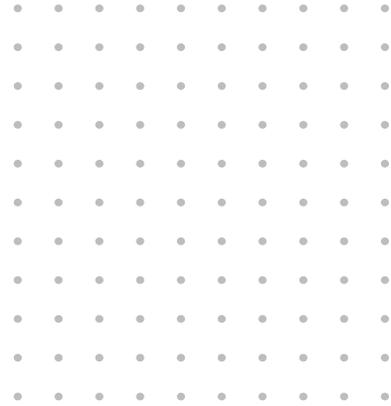
COVID-19 also caused decrease in employment rates. According to the simulations, only 32.1 percent of human capital will be adequately accumulated and utilized in 2021. COVID-19 has affected Afro-Brazilians disproportionately. Unideal health and well-being conditions make them more susceptible to COVID-19 infections. These populations (i) are mainly concentrated in occupations that are more likely to have higher exposure to the virus, (ii) often live-in crowded housing conditions that lack appropriate sanitation services, and (iii) are at increased risk of COVID-19 complications due to pre-existing health conditions caused by social inequality. COVID-19 impacts are not gender neutral. Considering the labor market, women have suffered the most significant decreases in employment rates.

Notably, the pandemic will have long-lasting effects. For example, research shows COVID-19 has increased intergenerational education inequalities: there is a projected decrease in the likelihood of children from low-income families completing secondary school in Latin America (Neidhöfer et al., 2021). In this sense, today's school-age children may face greater inequalities in adulthood. If the human capital of one generation depends on the human capital of the previous generation, or in other words, if there is a persistence of intergenerational human capital, the HCI may be adversely affected for decades to come.

Chapter 7

Drivers of Human Capital Formation

Socioeconomic Context, Infrastructure, and Policies



Main Messages

- ❖ This chapter explores variation within municipalities across time, controlling for numerous variables to elucidate possible variables correlated with HCI.
- ❖ Women accumulate 7 percentage points more human capital than men.
- ❖ Parental education is correlated with both education components (HLO, EYS) and with not-stunting and child survival rates.
- ❖ Full-time schools are associated with better education performance.
- ❖ The Bolsa Família program is associated with expected years of school and not stunting.

What drives human capital accumulation in Brazil? As shown thus far, different regions, states, and municipalities saw a widespread but heterogenous improvement between 2007 and 2019. While the HCI of Recife (Pernambuco) improved by more than 27.3 percent, Macapá (Amapá) increased its HCI by only 6.3 percent. This degree of difference leads one to question why some municipalities have greater HCI improvements than others. This chapter investigates this question by exploring municipal characteristics associated with HCI. The main objective is to map the variables associated with the evolution of the HCI in Brazil.

Two cities that illustrate this difference in HCI improvement are Cocal dos Alves (Piauí) and Ibimirim (Pernambuco).⁷⁵ Cocal dos Alves, a small city in Piauí, has less than 7,000 inhabitants in the Northeast and is the top-ranked municipality in Brazil for HCI results. The city is known for its exceptional educational outcomes, which are reflected in local learning results (IDEB) as well as its high participation in mathematic Olympics and high college admission rates. Ibimirim, on the other hand, is a medium-sized⁷⁶ city located in Northeast and is the 4th best performer in its state (Pernambuco). Between 2007 and 2019, Cocal dos Alves and Ibimirim had divergent rates of HCI improvement of 45 and 30 percent, respectively. *A tale of two cities*. This section will investigate the factors that might explain why Cocal dos Alves and Ibimirim have such different HCI improvement rates.

Before starting, it is important to outline two caveats. First, only factors for which data was available at the municipal level were considered. Relevant factors that might explain the HCI that were not measured or discussed include teacher quality and municipality management capacity among others. Second, the exercises were undertaken over a determined period of time (2007 to 2019), and other variables maybe more or less relevant outside this study period.

— Human Capital Index Drivers: Correlations

This section presents a short literature review about the drivers of each HCI component. Figure 7.1 describes some of these drivers. Appendix V defines each variable utilized in the analysis. Naturally, this chapter does not aim to be an exhaustive list of factors and variables associated with human capital. Instead, its purpose is motivating discussion. For a complete description of variables, see Appendix V.

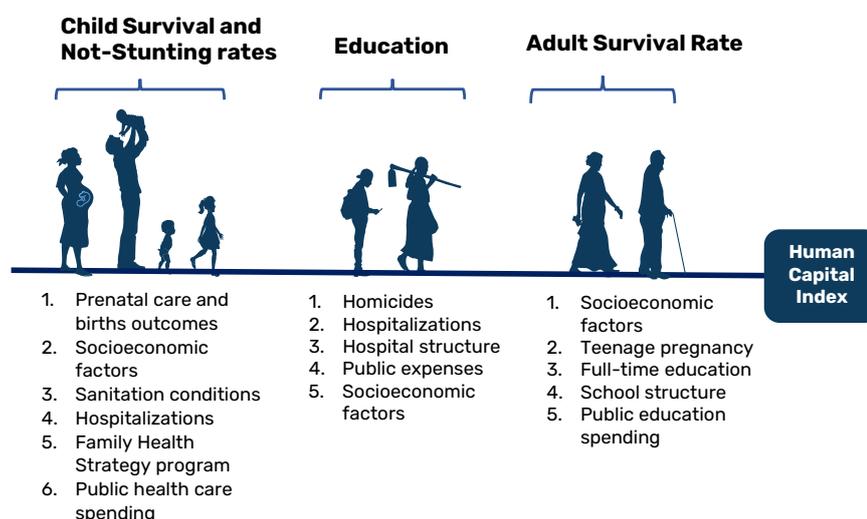


Figure 7.1
Possible Drivers of HCI across Life Cycle

⁷⁵ This report calls these municipalities positive outliers. Appendix I shows detailed HCI statistics for each of the positive outlier municipalities.

⁷⁶ Population estimates indicate that Ibimirim had 29,300 inhabitants in 2019.

Children Under Five: Child Survival and Not Stunting

Six variables have a strong correlation with child survival and not-stunting rates. As figure 7.2 shows, the probability of a child surviving until age five is positively related to prenatal care and birth outcomes. *The first two drivers analyzed start before birth.* In Brazil, the two leading causes of child mortality are prematurity (being born after less than seven months of gestation) and neonatal complications that are directly related to prenatal care and birth outcomes (e.g., low birth weight). Prenatal care is negatively associated with child survival. Figure 7.2.a shows a negative relationship at the municipality level between child survival rates and the percentage of births with insufficient prenatal care (less than four visits).

A second potential driver relates to socioeconomic status. Socioeconomic level correlates with child survival and not-stunting rates as higher-income families have better access to healthcare, food, and household facilities (i.e., sanitation, water). Figure 7.2.b shows that a lower proportion of mothers with low education levels in a municipality is associated with a higher proportion of children that survive to age five. Similarly, figure 7.2.c indicates that higher poverty incidence in a municipality relates positively to stunted (fewer children not stunting).

Unideal sanitary conditions hinder human capital accumulation.

Sanitation conditions are known to play a vital role in child survival and are considered a third potential driver of human capital formation. Poor sanitation can lead to several disease as: diarrhea, vector-borne and water-borne, which are prominent causes of under-five children's deaths.

Child Survival and Not-Stunting Correlations

Bivariate Correlations with Explanatory Variables, 2019

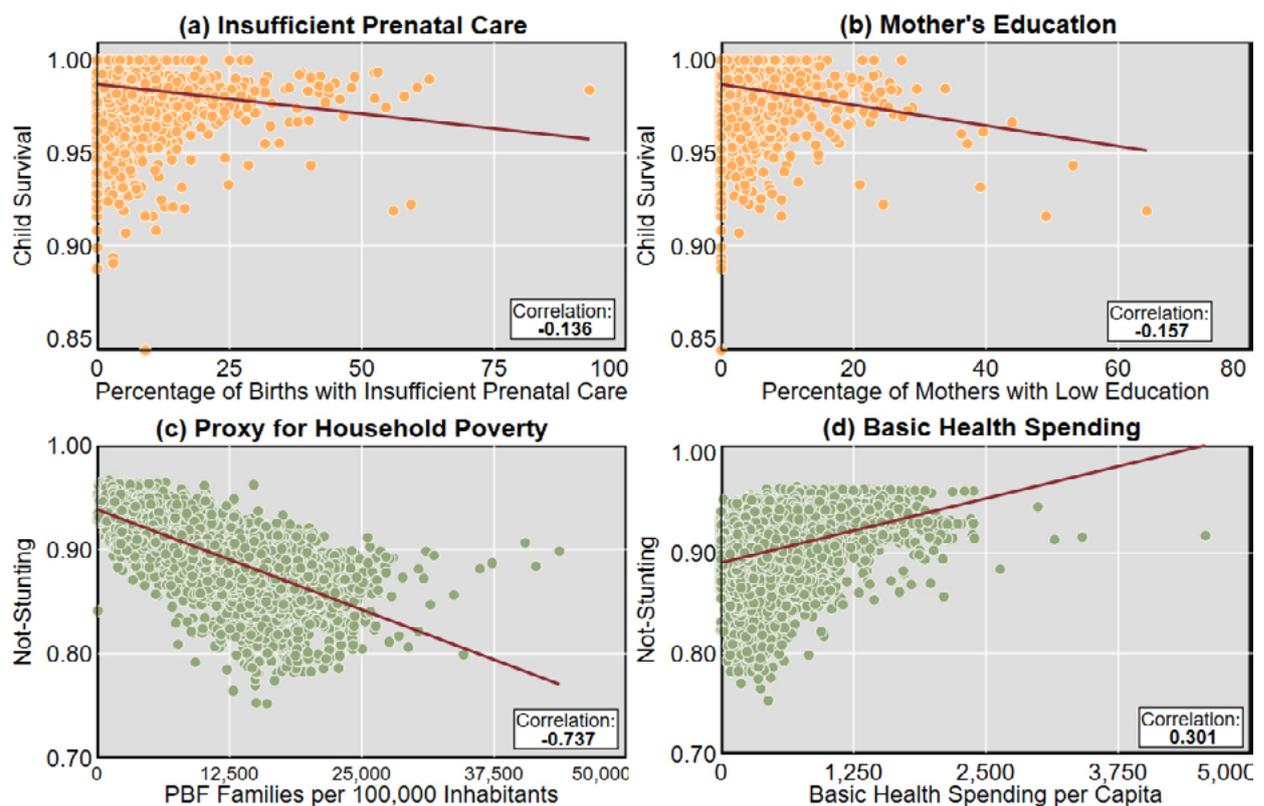


Figure 7.2
Child Survival and Not-Stunting Correlations

Box 7.1

Literature Review: Child Survival Rate and Not Stunting

Child Survival Rate

The first cause of child mortality deaths in Brazil is prematurity followed by other birth and neonatal complications (França et al., 2017). Prenatal care plays a vital role in guaranteeing child survival. Evidence also suggests that low birth weight is positively correlated to infant mortality (McCormick, 1985; Victora & Barros, 2001).

Diarrhea and diseases associated with the lack of adequate water, sanitation, and hygiene facilities are other major causes of child mortality that affect low-income families in particular (França et al., 2017). The lack of access to water and sanitation infrastructure is one of the factors that increases health risks linked to water-related diseases (Pimentel et al., 2020; Günther & Fink, 2010). The precariousness of the sanitation system leads to the spread of a group of diseases called Diseases Related to Inadequate Environmental Sanitation (Pimentel et al., 2020). A vast body of academic literature has also shown the strong relationship between maternal education and child health outcomes (Grépin & Bharadwaj, 2015; Grossman, 2006; Alderman & Headey, 2017; Breierova & Duflo, 2004; Keats, 2018; Currie & Moretti, 2003).

Public expenditure also seems to be also associated with child survival. A study has shown that increased public spending on health increases child survival rates, especially in areas with good governance (Rajkumar & Swaroop, 2008). Another study from Canada shows that lower health care spending is associated with a statistically significant increase in infant mortality (Crémieux et al., 1999). Human resources and hospital infrastructure also play a vital role in reducing the probability that an infant may die (Aguilera & Marrufo, 2007).

Lastly, the Family Health Strategy is a program focused on primary healthcare provision (see chapter 9) and is the main strategy for the expansion and of the Unified Health System (SUS). Research indicates that the program reduces unnecessary hospitalizations as well as the mortality of children under the age of one (Aquino et al., 2009; Pinto Junior et al., 2018).

Not Stunting

Child stunting refers to poor and insufficient growth before and after birth due to nutritional deficiencies and infections. Socioeconomic factors seem to play a pivotal role in explaining this condition. More impoverished families have less access to adequate food and have more exposure to poor sanitation and hygiene conditions, making them more vulnerable to infections (Grantham-McGregor et al., 2007).

Beyond income, maternal education has been shown to play an essential role in preventing stunting. Evidence shows that higher levels of maternal education are associated with protective childcare behaviors, such as giving children immunizations or accessing the local health care centers (Semba, 2008). In the same sense, the illiteracy rate of mothers has a negative correlation with child health outcomes, such as not stunting and child mortality (Grépin & Bharadwaj, 2015; Grossman, 2006; Alderman & Headey, 2017; Breierova & Duflo, 2004).

The availability of birth services, sanitation, and water infrastructure may impact child height and weight, increasing the probability of child stunting (Lavy et al., 1996). A comprehensive study in Indonesia shows that stunting is also associated with neonatal and post-birth outcomes, including premature birth, short birth length, and non-exclusive breastfeeding (Beal, 2018).

Lastly, since stunting is directly related to access to and quality of healthcare systems, public spending on health care can play an essential role in decreasing child stunting (Balla et al., 2021).

Prevalent causes of hospitalizations among children which correlate with child survival include sanitation-related diseases, malnutrition, and asthma. In recent decades, there has been consistent improvement in reducing the number of these hospitalizations among children in Brazil, which is the fourth potential driver of human capital formation (Appendix V).

The fifth potential driver is the Family Health Strategy program,⁷⁷ which has expanded primary healthcare provision in Brazil. Academic literature found evidence that the program reduced unnecessary hospitalizations and reduced infant mortality.

Public spending in basic health services is the six potential driver of human capital formation. Between 2007 and 2019, the basic health spending per capita in municipalities increased by 35 percent on average (Appendix V). Since child survival and not-stunting rates are intrinsically associated with access to and quality of primary healthcare, public spending on basic health is an important factor associated with the improvement of those components (figure 7.2.d).

School-Age Children: Education

This section looks at the five drivers related to the education HCI component listed in figure 7.1: (i) socioeconomic factors; (ii) teenage pregnancy; (iii) full-time schools; (iv) school structure; and (v) public education spending.

Education is the ladder for human capital formation in Brazil.

Harmonized Learning Outcomes & Expected Years of School

Bivariate Correlations with Explanatory Variables, 2019

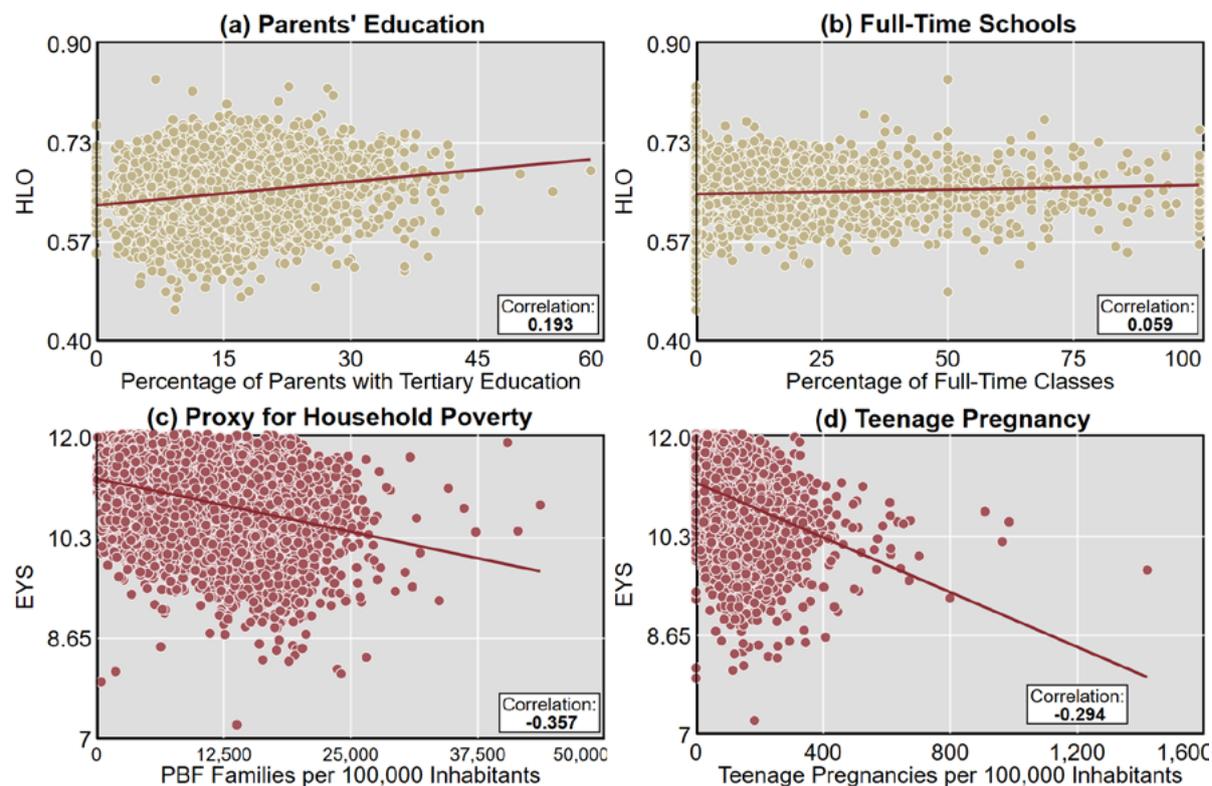


Figure 7.3
Harmonized Learning Outcomes and Expected Years of School

⁷⁷ For a more in-depth description, see chapter 8.

Higher socioeconomic status, proxied by income or parental education, correlates with longer years of education and better learning performance. This is due to the fact that high-income families tend to (i) send their children to better schools, (ii) provide a stimulating environment at home, (iii) have more access to knowledge, and (iv) allocate less of their children's time to household chores. Figure 7.3 presents the correlation between these two socioeconomic proxies and the HLO and EYS components. Figure 7.3.a shows that the higher the proportion of students with parents with tertiary education in a municipality, the higher the HLO. When parents study, children are likely to study. Similarly, figure 7.3.c illustrates that the higher the poverty incidence in a municipality, the lesser the EYS.

Another issue affecting student outcomes is teenage pregnancy. There is a great deal of evidence that connects teenage childbearing with detrimental educational outcomes, in particular by increasing dropouts and creating irregular school trajectories. The data presented in figure 7.3.d corroborates this notion by showing that the higher the incidence of teenage pregnancy in a given municipality, the lesser the expected years of school. It is worth noting that the number of adolescent pregnancies has dropped between 2007 and 2019 (Appendix V), which corresponds with an increase in the quantity of schooling seen over this period.

Some policies seem to enhance school quality. One example is full-time school education. Municipalities in Brazil have been increasing the percentage of full-time schools (Appendix V), which has been shown to have causal effects on learning. Figure 7.3.b demonstrates that there is a small but distinct correlation between full-time schools and HLO improvement.

Box 7.2 Literature Review: Education

Existing literature describes the many factors associated with education quality and school attendance. The characteristics of students and their families is one notable factor that may affect educational outcomes. Parental education seems to play an essential role in explaining children's educational attainment. One study suggests that a mother's education can causally determine her son's education (Black et al., 2005); other studies suggest that a mother's education can causally determine both their daughters' and sons' educational outcomes, but with a greater effect on their daughters' educational outcomes (Akarçay-Gürbüz & Polat, 2017). It is thought that there are fewer costs or that less effort needed for human capital accumulation for children with more educated parents; for example, their parents might be more available or have the knowledge to help with schoolwork.

Parental education can also influence their child's educational outcomes through income. Better educated parents are likely to have higher income and provide more support towards their children's education. For example, wealthier parents can put their children into better schools, create a better environment for studying at home, provide them with more books, and allocate less of their children's time to household chores. An increase in household income has been shown to increase education attainment (Akee et al., 2010) and increase reading and math test scores (Dahl & Lochner, 2012).

Another family characteristic that may affect a student's educational achievement is family structure. Evidence suggests that even in families with a similar income level, students who do not live with both parents are less likely to attend and complete college.

Another issue that may affect student outcomes is teenage pregnancy. Teenage pregnancy is seen as a social and health problem with negative impacts on educational outcomes, especially on dropouts and irregular school trajectories. The incidence of teenage pregnancy, sometimes associated with early marriage, also has a negative impact on a student's average number of years of schooling (Almeida et al., 2006; Teixeira & Madalozzo, 2019).

Box 7.2 (continued)

In addition to student and family characteristics, the quality of the school system has also been shown to affect student outcomes. A school environment with better infrastructure such as libraries and toilets seems to improve learning, and laboratories and drinking water appear to improve enrollment rates (Cuesta et al., 2016). Public expenditures can be a mechanism to enhance school quality and infrastructure as there is evidence of causal effects on educational outcomes (Jackson et al., 2015; Jackson et al., 2021; Johnson & Jackson, 2019), especially where there is better governance (Rajkumar & Swaroop, 2008).

Other policies can also enhance school quality, such as full-time school education. In Brazil, a standard school day lasts approximately four-and-a-half hours, while full-time school programs extend the school day to last about seven hours. Some research demonstrates that full-time school programs positively affect the quality and quantity of educational outcomes (Almeida et al., 2016; Cerdan-Infantes & Vermeersch, 2007). The model of full-time education, for example, was implemented in the public schools of Pernambuco and seems to have positively affected upper secondary school mathematics and language tests scores (Rosa et al., 2022). However, in another nationwide program, Mais Educação, full-time schooling appeared to have no effect or even to have negative effects on educational outcomes (Almeida et al., 2016; de Oliveira & Terra, 2018).

Adulthood: Adult Survival Rate

Adult Survival Rate

Bivariate Correlations with Explanatory Variables, 2019

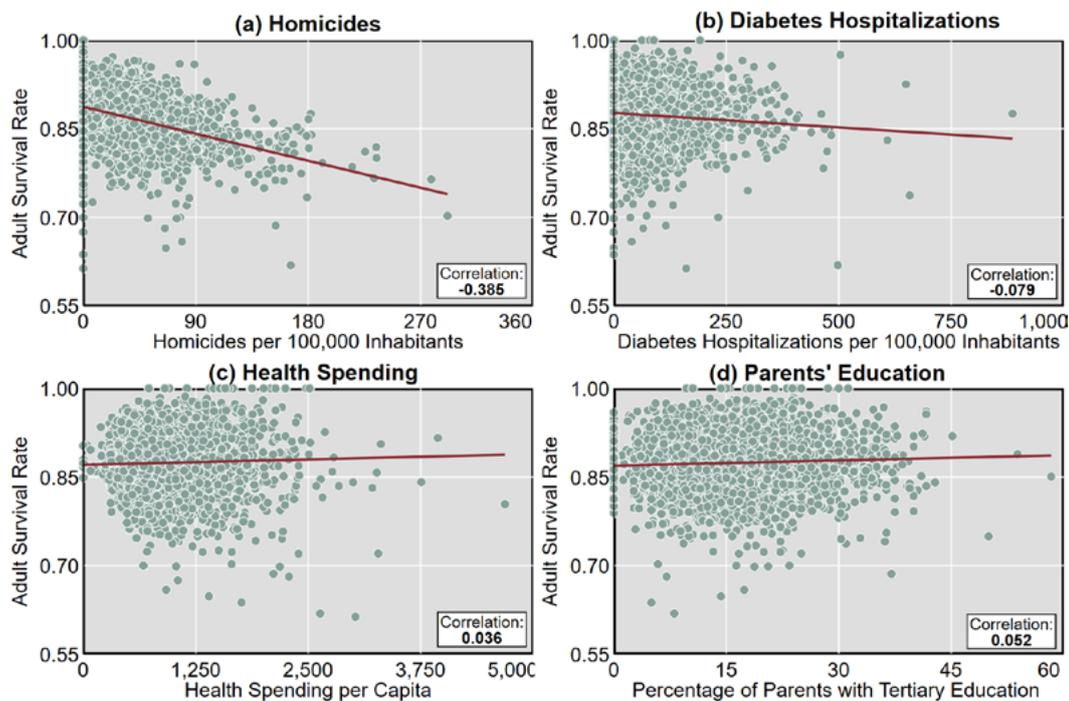


Figure 7-4
Adult Survival Rate

The adult survival rate component relates to a series of events that occur in adulthood. Figure 7.1 lists the five potential drivers correlated with this rate. An important death-related event is homicide. By performing a simple bivariate correlation, figure 7.4.a shows that the higher the number of homicides within a municipality, the lesser the adult survival rate. This relationship also captures income effects since lower income is highly correlated with homicides.

Health conditions such as diabetes, hypertension, obesity, and alcoholism are related to the probability of surviving until 60. Figure 7.4.b shows a small but distinctly negative relationship between diabetes hospitalizations and adult survival rates. Between 2007 and 2019, hospitalizations for obesity nearly tripled in Brazilian municipalities (Appendix V), indicating a deterioration in the population's health conditions.

Because health conditions are associated with the probability of surviving until 60, the quality of the healthcare system is an element that predicts adult survival rate. The relationship between hospital infrastructure variables and this HCI subcomponent were investigated to gauge these impacts. A small positive relationship between health spending per capita and the adult survival rate can also be observed in figure 7.4.c. Finally, the percentage of parents with tertiary education is small but positively correlated to the adult survival rate (figure 7.4.d).

Box 7.3 Literature Review: Adult Survival Rate

The adult survival rate component of the HCI is the probability of an individual surviving from age 15 to 60. This rate relates to a series of events that occurs with more frequency in this age group (e.g., homicides). In Brazil, approximately 11 percent of the deaths that occurred in adulthood are due to homicide.

Alcohol and smoking are more prevalent in although not exclusive to this age group. Both of these factors have a negative impact on life expectancy as do other risky behaviors (Crémieux et al., 1999).

In addition, obesity seems to be associated with a decrease in life expectancy and an increase in diabetes prevalence (Walls et al., 2012). This condition, when jointly associated with hypertension, can increase adult morbidity (Seravalle & Grassi, 2017).

Beyond factors relating to individual characteristics, health spending per capita and hospital infrastructure also seem to be associated with adult survival. In OECD countries, for example, lower health care spending has been associated with a significant decrease in life expectancy. On the other hand, an increase in the number of physicians and GDP per capita as well as decreases in poverty rates and population density positively affect life expectancy (Crémieux et al., 1999).

— Human Capital Index Drivers: Regressions

This section presents the regression results for each HCI subcomponent. The idea is to explore variation within municipalities across time, controlling for numerous factors (time-variant and time-

invariant) to identify factors that are correlated with human capital formation. It is worth noting that these regressions do not have causal implications.⁷⁸

Children Under Five: Child Survival

Figure 7.5 summarizes the results for child survival rates. Poor birth outcomes,⁷⁹ which are related to pre-term births and complications during labor (Svenvik et al., 2015), stand out from the other drivers showing significant correlations with child survival rates. Hospitalizations as a result of malnutrition have also been found to have a negative relationship with this component. These results are in line with findings in the academic literature.⁸⁰

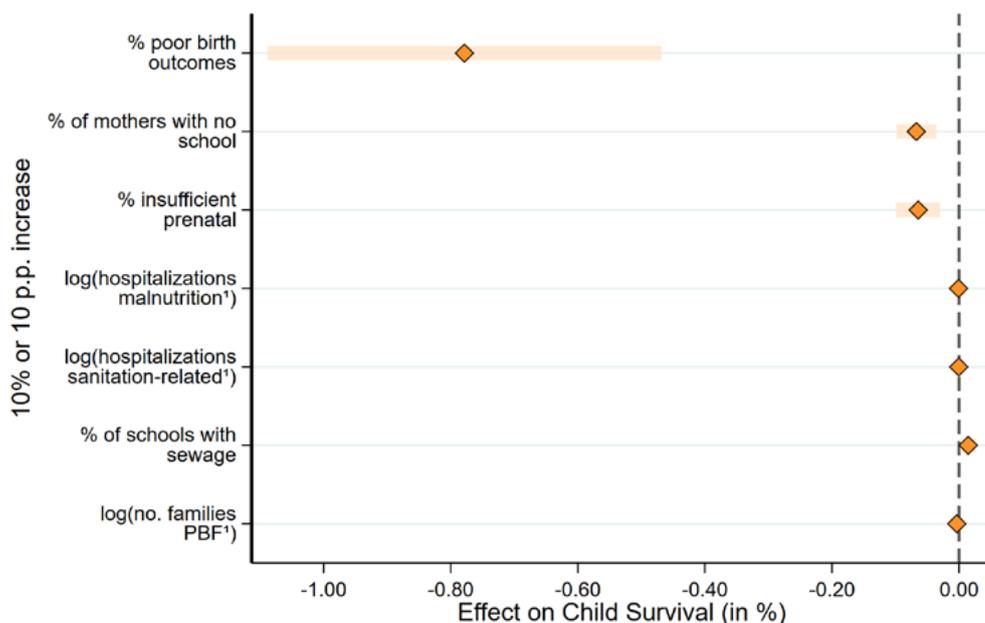
Another factor associated with child survival rates is mothers' education level.

More precisely, a 10 percent reduction in the proportion of mothers with a low level of education in municipalities corresponds with an approximate 0.8 percent increase in this subcomponent. One mechanism that contributes to this relationship is through birth outcomes. Evidence shows that there is a lower incidence of premature births and infants with low birth weight among educated mothers (Günther & Fink, 2010).

Increasing mothers' education can enhance child survival.

Socioeconomic Status As A Driver of Child Survival Rates

Average Effects from the Panel Estimation



¹Variables per 100,000 inhabitants. *Note:* The variables that were not significant, but included in the model were: number of Family Health Strategy physicians, number of X-ray machines, number of hospitalizations attributable to asthma, basic health spending per capita, and sanitation spending per capita.

Figure 7.5

Socioeconomic Status As A Driver of Child Survival Rates

⁷⁸ Panel data regressions were used controlling for municipal, year-fixed effects and state time-trends. The list of controls includes municipal characteristics (e.g., religion, culture, etc.); time-varying factors that are constant across municipalities (e.g., inflation); and time-varying factors that are constant within states (e.g., state government elections or state taxes). Tables with the complete regression results are shown in Appendix V.

⁷⁹ Poor birth outcomes are those with an APGAR score lower than 7 (Appendix V).

⁸⁰ Lavy et al. (1996), for example, showed that an increase in available birth services increased child survival rates and child height and weight in Ghana.

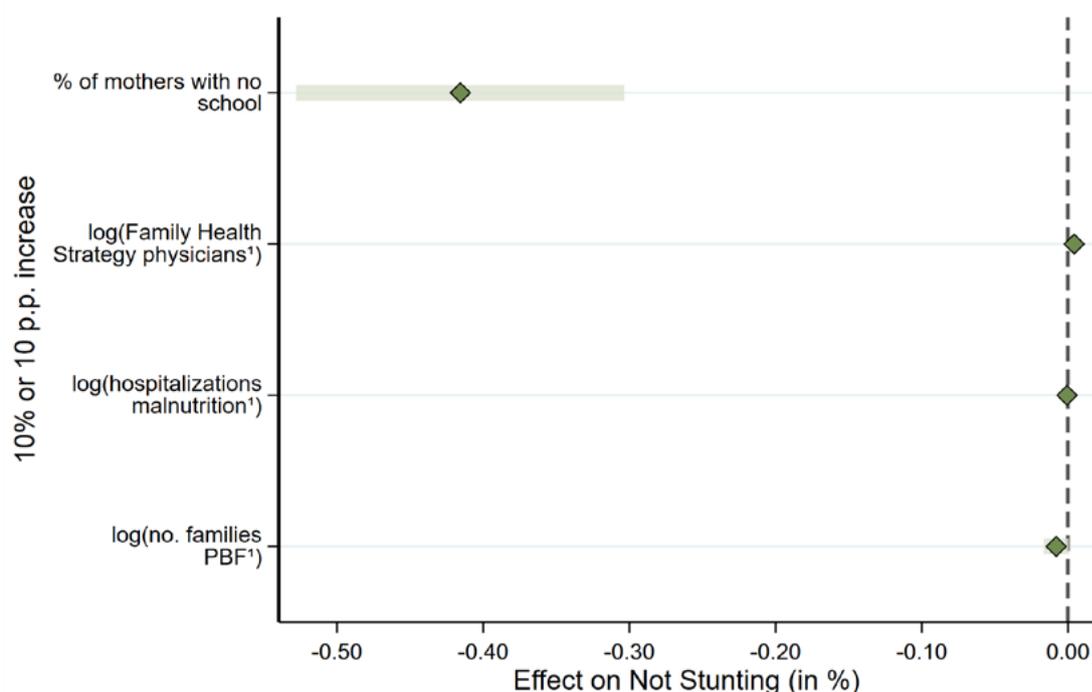
There is no statistically significant correlation between health care expenditure and child survival. However, evidence shows that public health spending reduces child mortality rates in countries with better governance (Rajkumar & Swaroop, 2008). Returning to the example of Cocal dos Alves, the child survival component increased from 0.939 to 0.958 over 12 years. Despite being small in absolute terms, this increase is around three times higher than the national average⁸¹ Variables that might explain this include the fact that Cocal dos Alves reduced the share of births with poor outcomes and the share of mothers with no education by 76.5 percent and by 58.9 percent, respectively.

Children Under Five: Not Stunting

Figure 7.6 shows the not-stunting subcomponent. The most important correlation refers to mothers' education. As has been shown in other research, a low level of education among mothers is negatively associated with child outcomes such as child survival, height, and birth weight. Additionally, the number of families receiving Bolsa Família (PBF) in a municipality has a negative effect on not-stunting rates. Box 7.5 looks at the causal effect of PBF on the not-stunting component in more detail.

Socioeconomic Status As A Driver of Not-Stunting Rates

Average Effects from the Panel Estimation



¹Variables per 100,000 inhabitants. Note: The variables that were not significant but included in the model were: basic health spending per capita, percentage of poor birth health outcomes, and percentage of insufficient prenatal care.

Figure 7.6
Socioeconomic Status As A Driver of Not-Stunting Rates

In Ibimirim, not-stunting rates notably increased by 3.4 between 2007 and 2019 compared to that of Brazil, which increased by 2.0 percent, on average. Over the same period, the share of mothers with no education in Ibimirim decreased by 74.5 percent. *Higher education among mothers relates to significant improvements in HCI.*

⁸¹ From 2007 to 2019, Brazil had increased on average by 0.36 percent in the Child Survival component. Cocal dos Alves increased by 1.99 percent.

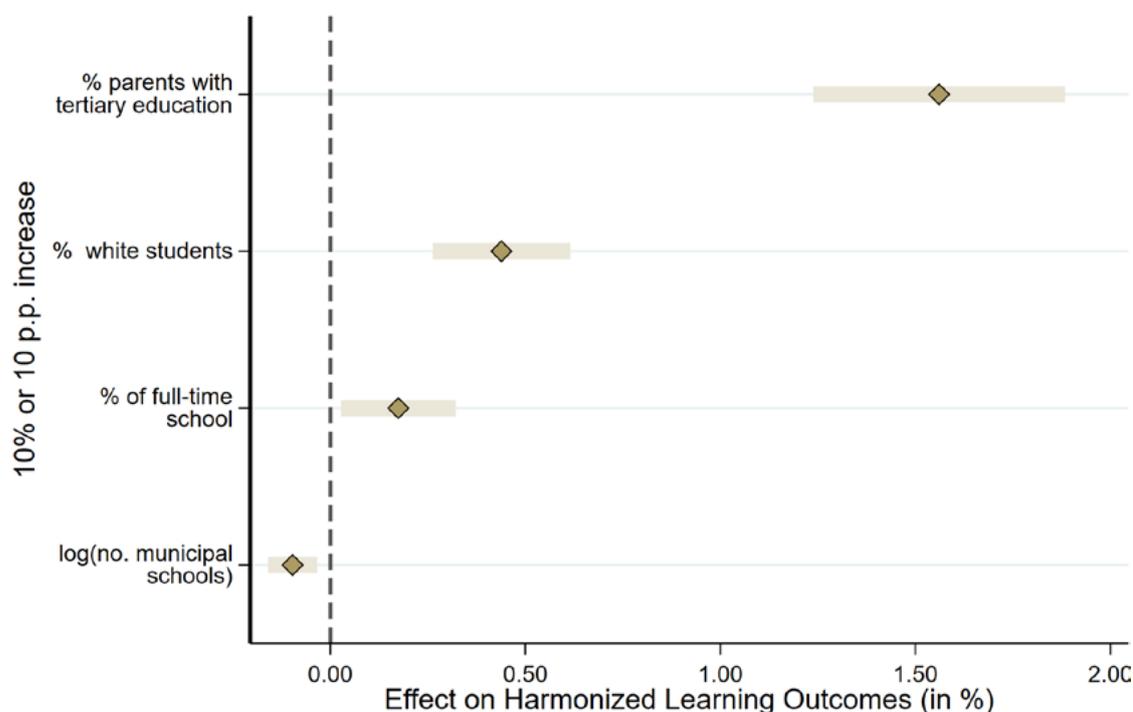
School-Age Children: Education

Harmonized Learning Outcomes. Figure 7.7 shows that family’s educational background and access to full-time school are positively correlated with HLOs. An increase of 10 percent in the proportion of parents with a college degree correlates with an increase of 1.7 percent in the HLO. These results correspond with the literature showing a strong relationship between tertiary parental education and children’s educational outcomes. Furthermore, figure 7.7 demonstrates that a 10 percent increase in full-time school is associated with 0.2 percent increase in HLO.

Parental education is associated with a higher quality of education.

In addition, there is a positive correlation between the proportion of white students in a municipality and the HLO. This is likely to due to the fact that this variable proxies for other variables such as household income. The negative correlation between the number of schools per municipality and HLO likely captures the complexities of larger school networks (Ostrom, 2000).

Full-Time School & SES As Drivers of Harmonized Learning Outcomes
Average Effects from the Panel Estimation



Note: The variables that were not significant but included in the model were: number of families receiving PBF, school infrastructure index, private school dummy, education spending per student, percentage of students living with parents, and number of teenage pregnancies.

Figure 7.7
Full-Time School & SES As Drivers of Harmonized Learning Outcomes

Expected Years of School. There is a positive correlation between family structure and EYS when the student lives with both parents. This correlation could be a proxy for better socioeconomic factors such as income. Figure 7.8 shows that a 10 percent increase in the number of students living with both parents increases the EYS by 0.2 percent. In addition, school infrastructure, full-time school, and per capita spending on education seem to be positively correlated with EYS. Figure 7.8 illustrates that this correlation is more significant for the first two factors. A 10 percent increase in school infrastructure and full-time school increases the EYS by 0.16 percent and 0.17 percent, respectively.

The finding that teenage pregnancy is negatively correlated with EYS is in line with the existing literature (Almeida et al., 2006; Teixeira & Medalozzo, 2019). Pregnant teenagers often drop out of school to take care of the child or to prematurely enter in the labor market. Although Brazil has seen improvements in reducing teenage pregnancy, the percentages remain significant.

Another important factor that might correlate with HCI education that was not explored under the regressions are teachers' characteristics. Box 7.4 discusses in detail this potential driver.

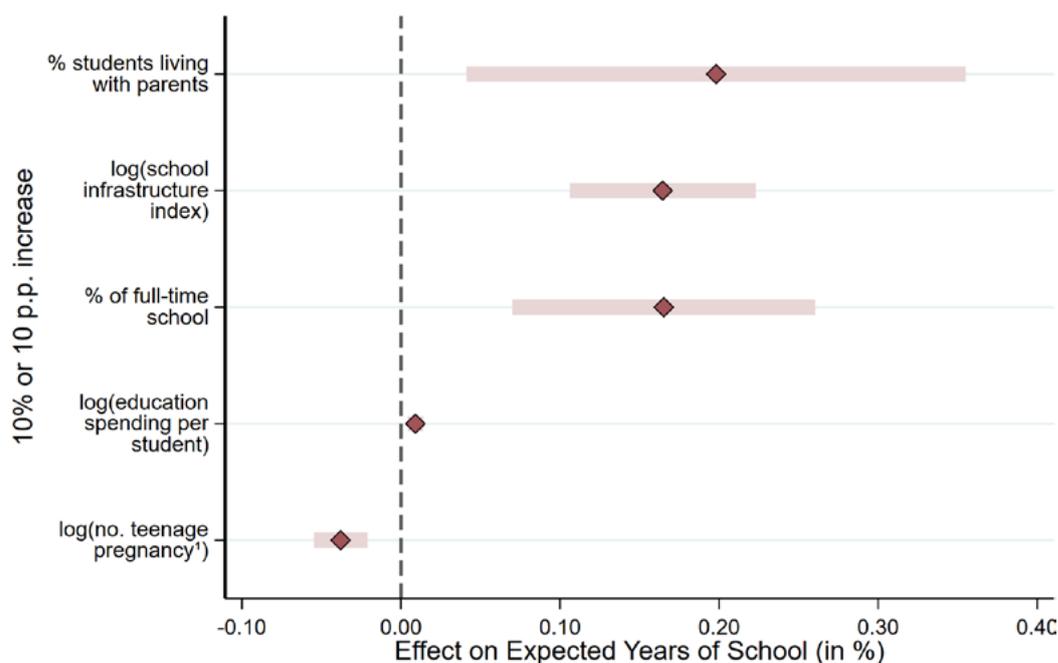
Teenage pregnancy is associated with low expected years of school.

A significant part of Cocal dos Alves's high HCI is due to its outstanding performance in education. Between 2007 and 2019, the city increased its HCI education component by 25

percent, well above the national average increase of 11 percent. This increase can be explained by the factors described in this section. For example, in 2007, there was no full-time upper secondary school in Cocal dos Alves, however by 2019, 98 students were enrolled in full-time upper secondary education (representing 60 percent of total upper secondary students). From 2007 to 2019, the city also reduced the teenage pregnancy rate by 34.9 percent, which likely had positive impacts on school attendance. Also, the proportion of parents with tertiary education tripled, probably indicating an improvement in the socio-economic indicators that affect education outcomes. *Advances in education follow improvements in social indicators.*

School Structure and SES As Drivers of Expected Years of School

Average Effects from the Panel Estimation



¹ Variables per 100,000 inhabitants. *Note:* The variables that were not significant but included in the model were: number of families receiving Bolsa Família, number of municipal schools, private school dummy, percentage of white students, and percentage of parents with tertiary education.

Figure 7.8
School Structure and SES As Drivers of Expected Years of School

Box 7.4

Do Teachers' Working Conditions Affect Learning in Brazil?

Prof. Naercio A Menezes-Filho

Inspira, University of São Paulo, Brazilian Academy of Sciences

Despite great progress in terms of access to education and average years of schooling in the last thirty years, learning is still very low in Brazil. Part of these learning difficulties relates to family background in a broad sense and part to school management and teachers' working conditions.

In terms of family background, recent literature has emphasized the importance of early childhood development (ECD) as a key phase in developing human capital (Heckman Equation, 2015). Resilience and perseverance are similarly essential to the learning process. Children who go through a long period of toxic stress are likely to fail to develop these abilities when the window of opportunity opens (Shonkoff et al., 2012). In Brazil, about 20 percent of children aged 0 to 6 come from poor families that do not receive any cash transfers, 25 percent live in houses with inadequate infrastructure (over-crowded or precarious), and 50 percent do not have access to sewage systems. These are significant hurdles in developing cognitive and socio-emotional skills in Brazil.

The poor performance of Brazilians in the PISA test score seems to be related to poor cognitive and socio-emotional skills. Pietra et al. (2020) used the fact that the PISA 2015 was computer-based and that the position of questions in the exam was randomized to study the performance of the Brazilian students relative to other countries. They found that the Brazilian students had the highest drop in performance in the exam amongst all countries that participated in PISA 2015. This drop in performance occurred because most Brazilian students do not even look at most of the questions or try to solve them, especially those that were placed at the end of the exam. This result suggests that Brazilian students lack the intrinsic motivation to go through all questions of an exam that does not evaluate them individually, as opposed to students in OECD and Asia.

Another important component of the human capital equation is school management and teacher working conditions as teachers could partially improve the impacts of poor socioeconomic conditions that stem from the family. The quality of Brazilian schools varies substantially across sectors (private versus public), across regions, and between rural and urban areas. Schools can improve student performance if they have better inputs and adopt better management and teaching practices (Glewwe & Kremer, 2006).

The literature emphasizes that the influence of teachers does count in student learning, that teacher motivation and ability to transmit knowledge can make a difference in a classroom, and that students matched with a good teacher accumulate more human capital in the long run (Rockoff, 2004; Hanushek & Rivkin, 2010; Chetty et al., 2014a; Jackson et al., 2014). In a recent paper, Marioni et al. (2020) examine whether teacher human capital and working conditions impact student performance, after controlling for the teacher, student, and match fixed-effects. Their focus is on teacher characteristics such as education, training, family income, experience, tenure, multiple jobs, and hours worked, controlling for unobserved students and teachers' traits such as teacher quality and student cognitive ability, which are fixed over time and for the match between them. The structure of their study is based on Woodcock (2015), which was originally designed to model the behavior of firms and workers, using only the variation

Box 7.4 (continued)

in teacher characteristics over time for a given teacher/student match. The data come from the 2005 Longitudinal Study of School Generation project (Estudo Longitudinal da Geração Escolar, GERES), which follows approximately 10,000 students from four large Brazilian cities over four years (Franco et al., 2008). The results show that the number of teachers' working hours positively impacts student achievement in both Portuguese and mathematics exams. Teachers who work full-time at a school have an impact of 24 percent of a standard deviation on Portuguese test scores relative to part-time teachers and an impact of 30 percent on the standard deviation in math. Moreover, teachers with more than 15 years of experience in the profession have a positive effect on Portuguese test scores (24 percent of the standard deviation) compared to teachers who have less than one year of experience. This finding suggests that more experienced teachers may better exploit their students' skills, leading them to achieve higher test scores. Interestingly, however, teacher experience and tenure do not have a significant impact on mathematics scores, while academic qualifications of teachers do. Students whose teachers hold a master's or doctorate degree score higher by approximately 55 percent of a standard deviation relative to the mean value, even after student-teacher match fixed-effects are controlled for.

In sum, family and teacher conditions both improve children's human capital accumulation. In Brazil, family conditions are critically important because a significant share of children live in poor environments and are therefore unable to develop the cognitive and socio-emotional abilities that are essential for human capital accumulation while teachers also lack adequate work conditions. Many teachers work in more than one school, dedicating only a few hours to the students of each school, and some lack qualifications to teach math. Therefore, one policy that could potentially improve human capital in Brazil is maintain teachers in one school only, so that they could spend more hours interacting with their students, have more time to prepare classes and to give feedback to students. And we must improve household conditions as well, by investing in infrastructure and improving existing income transfers programs.

Adulthood: Adult Survival Rate

The driver that seems most relevant in explaining the adult survival rate is homicides, as highlighted in figure 7.9. A 10 percent decrease in homicides would increase adult survival by approximately 0.10

Decreasing the number of homicides can increase the adult survival rate.

percent. Moreover, there is a gender imbalance in this ratio as men tend to live shorter lives. This imbalance has decreased in the last few years (Appendix V) and is positively correlated with adult survival, which is probably due to fewer deaths of men in particular by violent causes. For example, in 2019, 67.3 percent of all-cause of adult deaths were from men if situation was balanced this value would be closer to 50 percent. The PBF is also correlated with negative effects on the adult survival rate. This is likely due to the fact that the program is a proxy for poverty and not because of the program itself.

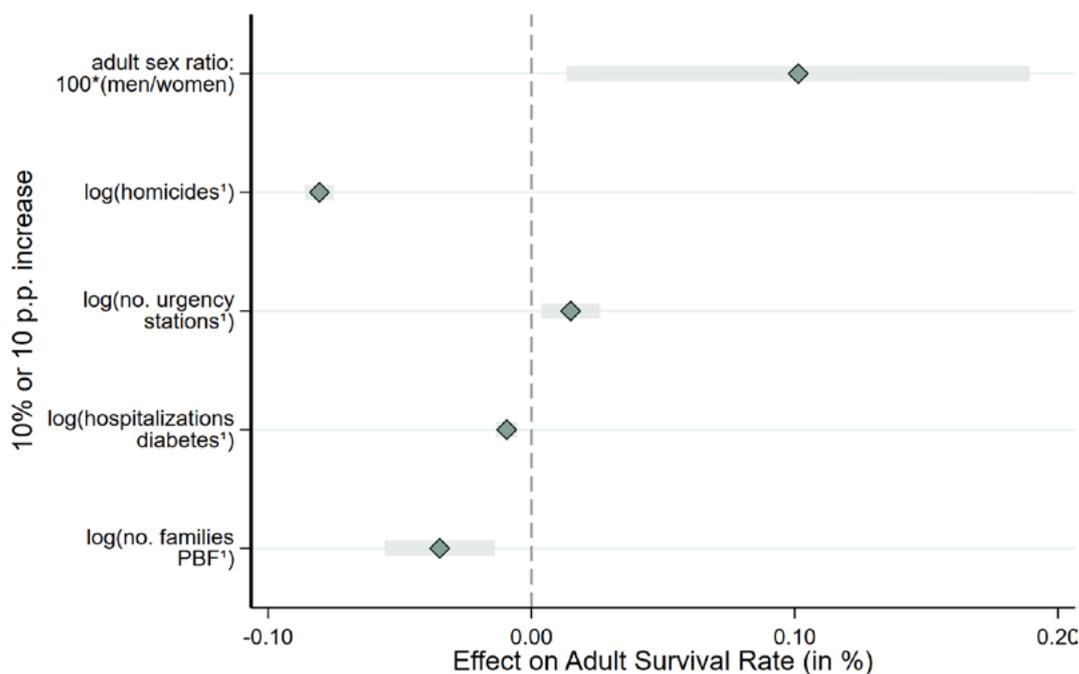
The number of hospitalizations due to diabetes is yet another factor that negatively correlated with the adult survival rate. Hospital infrastructure is also an important factor for health outcomes: a 10 percent increase, in the number of urgency stations would improve the adult survival rate by 0.02 percent.

Indeed, from 2007 to 2019, Ibimirim the adult survival component increased from 0.834 to 0.883, meaning that an additional five adults out of 100 survive until age 60. This increase is higher than the national

average⁸² and can be explained by the city's significant reduction in homicides (22 percent) and diabetes hospitalizations (34.3 percent). *Ibimirim increased their adult population's chance of surviving.*

Homicides & Demographic Structure As Drivers of Adult Survival Rate

Average Effects from the Panel Estimation



¹ Variables per 100,000 inhabitants. Note: The variables that were not significant but included in the model were : number of hospital beds, number of hospitalizations attributable to alcohol, number of hospitalizations attributable to hypertension, health spending per capita, and percentage of parents with tertiary education.

Figure 7.9
Homicides & Demographic Structure as Drivers of Adult Survival Rate

Overall Results

Table 7.1 summarizes the main factors that seem to explain the HCI and its components.

It shows that socioeconomic measures are closely associated with human capital accumulation as all HCI components have at least one driver related to socioeconomic status. Public expenditures, on the other hand, do not seem to play a significant role as education spending per student is only correlated with one of the HCI components. School structure, such as the percentage of full-time upper secondary schools and the school infrastructure index seem to explain improvements in the education components of the HCI, while hospital structure and hospitalizations seem to explain health outcomes of the HCI. The percentage of births with poor health and insufficient prenatal care as well as homicides also seem to play an important role in health outcomes. Decreases in these factors improve adult survival and child survival rates. Finally, teenage pregnancy seems to reduce EYS.

⁸² From 2007 to 2019, the adult survival rate component increased by 2.23 percent in Brazil compared to a 5.83 percent in Ibimirim.

<i>Variables</i>	<i>HLO</i>	<i>EYS</i>	<i>Adult Survival</i>	<i>Not Stunting</i>	<i>Child Survival</i>
Socioeconomic					
% white students	↑↑↑	~	-	-	-
% students living with mother & father	~	↑↑↑	-	-	-
% parents with tertiary education	↑↑↑	~	~	-	-
% of mothers with no school	-	-	-	↓↓↓	↓↓↓
Proxy poverty (families in PBF)	~	~	↓↓	↓↓	↓↓
Public Expenses					
Health spending per capita	-	-	~	-	-
Basic health spending per capita	-	-	-	~	~
Sanitation spending per capita	-	-	-	-	~
Education spending per student	~	↑	-	-	-
School Structure					
School infrastructure index	~	↑↑↑	-	-	-
No. municipal schools	↓↓	~	-	-	-
Dummy has private school = 1	~	~	-	-	-
% full-time upper secondary schools	↑↑↑	↑↑↑	-	-	-
Hospital Structure					
No. x-ray machines	-	-	-	-	~
Hospital beds	-	-	-	-	-
Physicians Family Health Strategy	-	-	-	↑	~
No. urgency stations	-	-	↑↑	-	-
Hospitalizations					
% schools with plumbing	-	-	-	-	↑↑
Hosp. due to diabetes	-	-	↓	-	-
Hosp. due to alcohol	-	-	~	-	-
Hosp. due to hypertension	-	-	~	-	-
Hosp. due to malnutrition	-	-	-	↓	↓
Hosp. due to sanitation-related	-	-	-	-	↓
Hosp. due to asthma	-	-	-	-	~
Birth & Pre-Birth Conditions					
% births in poor health	-	-	-	~	↓↓↓
% insufficient prenatal care	-	-	-	~	↓↓↓
Others					
No. teenage pregnancies	~	↓↓	-	-	-
Adult sex ratio: 100*(men/women)	-	-	↑↑↑	-	-
Homicides	-	-	↓↓	-	-

Note: Full regression tables can be found in Appendix V.

↑↑↑ or ↓↓↓ represents 10 percent or 10 pp increase in the explanatory variable increase the dependent variable in more or equal to 0.1 percent (in absolute values)
 ↑↑ or ↓↓ represents 10 percent or 10 pp increase in the explanatory variable increase the dependent variable in more or equal to 0.01 percent (in absolute values)
 ↑ or ↓ represents 10 percent or 10 pp increase in the explanatory variable increase the dependent variable in less than 0.01 percent (in absolute values)
 ↑ represents a positive effect
 ↓ represents a negative effect
 ~ not significant
 - not included in the model

Table 7.1 Overall Results

Box 7.5 Bolsa Família's Effect on Health and Educational Outcomes

Bolsa Família (PBF) provides income to poor families, especially those with children. Previous research has shown that education is highly correlated with poverty and health outcomes. Shei et al. (2014) showed that PBF increases the likelihood of visits to health centers for preventive services. Simoes and Sabates (2014) and Neto (2010) found a positive effect of families receiving PBF on children's educational outcomes. Finally, as most recently discussed by Chetty et al. (2014b) and Heckman (2006), the income that parents receive when children are younger may affect children's educational outcomes later.

After controlling for possible endogeneity, it was possible to detect a positive and statistically significant relationship between the PBF and expected years of school (EYS) and not-stunting subcomponents. To deal with the potential biases, a methodology using an instrumental variable was proposed. The instrument used was Benefício de Prestação Continuada program (number of elderly people over 65 years old who receive a minimum wage cash benefit), which is correlated with PBF but is not correlated with the error term of our main estimation.

Figure B.7.5 shows the results of this exercise. An increase of 10 percent in the number of families who receive PBF would explain a 0.3 percent increase in EYS. This result is in line with the work of Neto (2010) and Simoes and Sabates (2014). A possible channel that explains this positive relationship is that in order for families to receive the benefit, their children must be enrolled in and attending school.

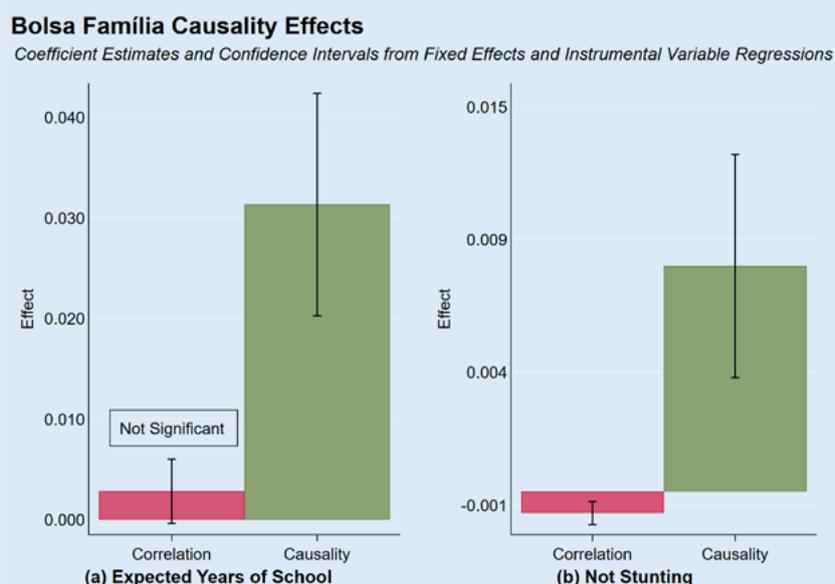


Figure B.7.1
Bolsa Família Causality Effects

There is also a positive and statistically significant effect of PBF on not stunting. An increase of 10 percent in the number of families who receive PBF may explain a 0.09 percent increase in this subcomponent. The channel that may explain the effect of the PBF is the frequency with which children need to go to the health center that are required by the program (De Brauw et al., 2012; Paes-Sousa & Santos, 2009). Paes-Sousa and Santos (2009) concluded that a "child receiving PBF had 26 percent more chance of having the appropriate height/age indicator

Box 7.5 (continued)

when compared to non-beneficiaries.” In particular, De Brauw et al. (2012) concluded that the PBF is effective in improving the body mass index but not in height and weight. They also showed that when mothers receive PBF, the likelihood that her children are born at full-term increases by 10.7 percentage points compared with mothers who do not receive the PBF.

These results demonstrate the importance of PBF, not only for reducing poverty but also for improving health and educational outcomes.

Human Capital Index Drivers: Results for HCI

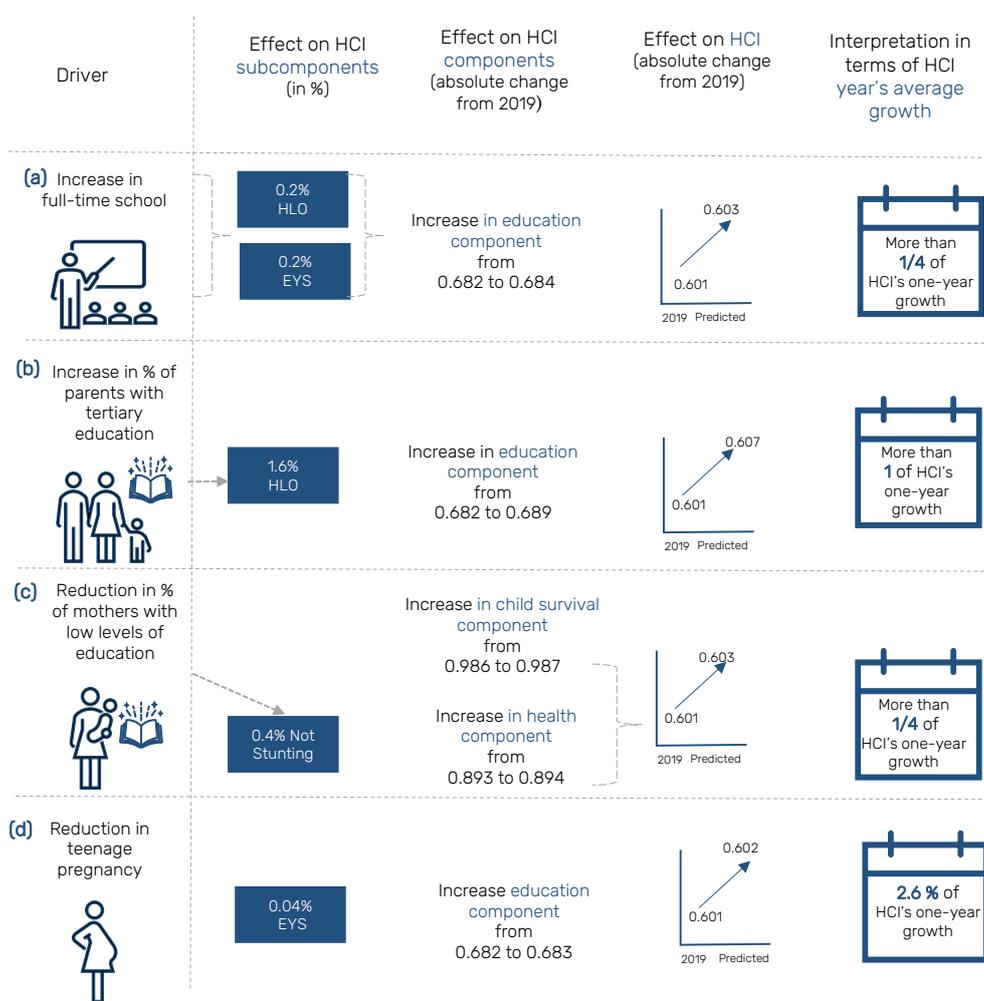


Figure 7.10 Simulated Effects on HCI

The previous section presents the key drivers of the HCI component and its subcomponents. But a question remains: what is the impact on the entire Human Capital Index? Figure 7.10 displays the overall impact on HCI.

As shown in the last section, the effect of a 10 percent increase in the number of full-time schools would increase HLO by 0.2 percent and EYS by 0.2 percent. If this improvement were to occur in all municipalities in Brazil, the education component would have increased from 0.682 to 0.684 in 2019. This would imply an increase in the overall 2019 HCI from 0.601 to 0.603, or the equivalent of more than one-quarter of the HCI's one-year growth (figure 7.10.a).

Also, increasing the percentage of parents with tertiary education by 10 percentage points has an important effect, increasing HLO by 1.6 percent. An effect of this magnitude in all municipalities in Brazil would raise the 2019 education component of HCI from 0.682 to 0.689, increasing overall 2019 HCI from 0.601 to 0.607, or the equivalent of more than one year of HCI growth (figure 7.10.b).

Another factor that appears to be an important factor in increasing the HCI is the reduction in the percentage of uneducated parents. A reduction in 10 percent in the proportion of parents with low levels of education increased child survival by 0.1 percent and not stunting by 0.4 percent. If this improvement were to occur in all municipalities in Brazil, the health component in 2019 would increase from 0.893 to 0.894 and the child survival component would increase from 0.986 to 0.987. This would create an increase in the 2019 HCI from 0.601 to 0.603 or the equivalent of more than one-quarter of a year in HCI growth (figure 7.10.c).

Full-time school, teenage pregnancy, and parents' education are key factors associated with human development.

Finally, addressing teenage pregnancy would have an important effect on HCI. A 10 percent reduction in teenage pregnancy increased EYS by 0.04 percent. If this progress were to occur

across all municipalities, it would increase the variation of the 2019 education component from 0.682 to 0.683 and overall HCI from 0.601 to 0.602. This is equivalent to 2.6 percent of HCI's one-year growth (figure 7.10.d).

— The Drivers of Human Capital

The findings in this chapter shed light on the past and the future of the human capital index in Brazil, and explains the growth trajectory seen in chapter 3. Municipalities in Brazil have improved in many aspects associated with HCI: enhancement in school and hospital structure, reduction in teenage pregnancy, decreases in homicides rates, decreases in hospitalizations due to malnutrition, among others.

Ibimirim, for example, which was selected as a study case because of the large HCI improvement in the last years, saw 20 percentage point decrease in the number of uneducated mothers; the number of children hospitalized due to sanitation problems fell by 90 percent; the number of homicides declined by 22 percent; the percentage of full-time classes available at the high-school level sharply increased; and the number of teenage pregnancies was almost cut in half. As the econometric exercises show, all of these factors are associated with an increase of human capital.

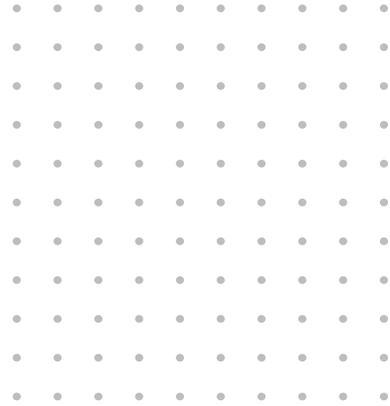
To some extent, this chapter also explains why the many Brazils described in chapter 2 exist by showing the degree to which variables that affect HCI components differs between municipalities (Appendix V). Some of these variables include full-time schooling, homicides, and hospitalizations due to malnutrition and sanitation related problems. This chapter indicates some of the areas on which long-term policies should concentrate to help states recover from the human capital losses due to COVID-19. These policies include programs to reduce teenage pregnancy, increase full-time schooling, and improve access to prenatal sessions and birth outcomes. Bolsa Família has also been shown to play a significant role in human capital accumulation: an increase in 10 percent of the number of families who receive Bolsa Família explained a 0.3 percent increase in the EYS and 0.09 percent increase in not stunting in 2019. In this sense, this chapter provides direction for the future of human capital in Brazil.

However, as highlighted at the beginning of the chapter, the present analysis did not include all aspects that explain the human capital growth in Brazil. The following two chapters explore more in-depth policies and use qualitative research to explain the other factors not included here.

Chapter 8

National Policies to Foster Human Capital in Brazil

The Road to Human Capital Progress



Main Messages

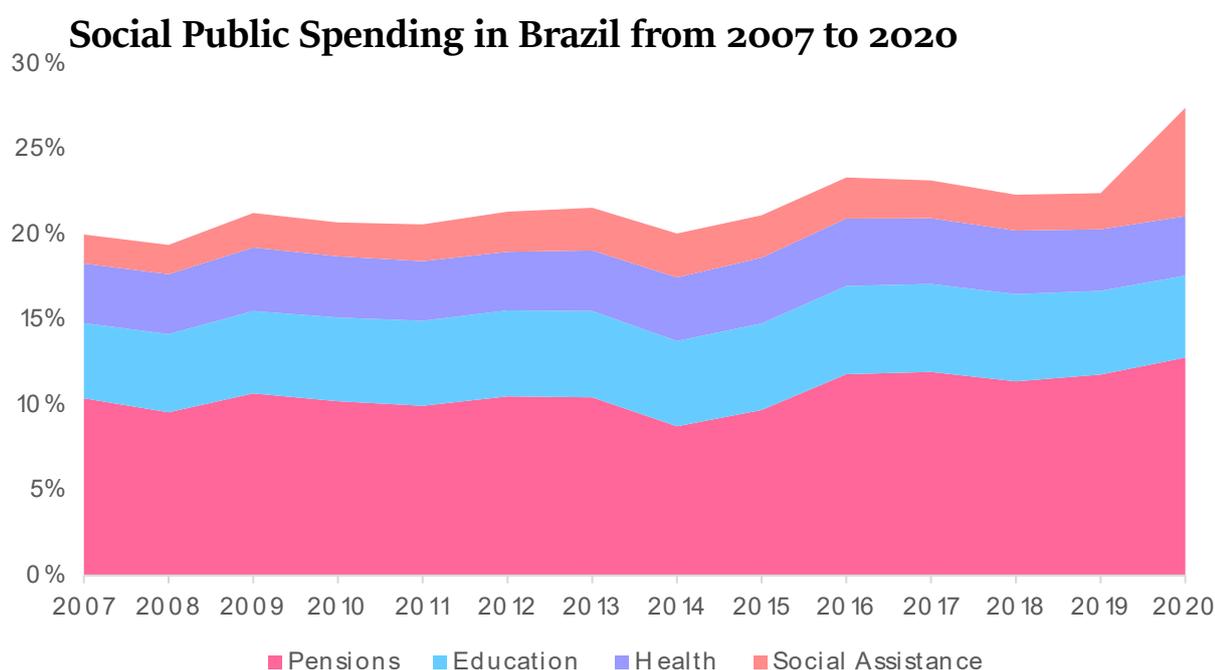
- ❖ This chapter presents selected policies implemented at scale that have contributed to the positive HCI performance in Brazil.
- ❖ Brazil's organization of governance in which the federal government provides framework and general guidance for states and municipalities to execute policies is generally effective.
- ❖ Brazil has developed programs and reforms oriented to support social protection and early childhood development in education.
- ❖ Policies for children and adolescents have prioritized reforms aimed at improving school appeal to the new generation of students as well as facilitating the school to labor market transition.
- ❖ For adults, policies have been designed to mitigate their propensity to engage in risky behavior and increase their access to the labor market.
- ❖ HCI improvement is highly dependent on reducing inequality, not only in terms of income, but also in terms of access to and quality of public services.

This chapter discusses the national policies related to pre-pandemic HCI growth. It discusses the implementation of policies that likely contributed to the HCI performance observed in Brazil from 2007 to 2019 and sheds light on reforms that could lead to better performance in the future. These suggested reforms are particularly relevant in the context of the COVID-19 pandemic recovery, which is predicted to reverse most of the advances of the last decade.

The sections in this chapter begin by explaining the public budget allocation for each of the four public services examined: education, healthcare, social assistance, and pensions. They then explain the responsibility of the different levels of government in their implementation and look at selected federal policies implemented at scale that may have contributed to Brazil's positive HCI performance. This chapter also discusses other areas that the federal government has prioritized for action in the coming years. Together, these initiatives create a social policy foundation from which Brazilian policymakers can implement further reforms to achieve the human capital and productivity goals as stated in the national legislation.

— _ Financing of Social Sectors

As a proportion of GDP, public spending in Brazil (federal, state, and municipal) by sector tends to be steady. For example, from 2007 to 2020, Brazilian social public expenditures as a share of GDP were on average 21.3 percent per year, with spending at around 5 percent on education, 3.6 percent on health, 2.2 percent on social assistance and labor market policies, and 10.5 percent on pensions (figure 8.1). Although Brazil has a relatively young population, it spends a considerable amount on pensions compared to international standards. With an aging population, spending on pensions will represent an even larger share of the national budget in the coming decades. Estimates suggest that in the absence of significant reforms like the Federal one that took place in 2019, all primary federal spending allowed under the “budget ceiling”⁸³ would have to be used for pension payments alone by 2030 (World Bank, 2017a).



Source: World Bank 2022

Figure 8.1
Social Public Spending in Brazil from 2007 to 2020

⁸³ Constitutional Amendment No. 95, also known as the Constitutional Amendment of the Public Expenditure Ceiling, is a limitation on the growth of Brazilian government spending for 20 years. This amendment limits public spending and investments to the same amount spent in the previous year, adjusted for inflation.

Data also shows that there is an overall stable trend of higher public resource spending on the elderly population as opposed to on children and youth. Public social spending also privileges education over healthcare, with much smaller shares allocated to social assistance and labor market policies. However, data also points to an increase in social assistance and labor market spending for 2020, which jumped from 2.2 percent of the GDP to 6.4 percent. This was in part due to the mobilization of resources to counteract the economic effects of the COVID-19 pandemic (including the emergency cash transfers under Auxílio Emergencial), especially among the most vulnerable populations.

— Implementation of Social Sector Policy across Government Levels

The national Constitution of 1988 set the ground for public spending and fiscal federalism in Brazil, which are applied to Brazil's leading public sectors: education, health, and social assistance. In this arrangement, the federal government acts as the main organizer of policies, setting frameworks and regulations as well as setting minimal monitoring standards for national policies while municipalities and states execute policies, adapting them to their specific population needs and adjusting the necessary funding.

Education

The federal government is responsible for planning and policymaking.

Brazil's education system is jointly financed and implemented by federal, state, and municipal governments to provide public education to 40 million students. An additional 8 million students are enrolled in private schools.⁸⁴ The federal government is responsible for overall education planning and policymaking (such as setting the minimum wage of teachers and the rules governing funding formulas) as well as exercising normative, redistributive, and supplementary functions in relation to the other educational jurisdictions. Apart from its role overseeing education policies, the federal government also manages some technical and military schools and is the main provider of tertiary education in Brazil.

States are responsible for financing public upper secondary schools (15- to 17-year-olds) and overlap in school management with municipalities, which are responsible for financing lower secondary education. Municipalities are also responsible for funding early childhood education and elementary school, i.e., daycare (up to age three), pre-school (four to five-year-olds), and elementary school (six to fourteen-year-olds).

A key element to guaranteeing public education services is the constitutional obligation of municipal and state governments to spend 25 percent of net tax revenues on education, and the supplementation of these funds by federal transfers. These transfers are managed by the National Education Fund (FUNDEB), a redistribution tool designed for the various levels of government to finance basic public education from daycare to upper secondary schools. FUNDEB was recently reformed in 2021 to increase federal financing contributions and include elements of performance (results-based funding) as part of the transfer criteria (Box 8.1).

⁸⁴ Law No. 9.394/1996 establishes the guidelines for national education. See http://www.planalto.gov.br/ccivil_03/leis/l9394.htm.

Box 8.1 The New FUNDEB

The Novo Fundo de Manutenção e Desenvolvimento da Educação Básica (New Fund for Maintenance and Development of Basic Education, FUNDEB), was created by Constitutional Amendment No. 53/2006, replacing the Fundo de Manutenção e Desenvolvimento do Ensino Fundamental e de Valorização do Magistério (Fund for Maintenance and Development of Basic Education and the Appreciation of Teaching, FUNDEF), which was effective from 1998 to 2006. The fund is composed of 27 different accounts, and it relies on contributions from the three levels of government (federal, state, and municipal). Each municipality and state deposit a share of their tax revenues into a joint account. The federal government complements the resource pool based on an established minimum amount per stage of education and per student for each year. Education networks with higher student enrollments and lower tax revenues for education are net recipients. In contrast, networks with relatively more taxes collected than enrollments transfer some of their resources to the other networks (Davies, 2006; Gouveia & Souza, 2015).

The New FUNDEB is a modification of FUNDEB, which was in place from 2007 to 2020. There are four main differences:

1. The New FUNDEB includes other education professionals on the fund payroll.

Under the new rules, up to 70 percent of the fund has to be used to pay education staff, whereas under FUNDEB 60 percent was directed to teachers alone.

2. The New FUNDEB increases the overall federal contribution to education. Before 2020, resources from the federal government were only allocated to states where pupil/year spending was below the national minimum, up to 10 percent of the sum of all state funds in the country. In the New FUNDEB this amount will reach 23 percent of the sum of all state funds in the country by 2026.

3. The New FUNDEB incentivizes adherence to the national curriculum. Under FUNDEB, municipalities that did not meet national minimum standards would not receive complementary funds from the federal government. Under the new regime municipal school systems that do not meet minimum standards will still receive complementary funds.

4. The New FUNDEB introduces additional support for early childhood education.

When the education network receives extra allocations from federal funding, 50 percent of these resources must be directed to early childhood education.

These criteria are designed to improve regional equity using a cash transfer mechanism that focuses on municipalities rather than states. This can significantly increase investment per student in the poorest municipalities and prevent the unnecessary transfer of funds to affluent municipalities in poor states.

The New FUNDEB also incorporates elements of school performance into the cash transfer criteria: 2.5 percent of the total resources is destined for public school systems that show improvements in attendance and learning indicators. This introduces a results-based incentive mechanism to spur education quality and efficiency beyond the minimum spending per student. The eligibility criteria follow recommendations for a sound managerial environment in schools including:

- School principals are chosen by a technical committee or with the participation of the school community according to technical merit and performance criteria

Box 8.1 (Continued)

- At least 80 percent of the students enrolled in the network participate in the national learning assessment
- Reductions in socioeconomic and racial educational inequalities measured by the national learning assessment
- The establishment of a normalized collaboration system between state and municipalities
- Curricular references are aligned with the National Common Curricular Base

Health

The federal government is the main financier of the public health system and is responsible for formulating national health policies.

The federal government is the main financier of the public health system. It is also responsible for formulating national health policies, which in turn, are implemented by states, municipalities, and other partners such as NGOs and private agents. The Ministry of Health is responsible for proposing policies, participating in co-financing, technical cooperation, evaluation, regulation, control and inspection, and conflict mediation (Brasil, 2006).

State governors have specific departments for health planning and the execution of policies. The state is also responsible for formulating policies as well as the coordination and planning of Sistema Único de Saúde (Unified Health System, SUS) service provision at the state level, following federal regulations. Both the Ministry of Health and state managers promote the decentralization of healthcare: *whenever possible, health services are to be executed by municipalities or states.*

Municipalities are the main actors in the provision of healthcare services. According to the Pacto Nacional pela Saúde (National Pact for Health), a document that organizes SUS, all municipalities are responsible for providing basic health care services and primary health surveillance. As with state governments, municipal governments are also able to formulate, coordinate, and plan their own health policies providing they adhere to national and state policies. They can also establish partnerships with other municipalities to provide access to procedures of complexity that are above those it can offer therefore guaranteeing the complete care of its population.

Municipalities are expected to be the main providers of basic healthcare as well as sharing part of the responsibility in the provision of medium-complexity care. When there is insufficient primary healthcare and medium-complexity care, the state government intervenes to contribute to the provision of health services. In order to guarantee high-complexity care and part of the medium complexity healthcare, regional organization is necessary. Regions can have four different configurations: (i) intrastate regions, composed of more than one municipality within the same state; (ii) intramunicipal regions, which would be appropriate for municipalities that are geographically large and have high population densities; (iii) interstate regions, made up of municipalities that border different states; (iv) border regions, made up of municipalities close to neighboring countries.

The decentralization of responsibility for service delivery provision has led to a restructuring and expansion the health network. Growth in outpatient facilities has been almost entirely led by municipal governments and has contributed to improving performance on key health indicators over time. For example, life expectancy at birth for Brazilians increased by 9.7 years between 1991 and 2019 (from 66.9 to 76.6 years of age) (IBGE, 2019c; Gragnolati et al., 2013).

Social Assistance

Political-administrative decentralization is also at the core of Brazil's social assistance provision where the family unit is given a central role in policy design and implementation. The Unified Social Assistance System (SUAS) organizes these social assistance services in Brazil. SUAS articulates the efforts and resources of federal, state, and municipal agents to execute and finance the National Social Assistance Policy (PNAS). SUAS classifies social assistance policies into two types of social protection: basic social protection and special social protection (medium and high complexity). Basic social protection focuses on preventive actions and strengthening family ties, and is provided at social assistance centers known as Centro de Referência da Assistência Social (Reference Center for Social Assistance, CRAS). Specialized social assistance centers, known as Centro de Referência Especializado de Assistência Social (Specialized Reference Center for Social Assistance, CREAS), provide medium-complexity social protection services. They target individuals and families whose rights have been violated without breaking family and community ties. In contrast, high-complexity special protection targets families and individuals who need to be removed from their family or community.

The federal government formulates, supports, and coordinates social assistance policies.

National social assistance policy management is the responsibility of the National Social Assistance Secretariat (SNAS), which is linked to the Citizenship Ministry. At the state and municipal levels, management is carried out by the state and municipal departments. Federal responsibilities include the formulation, support, and coordination of policies.

The states, in turn, take on the execution and management of social assistance within their sphere of competence, based on the municipality's managerial capacities, which are categorized into three levels: initial, basic, and full. Municipalities that have a functioning council and funding to provide basic social protection are eligible for initial management.

The SUAS management process also relies on the Tripartite Interagency Commission and the Bipartite Interagency Commissions. The first of these institutions coordinates the demands of federal, state, and municipal managers. In addition, it negotiates and agrees on operational aspects of social assistance policy implementation and, to this end, works closely with the second of these institutions to exchange information on the decentralization process. Bipartite Interagency Commissions are state bodies made up of representatives from the state and municipalities who represent the interests and needs of their region regarding social assistance policy. They determine the organization and management of the State Social Assistance System, following the deliberations of the State Social Assistance Council, the current legislation in effect, and the guidelines of the Tripartite Interagency Commission and the National Social Assistance Council (CNAS).

Finally, SUAS policy is carried out using specially allocated funds, which combine the resources of the three levels of government (federal, state, and municipal). Services are continuously financed through these social assistance funds, either directly by the provider or through co-funding, operated through fund transfers. Programs and projects have defined timeframes, and in-kind benefits are made by direct funding to citizens.

National Policies

This section describes some of the current human capital challenges for Brazil at different life phases and the efforts that have been made to address them (figure 8.2). The challenges and the national policies presented here mostly concentrate on inequalities that persist along the life cycle and affect human capital performance and its utilization. This section begins by looking at issues that are critical for children under five and policies directed towards the support of early childhood development. It continues by examining issues related to school-age children and the policy reforms that were made (i) to make school more appealing, (ii) to improve schools' capacities to provide quality education, and (iii) to ensure a smooth school to work transition. The section concludes with policies that affect all ages, in particular adulthood, including those related to labor market access, violence prevention as well as comprehensive health and social protection.

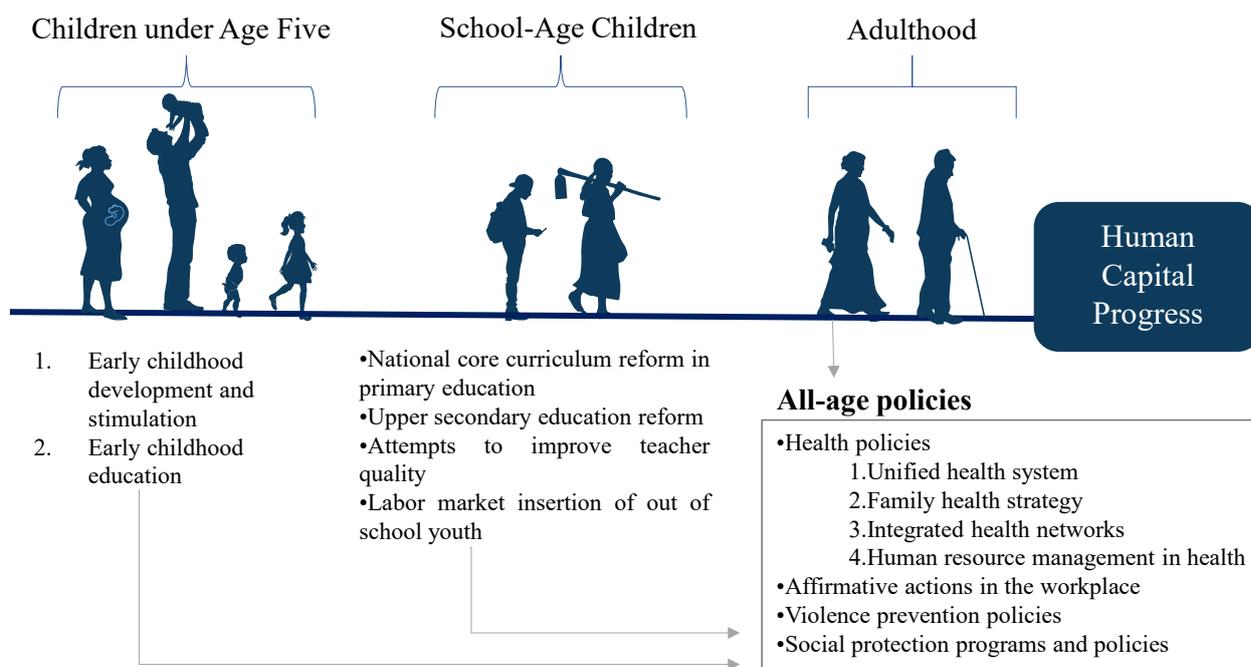


Figure 8.2
National Policies throughout the Life Cycle

Early Years

Three types of outcomes in early childhood are critical for life outcomes. They are physical growth and well-being, cognitive development, and socio-emotional development.

Skills development gaps between individuals and social groups emerge in early childhood and are closely linked to socioeconomic environments. Nurturing children in their early years is vital for addressing the effects of poverty and may be an effective way to break poverty's vicious cycle (Young, 2002). The development of abilities over a lifetime comes from different types of stimuli, which have a cascade effect; abilities beget other skills, as learning is continuous over time and generates new learning (Cunha & Heckman, 2007).

Conditions children face in poverty are also often associated with adverse health issues and other development issues. For instance, deficits in children's nutritional status and stunting (low height for age) are more prevalent among poor than non-poor children. Overall, children living in poverty score lower on standardized I.Q. and verbal ability tests and suffer from emotional and behavioral problems more frequently than non-poor children (Brooks-Gunn & Duncan, 1997). Thus, reasons to invest in young children go beyond economic returns, as early interventions help children escape poverty (Young, 2002). According to evidence collected from an American preschool program,⁸⁵ high-quality early childhood education produces a 7 to 10 percent return per year (Heckman, 2011).

Between 1991 and 2019, Brazil has made significant accomplishments in early childhood outcomes, especially regarding health indicators. The infant mortality rate, for instance, declined by more than 36 percent (from 18.7 to 11.9 per 1,000 live births), and the maternal mortality rate dropped by more than 19 percent (from 72.4 to 57.9 per 100,000 live births) (Ministério da Saúde, 2020). While some progress has been made with respect to early childhood education coverage in order to promote socioemotional and cognitive development, there is still room for improvement.

⁸⁵ Perry preschool program existed between 1962–1967, and was designed to provide high-quality education for economically vulnerable children. The program was conceived under a randomized control trial that aimed to understand how access to high-quality education impacted preschool-aged children and the communities where they live.

Despite the advancements made in early childhood development and education across the country, Brazil's poorest children are still the least likely to be enrolled in an educational institution. This is consistent with the Latin American context, where access to childcare services for children ages 0 to 5 is generally higher among more affluent households. In Brazil, as in many countries in the region, the wealthiest quintile has double the access to childcare and education institutions compared to the poorest quintile (Evans & Kosec, 2012). Making improvements to early childhood development (ECD) and education (ECE) as well as expanding the coverage of these programs continue to be urgent challenges for children under five.

Early Childhood Development and Stimulation

Early childhood development programs, either based on a one-time home visit or parent education programs, have demonstrated that they have a positive effect on early cognitive and socioemotional skills. Structured home-visit programs are intended to make positive changes in the home environment, which, in turn, positively affect children's development. In the long term, this translates into a potential increase in human capital in municipalities with such programs. Home-visit programs are a means to support vulnerable children, but do not substitute schools.

Recently, Brazil has been implementing one of the most extensive ECD home visitation programs in the world in terms of coverage through the Programa Criança Feliz (PCF) (box 8.2). The PCF aims to cover families with pregnant women and children in early childhood who are registered in Cadastro Único (the national registry of socially vulnerable people) and children who lost a parent during the COVID-19 pandemic. The goal of the program is to improve the quantity and quality of interactions between children and caregiver(s) by providing parents with information on early childhood development.

Box 8.2

Criança Feliz: The Home Visitation Program in Brazil

The Programa Criança Feliz (PCF) is a parental intervention program in Brazil that is also one of the largest home-visit programs in the world. Between 2015 and 2021, the program reached over 1.3 million children and pregnant women with more than 19,000 home visitors. The government's aim is to reach 3 million vulnerable children aged 0 to 3 by 2023. In 2021, the program's covered 12 percent of its potential beneficiaries, children aged 0 to 3 in Cadastro Único Registry, or 19 percent if the 2,644 municipalities that promoted home visits in July 2021 are the only municipalities counted (the other 2,926 municipalities did not adhere to the program or did not make any visits during July 2021).

The PCF consists of two related activities: home visits (the main activity), and intersectoral initiatives to strengthen regional policies for social assistance. Home visitors work with families to promote the strengthening of family skills and bonding between children and their caretaker(s). Home visitors establish a close relationship with socially vulnerable families and can refer them to other services provided by the government's social protection network. The success of the program depends on cooperation across networks at the federal, state, and municipal levels (Ministério da Cidadania, 2021).

The PCF was inspired by existing local child development support programs in Brazil, such as the Programa de Apoio ao Desenvolvimento Infantil (PADIN), implemented in the state of Ceará, and the Primeira Infancia Melhor (PIM) implemented in the state of Rio Grande do Sul. These interventions involve home visits as well as collective and community meetings to support and guide families in the care and education of their children in the early years.

Box 8.2 (continued)

PCF has faced challenges due to the fact that funding for the program is the same for every municipality. This makes implementing the program difficult in capitals and remote areas where implementation costs tend to be higher. Interventions need to be made so that the program can be adapted to these contexts while also considering cost-effectiveness and community needs.

During the COVID-19 pandemic the challenges to the implementation of this program was even greater as home visits could not be made. The use of technology for virtual visits or groups commonly used in developed countries may provide a solution to support families in places where home visits are more difficult, if not impossible. However, difficulties remain in reaching the most vulnerable families who do not have internet access.

The PCF acts on the premise that to reduce the cognitive and socio-emotional developmental gap among vulnerable children, it is necessary to modify the structure of stimuli to which children are exposed at an early age. Like all home-visit programs, PCF actions assume that by inserting a vulnerable family into the government protection system and strengthening child-parent bonds, parents will have more resources and support to promote their children's early learning. Consequently, this should diminish the developmental gap in poor children when they reach school age.

Early childhood development interventions such as PCF are essential to increasing Brazil's productivity as a whole and providing equitable opportunities for the disadvantaged. For that, other educational and health interventions are crucial, specifically universal access to daycare and pre-schools, both of which offer opportunities for child stimulation and development and which allow mothers to engage in other activities, whether paid or unpaid. Nevertheless, for ECD centers to be effective, they must satisfy quality standards and expose children to suitable activities and experiences (Evans & Kosec, 2012).

Early Childhood Education

International evidence suggests that quality early childhood education (ECE) has a significant impact on improving knowledge retention and learning at higher levels of education (Heckman, 2006).

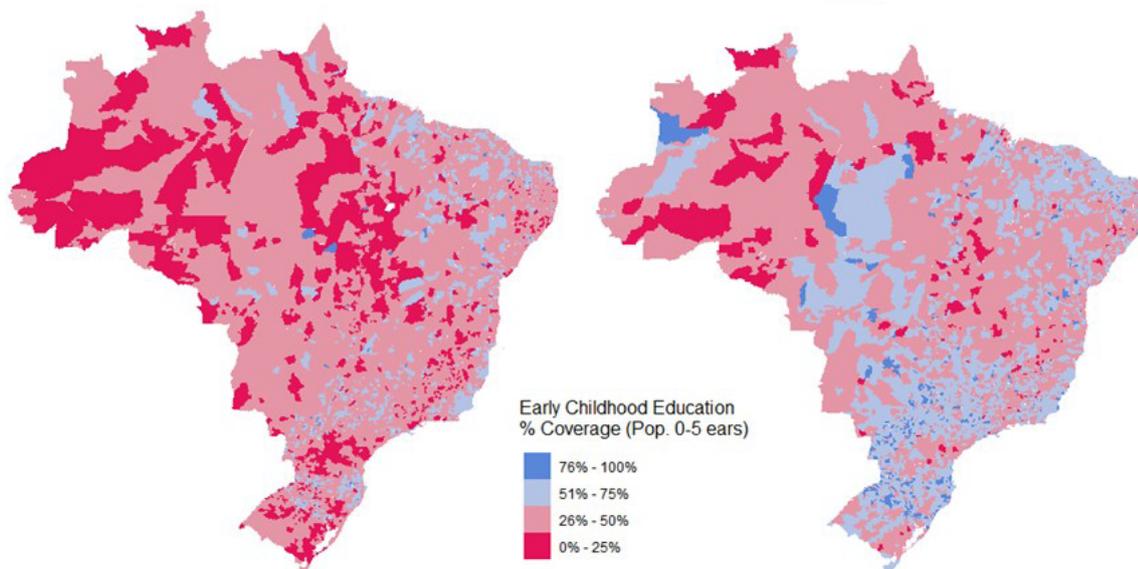
Although Brazil has achieved complete access to fundamental education (ages 6 to 14), there is still a long way to go to meet the demand for ECE for children ages 0 to 5. The National Education Plan (Casa Civil, 2014) stipulates that the government must guarantee daycare centers for at least 50 percent of children aged 0 to 3 and 100 percent of children aged 4 to 6 by 2024. In ten years, enrollment rates for the early childhood population (ages 0 to 5) in all Brazilian municipalities increased from around 39 percent in 2009 to 53 percent in 2019. In 2009, the ECE coverage of most municipalities (65.5 percent) was between 26 and 50 percent, as shown in figure 8.3 below.

Although there has been a significant increase in the supply of daycare centers, another reason that explains the increase in coverage is that there were fewer children in 2019 than in 2009. Brazil is undergoing a demographic change; its population is getting older. Overall, there is no replacement-level population, meaning fertility levels are lower than 2.1 children per woman, and that the population has negative growth. This has been the case in Brazil since 2005, when fertility levels were recorded at 2.09 children per woman (IBGE, 2019).

Early Childhood Education Coverage (Ages 0 to 5)

2009

2019



Source: INEP and IBGE 2009 and 2019.

Figure 8.3

Early Childhood Education Coverage (Ages 0 to 5)

Partnerships between the public sector and NGOs can provide significant resources to expand ECE services, improve their quality, and help create innovative ways to reach the most vulnerable populations (Evans & Kosec, 2012). Low fertility rates and the low-cost effectiveness of public daycare centers in low-density areas⁸⁶ create the need for an improved legal framework allowing for flexible delivery models that can rapidly adjust to enrollment needs.

In fact, over the last decade, most of the ECE service expansion occurred through a traditional building-based model in Brazil, where municipal governments directly manage schools with federal support.

However, there was also a rise in the private provision of ECE, especially in daycare centers: more than one-third of the 0 to 3 enrollments were in private institutions (INEP, 2021), and almost half (45 percent) were government-funded through *Creche conveniadas* (Convened Daycare) (box 8.3). The program is based on an agreement between the government and NGOs (such as philanthropic and religious schools) to provide free ECE services. The government co-finances the service cost and sees lower unit costs compared to the cost of standard public schools. Likewise, the conditional cash transfer (CCT) program *Auxílio Brasil* (Brazil Aid) has a mechanism for providing cost-share assistance for childcare for families with children up to four years old, increasing formal childcare access for the most vulnerable.

Box 8.3

Creches Conveniadas

Creches conveniadas are private daycare centers that partner with the municipal government to provide enrollment vacancies that cannot be supplied in the public network. It is an alternative school provision initiative, with public and private funding, designed to resolve the challenge of providing access to school for children aged 0-5 in a context in which demand for daycare institutions in the medium to long term is decreasing due to an aging population (Evans & Kosec, 2012).

⁸⁶ Low-density areas tend to have a smaller population of children, increasing the cost of childcare provision as fixed costs are divided for a smaller population.

Box 8.3 (continued)

The Censo Escolar (School Census) 2020, conducted by the National Institute for Educational Studies and Research (Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira, INEP), indicated that there were 6,414 creches conveniadas registered that year.

Cooperation between municipal governments and NGOs has been critical to the recent expansion in access to early childhood education. In the last decade, most of the increase to access was made possible by the building of schools directly managed by municipal governments with federal support and an increase in private provision (Devercelli & Beaton-Day, 2020). More than one-third of the 0- to 3-year-old enrollments are in private institutions, and about 45 percent of those institutions are government-funded but privately managed through the creche conveniadas. This joint-management model is responsible for around 17 percent of daycare centers and 5 percent of pre-school enrollment at the municipal level (INEP, 2021).

The Marco Regulatório das Organizações da Sociedade Civil, Regulatory Framework for Civil Society Organizations, provide standards for the quality of service. However, state and municipal governments still need to regulate the accountability framework and ideally set up results-based financing to promote quality in-service delivery. In May 2022, the federal government launched the Programa Primeira Infância na Escola (Early Childhood in Schools) with the goal of raising the quality of early childhood education in public schools. The program has three axes: monitoring the implementation of the National Parameters for Quality in Early Childhood Education; reinforcing management, leadership, and institutional strengthening; and the provision of curricular and pedagogical practices with attention to the development of socioemotional abilities. The initiative has been designed to strengthen ECE access and quality control in the country by providing a policy framework with financial and methodological support for ECE in public networks.

Regarding the quality of ECE, experience from high-, middle-, and low-income countries shows that an increase in ECE access does not necessarily translate into the improvement in children's developmental abilities. Low-quality ECE, for example, is unlikely to promote significant improvements in children's development at later stages in life. This means that without an adequate emphasis on quality interventions, children will not secure the potential benefits of ECE. This may, in turn, discourage parents from enrolling their children, and the resources used to build and manage the ECE will therefore have been wasted (Pushparatnam et al., 2021; Evans & Kosec, 2012).

Policies for Children and Adolescents

In order to make schools more appealing and prepare students for school to work transition, Brazil has undertaken several other reforms such as the establishment of a new national core curriculum in primary education, a comprehensive upper secondary education reform, improvements in school management systems, and improvements in teacher quality and accountability.

National Core Curriculum Reform in Primary Education

The Brazilian Education Guidelines and Bases Law No. 9.394/1996, approved in 1996, reinforces the right to free and quality education for all Brazilians, regardless of socioeconomic, cultural, geographical, linguistic, or other differences under the 1988 Brazilian Constitution. Although the idea of a standard education curriculum for all Brazilians was part of Law No. 9.394/96, it was only in 2017 that Brazil started to develop a normative national curriculum that defines essential learning and skills that students must develop in basic education (Brasil, 1996). Known as Base Nacional Comum Curricular (BNCC), the reform covers basic education, from early childhood to upper secondary education, and was officially approved by the federal government in December 2018. The document contains a list of 10 general competencies that frame

BNCC unifies education policies in Brazil's highly decentralized education system.

the reform and are strongly aligned with 21st-century skills that all students must achieve. These competencies include lifelong learning, critical thinking, aesthetic sensibilities, communication skills, digital literacy, entrepreneurship, self-care, empathy, citizenship, and ethics (Costin & Pontual, 2020). These skills are understood as a way to foster an education that contributes to societal transformation and the preservation of nature, and are aligned with the United Nations 2030 Agenda for Sustainable

Development (Secretaria de Direitos Humanos da Presidência da República, 2013).

In a general sense, the main objective of the BNCC is to align the main education policies in Brazil's highly decentralized education system at the federal, state, and municipal levels in terms of local curricula, classroom materials, student evaluations, and teacher training. Regarding local curricula, the Ministry of Education has implemented a program called ProBNCC that aims to help states incorporate BNCC into a state-level curriculum. The program finances, trains, and offers technical support to a group of writers nominated by a committee where the cities are represented to build their curriculum. There are also strong incentives for cities and states to work together on developing curricula, as most of Brazil's municipal departments lack the institutional capacity to do so on their own (Costin & Pontual, 2020). In terms of classroom materials, textbooks used by teachers and students are traditionally part of a pre-approved list by the federal government called the National Textbook Program (Programa Nacional do Livro Didático, PNLD). With BNCC, the content of textbooks made available by the PNLD focuses on developing the BNCC's 10 core competencies. School networks, together with their schools, now have more freedom to decide what specific school materials will be distributed within their network or to subgroups of schools (Ministério da Educação et al., 2021).

To improve teaching quality, the Ministry of Education has also developed a list of common competencies that teachers must develop through training programs, which the National Education Council fully approved in 2019. These competencies are supposed to help educators apply the BNCC's competencies in the classroom and help them feel confident and prepared to teach students. Teacher training is based on three dimensions: knowledge, i.e., mastering content; practical actions, i.e., the ability to foster and manage learning environments; and engagement, i.e., the teacher's commitment to learning, and interactions with colleagues, students' families, and the school community in general (Diário Oficial da União, 2020). However, a nuanced debate regarding teaching autonomy inside the classroom, especially in universities, is ongoing.

Lastly, concerning national student evaluations, Brazil's robust national learning assessment system, SAEB, has traditionally been the primary mechanism for evaluating student performance. With BNCC, however, student performance is expected to be assessed in an integrated way, considering all the dimensions of learning—intellectual, physical, social, ethical, moral, and symbolic—while accounting for the context and conditions of learning. This is referred to as “formative assessment” in the official document, and it is expected that these dimensions are integrated into SAEB.

Upper Secondary Education Reform

Inspired by successful international examples, such as education policy reforms in Poland and Portugal, the reform of the Brazilian upper secondary school system, Novo Ensino Médio (NEM), passed in 2017. The reform substantially changed the curriculum, increased student choice, strengthened the focus on socioemotional skills, and extended the school day.

The Brazilian upper education system displays low internal efficiency, with the highest repetition rate in Latin America, pervasive age distortions, and some of the lowest completion rates in the region (Bruns et al., 2011). The reform attempts to remedy the risk of school dropout rates, which is relatively high in Brazil (6.8 percent in 2019 among upper secondary students). Students report that the main reason for dropping out of high school is a lack of interest in the academic content offered (Almeida & Packard, 2018).

Some of the main drivers of dropping out include overloaded curricula, insufficient instruction time,

Upper secondary curriculum changes were made to add flexibility and improve socioemotional skills.

and a perceived lack of relevance for insertion into the labor market and higher education. Prior to the reform, the Brazilian upper secondary curriculum included 13 mandatory subjects taught in a four-hour day. About 40 percent of students indicate a lack of intrinsic interest in school as the main reason for dropping out (Neri, 2009).

It is reasonable to establish a link between this lack of engagement and the fact that graduates from public upper secondary schools generally do not have the skills needed for the labor market. Moreover, public school students find it difficult to progress to tertiary education because they compete with better-prepared private school students, especially for admission to free-of-charge public universities.

In this context, the federal government proposed a substantial overhaul of the upper secondary education system, adding flexibility to a new competence-based curriculum and extending the school day.

The main change associated with the curriculum consists of moving from a rigid structure to a more flexible, adaptable configuration, which comprises a common compulsory element for all states and schools and a flexible element with 'itineraries.' Specifically, the reform reduced the 13 mandatory subjects to three core curriculum subjects: Portuguese language, mathematics, and English language. Students can then focus on a 'learning itinerary' from five areas of knowledge: languages, mathematics, natural sciences, humanities, or technical education. The reform also included the development of key competencies, including socioemotional skills. Students who opt for a technical track can replace some of the traditional subjects with technical courses and internships.

Effectively implementing the curriculum change took time, as the redesign for each state had to be fully aligned with the BNCC and NEM legal framework, including the design and implementation of flexible learning itineraries. It also required training for education officials, technical staff, school principals, pedagogy coordinators, and teachers. Training included pedagogical practices, use of teaching time, and socioemotional skills. Teacher redeployment and in-service professional development for teachers also needed to adapt to the new curriculum, with a focus on instruction and learning. School spaces had to be reorganized, and the national textbook program (PNLD) had to be adapted to the new education framework. Finally, the main upper secondary education assessments, Exame Nacional do Ensino Médio (National High School Exam, ENEM) and Prova Brasil (Brazil Exam) also had to be redesigned.

On extending the school day, the Ministry of Education established that, by 2024, at least 25 percent of all students enrolled in public upper secondary education in Brazil must attend full-time schools. Currently, most upper secondary students in public schools attend four hours of classes on average per day. The reform provides financial support for states to increase the school day to five hours in all schools and seven hours in select schools. The extended school day supports the diversification of the curriculum and the development of key competencies.

The school-day extension will be accompanied by the rollout of the new curriculum and new school facilities (Information Communication Technology, ICT, laboratories). The curricular proposals of participating schools must include a minimum of 2,250 minutes weekly, with at least 300 weekly minutes dedicated to the Portuguese language, 300 weekly minutes to mathematics, and 500 weekly minutes dedicated to students' flexible itineraries.

The COVID-19 pandemic has affected the rollout of the NEM reform, but progress has continued on many fronts. All states have enacted the regulation for its implementation, and 20 states have started piloting the flexible curriculum itineraries. Around 15 states have fully adapted their curricula to NEM. All states have full-time school implementation plans approved by the Ministry of Education, and as of March 2022, around 313,000 students were enrolled in schools implementing the full-time school schedule. As demonstrated in chapter 7, the increase in full-time schooling is directly associated with improving the HCI education component. In that sense, *the upper secondary school reform is one route to human capital advancement.*

Improving Teacher Quality

Research over the past decade has provided new evidence that (i) once children are in school, the quality of teachers determines their performance (see box 7.4 for a literature review), and (ii) that pedagogical practices are the most crucial factor affecting teaching quality. This means that teacher quality is one of the drivers for learning that are within school reach. International evidence also shows that successful education systems have better teachers (Bruns & Luque, 2014). The best school networks consistently attract high-quality candidates, use training to develop teachers' skills, focus on building teacher capacity, and establish career structures that reward good teaching.

Competitive education systems worldwide often have rigorous entry requirements; the most demanding require a research-oriented bachelor's or master's degree (World Bank, 2016). In 1996, a new law in Brazil mandated that all basic education teachers must complete a tertiary education diploma, creating a significant shift in teacher profiles. However, the teaching career remains unattractive and poorly managed. Public school teachers point out that university training courses and in-service training strategies are highly ineffective, primarily because of the disconnect between teacher training and pedagogical practices. Teacher training is fragmented, with little relationship to educational evaluations and lacking formal incentives to improve teaching quality (Instituto Ayrton Senna, 2014).

Between 2009 and 2019, the proportion of basic education teachers with higher education diplomas in Brazil increased from 67 percent to 85 percent; there remains a considerable gap to close. Despite this significant change in teacher qualifications over the last decade, the low quality of teachers is a binding constraint for learning (Damasceno & Fontes, 2019; Louzano et al., 2010).⁸⁷

The ineffectiveness of teacher education in influencing student learning is explained by a combination of poor quality of teacher training programs and the individual characteristics of those who choose a teaching career. There is an expectation that the recent changes in education financing (FUNDEB) may reduce the disparity of teacher wages relative to average wages received by other professionals with higher education degrees, thereby making teaching a more attractive profession.

Similarly, teacher selection processes do not focus on identifying the most suitable candidates for the profession. In the best-performing countries, teachers are selected from a pool of high-performing upper secondary students. In these systems, teacher wages are not always high relative to other occupations, but recruitment processes are competitive, focusing on selecting motivated applicants with outstanding academic achievements and good communication skills (Bruns & Luque, 2014). Brazil has two instruments for recruiting teachers: an admission test (public competition) and a three-year trial and follow-up period. However, these instruments are not used properly. The tests only focus on regulatory issues and knowledge of the discipline in which the teachers will work, and the three-year trial period before achieving tenure is generally shorter until the final hiring (and tenure) is achieved.

Most education systems in Brazil also lack proper mechanisms to evaluate and promote teachers based on meritocratic assessments. This prevents the system from identifying overall weaknesses, rewarding high performers, and targeting in-service training to the areas and the teachers needing the most help. Almost 95 percent of education systems have teacher career plans, but only 37 percent include performance-based compensation schemes for teachers (Todos pela Educação, 2020). The rest allow career progression based only on formal degrees or years of experience. Brazil lacks a high entry standards for candidates who wish to take teaching courses at tertiary level, and there is no national exam to certify graduates before teaching in the classroom. Although the overall picture of teacher quality in Brazil is not good, the abovementioned guidelines may contribute to enhancing teacher training courses if adequately implemented and coupled with other initiatives.

Making teaching an attractive profession and improving the quality of pre-service and in-service teacher training are vital steps for Brazil to have an effective education system. It is critical that Brazil improve

⁸⁷ Between 1996 and 2015, the percentage of lower secondary teachers with higher education rose from 52 percent to 83 percent, and from 86 percent to 93 percent in upper secondary schools (Ponte Barbosa & Oliveira Costa, 2019).

the attractiveness of the teaching career by diversifying teacher career structures and widening career advancement opportunities. Compensation policies are also an important tool, which will become more accessible as financial resources available to education systems increase due to the recent changes in FUNDEB. However, wage increases must be carefully planned to avoid compromising future public budgets with pensions. The provision of continuous support and motivation to teachers in the form of high-quality in-service professional development similar to those provided in Ceará's education system is yet another means of improvement. All of these options are complementary; if education systems ensure that schools use student assessments to tailor pedagogical practices and elevate teaching to the right level, student learning will likely increase. *The road to human capital progress should include improving teachers' and pedagogical practices.*

Labor Market Insertion of Out-of-School Youth

School dropout affects the human capital accumulation and affects many Brazilian teenagers (box 8.4). A growing body of research has attempted to understand young people's underlying decision-making processes in dropping out and points to the influence of factors in early childhood on dropout. Successful

Box 8.4 Not in Education, Employment, or Training

According to the Organization for Economic Co-operation and Development (OECD), Brazil is currently the country with the second highest percentage of "not in education, employment, or training" (NEETs) among those aged between 15 and 29 years old (35.9 percent), only after South Africa (45 percent). Pre-pandemic data reveals that seven percent of 15- to 17-year-old population did not attend school. Among the main reasons for dropping out of school was the need to work (39.1 percent) and lack of interest (29.2 percent). Young women also reported pregnancy (23.8 percent) and housework (11.5 percent) as reasons for dropping out (UNICEF & Cenpec Educação, 2021).

As schools gradually reopen after the COVID-19 closures, vulnerable students are less likely to return to and stay in school. Even before the pandemic, school dropout was a central challenge for the education system. According to the IBGE, nearly 1.4 million school-age students between 5 and 17 years old were out of school in 2021. The estimates for the state of São Paulo depict a more disturbing scenario: the risk of school dropout has increased by 365 percent in the wake of the pandemic (Lichand et al., 2021).

The costs of prematurely leaving school can have direct implications for the individual's and society's ability to recover from the effects of the COVID-19 pandemic, given that school dropout is associated with a lower probability of future employment, lower wages, and higher involvement in crime (Adelman & Szekely, 2016; Cook & Kang, 2016). In monetary terms, studies using local data estimate that dropping out of school costs Brazilian society approximately R\$395,000 per person, around US\$ 77,000 (de Barros, 2021). In this context, bringing students back to school is one of the most critical education challenges that was exacerbated by the COVID-19 pandemic.

Young Brazilians live in a context marked by fast technological advances and a dynamic and competitive labor market that demands 21st century skills and qualifications to obtain employment. If youth discontinue school, they will lack essential skills required by the formal sector, and will thus have a higher probability of ending up settling for lower-wage jobs or less stable jobs in the informal sector, which may set them on a lifetime path of lower earnings and opportunities (World Bank, 2021d). Furthermore, young Brazilians are currently face a significantly high unemployment rate (around 11.1 percent in 2021), which may increase the difficulty in joining the labor market (Governo do Brasil, 2022). Data collected in 2016 shows that youth in Brazil significantly underestimate the economic value of education from the

Box 8.4 (Continued)

perspective of generating income and the likelihood of employment (Almeida & Packard, 2018; Kiss et al., 2021).

Vulnerable populations are especially at risk of becoming NEETs. A study by Fundação Getúlio Vargas (FGV), which analyzed the Pesquisa Nacional de Amostra por Domicílios (National Sample Survey of Households, PNAD) data from between 2001 and 2011, shows that the largest groups of NEETs are youth with low educational attainment levels and women who have children. In fact, almost half of all youth NEETs (43 percent) were stay-at-home mothers with high levels of inactivity. Young women usually stop studying due to pregnancy or taking care of a family member, while men withdraw from school in order to work and help with household expenses. The study also shows that inactivity has grown among men, especially the ones with less education, and among youth who have completed high school (Monteiro, 2013). Other studies have also highlighted how inactivity poses long-term risks to youth. It can lead to a higher probability of unemployment, drug and alcohol use, teenage pregnancy, and crime (Coles et al., 2002; Pardo, 2012, Dorsett & Lucchino, 2012).

The education system's capacity to recover quickly from the impacts of COVID-19 depends on how effectively municipal and state governments manage their school networks. Local governments must, for example, monitor student enrollment closely to avoid new upsurges in dropout rates, manage the quantity and the quality of school meals to integrate schools into the social protection system better, and offer efficient school transportation for all students regardless of their distance from school.

interventions depend on the country's context and vary significantly in their targeting approaches and intensity of delivery. This, in turn, means that the resources (human, financial, and other) required to implement them also vary.

School dropout is a multisectoral problem because it has long-term effects: it hampers social mobility and contributes to persistent inequality. International interventions have proven to be successful in addressing the "not in education, employment, or training" (NEET) phenomenon, such as the Programa Joven (Youth Program) in Argentina, the Jóvenes en Acción (Youth in Action) in Colombia the ProJoven (ProYouth) in Peru. These three programs demonstrate that the provision of training and internships increase the probability of obtaining formal employment. All three programs targeted young people from poor households with low educational levels. In addition to the training and internships, the programs also provided some form of a stipend, lower than the minimum wage, to guarantee transportation and meals (World Bank, 2021d).

In Brazil, the Programa Nacional de Acesso ao Ensino Técnico e Emprego (National Program of Access to Technical Education and Employment, Pronatec) has offered technical courses to low-income youth for labor market insertion. However, a study commissioned by the Ministry of Treasury has shown that the program has not given enrolled students an advantage when returning to the labor market (Secretaria de Política Econômica, n.d.). The Programa Jovem Aprendiz (Youth Apprenticeship Program) on the other hand, has been found to have had a direct impact on NEET youth. The program concedes payroll subsidies to firms that hire and train young workers (aged 14 to 24 years old) under special temporary contracts to help them successfully complete the transition from school to work. A study conducted by the Company Integration Center School (CIEE) showed that 76 percent of youth who had completed their apprenticeship between 2016 and 2017 were either working or studying post-program (Centro de Integração Empresa-Escola & Instituto Datafolha, n.d.). *Technical training and apprenticeship programs pave the way for human capital progress.*

Policies across All Ages

Although the HCI follows a life cycle structure, some policies that affect human capital are transversal. This section describes national policies that affect people across all ages, including in adulthood. It is centered on health and social protection policies aimed at increasing productivity and protecting disadvantaged groups with a focus on boosting human capital.

Box 8.5

Increased Labor Productivity: Can It Be Achieved without A Strong Health Agenda?

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Health is critical to development. It is a form of human capital, and it facilitates the production of other forms of human capital (Bleakley, 2010; Bloom & Canning, 2003). In Brazil, two critical moments in history highlight the importance of health for development: the sanitary movement of the early 20th century (Lima, 2007), and the 1988 Constitution and subsequent onset of the Unified Health System (Sistema Único de Saúde, SUS) (Castro et al., 2019).

In 1916, a report detailing the findings of expeditions sponsored by the Oswaldo Cruz Foundation to the North and Northeast regions of Brazil exposed the precarious conditions of the rural communities in the country, the high prevalence of several infectious diseases, and the almost complete absence of local governmental assistance (Schweickardt & Lima, 2007). The need for a sanitary movement gained momentum, and was seen as the path to nation building, increasing labor productivity, and development. The first agency for public health and disease control was created in 1920, and rural health centers started to be established across the country (Lima, 2007). Over the following decades several public health campaigns targeting infectious diseases were launched, some with the support from the Rockefeller Foundation (Löwy, 1999). The achievements were many including the elimination of urban yellow fever in 1942 and the elimination of the *aedes aegypti* mosquito (Soper, 1963) as well as the control of the vector of Chagas disease (Barreto et al., 2011), among others. Between 1920 and 1960, life expectancy in Brazil increased from 35.2 to 52.3 years, and infant mortality was reduced from 162 in 1930 to 115 in 1970.

Many gaps persisted, though. Before the 1988 Constitution, access to health services were limited. Those in the formal labor market had access to care through the National Institute of Medical Assistance and Social Security (INAMPS), while informal and agricultural workers depended on philanthropic institutions, or had to incur out-of-pocket payments (Elias & Cohn, 2003). At the time, there was no primary care program and no universality and equality in healthcare. The Constitution changed this scenario. It established health as a right of the population, paving the way to the establishment of the SUS, a first step toward universal health coverage (currently, one of the targets of the Sustainable Development Goal 3) and, therefore, the reduction of inequalities.

Over three decades, the SUS progressively expanded policies and programs to deliver universal and comprehensive healthcare, and despite many challenges, it has reduced inequality in health access and outcomes (Macinko & Lima-Costa, 2012; Macinko et al., 2009). In 1994, the Family Health Program, renamed the Family Health Strategy (FHS) in 2011, was developed to

Box 8.5 (Continued)

provide primary healthcare through teams comprising a general physician, a nurse, a nurse assistant, and community health agents. The FHS delivers comprehensive care including acute services, health promotion and prevention, chronic disease management, and maternal and child services (Andrade et al., 2018), and has contributed to improvements in health outcomes with reductions in morbidity, avoidable mortality (Andrade et al., 2018; Guanais & Macinko, 2009; Hone et al., 2017; Macinko et al., 2011; Macinko et al., 2010; Rasella et al., 2014; Boing et al., 2012), infant mortality (Aquino et al., 2009; Macinko et al., 2006; Rocha & Soares, 2010), and avoidable hospitalizations (Macinko et al., 2010; Ceccon et al., 2014; Dourado et al., 2011). Infant mortality, in particular, declined 42 percent from 1990 to 2000, and Brazil was one of the few countries to successfully meet the Millennium Development Goal 4 (reduce child mortality by two-thirds between 1990 and 2015) (Countdown Coverage Writing Group, 2008; UNICEF, 2005).

These health improvements achieved over the 30 years of SUS affected the entire life span of individuals, from the prenatal period to old age, with direct implications to human capital (figure B.8.1). Aside from the FHS, other programs that were critical in affecting human capital include the national response to the HIV/AIDS pandemic (Oliveira-Cruz et al., 2004), the national immunization program (Domingues et al., 2020), the early childhood program (Criança Feliz) (Buccini et al., 2021), and the breastfeeding strategy (Passanha et al., 2013), among others.

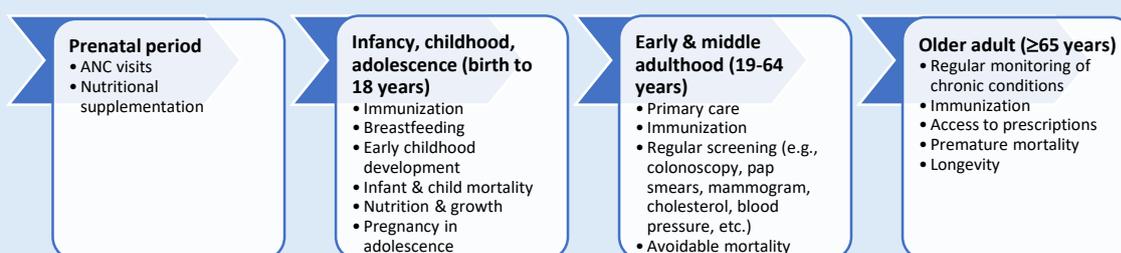


Figure B.8.1

Condensed Representation of Lifespan Stages and Indicators Affected by the SUS

Concurrently, and related to the improvements in health, the demographic characteristics were also changing: life expectancy at birth increased 7.5 years from 1990 to 2019, the total fertility rate declined from 2.9 to 1.7 between 1990 and 2018, and the population older than 65 increased from 4.3 percent in 1990 to 9.3 percent in 2019. These changes resulted in an overall increase in the share of the working-age population, also called the demographic dividend, which, when associated with education, had an important contribution to economic growth (Baerlocher et al., 2019).

The sustainability of those gains, however, face many challenges, and three in particular, are of utmost importance. First, inequalities in the geographical distribution of healthcare professionals and healthcare services persist (Özçelik et al., 2021). Second, fiscal policies introduced in 2016 and subsequent budget cuts resulted in underfinancing of the SUS (Massuda et al., 2018; de Souza, 2017). Third, the recent COVID-19 pandemic highlighted and exacerbated local inequalities (Silva et al., 2020; Rocha et al., 2021; Ranzani et al., 2021; Ribeiro et al., 2021; Castro et al., 2021a). The FHS and the network of community health agents were

Box 8.5 (Continued)

not incorporated into the response (Lotta et al., 2020), with consequences to routine services, screening, and procedures (Barone et al., 2020; Marques et al. 2021; Silveira et al., 2021). The heavy death toll has setback Brazil to mortality levels not seen since 2014, reducing the life expectancy at birth in 2020 by 1.3 years (17.3% of the gain observed between 1990 and 2019), with large state disparities (a decline of 3.5 years in Amazonas) with even larger declines expected for 2021 (Castro et al., 2021b). Among survivors, long-term consequences of COVID-19 (Nalbandian et al., 2021) is likely to result in societal consequences including worsening health conditions, education deficits, and reduction in workforce productivity (Brüssow & Timmis, 2021). Economic hardship brought about many challenges, including hunger (de Carvalho et al., 2021) and the worsening mental health of the population (Goularte et al., 2021).

In light of this current scenario, what comes next? To avoid an even direr situation and mitigate the many societal consequents of the pandemic, Brazil must strengthen the SUS. It is the only way to fulfill the increasing demand for care (e.g., long-COVID, mental health, postponed procedures) with equity. It is critical to reestablish the federal pact between the federal, state, and municipal levels of governance, with a new interfederative governance to mitigate some of the challenges of decentralization (Castro, M. C., Massuda, et al., 2019). Investing in health is needed to devise innovative ways to fulfill the demand for care; this includes rethinking ways in which telemedicine could be incorporated into the FHS to facilitate increasing coverage. Above all, revisiting budget cuts is urgently needed. It is unimaginable that investments in health and science are reduced at a time when the country faces a pandemic. If a change does not come soon, the societal consequences of COVID-19 will be felt in the long run, with negative consequences to human capital and labor productivity.

Virtually the entire poor and vulnerable population relies exclusively on SUS. **Health Policies**

SUS is one of Brazil's main achievements in terms of social policies. The creation of SUS in 1988, establishing universal health coverage (UHC), has been associated with the expansion of the health service delivery with remarkable improvements in access, financial protection, health outcomes, and ultimately, productivity outcomes (box 8.5). The decentralization of responsibility is the critical process in SUS regarding the provision and execution of healthcare services.

SUS is the main source of healthcare for the poor and vulnerable population in Brazil. According to the 2019 National Health Survey (Stopa et al., 2020), virtually the entire poor and vulnerable population (bottom 40 percent of the income distribution) relies exclusively on SUS to access health services. However, this ratio diminishes substantially for the upper-income deciles. The SUS is also the main provider to the general population at large with over 60 percent of the population using the SUS system, and 70 percent of hospitalizations occurring in SUS facilities. Only 25 percent of the general population has private voluntary health insurance, either paying directly or through employment-based plans.

The poor and uneducated tend to be less healthy with higher propensities of having co-morbidities rendering them more vulnerable during the COVID-19 pandemic. As discussed in chapter 6, COVID-19 had a greater impact on the most vulnerable groups. About 54 percent of SUS users who rely exclusively on

primary healthcare (PHC) provisions are unemployed, while about 65 percent earn less than the minimum wage (R\$1.212 around US\$235). According to the latest National Health Survey, those with no schooling or who have only completed primary education (and, therefore, more likely to be poor) were twice as likely to have a high blood pressure than those who had completed university-level education (36.6 percent versus 18.2 percent, respectively). Similarly, diabetes was also found to be more prevalent among the less-educated than among those with higher education: 12.9 percent versus 4.7 percent, respectively.

Family Health Strategy

SUS primary health services are provided through basic health units and Estratégia de Saúde da Família, (Family Health Strategy, ESF). In the 2000s, the SUS network expanded considerably, particularly in the provision of outpatient services driven by the expansion of ESF. Data shows that basic health coverage increased from 41 percent to 76 percent of the Brazilian population between July 2007 and July 2020.

The ESF was introduced as a federal program in 1994 to provide integrated primary care to patients, but its origins date to an earlier era. The ESF model began as a maternal and child health program in Ceará in the 1990s that relied on community health agents. As a community-based approach, ESF provides healthcare services by deploying interdisciplinary healthcare teams that include a physician, a nurse, a nurse assistant, and four to six full-time community health agents who act as a bridge between health units and the population. The teams are distributed geographically and cover up to 1,000 households per area. ESF follows a decentralized healthcare management structure, in which the municipal government is responsible for the management and provision of health services. This is intentional, as local governments can better identify and address their own needs. In terms of financing, each municipality receives a fixed amount from the federal government for primary care expenses, which varies depending on the number of residents. Funding amounts are tied to performance indicators that the federal government monitors.

The implementation of the ESF has been linked to a decrease in the infant mortality rate, an overall reduction in mortality throughout the age distribution, reduced fertility rates, an increase in school enrolment, and an increase in labor supply. The higher the program's coverage rates, the greater the reduction in avoidable hospitalizations for a number of chronic diseases with the exception of diabetes or chronic obstructive pulmonary disease (Pinto & Giovanella, 2018; Macinko & Mendonça, 2018). Chapter 7 showed that the higher the number of physicians in the Family Health Strategy in a given municipality, the better the outcomes in the not-stunting component. *Basic healthcare policies are imperative for national human capital progress.*

Integrated Health Networks

There is no doubt that the decentralization of PHC in Brazil has been one of the drivers in the expansion of coverage in the last 20 years. Today, the main efficiency-related challenges faced by SUS are related to the fragmentation of service provision that stems from the decentralized institutional arrangements of these services. This fragmentation generates diseconomies of scale and coordination among providers and levels of care (primary, secondary, and tertiary) is limited (World Bank, 2017b). The government is rightly focusing on improving this coordination across levels of healthcare as a priority for SUS reform.

Fragmented healthcare systems are organized under a hierarchical structure, defined by levels of increasing "complexity," with order and degrees of importance among the different levels of healthcare. This hierarchical organization results in systems that are isolated and do not communicate with each other. This means that PHC does not communicate fluidly with secondary healthcare, and these two levels do not coordinate with tertiary healthcare, support systems, or logistical systems (Mendes, 2010).

Despite the increase in chronic diseases, which require integrated and continuous treatment arrangements across provider settings, and a focus on managing and controlling risk factors, the SUS delivery system is organized to provide acute care through stand-alone facilities. The fragmentation of the SUS network results in service duplication and excess capacity, which results in significant inefficiencies that could benefit from the implementation of integrated systems. For example, in Araraquara (São Paulo), approximately 50 percent of PHC exams are repeated at other levels of care, which create costs equivalent to 5 percent of the municipality's annual health budget (World Bank, 2017b). International experience demonstrates that coordination of care is critical to improved efficiency of healthcare service delivery through reduced hospitalization, improved quality of care, fewer medical errors, and more appropriate prescription and use of medication.

An integrated health network functions by connecting the work of various healthcare providers through clinical protocols and optimized financial flows using contracts to vertically coordinate services across primary, secondary, and tertiary levels (World Bank, 2017b). This fosters more horizontal relationships among the various services that begin to behave as interconnected points of care with permanent communication channels (Magalhães Junior, 2014).

The coordination of a care network presupposes the development of structures and processes to improve communication, continuity of care, and information sharing within the health services system (World Bank, 2017b). The information system must be designed to support a continuous flow in the network. For example, shared electronic medical records with a permanent identification number, made available across teams, are as vital as having sufficient care teams. The same can be said for a regulated health transportation system and the provision of continuing education and monitoring of health professionals (Magalhães Junior, 2014).

The implementation of a functioning network will require a redesign of service delivery models, management, and financing of SUS services. A shared information network arrangement involves protocols and processes to standardize health service provision and assure the flow of information. A key component is data governance and accountability for data integration and coordination at municipal, state, and federal levels.

Integrated health networks are the key for fostering an efficient health system.

For this, Brazil needs to implement a method of sharing patient-related information, build capacity through access to essential infrastructure, enforce data standardization, implement clinical itineraries and protocols to serve as clinical guidelines for treating diseases, establishing standardized referral and counter-referral rules, defining roles and competencies of service providers, and providing training for compliance (OECD, 2021).

These efforts aim to obtain scale efficiencies and reinforce primary care as the entry point to the service delivery system. In that way, ESF could incorporate solid filtering, gatekeeping, and coordination functions. The reinforcement of PHC is also directly related to increasing the number of family and community health physicians. This brings us to the matter of the distribution of physicians in the territory.

Human Resource Management in Health

The shortage of primary care physicians and the difficulty to attract qualified personnel to work in poorer and more distant areas as opposed to urban centers are other crucial challenges for expanding PHC services in Brazil. Between 2010 and 2019, the greatest expansion in the medical profession in Brazil was seen in family and community health medicine (FCHM), as seen in the increased numbers of resident physicians in this medical specialty. This specialty is the most appropriate specialty for working in PHC in ESF teams.

Countries where primary healthcare provision relies on general practitioners have better health outcomes than places that rely primarily on non-general practitioners. However, one of the great challenges for consolidating primary healthcare specialization worldwide is related to education. Despite its relevance and the recognition of its importance, FCHM is not prioritized within Brazil's health system (Izecksohn et al., 2017).

To change the service delivery model and ensure that primary healthcare is the patient's first entry point to the health system, the federal government recognizes that it is necessary to improve the status of family and community health physicians to attract more health professionals to work in the primary healthcare context. In Brazil, the density of health professionals (particularly physicians) per inhabitant is lower than that found in countries with similar development levels and well below the average among OECD countries. In addition, the geographic and sectoral distribution of family and community health physicians is marked by significant inequalities; 54.3 percent are located in the 27 capitals and the federal district, while the remaining 45.7 percent are shared across Brazil's 5,543 other municipalities. In addition, there are regional inequalities in this distribution, with only 5 percent in the North, 7.7 percent in the Center-West, 14 percent in the Northeast, 19.1 percent in the South, and 44.2 percent in the Southeast (Scheffer et al., 2020). The provision and settling of PHC physicians in peripheral municipalities, including on the outskirts of large cities, is one of the most serious and chronic problems the Brazilian health system faces (Anderson, 2019). This translates to a reality in which 32 percent of the population that lives in the 48 cities with more than 50,000 people have access to 62 percent of the physicians in Brazil.

Increasing the relative remuneration of primary healthcare professionals also has the potential to increase the supply of these professionals in the medium and long term. Countries such as England and Turkey have reduced the pay gap between specialists and family and community health physicians as well as other hospital-based professionals. Another strategy to expand primary healthcare is to broaden the scope of practice of nurses and other health professionals to extend coverage, increase efficiency, and in some cases, improve the quality of care (World Bank, 2017b).

Finally, despite the shortage of family and community health physicians, Brazil makes little use of other professionals to provide healthcare services. For example, although the Brazilian national regulation authorizes nurses to perform consultations and prescribe certain medications and exams in basic health units, this practice faces professional and institutional resistance. SUS could also expand prenatal care coverage by adopting a training process that is more intensive for nursing professionals than for physicians (World Bank, 2017b). *The path for fostering human capital includes efficient allocation of human resources.*

In addition to education and health policies, three other transversal aspects will be discussed in the following sections: (i) affirmative action in the workplace, (ii) violence prevention policies, and (iii) social protection programs and policies.

Affirmative Action in the Workplace

The first step to improving outcomes related to labor access is to ensure that students have equal chances to acquire knowledge and skills. Still, not all individuals benefit from education equally, which means that there are unequal labor market outcomes. The challenges to human capital in Brazil are not only related to factors that prevent its full performance potential, but are also linked with inequalities and the underutilization of HCI in the labor market.

Brazil has adopted several policies that have had direct or indirect impacts on increasing equality and access to the formal labor market. Policies related to better outcomes in education have been a key element in opening the door to the labor market, as skills, knowledge, and competencies, often acquired through education, highly improve access to the competitive labor market. Several studies have highlighted the link between education and labor market outcomes. Ramos (2007) shows that education was the most important element in explaining the decrease in wage inequality in the country between 1995 and 2005, and Soares et al. (2007) show that the educational gap between white and non-white workers in Brazil has been reduced over time, which is contributing to the reduction of the racial-wage gap.

Policies that reduce inequalities in education will have positive spillovers in the labor market.

Brazil has introduced affirmative action into public universities through the approval of Quota Law (12.711) in 2012, which mandates that federal universities (which are the most selective universities in the country) reserve a percentage of their admission slots to students on the basis of race and/or class. Despite receiving much backlash and resistance from opponents, research has revealed that the demographics of students in Brazil's public universities have become more diversified and that the higher education system has become more democratic. Despite these improvements, there is still a need to ensure student retention in public universities (Heringer, 2020; Ristoff, 2014; Paula, 2017; Salata, 2018).

Nevertheless, it is important to note, that Brazil loses a significant share of its potential productivity when it comes to the labor market as a result of the discrimination and resulting barriers that underprivileged groups, such as Afrodescendants, Indigenous peoples, women, persons with disabilities (PWDs) and other political minorities face. Consequently, human capital accumulation, especially in relation to educational attainment, does not always translate into better opportunities and access to the labor market. Thus, education and skills can be regarded as necessary but by no means sufficient for achieving favorable labor market outcomes (Fasih, 2008).

There have been specific policies in Brazil to include these groups in the labor market. The establishment of mandatory quotas in companies for disabled persons through Law 8.213 in 1991 is an example of such policies. Another example is Law 12.990/2014, in which a quota was set to allocate 20 percent of

government jobs to Black and Indigenous individuals and which has shown significant success. While in 2000, 76.5 percent of new civil workers were white, and 17 percent were Black, this has been changing in recent years. Today, 38 percent of new civil workers identify as Black, and 57 percent are white (Ipea, 2021).

For women, the Programa Pró-Equidade de Gênero e Raça (Gender and Race Pro-Equity Program) has executed the recommendations in the National Plans of Policy for Women, focusing specifically on gender equality in the labor market.⁸⁸ Since 2005, the program leaders have been working with the Secretaria de Políticas de Promoção da Igualdade Racial (Special Secretariats for the Promotion of Racial Equality, SEPPIR) and the Secretaria Nacional de Políticas para as Mulheres (National Women Policy Secretary, SNPM), the International Labor Organization (ILO) and UN Women in specific activities that will be undertaken to promote race and gender equality in the workplace such as improvements in the work environment, overcoming racial and gender wage gaps, increasing access to jobs, and occupation of managerial positions (UN Women, 2019). Compared to non-participant institutions, institutions that have joined the program have three times as many women in managerial positions, occupying 40 percent of all managerial positions (compared to 59 percent for men), a small but significant step towards equality (SPM, n.d.). *The story of unshared prosperity should become a story of inclusive success with affirmative policies.*

Violence Prevention Policies

Chapter 4 showed that, in 2019, men died seven times more often from external factors than women, and that these deaths are mostly a result of aggression and traffic accidents. Moreover, as demonstrated in chapter 5, homicides are intrinsically correlated with adult survival rate, and therefore, with the HCI. About 10 percent of the total homicides in the world and half of those in Latin America and the Caribbean (LAC) are concentrated in Brazil. In 2019, 38 out of every 100 deaths of Brazilians between the age of 20 and 24 were victims of lethal violence. When looking at the population aged 25 to 29, these numbers drop to 31 out of every 100 deaths (Capriolo et al., 2017; Cerqueira et al., 2021).

With respect to information available on homicides, studies indicate that victims and perpetrators in Brazil often have the same sociodemographic profile: they are between the ages of 15 and 29 and are generally male, low-income, and Black. A staggering 92 percent of homicide victims in the 0 to 19 age group are male. The proportion of male victims increases from age 13 onward, reaching 95 percent for victims over 17 years old (Muggah and Pellegrino, 2020). There are several risk factors that increase the vulnerability to violence among males, notably: chronic exposure to violence, extreme social inequality configurations, family units headed by a single person, living in neighborhoods and communities affected by organized crime, and unequal services access, especially to education (Muggah and Pellegrino, 2020; Waiselfisz, 2017). One of the empirical regularities of homicides is the clustering, known as hotspots, of crime and violence. These hotspots have common deprivation problems, including high levels of poverty, lack of public services, and high exposure to natural disasters (World Bank, 2013).

In Brazil, the relationship between violence and access to quality education is comparatively robust (Muggah and Pellegrino 2020, Waiselfisz, 2017). Homicides are intrinsically related to the human capital components. There is also a clear and well-established link between homicide rates and inequality: countries with pronounced income inequality tend to have a comparatively higher homicide rate. Almost 40 percent of the variation in homicide rates across countries is explained by inequalities (UNODC, 2019).

Four themes appear to be influential in achieving results in preventing and reducing crime (World Bank, 2013). These are:

- Conditional cash transfers programs and monitoring targeted at families in violent crime areas.
- Comprehensive crime prevention strategies that combine territorial interventions with improved

⁸⁸ The three Planos Nacional de Políticas para Mulheres (National Plans of Policies for Women, PNPM) are regarded as landmark frameworks in the country towards building an inclusive gender equality and equity agenda that takes into account race, ethnicity, age, sexual orientation, and disability, and were a product of engagement between civil society and governments at all levels (Presidência da República & Secretaria Especial de Políticas para Mulheres, 2005).

urbanization, access to quality education, and other policies that provide youth with positive activities and aspirations.

- Results-oriented policing that rewards innovation and performance accountability.
- Monitoring and evaluation systems that allow key actors involved in the public safety agenda to share diagnosis data and make policy adjustments.

In terms of interventions adopted in Brazil to mitigate violence and crime, firearm control strategies such as the Estatuto do Desarmamento (federal Disarmament Law) have had an impact on the rate of growth of homicides of children and young people. For example, between 1980 and 2003, there was an average annual increase in children and youth homicides of 6.2 percent, followed by an average decrease of 3.3 percent between 2003 and 2006. From 2006 to 2011, the annual growth rate remained stable at 3.8 percent, however, from 2011 onward, it rose sharply to 8.9 percent (Waiselfisz, 2017). The statute was passed to limit firearms imports while making it illegal to own unregistered guns or carry them on the street as well as increasing penalties for violating gun control laws (World Bank, 2013).

One way to address the multiple risks associated with violence is to engage in multiple interventions that address each risk one at a time. This can be done either using multiple programs, each of which prioritizes a specific territory or population target or by designing a singular program with multiple components for example: gun and alcohol consumption control, police capacity building, and initiatives that promote cultural changes or access to cultural activities and other types of regeneration of urban spaces. The decrease in violence indicators in São Paulo and Belo Horizonte, have been linked to urban renewal processes, demonstrating the potential effectiveness of such policies. Generally, urban environment improvements associated with poverty-reducing policies have positively reduced violence-related activities (World Bank, 2013).

Multisectoral interventions should address risk behaviors one at a time.

While men have higher rates of death due to aggression and homicides, women are also affected by violence, although they experience a type of violence that is specifically tied to their gender, known as gender-

based violence (GBV). Gender-based violence is a structural issue in Brazil, affecting predominantly women and girls, but also men, boys, and other gender identities, and is committed mostly by an intimate partner. A woman was raped every 10 minutes and a femicide was committed every seven hours in Brazil in 2021 (Fórum Brasileiro de Segurança Pública, 2021). GBV has not only severe consequences for the survivors' physical and mental health but also has intergenerational effects. Data shows that 4 out of 10 women who grew up in a violent household experience violence during adulthood (PCSVD in Universidade Federal do Ceará, 2017). Furthermore, GBV has a high social and economic cost, directly impacting human capital, productivity, and public spending. Similarly, GBV costs to women are rooted in a cascade effect where the inability to work results in income forgone by victims, diminished profits for business, and decreased tax revenue to the government (Laing & Bobic, 2002). Estimates show that the costs of gender-based violence can amount to up to 2 percent of the global GDP (UN Women, 2016).

To tackle GBV, Brazil passed the Maria da Penha Law (11.340) in 2006, which has been recognized nationally and internationally as one of the most innovative and comprehensive legislation packages (Pasinato, 2016; Sardenberg, 2016; Instituto Maria da Penha, n.d.). Before 2006, violence against women was trivialized and considered a "minor crime;" punishment for aggressors was reduced to community work or food parcels. Inspired by international conventions and feminist movements, the Lei Maria da Penha (Maria da Penha Law, LMP) brings three main changes: (i) it expands on the definition of violence, defining it as physical, sexual, psychological, moral, or patrimonial violence; (ii) it enlarges the concept of family and womanhood, recognizing same-sex unions, and more recently including protection for trans-women (TJDFT, 2022), and (iii) it not only assigns punitive measures against aggressors but also provides protective and assistance measures to survivors as well as important preventive measures at large (Sardenberg, 2016; Pasinato, 2016).

Despite the creation of a progressive legal framework to address gender-based violence, GBV remains an important issue in Brazil. Studies that analyze the impact of the LMP have noted a wide range of outcomes including: a reduction in specialized services for women in recent years, a high concentration of such services in capital cities, a lack of a national information system on GBV, a lack of material and human resources, failures in network articulation, and difficulties in incorporating new changes introduced by the

LMP. The literature also shows that professionals are not fully trained and prepared to provide specialized GBV assistance, and that there is a lack of institutional policies that encourage professional training in this area (Pasinato, 2016; Senado Federal, 2013; OBSERVE, 2010).

The COVID-19 pandemic brought new attention to the urgency in addressing violence against women, as discussed in chapter 6. The conditions created by the pandemic have led to increases in domestic abuse, thus highlighting (i) the importance of expanding, strengthening and adjusting the existing violence-related response systems and networks, and (ii) the need to train professionals to offer proper assistance to survivors.

Social Protection Programs and Policies

The Programa Bolsa Família (Family Grant Program, PBF) was a CCT program that consolidated smaller cash transfer programs such as Programa Bolsa Escola (School Grant), Programa Auxílio Gás (Gas Aid), and Programa Bolsa Alimentação (Food Stipend) in 2004 (Brasil, 2004). PBF targeted low-income families and had three main focuses: income transfers for immediate poverty relief; conditions to reinforce access to fundamental social rights in education, health, and social care; and complementary programs aimed at family development to assist them in overcoming their vulnerabilities (Martins & Monteiro, 2016; Warby, 2018).

In 2019 and 2020, the program was composed of one basic benefit, four elective benefits, and a benefit to overcome extreme poverty.⁸⁹ The last of these benefits was paid to families with income levels that remained below R\$89 per capita after the other transfers; the value of this benefit was the amount necessary to cover the gap. The table below presents the basic design of PBF in 2021.

The PBF was designed to be responsive to income losses. It relied on a combination of self-declared income, household visits, and administrative cross-checks. The operational and institutional arrangements of PBF involved well-established coordination between municipal social assistance centers (CRAS), the Ministry of Citizenship, banks responsible for cash transfers, and health and education services providers.

Municipalities were responsible for identifying families and their registration in the social assistance registry, Cadastro Único (box 8.6). The Ministry assessed the eligibility of PBF applicants based on information declared in Cadastro Único and cross-checked verification in other public registries. Once eligibility was verified, and provided that the program had space to accept new families, the Ministry activated the benefit. If the family was eligible but budget constraints prevented their inclusion, the application would be held in a virtual waiting line. After the benefit was authorized, the bank responsible for transfers would make the payments, which were withdrawn by beneficiary families using a dedicated debit card. Once enrolled, families had to comply with the education and health co-responsibilities in order to continue benefitting from PBF.

By combining administrative cross-checks, program administrators could track families that were falling into poverty and those currently living in poverty. The application process involves submitting primary personal data and self-reported income and is usually initiated by local CRAS, which act as the entry-points to PBF and the National Registry for Social Protection programs.

The PBF has allowed beneficiaries to acquire more human capital through its health and education conditionalities. To receive monetary transfers through the program, families must conform to the following conditions:

- Children must stay in school until age 17, and attendance must be at least 85 percent among individuals from 6 to 15 years old and 75 percent among teenagers aged 16 to 18.
- Pregnant women must attend prenatal and antenatal care appointments, and all children must be fully immunized by age five and have growth checkups until age six.

⁸⁹ For social protection programs, the Brazilian Ministry of Citizenship defines extreme poverty as families with a monthly income of up to R\$89.00 per person, and poverty as families with a monthly income between R\$89.01 and R\$178.00 per person.

TABLE 8.1 Bolsa Família Structure, 2021

BENEFITS	VALUE	ELIGIBILITY LINE (income per capita)	CONDITIONALITIES
Children (15-0 years)	41	178	Educational conditionalities: <ul style="list-style-type: none"> • Children between 6 and 17 need to be enrolled in school. • School attendance must be at least 85 percent for 6 to 15 year olds and 75 percent for 16 to 18 year olds.
Mother and Child (6-0 months)	41	178	
Pregnant Person	41	178	
Adolescent	48	178	Health conditionalities: <ul style="list-style-type: none"> • Children under seven years old need to get recommended vaccines. • Weight, height, growth, and development must be monitored every six months.
Basic Benefit (household)	89	89	Families in extreme poverty
Benefit for Overcoming Poverty (household)	EXTREME POVERTY GAP	89	Families in extreme poverty

Source: Caixa Econômica Social.

- Parents must commit to keeping their children in school rather than working.

Studies have shown that PBF has positive impacts on building human capital, especially for children. The program has increased the use of preventive health services for young children (Shei et al., 2014), with a spillover effect on other family members. In addition, studies have associated PBF participation with declines in under-five mortality rates (Shei, 2013) and diminishing stunting rates (Labrecque et al., 2018). Indirectly, there is also evidence that PBF has contributed to higher per capita expenditures on food, higher per capita availability of total calories, and expanded access to better-quality food such as natural or minimally processed foods (Martins & Monteiro, 2016; Coelho & Melo, 2017). Furthermore, the program has been associated with an increased likelihood that children are born full-term, improved weight-for-

Box 8.6 Cadastro Único, The National Social Registry of Low-Income Families

Cadastro Único is the federal government's database on vulnerable families. Once included in the government registry, a vulnerable family benefits from the Brazilian social protection safety net. All PBF (now Auxílio Brasil) recipients are automatically included in this national registry. The registry is not only useful in identifying the families that are most in need, but also in understanding the different conditions of vulnerability that low-income families face in the country. Information extracted from the consolidation of registry data is used to expand social protection programs.

The registry works as a decentralized tool for data collection in 5,570 municipalities of the country. Municipal responsibilities include identifying eligible families, enrolling them, and monitoring their progress. Currently, the registry is the entry-point to 27 federal initiatives as well as to other public programs offered by state and municipal governments for the more than 26 million registered families. The main federal program that uses data from Cadastro Único is PBF/Auxílio Brasil.

Box 8.6 (Continued)

Cadastro Único also contains data on other groups such as the transient poor and self-employed and informal workers who were above the PBF eligibility line before the pandemic. Notably, prior to the COVID-19 pandemic, total expenditures on social protection in Brazil were already large by international benchmarks and biased in favor of formal workers and the elderly, the latter of which are near universally covered by formal or social pensions.

PBF benefits children and has spillover effects on all family members.

height and body mass ratio, and increased vaccination rates (Amaral & Monteiro, 2013).

In education, the program has led to an increase in school enrollment (Glewwe & Kassouf, 2012) and an increase in school attendance and high school completion. Beyond

that, as it challenges the traditional sexual division of labor and gender roles and demonstrates that the promotion of the financial autonomy of women can produce progressive changes. Research shows that assigning women financial responsibility for the household, as is the case in 88.6 percent of PBF recipients, has empowered women across several dimensions. Evidence points to increases in women's financial autonomy, supporting more balanced intra-household decision-making and better access to reproductive services (Azevedo & Favara, 2012; Bartholo et al., 2019; Santos, 2014).

Since its creation, PBF has gone through several cycles of stability and expansion of coverage. From the beginning of the program to 2006, there was rapid expansion, exceeding 11 million beneficiary families, followed by a phase of stability that lasted until mid-2009. During the 2008 food and fuel crisis in Brazil, the PBF was used as an anti-cyclical policy, initiating a new expansion. PBF reached more than 13 million families by 2011.

With the implementation of the Plano Brasil Sem Miséria (Brazil without Extreme Poverty Plan) in 2012, PBF reached 14 million families, serving approximately 23 percent of the Brazilian population. However, in contrast, the period of economic downturn and recession that started in the second quarter of 2014 did not result in an increase in the program's coverage (Barbosa, 2017). In 2019, families who met the eligibility criteria did not receive PBF benefits due to government budget constraints. This generated a virtual queue of approximately 1.5 million families waiting to receive the benefit. By March 2020, with the beginning of the COVID-19 pandemic and resulting economic and social crisis, reducing the waitlist became an urgent priority.

Figure 8.7 shows the evolution of PBF beneficiaries from 2004 to 2021, in millions. The program began with about 4 million family beneficiaries. By 2021, reach had expanded to about 14 million families. The program started by covering about 80 percent of the bottom 40 percent of Brazil's population by income distribution; by 2019, it was covering about 90 percent of the bottom 40 percent of the population by income distribution.

The program's challenges to coverage and the decrease in the actual value of transferred cash started a debate about the role of the program as an anti-cyclical policy and how it could be more effective. Among the issues discussed were the possibility of expanding program coverage based on demand and the program working as an automatic stabilizer and an anti-cyclical policy against poverty.

Another matter discussed was related to how it could be financed during recessions. The COVID-19 crisis, and the implementation of the temporary Auxílio Emergencial intervention reinforced the need to determine how to finance PBF. The heightened demand for PBF and the passing of the federal government's expenditure ceiling in the second half of 2020 led to discussions in the media and among government officials concerning the redesign of PBF and its financing. The debate on PBF reform concentrated on

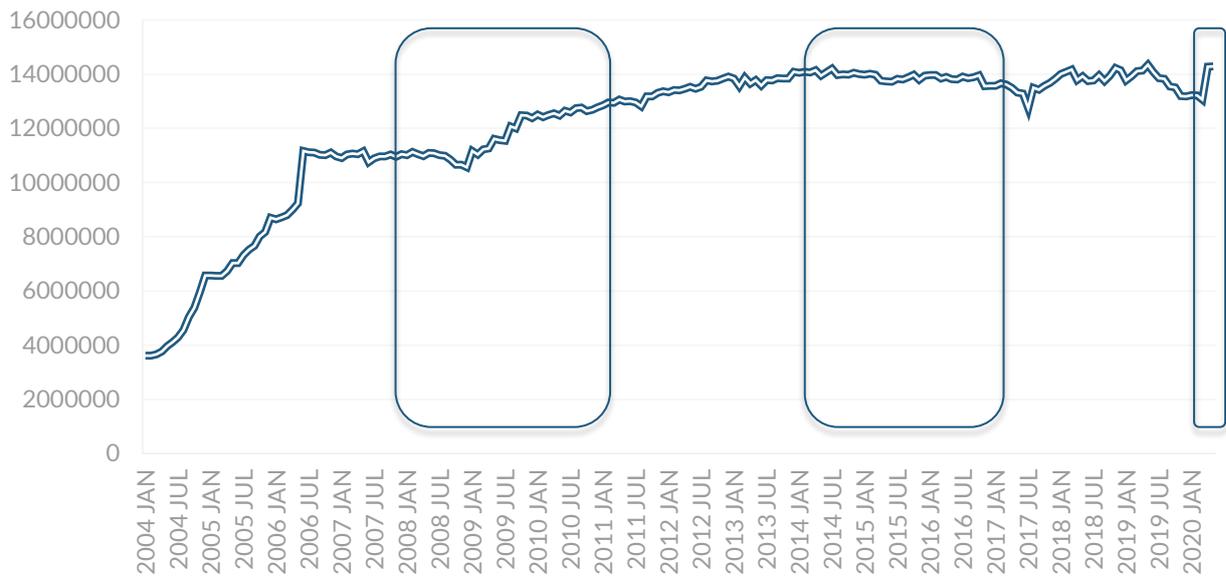
PBF Impacts	
Health	<ul style="list-style-type: none"> • Increased vaccination rates among children • Decreased under-5 mortality, leprosy, and diarrhea
Nutrition	<ul style="list-style-type: none"> • Increased food consumption • Decreased chronic malnutrition
Education	<ul style="list-style-type: none"> • Increased school attendance • Increased likelihood of grade progression • Decreased delays in children's labor market entry
Women	<ul style="list-style-type: none"> • Reduced time on domestic work for girls • Increased balance in intrahousehold decision-making • Increased reproductive and sexual rights access
Maternity	<ul style="list-style-type: none"> • Increased likelihood of full-term birth • Increased number of prenatal visits
Poverty	<ul style="list-style-type: none"> • Reduced poverty by lifting around 36 million people out of extreme poverty (numbers vary by year)

Figure 8.4
PBF Impacts

criteria for expansion and other program updates and determining how long families should benefit from the program. The debate touched on proposals to expand the poverty line beyond R\$178 per capita and to create a mechanism to periodically update this metric. Another topic of debate was whether to introduce variable benefits, specifically for the amounts transferred per child/young adult, the existence of an age threshold (up to age 17), and a link with school accomplishments, such as extending the benefit to young adults who are currently enrolled in a technical or university course until the age of 21. The question on PBF reform was not only related to who should receive the cash transfer, but how much, and under what circumstances.

PBF was terminated in November 2021, and replaced with a restructured CCT program called Auxílio Brasil. This program has brought about four main changes. First, it has simplified PBF's traditional structure, combining two family-level benefits into a single minimum income benefit with a top-up structure. Second, it provides more generous benefits to families with young children (aged 0 to 3) and extends coverage to adolescents and young adults up to age 21 who need more time to complete secondary education. Third, it incentivizes excellence by rewarding achievements in education competitions, sports, and sciences, as well as improvements in school grades. Lastly, it stimulates labor market integration

Bolsa Família Coverage, 2004–2020



Source: Ministério da Cidadania

Figure 8.5
Bolsa Família Coverage, 2004–2020

by partially covering early childcare costs, allowing block grants to CRAS to fund economic inclusion, improving the right to re-enroll in the benefit after changing income thresholds, offering a bonus to those taking up a formal job, and providing payments to family farmers. (box 8.7)

Box 8.7 Auxílio Brasil: The CCT That Replaced PBF

Auxílio Brasil is the conditional cash transfer (CCT) program that replaced PBF. The new program has six main features that differentiate it from PBF:

1. Basic benefit and poverty lines: Auxílio Brasil raised the extreme poverty line and the total poverty line from R\$89 and R\$178 to R\$100 (US\$21) and R\$200 (US\$42), respectively. Auxílio Brasil has the same top-up structure as the PBF benefit to overcome extreme poverty, meaning that every beneficiary family will receive enough to reach the extreme poverty line per capita. However, the novelty of Auxílio Brasil is that it establishes a minimum income guarantee benefit per family member whereas there was a maximum of five benefits per family in PBF.
2. Simplified structure: Instead of three kinds of variable benefits there are only two in Auxílio Brasil. One is based on early childhood, which provides R\$130 (US\$28) per infant (0 to 36 months old), and the second benefit of R\$65 (US\$14) is provided to pregnant women youth (aged 3 to 21) who are enrolled in formal education. Conversely, the PBF benefits ceased at the age of 18.

Box 8.7 (Continued)

3. Exit threshold: The PBF exit threshold was tied to the minimum wage and updated frequently. Eventually, this led to increasing the gap between PBF eligibility, which was not updated as frequently, and the exit threshold. Under Auxílio Brasil, the exit threshold is tied to the poverty line, guaranteeing the same pattern of program entry and exit. Within Auxílio Brasil, the exit rule is tied to the eligibility line, reaching 2.5 times the poverty line per capita. The rule enables families to stay in the program even if their income exceeds the thresholds. This mechanism grants stability to beneficiaries, considering that income fluctuation is common. It ultimately aims to incentivize labor market participation, among other things.
4. New performance benefits: Auxílio Brasil provides new incentives to reward student excellence such as a sports scholarship to reward top performance in official school competitions for students aged 12 to 17, and a science scholarship for students who perform well on national academic and scientific competitions.
5. Productive inclusion aid: Auxílio Brasil also stimulates labor market integration through a rural benefit paid for up to 36 months to families that are farmers; an urban benefit for beneficiaries who secure formal employment; and through the Child Citizen Assistance program to help cover daycare expenses for families with infants (0 to 48 months old).
6. Conditionality: Like its predecessor, Auxílio Brasil maintains conditionalities regarding school attendance, vaccination, and pre-natal care.

In addition to the novel incentives, the program's coverage has been expanded. PBF covered 14.6 million families and Auxílio Brasil is reported to have reached 17.5 million families at the beginning of 2022.

The Road Ahead

The current challenges faced at each stage of the life cycle are not easy to address and require (i) coordination ability between jurisdictions, (ii) policy adjustments to program capacity and service provision based on territorial needs, and (iii) a multisectoral approach for a comprehensive intervention design. The implementation of PBF and ESF has not only demonstrated track record in terms of development outcomes⁹⁰, but also the effectiveness of Brazil's organization of government in which the federal government acts as the provider of policy frameworks, which are in turn adapted, adjusted, and executed by state and municipal governments.

Several factors have increased the urgency in addressing the challenges presented in this chapter. Inequalities are widespread in Brazil and begin early in the lifecycle with unequal access to ECD and continue to the end of the lifecycle with the growing demand for public services of an ageing population. This is complicated by the fact that Brazil is a very heterogeneous country, with regions that have different needs and face problems with different intensities. The need to recover from the substantive human capital losses due to the COVID-19 pandemic makes these challenges even more urgent.

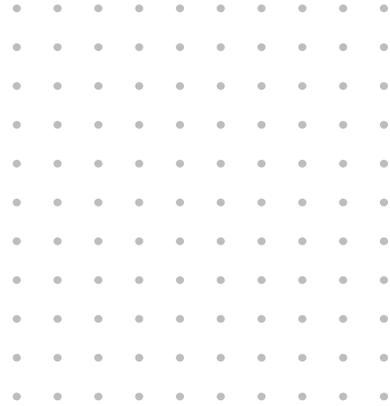
In Brazil, the Human Capital Index performance is highly dependent on reducing inequality in access and quality to public services and providing individuals with opportunities to develop talent including improving access to education, the labor market, and cultural life. Post-pandemic HCI recovery can only be sustained by addressing differences in the quality provision of public services across municipalities and in particular for minorities. The following chapter documents policies that have performed well at the municipal level and can serve as a model to other regions.

⁹⁰ Aransiola et al. (2022).

Chapter 9

Subnational Human Development Policies

Good Practices That Lead to Sound Policy Implementation



Main Messages

- ❖ Municipalities implement a rich set of policies to boost human capital.
- ❖ Most municipalities collect data for the three social sectors (education, health, social protection) and monitor them successfully.
- ❖ The challenge for municipalities is how to effectively use the information for policy planning.
- ❖ There seems to be a general scarcity in primary healthcare professionals specialized in malnutrition as well as teachers knowledgeable on early childhood literacy practices.
- ❖ All sectors recognize the importance of multisectoral policies. However, they have expressed difficulties implementing them. There is a demand for formalized procedures with clear goals and responsibilities.
- ❖ Education, health, and social protection sectors should promote the continuous training and education of staff.
- ❖ Best-performing municipalities execute practices that should be replicated.

This chapter introduces successful procedures and practices at the municipal level that can be used as models to guide public policy towards reaching human development goals. The discussion is centered around two areas of action: (i) quality of service delivery and (ii) creating an enabling environment for improved outcomes.

The quality of public service delivery is highly dependent on an enabling environment for policy implementation. An enabling environment is one in which the government is able to shape and regulate the conditions under which policies are provided and accessed. The quality of service delivery also depends on support such as infrastructure and formalized processes and is largely shaped by the competence of service providers and their adherence to established practices.

In order to ground analysis, this chapter contains cross-municipality and cross-sectoral data to describe the managerial environment for public policy implementation at the municipal level in Brazil. Data collection was done through a qualitative survey with government officials that considered the policy management environment of the three main sectors associated with the Human Capital Index (HCI): education, health, and social assistance.

The survey goal was to collect data on the institutional constraints and existing setups for public policy implementation. Survey questions aimed to capture the enabling environment and quality of public service delivery. The survey design considered the HCI subcomponents (child survival, adult survival, stunting, years of schooling, and harmonized test scores) and was administered to officials in the Health and Education departments, which directly influence those subcomponents. Information was also collected from the Social Assistance Secretariats, as these offices integrate the Brazilian basic social protection network and may transversally affect HCI performance overall.

The first part of this chapter presents the survey methodology and its dimensions. The second part presents the results for each sector (education, health, and social assistance) and assesses the differences in performance observed for each sector. This is followed by a diagnosis of the performance of outliers through focus-group interviews. This section also presents data on some of the challenges that municipalities have faced during the COVID-19 crisis and what they were able to do to mitigate its impact. Finally, this chapter reflects on the enabling environment and quality of service delivery for the Brazilian municipalities based on each sector's response.

— Subnational Survey

The *Human Capital Index Compass* (World Bank, 2020b) provides a guide to assessing progress on HCI performance and considers the institutional and managerial context at two levels: the enabling environment and the quality of service delivery. The HCI Compass methodology identifies broad areas linked to good HCI performance that considers each country's unique context. HCI compass framework guided the process of collecting information at the municipal level. A total of 27 municipal capitals were consulted to identify and describe the main impediments to developing human capital in their constituencies. These capital cities are among the largest municipalities in the country, and the data collected reveal the typical practices of local governments with higher capacity.

The Brazil subnational survey had 49 open-ended and 51 closed-ended questions related to education, health, and social protection (see Annex 1 for the complete questionnaire). Beyond providing information on specific actions in areas directly related to HCI performance, the aggregate responses revealed each sector's execution and the existence of general practices, standards, and procedures. Data was collected between April and August 2021. From the 27 state capitals, 23 participated in the survey, out of which 21 fully responded and two partially responded to the questionnaire, as per the map on the right.

State Capitals which participated in the survey

Human Capital Index Compass, 2021



Figure 9.1
State Capitals That Participated in the Survey

Survey Dimensions

The HCI Compass methodology inspired the survey design sent out to the Brazilians capital cities. The methodology helps to identify public policy procedures and practices that have the potential to improve HCI performance. All in all, the categories evaluated can be separated into three areas that form the foundation of public policy management: (i) resources, (ii) data collection and monitoring, and (iii) the use of information directly related to the enabling environment.

Enabling Environment

An enabling environment is one in which setup costs and practices allow for the planning and execution of effective policy:

- a. **Legal and policy framework:** Legal and policy measures may create a space for improving the use of services. For instance, the needed reforms presented in the previous section relate to actions that directly affect the government's ability to reach its population.
- b. **Financing:** Public investment in human development sectors is critical to improving human capital outcomes. Many of the most cost-effective interventions for human capital development happen at primary levels of care, such as basic education, primary health, and social assistance.
- c. **Government capacity to manage:** This element relates to the government's ability to plan and manage policy efforts. High-performing public systems rely on data and evidence to adjust service delivery, inform policy, and make operational decisions. It includes accountability, transparency, and other mechanisms to enforce quality standards on converting resources into human capital outcomes.

Quality of Service Delivery

Even when there is a match between demand and reach of public service, poor service delivery affects human capital outcomes. The quality of services people receive depends on the quality of providers, availability of infrastructure, and use of the provided inputs. The aspects considered here relate to the capacity of governments to identify and reach poor and marginalized communities through their policy interventions. The maturity of policies that set quality standards and the monitoring mechanisms to ensure them will determine the rate at which resources convert into human capital performance. Quality of service delivery is where policies, legal frameworks, financing arrangements, and overall government capacity manifest their effectiveness. Service quality was assessed in three ways:

- a. **Availability of protocols, inputs, and infrastructure:** These elements provide physical means and guidance on standards for policy implementation. Understanding what is available for service providers makes it possible to improve the conditions of service provision and provides a proxy for service quality.
- b. **Competence of service providers:** This relates to the knowledge of service providers and their ability to engage in their job. For example, primary care providers' experience plays an essential role in identifying and providing drug treatment and counseling to people with non-communicable

diseases. In an education context, teachers' pedagogical skills and content knowledge as well as principals' management abilities, are critical to student learning. In a social services context, the communication skills of social workers determine the success of family and parental interventions based on counseling.

- c. **Service provider practice and adherence to protocols:** This refers to providers' efforts to follow procedures and protocols to provide services, meet quality standards, and follow up with service users. Adherence to protocols directly impacts the government's ability to measure, monitor, and plan public policies.

— – Survey Results

The responses were systematized, considering broad categories for each sector. The percentages presented in the figures throughout this chapter represent the capital cities that responded positively to the questions (figures 9.2 to 9.21).

Education

Education questions addressed school autonomy as well as state management's capacity to provide support and direction to its education network. The questions also aimed to determine whether the municipality monitors and uses data to inform its decision-making in the management of its education network from the micro to macro level. Beyond focusing on education policy procedures, the survey also included questions regarding efforts to address school dropouts and positive practices in planning and monitoring that lead to better school system performance, such as those observed in Sobral, Ceará (see box 9.1).

Box 9.1 The Sobral Case

Despite adverse socioeconomic conditions, Sobral, a city in the state of Ceará, has consistently had outstanding performance in the Index of Basic Education Development (Índice de Desenvolvimento da Educação Básica, IDEB). Sobral is home to 200,000 inhabitants and is located in Ceará, the state with the fifth lowest GDP per capita in Brazil. Between 2007 and 2017, the municipality increased its share of students in primary education with adequate and high learning performance by 60 percentage points, as reflected in results of the IDEB national exam. For both primary and lower secondary education outcomes, Sobral students achieve higher levels of student learning compared to their peers of similar socioeconomic status. Despite the fact that all schools in Sobral are at levels 2 and 3 of socioeconomic development, they are at the top of the distribution in those levels, and student results surpass many schools with higher socioeconomic characteristics (Loureiro & Cruz, 2020).

Public education in Sobral has one goal: every student must complete lower secondary education at the right age and with appropriate learning. The municipality found success by prioritizing learning, establishing clear goals within the school community, and monitoring progress. Overall, the municipality adopted seven main objectives towards meeting this goal: (i) promote literacy at Grade 1; (ii) ensure children in Grades 2 to 4 are able to read through remedial education; (iii) eliminate age-grade distortion; (iv) reduce school dropout rates to less than five percent of enrollments; (v) expand ECE; (vi) restructure lower secondary education; and (vii) provide adult and youth education (Loureiro et al., 2020).

Box 9.1 (continued)

In addition, the municipality organized the education policy under four pillars: student assessment, foundational skills competency, teacher motivation, and autonomous school management. The municipality also implemented an effective program of student assessment, introduced a monitoring and evaluation system in which student outcomes in learning shaped pedagogical interventions, and closely monitored student and teacher attendance.

Furthermore, the municipality established a focused curriculum with a clear learning sequence prioritizing foundational skills. For instance, Sobral established a set of learning strategies to ensure all students were able to read by the end of Grade 2, and provided the existing illiterate students in Grades 3 to 5 with access to additional support to become literate.

The municipality also prepared and motivated teachers. Teacher training in Sobral promotes a solid understanding of curricula and learning objectives and the use of structured teaching materials. The municipality offers structured lesson plans to help teachers acquire a classroom routine. There is also a classroom observation intervention to provide teachers with feedback to strengthen their practice.

Finally, the municipality has sought to establish autonomous and accountable school management. For instance, school principals are appointed through a meritocratic and technical selection process. Appointing qualified professionals to lead schools is the basis for providing pedagogical, administrative, and financial independence. Sobral also created a fund that provides schools with the means to pay for utilities such as electricity and water, maintenance, and small repairs (Holanda et al., 2020; Lautharte et al., 2021).

The Secretariat of Education also supports schools in school management and pedagogical practices. Pedagogical secretariat staff regularly visit schools and meet the principal and pedagogical coordinator to discuss student learning and teacher professional development. Sobral is a success case because of its commitment to a set of good practices and a high level of political commitment to education reforms, which include a learning diagnostic, learning goals, and the provision of teacher training (Loureiro et al., 2020).

To reproduce Sobral's success, the most important step is to ensure that the head of the government is not only willing to commit to educational reforms but also has the ability to have dialogues with different stakeholders. Learning assessments of students at the lower grades are another step that should be taken to detect foundational problems and to set a baseline of learning targets. Baseline results can then be communicated to teachers and parents to raise awareness of emerging issues and to support teachers in addressing them through in-service training. Once these goals are set, student learning can be improved by monitoring and strengthening teacher performance as well as by adjusting the pedagogical planning and managerial practices at the school and municipal levels (Lautharte et al., 2021; Loureiro & Cruz, 2020).

In education, survey responses regarding government capacity to manage were grouped into "data collection," "use of information," and "principal selection process." These three categories provide insights into each government's use of data to adjust service delivery and the arrangement of operational procedures based on impartial/partial criteria. Regarding formalized standard procedures and infrastructure, survey responses were classified into "network support" and "curricular adaptation." With respect to the competence of providers, "lifelong learning" presents information regarding the training and education of service providers.

Survey questions also examined the existence of procedures to guarantee adaptation to context needs such as adapting curriculum content for Indigenous students or having a degree of autonomy when allocating financial resources to school maintenance. Results were presented under network support and curricular adaptations.

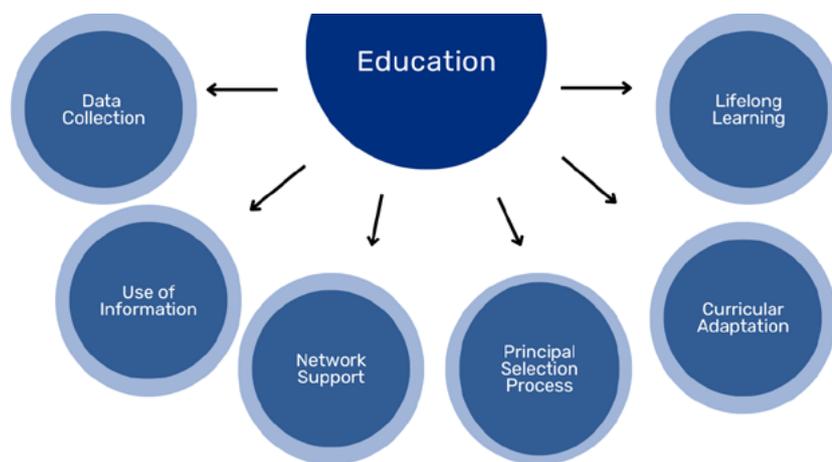


Figure 9.2
Education Survey

From the general responses, the main self-reported problems concern the lack of sufficient protocols, inputs, and infrastructure. Most of the state capitals studied adhere to federal programs and monitor data at least yearly. However, there are gaps in the follow-up process of monitoring such as the systematization of data and its usage. Survey answers point to the absence of a formalized process for data usage, the lack of capacity of service providers to turn data into information that can be used, and inaction on the part of governments to provide a platform to store and use relevant data.

When asked about the biggest challenges faced by their network before the COVID-19 pandemic, the surveyed education secretaries cited matters related to (i) adapting school infrastructure while having classes, (ii) a lack of teacher expertise regarding early childhood literacy, (iii) dealing with school dropouts, and (iv) guaranteeing the provision of early childhood education coverage.

Data Collection

Survey questions related to data collection and monitoring were designed to identify the type of data schools collect based on network orientation.

Most respondents reported that their schools monitor student performance, teacher absenteeism, and school meal quality. The main difference between municipalities is the frequency of monitoring activities, varying from every month to every year. The survey revealed that schools generally have data collection protocols, but that data usage still needs more direction. Considering school dropout rates, 100 percent of the surveyed municipalities stated that they support their network to reduce their dropout index. However, less than half use a data system across their entire education network to monitor school dropouts. There is currently no systematic approach to school dropouts, leaving each school to address the problem individually and indicating a lack of coordination in addressing school dropouts.

Municipalities stated they could quickly identify when a student likely to drop out. Despite this, the most common challenge is to contact the students or their families after school dropout has been observed. The persistence of this challenge indicates a lack of protocols, processes, and procedures to (i) track families and students and (ii) to identify and address issues related to students' decision to drop out of school. In other words: *the school network has information but does not have a follow-up plan once this information is collected* (see box 9.2).

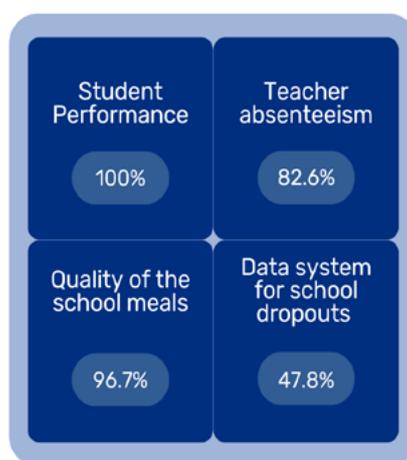


Figure 9.3
Monitored Variables on Education

Use of Information

The use of information reveals how networks use data to adjust service delivery. When it comes to using collected data, most education secretaries (82.6 percent) stated that they use data to tailor programs based on their network needs and to set school performance. To a lesser degree, 65.2 percent of municipalities said they use data to allocate resources. An even smaller percentage of the network uses data to evaluate teacher and principal performance, which shows that it is uncommon for the education network to evaluate its staff. This, in turn, reflects on the network's ability to implement incentive programs related to staff performance, revealing a general problem related to the government's capacity to manage staff.

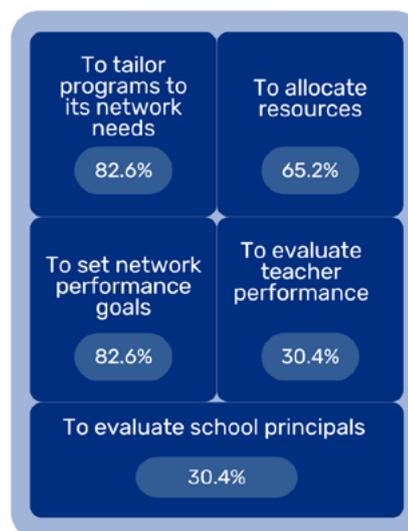


Figure 9.4
Network Use of Data

Box 9.2 Student Dropout: Early Warning System

Dropping out is a process of disengagement that has early warning signs. Although early warning systems are widely used in the US and high-income European countries, few middle- and lower-income countries have implemented such a system (Haimovich et al., 2021; O’Cummings & Therriault, 2015). In Brazil, it is estimated that 1.1 million children and teenagers were out of school in 2019.

Guatemala has had success in implementing an early warning system pilot program designed to reduce dropout rates in the transition from primary to lower secondary school. This program was called Estrategia Nacional para la Transición Exitosa (National Strategy for Successful Transition, ENTRE). As described in Haimovich et al. (2021) and Adelman et al. (2018), the program employs three main strategies:

- Educating school staff about effective strategies to prevent students from dropping out:** This component involves a half-day training for school principals and sixth-grade teachers on evidence-based methods to support students in making the transition from primary to lower secondary school. The training covers challenges students face in continuing school, from lack of motivation and family support to financial constraints, and poor academic performance. Training also informs school staff of the importance of avoiding student stigmatization.
- Providing information to teachers on how to identify students who are most prone to dropping out:** This component includes a government provided list that indicates students who are at high risk of dropping out in the transition from primary to lower secondary school. The list for each school is obtained through a linear regression combined with an algorithm using administrative panel data on students. The model used in ENTRE is able to identify 82 percent of the sixth-grade students who will drop out within the next year. Data is only shared with school principals.
- Reminding school staff to prioritize the identification of dropout-prone students in the early years of primary school:** The third element involves nudges, or five monthly reminders, sent to school principals that aim to keep the risk of student dropout a priority and motivate them to engage in prevention strategies.

ENTRE reduced the dropout rate in the transition from primary to lower secondary school by 4 percent among schools assigned to the program, showing a pathway to successful intervention for middle-income countries (Haimovich, 2021; Adelman, 2018).

Principal Selection Process

How school networks formalize the selection process for principals informs decision-making and is related to the government’s capacity to coordinate school management. Across municipalities, there is a range of approaches to selecting school principals. The most common approach (43.5 percent) is for municipal education secretaries to appoint principals politically. The second most common process (30.4 percent) is to hold a selection process and allow the school community to vote. Some evidence points out that schools that select their principals through transparent/technical selection processes (linked to a “public exam”, “election” and/or “appointment by technical staff”) lead to desired outcomes, such as having principals who remain in their roles for longer tenures and have positive leadership characteristics (such as encouraging teachers to pursue continuing education). In contrast, principals appointed by the secretariats have been generally shown not have these characteristics (Pereda et al., 2019; Assis & Marconi, 2021).

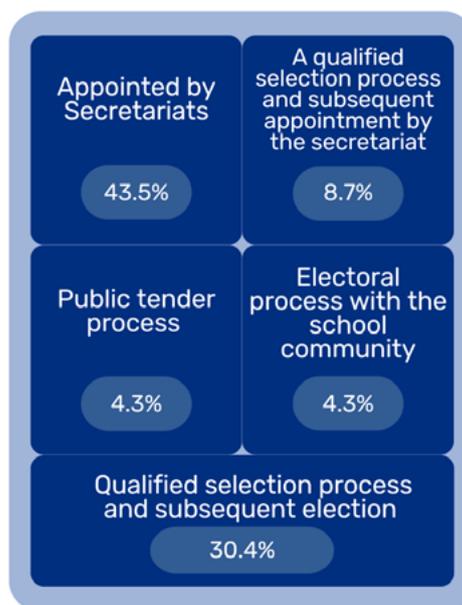


Figure 9.5
Principal Selection Process

Network Support

Network support relates to formalized procedures or protocols provided to each school for the execution of service provision. Only 17 percent of the municipal secretariats surveyed stated that the schools in their network are fully responsible for their curriculum. In other words, 83 percent of municipalities provide some kind of support, such as the provision of materials, templates, or guidance to tailor their pedagogical projects. When asked about arrangements for attending to schools’ infrastructure needs, 65.2 percent of the municipalities’ education secretaries stated that their schools have the autonomy to plan school maintenance activities. On matters related to finance, 60.9 percent stated that schools in their network had financial autonomy and 91.3 percent declared that the schools in their network have the freedom to promote thematic projects and extracurricular activities.

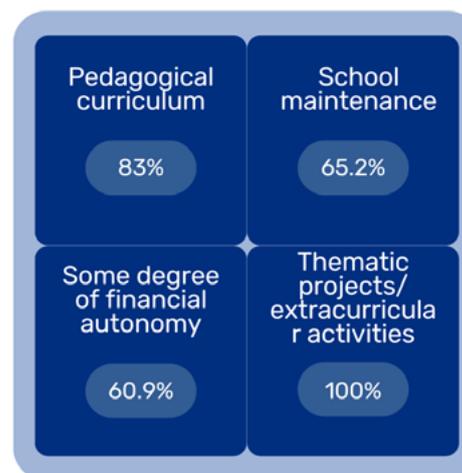


Figure 9.6
Network Support

Curricular Adaptation

Curricular adaptation concerns reveal the level of support given to the context-specific learning needs of schools. Regarding teaching adaptation, 56.5 percent of the municipalities provide programs to their network based on three common adaptation needs: low-performance students, developmental needs, and Indigenous education. Among the municipalities surveyed, 4.3 percent only offer curricular adaptations for low-performance students, and 30.4 percent only offer curricular adaptation support for developmental needs. No municipality surveyed offers exclusive curricular adaptation support for Indigenous students. Extensive research indicates that adapting instructions to students’ needs is potentially transformative, especially for the most vulnerable, and that it has positive learning effects. An example of a successful, related policy is Teaching at the Right Level (TaRL, box 9.3) (Banerjee et al., 2016; Banerjee et al., 2010; Banerjee et al., 2007).

Box 9.3 Teaching at the Right Level

Teaching at the Right Level is a methodology developed by Pratham, an NGO based in India, and implemented in more than 16 countries. The key feature of this pedagogical approach is that low-performing students are grouped according to their knowledge level, regardless of their age or their grade, and are exposed to a range of engaging learning activities for basic concepts in language and mathematics. Student progress is constantly tracked and students are regrouped accordingly (Banerjee et al., 2016; Banerjee et al., 2017; Duflo, 2017; Nickow et al., 2020).

The program has four structuring dimensions:

- **Implementation teams:** These teams are responsible for coordinating the program, teaching students, monitoring implementation, and improving program activities. In general, there are three teams: the coordination team, the mentors, and the instructors.
- **Student assessment:** Every assessment starts by establishing the skills needed. The focus is to identify the fundamental skills that students are lacking. Instructors use assessment results to create student groups with similar learning needs and use level-appropriate activities to help children learn. International evidence suggests that the impacts on learning are greatest in groups of three to five students.
- **Methodology:** After gaps are assessed and students are grouped, mentoring activities begin. These activities are not intended to replace teacher in the classroom work. Rather, mentors strengthen the focus on students' fundamental difficulties and engage students in creative and fun activities focused on learning these skills. Evidence suggests that certified teachers that are not part of regular school faculty produce the best impacts as mentors.
- **Measuring and monitoring:** Instructors regularly evaluate the students and measure their progress individually so that they can be regrouped according to their individual progress. Follow-up is a fundamental part of the impact of personalized tutoring. Frequent data collection is essential in following the development of students with learning difficulties and ensuring the quality of the activities proposed. Monitoring guarantees a clear measure to inform future actions and program improvements.

Researchers have tested different arrangements for TaRL personalized tutoring in countries such as Chile, Botswana, Zambia, and India, and the impacts remain consistent. In India, randomized controlled trials showed that the number of children able to read a paragraph doubled after 50 days of implementing personalized tutoring strategies (Banerjee et al., 2016). In Nigeria, students were 31 percent more likely to read a full paragraph and 41 percent more apt to understand fractions after 180 hours (Nugroho et al., 2020). Similarly, in Botswana, personalized tutoring reduced the number of students without basic math skills by 21 percent (Youth Impact, 2022). In Chile, there was an increase in language performance for primary fourth grade students.

In terms of implementation, the fundamental characteristic is flexibility, which is essential to the Brazilian education system. It is important to emphasize that TaRL interventions are a generalization of the concept of the policy. Each implementation is a slightly different as they are adapted to their country's context and tailor teaching to the needs of the students.

Early childhood literacy programs are also curricular adaptations that help guarantee quality and standards related to early childhood development. With respect to early childhood literacy programs, 69.6 percent of the municipalities surveyed adhere to the existing federal program. Respondents noted that the biggest challenge to implementing an early childhood literacy program is the competence of service providers, that is, teachers do not have expertise in early childhood literacy teaching techniques, although most of the municipalities reported having teacher training on early childhood literacy. This mismatch between action and expectations reveals that efforts have not been sufficient or well implemented for early childhood literacy.

On the other hand, some municipalities reported positive initiatives in public policy management aimed at improving early childhood literacy. For example, Fortaleza has been using the state of Ceará's Literacy at the Right Age program known as Pacto pela Alfabetização na Idade Certa (Pact for Literacy at the Right Age, PAIC) since 2007. In short, the program provides structured material and technical support to municipal education secretariats on teacher training, monitoring learning, educational management, early childhood education, and reading. The state also provides diagnostic evaluation tools for municipalities to apply for the first two years of elementary school (when children are six and seven years old) and sponsors an annual standardized evaluation at the end of the second year. Studies suggest that the program improves students' later-in-life performance in Portuguese and mathematics. Further investigation is required on the program's impact on the observed gap between students who attended and those who did not attend early childhood education institutions (Costa & Carnoy, 2015). The program encourages evaluation/diagnosis, training, and action/intervention by combining financial and bonus reward mechanisms to incentivize schools to teach children to read by second grade. The state of São Paulo also implements a pedagogical management monitoring system that collects data to determine the quality of early childhood literacy. This system is called Ler e Escrever (To Read and Write). Similar to PAIC, the program provides course material for students, teacher guides, weekly teacher training, and learning monitoring protocols.⁹¹

The Fortaleza and São Paulo initiatives both include best practices in education policy, monitoring the outcomes of permanent training for teachers and the impacts on the quality of service delivery. These municipalities have established protocols and made financing available for schools to implement standard procedures.

Although most municipalities monitor school dropouts, they do not generally have protocols or procedures in place to communicate with the families of their students. Networks could benefit from formalized procedures that serve as guidance on approaching education's most common challenges, such as addressing dropouts.

School Infrastructure

In relation to school infrastructure, most municipalities surveyed reported that the main challenges are to adapt the buildings according to technical standards and to promote adaptations concurrent within the school year.

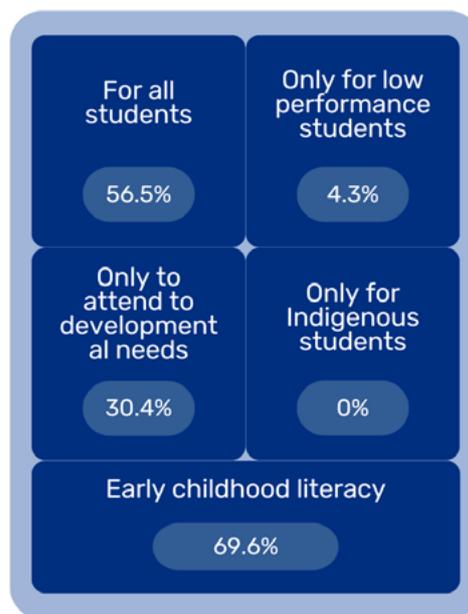


Figure 9.7
Curricular Adaptation

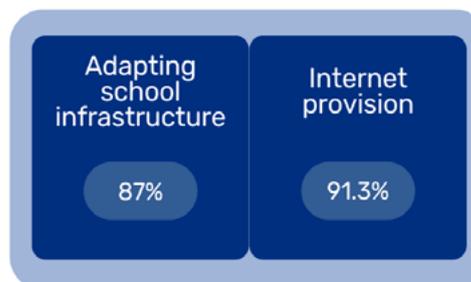


Figure 9.8
School Infrastructure

⁹¹ The state government finances the printing and delivery of teaching materials and the standardized test at the end of the second year. Each municipality is responsible for organizing its teacher training, while the state provides the instructors.

Eighty-seven percent of municipalities' school networks have stated the existence of a program dedicated to adapting school infrastructure to meet students' and staff needs. In terms of providing internet access for their staff and students, 91.3 percent have adhered to the federal program for internet provision. Nonetheless, most municipalities have had difficulties providing internet access in schools located in marginalized or remote areas.

Lifelong Learning

The availability of lifelong learning opportunities and resources for teachers and school staff influences their capacity to adapt to student needs. Most school networks provide lifelong learning opportunities in early childhood education for teachers and staff in addition to providing principal and teacher training. When it comes to addressing the needs of students with disabilities, 95.7 percent of the municipalities provide a permanent training plan for their teachers. Among the municipalities surveyed, 56.5 percent reported providing lifelong learning opportunities to the staff of schools in vulnerable areas, and 34.8 percent provided specific training on Indigenous education.

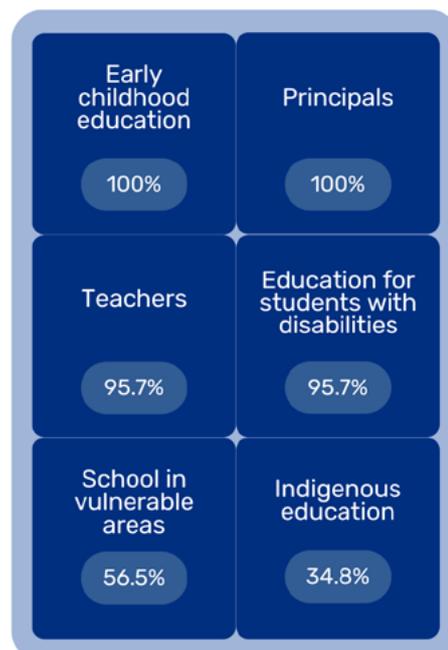


Figure 9.9
Lifelong Learning Plan

Health

Survey questions related to the health sector aimed to cover two factors directly connected to human capital formation: early years care and teenage pregnancy. These factors directly affect young girls' years of schooling. Investments in the early years are crucial for adult productivity. Interventions focused on good health, full nutrition, etc., in the early years have proven to bring lifelong and intergenerational benefits (World Bank, 2021c; Tanner et al., 2015). Teenage pregnancy is a potential factor contributing to young girls being trapped in a cycle of poverty and low education, resulting in worse human capital performance due to less time spent in school (Santos et al., 2017; Chaaban & Cunningham, 2011).

Responses to health sector questions in the survey were organized into four themes: (i) government capacity to manage, which is its ability to plan and execute critical health policies related to early childhood development (ECD) and teenage pregnancy; (ii) network support and adherence to federal programs, which refer to the establishment of formalized standard procedures; and (iii) lifelong learning, which refers to the availability of training and education to enhance the competence of health service providers.

The most common problem in the health sector is related to the government's capacity to manage. Municipal health services often encounter challenges with the public's adherence to public health guidelines. These challenges indicate the need for stronger communication strategies to encourage public buy-in and participation (for example, Brazil usually has a strong adherence to vaccination calls, however, this has not been true for the HPV vaccine roll-out). The overall environment in which health services operate presents challenges to executing actions mandated by municipalities, and the federal government has not offered adequate policy or operational solutions to help address them. It is also common for municipalities to report that they do not have a competent service provider for specific actions like promoting breastfeeding or identifying cases of child malnutrition. Indeed, few municipalities have a permanent training plan in place for their healthcare workers.

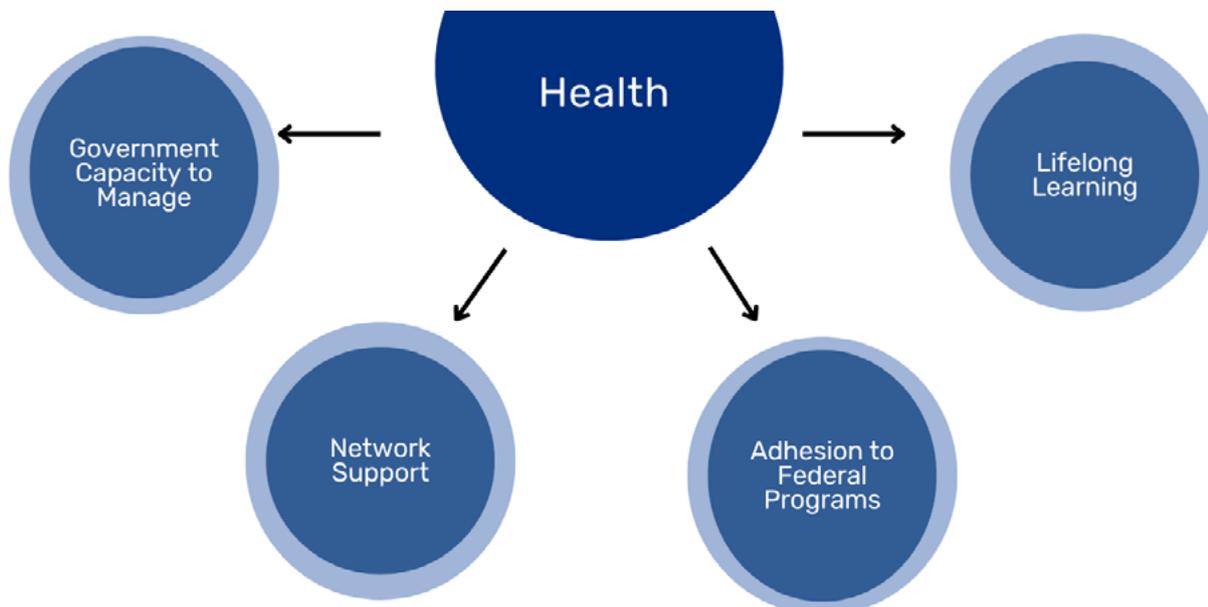


Figure 9.10
Health Survey

Government Capacity to Manage

This section presents information on planning and management across state institutions focusing on areas critical to HCI performance: policy planning, ECD, and teenage pregnancy prevention.

In the survey, 100 percent of municipalities reported having a formalized plan and targets for their health networks. When asked if they had a monitoring plan for their network’s quality of service and robustness, 76.2 percent reported affirmatively. These monitoring plans include the evaluation and measurement of health outcomes and indicators, and they consider: (i) the capacity of teams to undertake evaluation activities, (ii) work conditions, (iii) formal procedures, and (iv) the overall structure of healthcare facilities.

When asked about promoting activities for labor planning and birth care, 90.5 percent of the municipalities answered positively. Regarding child malnutrition, 81 percent answered they had protocols or a program in place to identify and resolve the issue. Municipalities have stated that their main difficulties in implementing a birth care planning program are (i) establishing referral and counter-referral processes between the basic units responsible for performing prenatal care and hospitals and birth centers and (ii) assessing high and low-risk pregnancies and their needs.

Regarding teenage pregnancy, over 80 percent of municipalities reported that they promote activities toward its reduction (see box 9.4 for details). On family planning, 85.7 percent of the municipalities surveyed indicated that they offer support actions in this area.

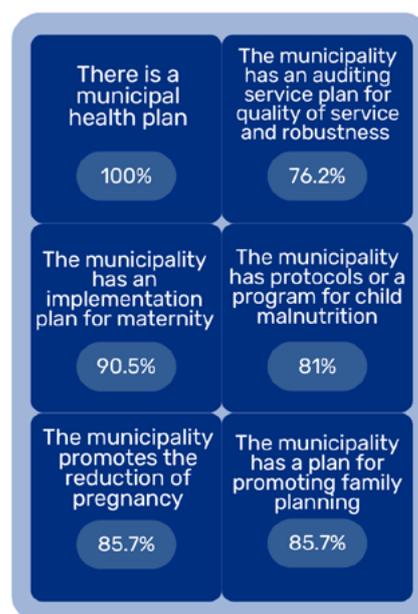


Figure 9.11
Government Capacity to Manage

Box 9.4 Teenage Pregnancy Programs

There is robust evidence showing that policies that aim to widen the set of opportunities for women and strengthen their capacity to be in control of their own lives are most effective in reducing the risk of teenage pregnancy. In addition, interventions designed to raise awareness among female teens about the costs and benefits of unprotected sexual activity can be effective. Successful programs include specific and actionable information about the risk of sexually transmitted infections (STIs) (Azevedo et al., 2012; Santos, et al., 2017). Evidence-based research points to four effective practices that should be considered when designing interventions to prevent teenage pregnancy:

- **Increase access to health services and to contraceptives:** Such programs have positive effects, especially among vulnerable populations.
- **Increase the opportunity cost of pregnancy:** Interventions like conditional cash transfers and school subsidies allow adolescents to stay in school and reduce early childbearing.
- **Increase awareness among teens:** Teenagers can change their sexual behavior in response to information provided. Success depends on the channel (mass media or through school programs) and the message (contraceptive use).
- **Promote adolescent aspirations:** Providing technical and vocational guidance can delay early pregnancy.

Overall program configuration can vary. Programs may be school based, provided during regular or extend hours, include peer educational elements, or delivered exclusively by professionals. Programs can also take place in health centers or community centers. Conditional cash transfer programs and youth training programs can also change the perspective of the vulnerable population and consequently, their choices. Empowerment programs can also include information on sexual and reproductive health (Bergstrom & Ozler, 2021; Bandiera et al., 2020; Azevedo et al., 2012; Chaaban & Cunningham, 2011).

Notably, successful teenage pregnancy prevention interventions are highly sensitive to context. When considering a targeted population, policy makers need to consider if adolescents have limited bargaining power at home, and if it is the case, interventions should be aimed at their parents (Bergstrom & Ozler, 2021; Bandiera et al., 2020; Chaaban & Cunningham, 2011).

Related to experiences in Brazil, in Salvador (Bahia) there is a pilot program in 88 secondary schools focused on pregnancy, reproductive health, and life aspirations. The intervention is based on peer-led educational initiatives and requires the direct involvement of teachers and students. Schools are provided with supporting material, including a laptop, projector, and booklets on teenage health for each student enrolled. Some students are selected as mobilizers. They are trained through a series of meetings with program officers (trained teachers) and are tasked with organizing activities for their school. The pilot has shown positive results, with a decrease in teenage pregnancy and an increase in contraceptive use and post-secondary school enrollment.

In the municipal survey, the municipalities of Palmas, Fortaleza, and Vitoria reinforced that they promote initiatives through *Saúde na Escola*, which provides information on teenage pregnancy in schools. *Saúde na Escola* is a federal program that aims to create links between primary healthcare workers and schools. The program targets education and healthcare workers, the school community, and public school students by promoting (i) the evaluation of student health conditions, (ii) the communication on health and prevention activities, (iii) the permanent training for education and health professionals, and (iv) the monitoring and internal evaluation of program implementation.

Box 9.4 (continued)

Another positive initiative reported in the survey is the BrincanTO Project implemented in Recife. BrincanTO is a set of educational games (digital and physical) that address themes such as body changes, STI prevention, unwanted pregnancy, prevention of sexual violence, safe experiences of sexuality, and gender/sexuality. Several initiatives worldwide use game-based learning as a tool to discuss matters related to relationship and sex education (RSE) in different kinds of media, but further investigation is needed to understand its effectiveness.

Network Support

Regarding intrasectoral work, meaning work within a sector that demands coordination from within, 85.7 percent of the surveyed municipalities stated their networks have pre-hospital and intra-hospital emergency medical services, meaning they rely on a transportation system between basic units and hospitals.

The municipalities that do not have a municipal transportation system reported having to rely on the state transportation within their health network and across networks.

When asked about intersectoral initiatives (initiatives that involve different sectors), 81 percent of the municipalities answered that they execute intersectoral work in relation to immunizations. Most municipalities surveyed indicated that they use schools and or social assistance centers to execute immunization plans. Regarding intersectoral work in general, it is more common for municipalities to promote integrated health policy actions through educational institutions than through social assistance sectors. The ability to provide health services through other sectors strengthens the government's ability to tailor health matters to local needs and conditions, reaching a larger population (Madhav et al., 2017; World Bank, 2021e). While 85.7 percent of the municipalities stated that they collaborate with the education secretariat, only 42.9 percent said they collaborate with the social assistance secretariat. When asked about family planning strategies, most municipalities indicated partnering with schools to promote action on family planning. Still, there is an overall lack of awareness-raising initiatives for young adults through social assistance centers.

From the general responses of health secretaries, we observed that the main issues related to intersectoral work are the lack of availability of protocols and government capacity to manage.

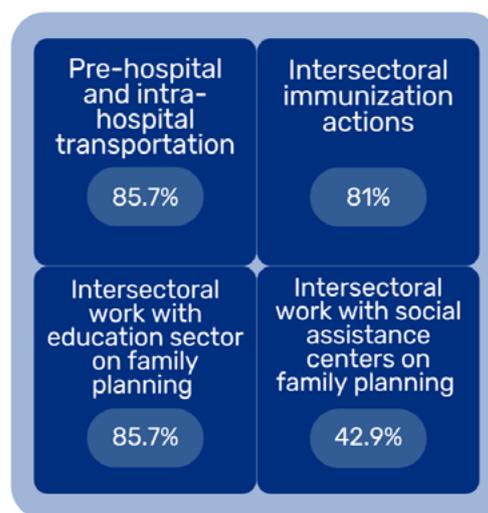


Figure 9.12
Network Support

Adherence to Federal Programs

Federal programs provide protocols and inputs for service provision. Like education secretaries, most health secretaries implement federal programs, such as Estratégia de Saúde Familiar (ESF) and Saúde na Escola (Health at School), which has been linked to a decrease in drugs and cigarettes consumption (Becker, 2020) and has been heterogeneously implemented across the country (Ataliba & Mourão, 2018). Regarding adherence to other programs, all municipalities are part of the Rede de Atenção à Pessoa com Doença Crônica, Federal Care Network for the Chronically Ill. Most municipalities carry out primary health care monitoring for diabetes and systemic hypertension as part of the ESF on chronic diseases.

Along with existing monitoring initiatives, the federal government has established a program partnership with municipalities to provide free medicine for hypertension, diabetes, and asthma and subsidize up to 90 percent of high cholesterol, rhinitis, osteoporosis, and glaucoma prescriptions. Among those surveyed, 71.4 percent of the municipalities indicated that they are taking action on access to medicine.

Furthermore, most municipalities are also part of a program that promotes access to exercise equipment. The Programa Academia na Saúde has been linked to less hospital spending for cerebrovascular disease treatment (Lima et al., 2020) and better performance on obesity indicators (Rosa et al., 2017).

Adherence to the national program on vitamin A supplementation is above 80 percent for the municipalities. The program provides vitamin A supplements for children from 6 to 59 months old. Brazil recognizes that vitamin A deficiency is a moderate public health problem, especially in the Northeast and in some parts of the Southeast and the North.

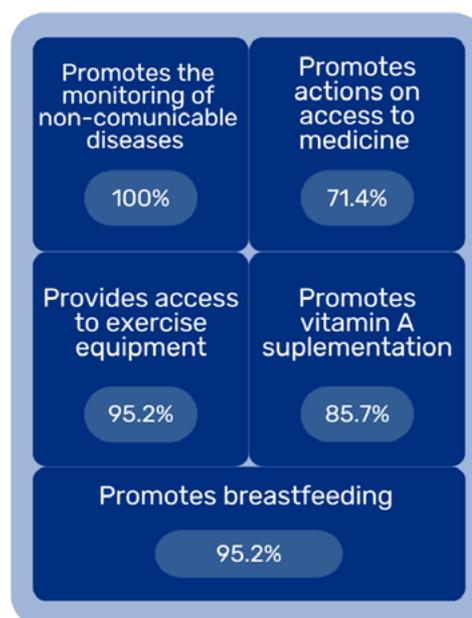


Figure 9.13
Adhesion to Federal Programs

Regarding the health of young children, most municipalities are part of the Programa Nacional de Incentivo ao Aleitamento Materno., National Program to Encourage Breastfeeding, a broad policy initiative that has been in place since 1981, which aims to reduce infant morbidity and mortality (box 9.5).

When considering their adherence to programs, municipalities surveyed answered that most challenges in the implementation of health programs such as HPV immunization in schools, milk banks, and breastfeeding campaigns, are related to a lack of adherence from families, students, and professionals. It is also associated with the government’s ability to communicate the importance and existence of the programs and their potential beneficial outcomes. For instance, 71 percent of the municipalities have a program for HPV vaccination in schools, but only 4.8 percent have reached their goal of vaccinating their target population against HPV.

Box 9.5 **Breastfeeding and Milk Bank Programs**

The scope of the National Program to Encourage Breastfeeding involves the following main initiatives:

The Brazilian Breastfeeding and Feeding Strategy (formerly Rede Amamenta Brasil, now Estratégia Amamenta e Alimenta Brasil) provides a permanent training plan for health professionals and the continuous monitoring of breastfeeding indicators at primary health care facilities. Municipalities that implement the program have a set of implementation criteria, and those that achieve program goals receive a certification. Early studies suggest that in certified municipalities that continue their compliance with the criteria, the program positively impacts breastfeeding indicators (Machado et al., 2021; Venancio et al., 2016; Brandão et al., 2015; Passanha et al., 2013).

The Baby-Friendly Hospital Initiative, (Hospital Amigo da Criança, BFHI), a WHO and UNICEF initiative, orients hospitals towards using a quality assessment and improvement system embodied in a ten-steps program. Studies suggest that there is a higher prevalence of exclusive breastfeeding practices with infants less than 4 months old and any type of

Box 9.5 (continued)

breastfeeding with infants less than 1 year old among children born in a BFHI hospital (Pérez-Escamilla et al., 2016).

The Brazilian Network of Human Milk Banks (Rede Brasileira de Bancos de Leite Humano, BLH-BR) currently has 224 milk banks and 216 collecting facilities and is the biggest and most complex facility of its kind, globally. It is also present in 42.9 percent of the surveyed capitals.

Brazil's legal framework of protection for breastfeeding includes the monitoring and enforcement of the Brazilian Standard for the Commercialization of Foods for Children, Pacifiers, and Feeding Bottles regulation, and the guarantee of the rights of working women who breastfeed.

The Kangaroo Method is a model of care for premature newborns and their families created in Colombia in 1979 by the Instituto Materno Infantil of Bogotá. Other initiatives involving civil society include the Firefighters of Life (Bombeiros da Vida) program, where firefighters collect breastmilk donations and take them to breastmilk banks; the Postman Breastfeeding Friend (Carteiro Amigo da Amamentação), which is an initiative of the Ministry of Health and the national postal service to inform the population about the importance of breastfeeding and the 10 steps to successful breastfeeding. The firefighters and postal workers initiatives train people who are not health professionals to advise the population on the benefits of breastfeeding.

Considering municipal initiatives, the Safe Delivery to the Paulistana Mothers program offers assistance not only on breastfeeding but also on the guidelines of human-centered care in the process of labor and birth. Since the program has been implemented, mothers receive seven prenatal consultations on average, which is more than the six suggested by the Brazilian Unified Health System (SUS). A reduction in neonatal mortality has also been observed, representing an increase in the proportion of regular deliveries and breastfeeding.

Lifelong Learning

Information was also collected on specific training agendas for health professionals, particularly on teenage pregnancy and breastfeeding. About 50 percent of the municipalities surveyed stated they promoted permanent training for their health professionals. When asked about specific spaces for their professionals, only 42.9 percent answered that they provide a specific space for training their professionals. Furthermore, only 23.8 percent of the municipalities surveyed are a part of an arrangement to organize training with other municipal networks, meaning there is potential to develop municipal cooperation through a shared network of permanent training initiatives. A plan for primary healthcare training is more common (81 percent). More than 80 percent of the municipalities surveyed provide specific training on breastfeeding and sexually transmitted infection (STI) prevention.

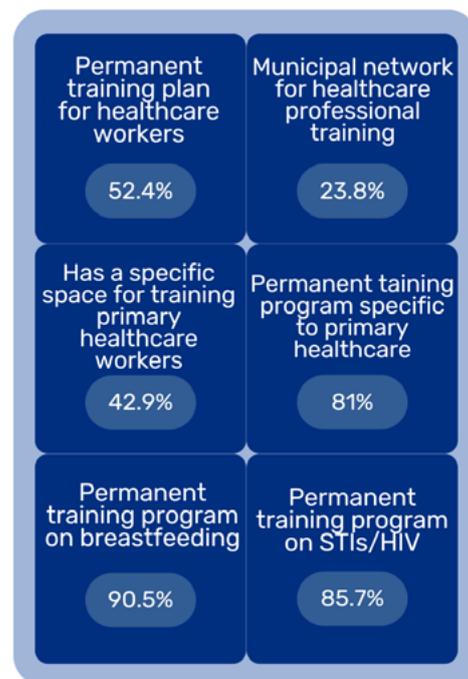


Figure 9.14
Lifelong Learning Plans

Social Assistance

Questions regarding social assistance focused on early childhood initiatives and food security. The conditions faced in the early years have a significant impact on productivity later in life. The survey included questions on actions to include women and youth, given that the two demographic groups usually face more challenges entering the labor market.

From the general responses regarding the provision of social assistance services, the challenges faced by municipalities relate to the availability of infrastructure, human resources, financing, and an overall limited government capacity to manage. Most of the municipalities agreed that the Unified Social Assistance System (SUAS) needs to strengthen its human resources and increase its financial resources.

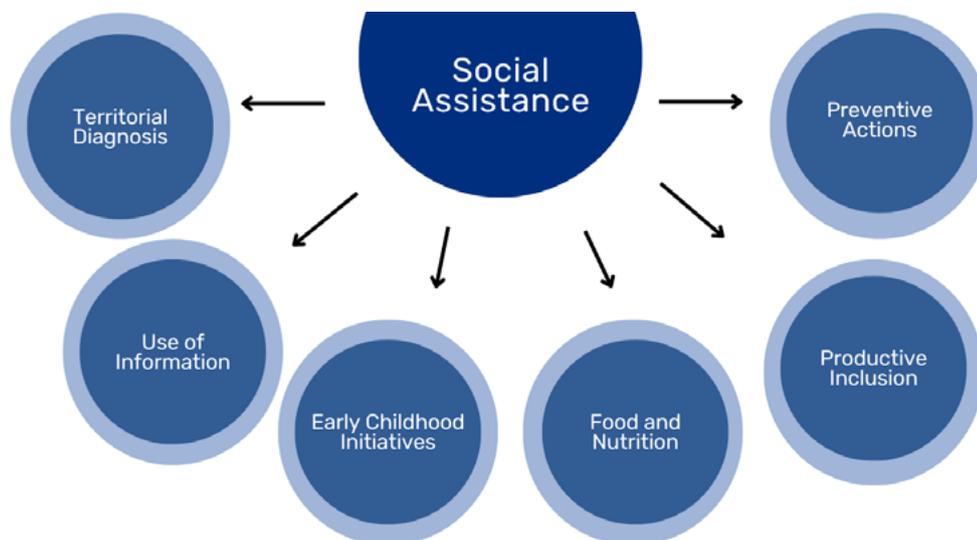


Figure 9.15
Social Assistance Survey

Questions related to social assistance were organized into six main areas. Aspects related to government capacity to manage were grouped into “territorial diagnosis” and “use of information,” which are related to the ability to plan and execute policies. Regarding formalized standard procedures, information is presented as critical issues that affect HCI performance: “early childhood initiatives,” “food and nutrition,” productive inclusion,” and “preventive actions.”

Territorial Diagnosis

In the Brazilian social assistance system, the territorial diagnosis is an essential part of collecting information for policy planning. The diagnosis includes information about social risks and vulnerability tied to the territory, along with data on existing social assistance services. Regarding executing a territorial diagnosis for planning based on population needs, 81 percent of the surveyed municipalities have a designated Social Assistance Surveillance Area, which is usually responsible for information management to support planning activities and the monitoring and supervision of policies. Only 66.7 percent of the municipalities surveyed perform a socio-territorial diagnosis. Those who reported access to a georeferencing system is even lower at 47.6 percent. This is a severe limitation since the planning and execution of social assistance policies are directly

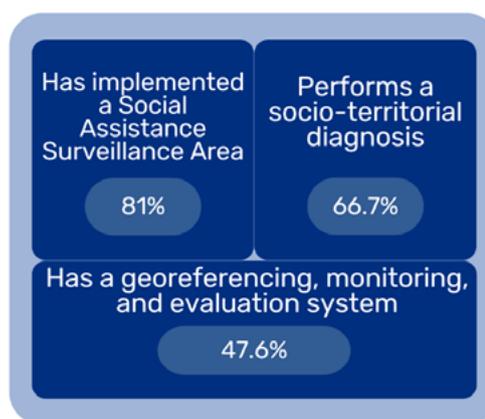


Figure 9.16
Territorial Diagnosis

related to assessing a specific area within a municipality. Policymakers should have detailed information regarding the existence of sanitation and waste collection services, the presence of identity-tied groups, and other information that is crucial to the development of policies that respond to the needs of the vulnerable population of a specific territory.

Use of Information

The use of information reveals how policy makers are incorporating available data in the decision-making process. All of the surveyed municipalities use data from the national registry, Cadastro Único, to plan their initiatives. Municipalities are responsible for updating the registry. However, the lack of planning in researching, collecting, and registering information on specific vulnerable groups reveals a deficiency in the process on the part of the municipality. Only 57.1 percent of municipalities stated they have a plan to reach out to specific vulnerable groups. Similarly, in terms of planning, municipalities were asked if they have a protocol that integrates the different actions promoted by SUAS, and only 71.4 percent have such protocols. This is reflected in the results: only 23.8 percent achieved 75 to 100 percent of the goals set out in their social assistance municipal plan.

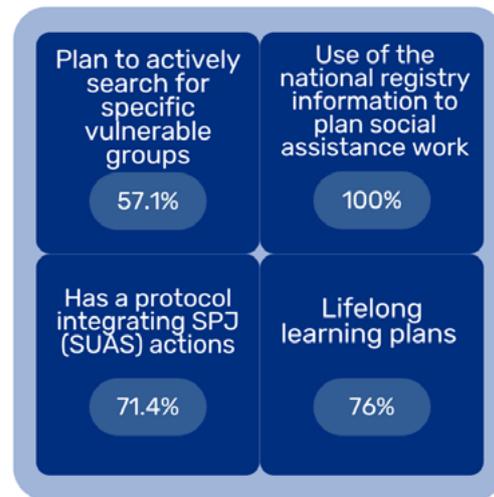


Figure 9.17
Use of Information

Regarding lifelong learning for their staff, 71.4 percent of municipalities surveyed have a permanent training plan for social assistance professionals. When it comes to having a plan to assist their population during emergencies, 76 percent answered that they have a contingency plan.

Early Childhood Initiatives

Municipalities also answered questions on different types of parental support and ECD initiatives ranging from community approaches to family and caregiver bond strengthening. In implementing early childhood programs, municipalities highlighted intersectoral work and the articulation of family and childcare programs with other policies under the social protection net as their main challenge, pointing to an overall lack of government capacity to manage and articulate its actions.

Regarding action in early childhood initiatives, 67 percent of the municipalities stated they implement a program for parental support such as Criança Feliz. Regarding family workshops or other community group meetings, 66.7 percent of the municipalities promote workshops, and 52 percent have other community programs that encourage family bonding. Ninety-one percent of the municipalities answered positively about having ECD programs, such as Criança Feliz or other local initiatives.

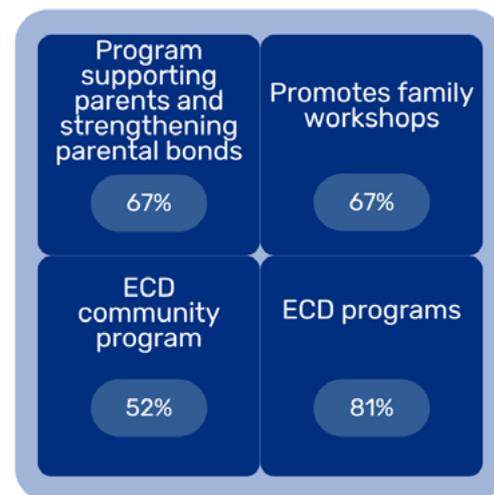


Figure 9.18
Early Childhood Initiatives

An overall challenge affecting the capacity of Social Assistance Secretariats to perform sound service provision is the pervasive lack of human and financial resources. The secretariats' responses reveal a general lack of human resources and infrastructure access and an extensive coverage area for the Social Assistance Centers (CRAS) in terms of territory. This lack of resources is foundational to a general fault in the governments' capacity to manage and implement policies.

Food and Nutrition

In the Brazilian social assistance system, interventions related to food and nutrition include actions to enhance food security and productive inclusion. Regarding food security, 81 percent of the municipalities surveyed stated they have a program for food security. Brazil's National System of Food and Nutritional Security is an intersectoral public system that carries out activities to promote family farming and agricultural production, emphasizing small-scale agriculture.

This system is composed of two main programs. The Food Acquisition Program (Programa de Aquisição de Alimentos, PAA) and the National School Feeding Program (Programa Nacional de Alimentação Escolar, PNAE) were created to leverage the development of local family agriculture while guaranteeing access to good quality food (see box 9.6). With the acquisition of food from small-scale farming through PAA, the government supports self-production and acquires the surplus for a referenced price. PAA is responsible for strengthening small-scale, diversified production, increasing the monthly monetary income of rural families, and preventing rural exodus. Furthermore, 66.7 percent of municipalities surveyed are part of a program on inclusive, small-scale farming similar to PAA, and 57 percent are part of a program like PNAE that integrates school meals and local agriculture.

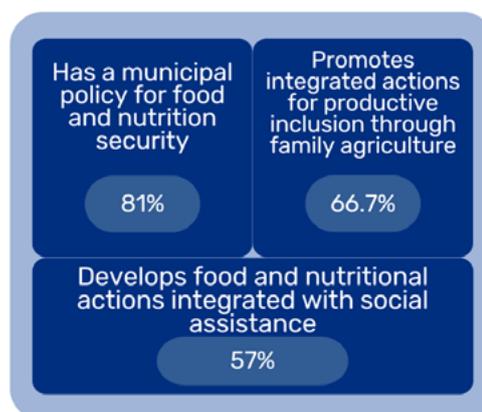


Figure 9.19
Food and Nutrition

Box 9.6

Brazilian National School Feeding Programs

The Programa Nacional de Alimentação Escolar (PNAE), is the Brazilian federal school feeding program that is managed by an autarchic fund of the Ministry of Education. The main objective of PNAE is to contribute to biopsychosocial growth and development, school performance, learning, and healthy eating habits among students through the provision of meals that cover children's nutritional needs during school term. The program also establishes partnerships with local producers since it requires municipalities to allocate at least 30 percent of the funds received to the direct purchase of food from family farms (Casa Civil, 2009). The complementary objectives of the PNAE are:

- To involve all federated entities (states, the Federal District, and municipalities) in the execution of the program
- To stimulate social accountability
- To contribute to the local economy through job creation and income generation
- To foster respect for local food habits and agricultural vocations (TCU, 2017)

Beyond general directives, the program is designed to adapt to local contexts. For instance, a school nutritionist is responsible for planning, coordinating, directing, supervising, and evaluating all food and nutrition actions in schools. PNAE assess the nutritional status of students to identify those with specific nutritional needs. In addition, the program promotes food and nutrition educational activities for the school community. PNAE requires states, municipalities, and the Federal District to set up a School Meal Council, which is responsible for monitoring and controlling the quality of school meals within the school network.

The program provides a good practice manual with directives to incorporate school-meal planning according to the reality of each school unit and a general template for each school

Box 9.6 (continued)

category, from ECD to high school. Funds vary according to each school stage, and ECD and full-time schools receive more per student in comparison to other structures. The amount of meals also varies from one to three a day, as do the percentages of the daily needs that should be covered by the program, which range from 20 to 70 percent, depending on the duration of the school day (Honorio et al., 2020; TCU, 2017).

Although PNAE is recognized as a landmark policy that merges a nutritional strategy with local production incentives, the program's impact on food safety for students, the economy, and on the local producers income needs further investigation. It has been reported that the program implementation is heterogenous in the territory (Rossetti et al., 2016; Libermann & Bertolini, 2015; de Paula Ribeiro et al., 2013; Villar et al., 2013;).

Productive Inclusion

Regarding productive inclusion programs and actions, the surveyed municipalities were explicitly asked about interventions targeted at vulnerable women, persons with disabilities, youth, and the homeless populations. Overall, 67 percent of the municipalities have at least one action on productive inclusion. About 33 percent have a program for women, 33 percent have a program for people with disabilities, 38 percent have a program for the homeless population, and 33 percent have a program for youth. This last category is increasingly important as in 2019, NEETs (young adults aged 15 to 24 who are not in education, employment, or training) represented 23.5 percent of Brazil's youth (International Labour Organization, ILOSTAT database. Data retrieved December, 2021.).

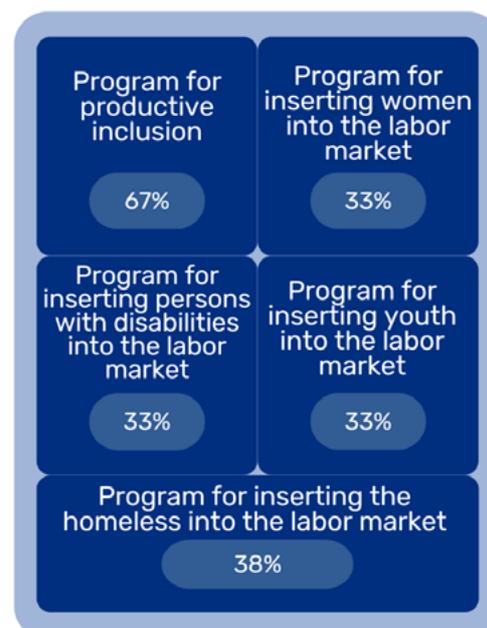


Figure 9.20
Productive Inclusion

Preventive Actions

Preventive actions in social assistance relate to the ability to identify risks before a situation requires complex interventions. This requires data collection and the ability to anticipate problems before they arise.

All municipalities in Brazil implement the Comprehensive Family Care Program (Programa de Atenção Integral à Família, PAIF). PAIF works to strengthen family and community ties and to promote actions to prevent the rupture of family ties. However, 40 percent of municipalities do not have a plan to recruit vulnerable families into the program. Among those that do have a plan, active search is part of the working methodology of the PAIF teams. These searches generally apply to families that are monitored by social workers, families in non-compliance with BFP conditionalities, and families with referrals from the Serviço de Proteção e

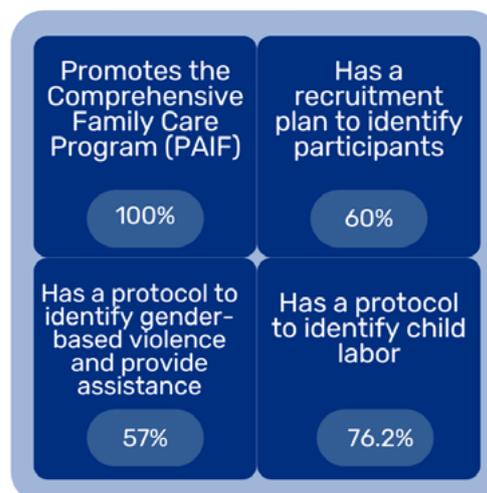


Figure 9.21
Preventive Actions

Atendimento Integral à Família (Comprehensive Family Care Network, PAIF) and the Sistema de Garantia de Direitos.(Rights Assurance System).

The survey included questions about the existence of protocols to identify gender-based violence and child labor. About 57 percent of the municipalities have a protocol for gender-based violence (box 9.7). More municipalities, however, have a protocol for child labor (76.2 percent), which potentially diminishes the child's health, education, and latent human capital.

Box 9.7 Preventing Gender-Based Violence

Gender-based violence (GBV) is considered an endemic challenge across the world and in Brazil. It impacts women and girls not only at the individual level, but also entire households and communities, spanning generations. A significant body of international evidence suggests that social protection programs can lead to a decrease in GBV (especially in intimate partner violence, IPV) as well as in violence against children. This is achieved by empowering women, reducing poverty, and strengthening social networks. Literature points to a diverse range of social protection programs that vary according to countries, and that have proven to be effective in reducing GBV even when they are not designed to do so. However, the links between GBV and social protection still remains underexplored (Perrin et al., 2019; Casey, 2018; Tappis et al., 2016).

In the case of Brazil, the Unified Social Assistance System (SUAS) has been a key mechanism used to guarantee social protection for families and individuals at risk, especially women. SUAS is a unique government-run system that stands out for its decentralized, intersectoral, and participatory management model. It offers services under two main umbrellas: basic social protection, with a focus on risk prevention, and specialized social protection, with a focus on the protection of victims. However, despite prevention being a priority for SUAS, programs on GBV prevention are usually underfunded and have received less government support compared to those that focus on protection. This means that women and girls receive institutional support only after the abuse has taken place.

Salvador launched a pilot project that aims to strengthen the preventative aspect of SUAS to reduce gender-based institutional and intra-family inequalities experienced by beneficiary families. Emerging data shows a significant increase in femicide in the state of Bahia, from 74 cases in 2017 to 113 in 2020. Victims are mostly Black women who have been killed by their intimate partners (Secretaria de Segurança Pública da Bahia, 2021). In Salvador, the state capital, the lifetime prevalence of domestic violence also increased by 31.99 percent between 2016 and 2019 (Carvalho et al., 2020).

The Salvador project targets both beneficiary families and workers of local Social Assistance Centers and is composed of five main activities:

- **Qualitative and quantitative diagnosis:** Assessment of GBV in Salvador is made by looking at the perceptions, norms, and behaviors related to gender roles and GBV that are present in the daily lives of beneficiary families and social workers. This also includes an examination of their perceptions with regard to the services offered by CRAS and CREAS centers.
- **Training methodology and material:** This includes the development of methodology and training material based on the diagnosis to support training and workshops with social workers and families.
- **Training and workshops:** Online training sessions were developed for social workers to address themes such as violence, GBV, gender equity, intersectionality, racism, transsexuality, and religion. For beneficiaries, two online workshops were offered: first,

Box 9.7 (continued)

to a group of father and father figures, which aimed to discuss fatherhood and gender relations, and another for youth, with a focus on gender relations and job skills (a need identified through the diagnosis).

- **Evaluation and assessment:** Evaluation tools were developed to assess changes in participants' perceptions on GBV as well as the training methodology and materials.
- **Dissemination:** The outcomes and main findings of the project are currently being disseminated through two seminars as a way to engage relevant stakeholders such as government officials and civil society actors.

While the results of the intervention look promising, there is still no official data on outcomes. However, the project has some novel elements that pave the way for future conversations on GBV policies as a means to strengthen the prevention aspect of SUAS at a structural level. Nonetheless, more research and initiatives are needed to settle on effective practices for replicable policies to address GBV.

— — What are Municipalities Doing Differently? Evidence from Outliers

This section presents survey responses from structured interviews with select high-performing outliers from smaller municipalities, including: municipalities demonstrating consistent improvement, best-ranked cities at the national and/or regional levels, and best-ranked cities in poor-performing regions. To better understand the nuances of their outstanding performance in recent years and how they could serve as models for similar municipalities, government officials were invited to participate in focus groups. The municipalities of Cocal dos Alves Piauí,⁹² Guanambi, Bahia,⁹³ and Ibimirim Pernambuco⁹⁴ agreed to participate. Focus groups included representatives from the planning, education, health, and social protection departments.

Municipalities were asked how they conduct policy implementation, coordinate network service provision, and integrate their innovative practices into their daily activities. Overall, the focus group data revealed their standard practices, which are presented in this section.

- **Collaborative planning:** The three municipalities have collaborative planning mechanisms to promote intersectoral work. They set up working groups for specific programs, like Saúde na Escola, which count on either the direct involvement of municipal workers in the managerial work of their sector or thematic councils to address specific issues. Decisions are made in meetings that occur at least monthly.
- **Public consultations:** All three municipalities reported a mechanism to incorporate public consultations into their planning and monitoring routines. The format varies, from public conferences to consultations intended for multi-year planning of monitoring and follow-up activities. Overall, the municipalities rely on council members to understand the current demands and to get feedback on ongoing work so that service delivery can be appropriately adjusted. Public consultations are held to collect input and requests from the population. They are held according to a theme such as education, health, and social assistance. The general public and community leaders are invited to present their demands.

⁹² Cocal dos Alves was rated the third-best city in HCI outcomes at the national level and/or regional level.

⁹³ Guanambi was selected as one of the best-ranked cities regarding HCI in poor-performance regions.

⁹⁴ Ibimirim had a 45 percent improvement in HCI in 2019 (compared to 2007) and demonstrates consistent improvement.

How does a public consultation for social assistance take place?

It is carried out through community representatives, whether they are professionals or people who represent the community, through various areas of proposals—proposals for infrastructure, for education, for public health, and for social assistance. The population has the opportunity to put it in their words, “buy an ambulance, build a school in the neighborhood, which we need, build a health center.” This public consultation existed before the pandemic, now it will be a new beginning, in-person, in city neighborhoods, with the vulnerable population, the population in general. We say the vulnerable population because they have more demands. (Health Secretary commenting on civil society engagement).

...I understand councils to be [the] people involved in monitoring and following up on our work, not in the sense of supervising, right? In the sense of helping us, coordinating, and really looking for strengths with our councilors. (Social Assistance Secretary commenting on civil society engagement)

...we have the Municipal Council of Social Assistance, and we have government and civil society representatives, and the [councils] are other spaces to listen to the population. Of course, the participation could be much better, the meetings could be better publicized so that more people would participate. (Social Assistance Secretary, commenting on civil society engagement).

...we have a lot of councils— the Health Council, the Social Assistance Council, the Elderly Council, the Women’s Council—and all of these councils have a health [sector] member. This member is usually someone who is part of the management team so they know what is going on, what is interesting and [aligned with the] profile of the management, and what the management can do [and can] contribute at this moment. (Social Assistance Secretary, commenting on intrasectoral initiatives planning).

- **Monitoring and follow-up:** Program evaluation is routine, and coordination and monitoring work is computerized. Active monitoring relies on systems that generate reports and dashboards based on data inserted by a technician. The data collected drives the monitoring activities and feeds into planning. It is noteworthy that, among these high-performing municipalities, specific technicians are assigned to data entry and monitoring, and they are accountable for its quality. *knowing the reality is very important... there is no work without monitoring. [In addition to digital coordination], we have a circle of professionals that attend to [data collection and monitoring]. With this active monitoring, [we] know if there is any mistake in any record... [Having] information in record time makes a big difference.* (Health Secretary, commenting on using technology as a support tool).
- **Government and team engagement:** In general, smaller municipalities have a strong sense of community, reflected in their administrative practices. There is a drive for results, and likewise, in the experience described by Sobral in box 9.1, there is a public commitment to the goals communicated to stakeholders. Usually, one department drives the efforts. Sometimes, schools are the focal point for support and communication for the social protection network in the municipality. Hence, it is natural for the Education department to lead. Sometimes the Social Assistance Secretariats take on the role of communicating and exchanging information with the community in periodic council meetings. Either way, goals are clear, and information is disseminated widely.
- **Adherence to federal programs:** Municipalities commented on the importance of joint efforts and counting on federal programs for support. According to the municipalities, federal programs provide not only financial support, but also monitoring and implementation methodologies that contribute to the overall organization of the work within the departments. Federal programs also coordinate

intersectoral work. Municipalities have cited the importance of federal government support in providing permanent training as well as monitoring tools such as Datasus, the School Census, and Social Assistance (SUAS) Records, which are incorporated into municipal planning.

...everything here starts, in fact, from the commitment we have... we don't work just to work, we work for results... We have always worked from this perspective of having a diagnosis of the work and of what we are doing and, based on this diagnosis, organize goals to achieve positive results. (Education Secretary commenting on the importance of diagnosis to set clear goals).

We work with agreements. Education receives federal resources [for adhering] to programs, and at the municipal level we have the resources of the 25 percent that we use for the educational policy proposed by the mayor's management plan and the management plan of the municipal secretariat of education. (Education Secretary commenting on federal programs).

- **The UNICEF Seal:** The UNICEF Seal for intersectoral work was mentioned in all interviews. It is an initiative that promotes and strengthens public policies to reduce inequalities and guarantee children's rights. The UNICEF Seal provides a methodology for setting up processes and instruments in three areas: public policy management, social participation, and social impact. The method sets clear goals and means to achieve them by providing municipalities with strategic actions and social-impact indicators. In addition, the method includes public consultations, community forums, an online monitoring platform, and an intersectoral committee with members from the education, health, and social assistance secretariats. The committee is responsible for planning and executing the Municipal Action Plan for the Rights of Children and Teenagers. The UNICEF Seal also aims to set up guidance on municipal planning. Municipalities that achieve minimum scores on strategic actions and social-impact indicators by the end of the four-year plan get a certificate (UNICEF, 2021).

I think that this part of [working in a] network has a very good articulation ability. So within health, we can co-organize with several sectors. We can work very well with health, education, and social assistance. It has the recognition of the UNICEF Seal that worked in partnership with these three secretariats. (Health representative commenting on multisectoral work)

We are very close to education, mainly because of the UNICEF Seal, which stimulates this. A well-articulated, integrated policy action with education and health, the UNICEF Seal is the one that most promotes this integration. (Social Assistance representative commenting on multisectoral work).

— COVID-19 Responses: Lessons, Challenges, and Moving Forward

As discussed in chapter 7, the COVID-19 pandemic has hit Brazil with great intensity, presenting unprecedented challenges to policymakers, public service workers, and authorities. It has highlighted the need to both develop emergency responses to crises and to find solutions to pre-pandemic issues that have been exacerbated by the outbreak.

For instance, social assistance secretaries were reportedly understaffed even before the pandemic. With the consequences of lockdowns and quarantining, the number of vulnerable people increased as did demands on social workers. In education, schools located on the outskirts of cities that had reported difficulties providing internet connections had the added challenge of providing internet connection in students' homes and providing them with adequate tools for online learning during the pandemic. In health, the challenge to integrate actions between health surveillance, assistance, and higher complexity

healthcare providers proved to be a pressing issue involving the need to establish information networks and articulate action regarding the spread of the COVID-19 virus.

The following section presents information on the challenges specific to education and the actions that were taken by state capitals in education, health, and social protection sectors to address these issues.

Education

The pandemic impact on education has been significant as most schools suspended their classes for about two years. In general, the education system was not ready to conduct online classes and engage students remotely. Education secretaries reported they had expected that in-person classes would resume in 2021 with the vaccination roll-out. The unanticipated extension to school closures produced negative impacts on education outcomes around the world as demonstrated in chapter 7. Brazil experienced these effects more intensely given that it was one of the countries in the world with the longest schools closures. Moreover, there were essential coverage differences between public and private schools, and responses to school closures affected vulnerable groups the most.

Unequal access to digital tools and internet connectivity as well as a lack of ICT training among education staff have posed several challenges for governments, schools, and teachers in promoting distance learning and student engagement during the COVID-19 pandemic. According to the 2020 School Census (INEP 2020), only 60 percent of public schools in Brazil have internet access. According to the last SAEB (2019), the percentage of lower secondary students with a computer at home was 66 percent in the South and Southeast, 42.6 percent in the North, and only 36.8 percent in the Northeast (SAEB 2019). This scenario translates into limited learning and regional inequalities.

In addition, the prolonged period of school closures exacerbated school dropout rates, learning losses, and inequalities that, even before the COVID-19 pandemic, presenting significant challenges for the education system. Most of these aspects are reflected in the survey answers reported by the capitals.

Municipalities reported difficulties engaging students in online classes. They listed several reasons for those difficulties and included resource limitations, as students did not have adequate technological devices or even internet connections to participate in online classes, as well as a general lack of ability among teachers who were not adequately trained to plan and conduct online classes. In addition, municipalities also reported difficulties keeping in touch with students and families to avoid school dropouts, an issue that existed before the pandemic. Municipalities also reported maintaining school feeding programs as a challenge. Most capitals organized some form of food package delivery to students' homes to maintain food security for school-aged children. Lastly, respondents expressed an understanding that students would experience learning losses due to the challenges of adapting to pandemic lockdowns and remote learning, and the impacts this would have on the socioemotional state of children and teachers.

Regarding the challenges of reopening schools, respondents mentioned the need to provide socioemotional support to students and teachers and to reorganize school curricula to account for learning losses. They also identified problems related to budget constraints in adapting infrastructure to keep areas well-ventilated and maintain social distancing standards for in-person classes. In addition, they stressed difficulties in enforcing students' compliance with protocols. In general, school networks faced resistance to in-person classes as a result of low community confidence in safety guidelines, the vulnerability of elderly teachers to serious COVID-19 outcomes, and government strategy for children vaccine roll-out. Lastly, difficulties in implementing hybrid education strategies were also mentioned.

Health

The health sector has played a prominent role throughout the pandemic, as it was at the forefront in responding to the spread of COVID-19. Regarding the main challenges faced by this sector, municipalities listed not having enough qualified staff to continue the provision of regular health services in addition to the needs generated by the pandemic. Municipalities adopted a range of approaches to raise the number of available health professionals. They extended working hours and hired new health professionals through calls for tender, temporary contracts with partner organizations, emergency or simplified selection processes, and via the Mais Médicos Program. Municipalities also offered courses on COVID-19 standards procedures to keep health professionals up-to-date on safety practices and support and established training teams

to provide information on Ministry of Health protocols. Municipalities also undertook efforts to provide psychological support to the health staff directly involved in the pandemic response.

Beyond human resources, another challenge to the health sector has been the provision of infrastructure and materials, which requires the mapping of resource needs and planning for emergency purchases. Municipalities promoted the expansion of ICU beds, ambulances, oxygen tanks, personal protective equipment for medical staff, and medications. In addition, municipalities undertook emergency measures to expand the supply of resources (masks, tests, vaccines, etc) needed to fight COVID-19 such as prospecting for new national suppliers, establishing partnerships, and coordinating with other procurement systems. Civil society actors have also donated financial resources to fight the pandemic in order to complement municipal purchasing efforts.

Other responsibilities of the health sector included providing technical notes with specific rules and guidelines to various public and private establishments including drugstores, schools, and gyms. This was done to disseminate information to the population about the seriousness of the pandemic and to orient them towards the Unified Health System. The capitals established a local scientific committee to determine isolation guidelines and general public health strategies based on federal government and WHO recommendations. State capitals also set up public communication strategies based on data transparency via social media and daily newsletters to communicate guidelines.

Social Assistance

In terms of social assistance, challenges in the provision of benefits and services to vulnerable populations arose with the pandemic. Social assistance policy in Brazil has two main functions: the provision of social services through the Unified Social Assistance System (SUAS) and the provision of direct monetary benefits such as the Continuous Cash Transfer Benefit (Benefício de Prestação Continuada, BPC), an unconditional cash transfer to the elderly or extremely poor individuals with disabilities, and the BFP. In terms of coordination, SUAS is designed to perform in a decentralized manner, distributing power, resources, and responsibilities among states and municipalities. The federal government is responsible for approving national guidelines and developing strategies and evaluation protocols, while municipal governments coordinate service provision, and states aid them by offering financial and technical assistance (Segatto et al., 2022).

In April 2020, the federal government launched Auxílio Emergencial (AE) to protect low-income Brazilians affected by the COVID-19 pandemic. AE was conceived as a temporary cash transfer program, meant to last a few months (although it lasted for a total of 16 months), and it was limited to those not already covered by other social protection transfers. AE was implemented by many institutional actors at the central government level with little to no participation of subnational governments or the SUAS (Lara de Arruda et al., 2022). Unsurprisingly, when asked about the challenges faced by the social protection network, respondents highlighted that they had difficulties providing information to beneficiaries on how to access the AE benefit, as SUAS was not a part of its operations. The pandemic increased poverty and consequently generated an increase in demand for access to the Cadastro Único, Brazil's social registry of the poor and vulnerable used for AE enrollment, but granting this new benefit was a challenge. Bolsa Família (PBF), was also available, but it had an extensive waiting list, which discouraged many from applying or re-validating expired applications (Lara de Arruda et al., 2022). Respondents also expressed that it was challenging to maintain the registry of Bolsa Família beneficiaries.

Another critical point is that access to these benefits requires applicants to have mobile phones to receive cash transfers through an application. The services offered by SUAS, which are traditionally offered in person, also had to be provided remotely due to social distancing, requiring new online methods and technologies with new operating protocols. Both the lack of technological resources and the suspension of in-person services were highlighted by respondents as a challenge to operationalizing SUAS during the pandemic. Respondents stated that access to remote services disregarded the context of vulnerability and/or the social risk of beneficiaries, who sometimes lacked technical resources.

Insufficient human resources were also highlighted. As individualized services were prioritized over collective services, social assistance service providers had an increase in time demands and workload. Some service provision continued to be offered in person with minor adaptations like the use of face masks or meeting in open spaces. Some municipalities also identified child labor as a growing threat during the crisis and

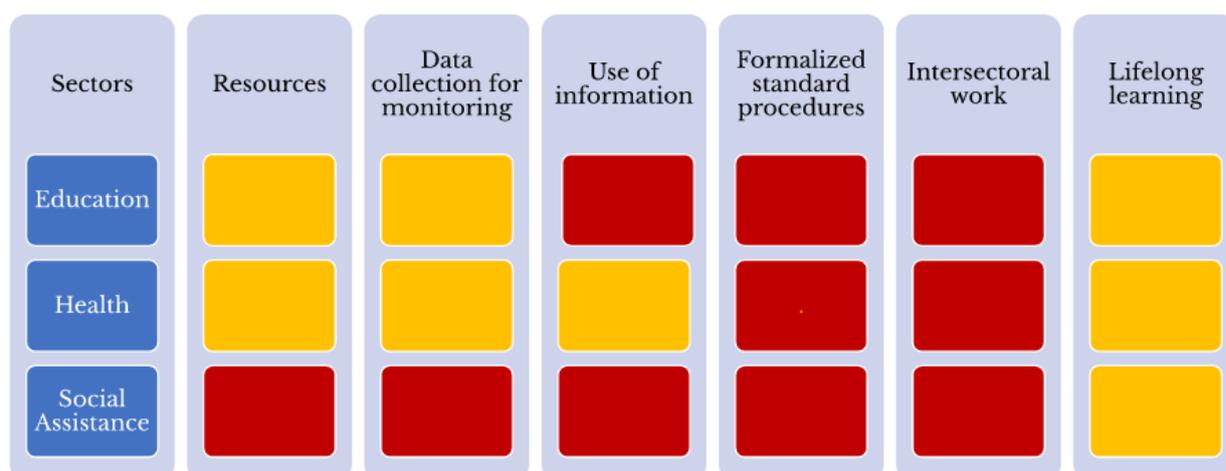
promoted actions to eradicate it. Other respondents expressed difficulties in managing and coordinating the expansion of temporary shelters for homeless people given the increase in the demand for shelters.

Thus, in social assistance, the main challenges were related to the local coordination of benefits like AE and PBF and the lack of adequate tools, protocols, and human resources to provide remote services.

— — Comparative Sector Analysis

Considering the survey data collected on policy practices, coordination ability, and the formalization of procedures for each sector, it is possible to evaluate overall performance for six broad categories: (i) resources, (ii) data collection and monitoring, (iii) use of information, (iv) formalized standard procedures, (v) intersectoral and intrasectoral work, and (vi) lifelong learning for staff. As stated at the beginning of this chapter, the first three categories relate to the enabling environment as they are inputs that inform policymakers and are key elements for planning and policy adjustments. At the same time, formalized standards procedures, intersectoral work, and lifelong learning are categories that inform the quality of service provision since they reveal policymakers' ability to execute actions based on the inputs they are able to provide. Figure 9.22 presents an overall diagnosis of each sector considering the responses to the survey given in this section.

Overall Performance Evaluation of Sectors



Note: Red boxes indicate areas where there is a general problem for municipal networks. Yellow boxes indicate areas where there are good emerging practices with room for improvement, and green boxes indicate areas where observed practices may lead to sound policy management.

Figure 9.22
Overall Performance Evaluation of Sectors

Regarding the availability of resources, the inadequate means to finance and staff the social assistance sector was most often identified as a barrier to executing public policy. The health secretariats signaled the need for more primary healthcare professionals specialized in malnutrition and education, and the need to address the pre-existing demand for early childhood educators with expertise in early literacy. With respect to financing, health and education budgets are tied to a constitutional minimum, while social assistance budgets are not, which explains the main differences in sector performance (as reflected in the number of red areas on the social assistance line in figure 9.22).

Education secretariats and social assistance secretariats also identified infrastructure challenges. Education secretariats pointed to difficulties in adapting schools to accommodate accessibility needs and access to broadband internet, particularly for those outside of urban centers. Social assistance secretariats pointed to the need for more basic social assistance centers (CRAS) and qualified personnel. The general consensus

is that the existing number of centers is insufficient to attend to the vulnerable population and that most centers are in the central region, far from the vulnerable populations requiring services.

Data collection and monitoring relate to efforts to collect data and use it to track progress on relevant matters. For education, there is a heterogeneity in the periodicity for data collection that corresponds with how often data is used for plans and interventions/adaptations. Most monitored indicators are related to student attendance and performance, which are regulated, and most data is collected annually, which suggests that most of the planning is conducted on a yearly basis. Only 28 percent of all municipalities use collected data for teacher evaluation and even fewer, about 25 percent, use data for principal evaluation. All municipalities stated that municipal health plans are established for a period of four years, but revised every year. With the change of focus from hospitalizations to preventive care in primary healthcare, a monitoring culture has developed. Most municipalities have monitoring mechanisms in place for diabetes and hypertension, but there are few initiatives for other non-communicable diseases. For social assistance, although most interviewed municipalities stated they have a Social Assistance Surveillance Area, few have a system for data monitoring. This suggests that information is not systematized and used in planning and monitoring. Data collection is usually conducted for the Cadastro Unico (Unified Registry), but secretariats have yet to integrate this database into their planning and monitoring routines.

With regard to the use of information, the collection and monitoring of variables used as inputs for planning and goal setting was examined. Only 65 percent of the education secretariats use data to allocate resources within their network. Secretariats reported that they know how to monitor student-related matters, but that guidance is required on the use of that information. For instance, secretariats have the means to identify students at risk of dropping out, but they do not have a standard procedure to address the situation. In health, only two municipalities stated that they have regular monitoring reports based on indicators in the four-year municipal plan, but 73 percent of the municipalities indicated that they control for quality of delivery and service resolution, which suggests a common culture in the use of information and monitoring activities. For social assistance, the primary source of data is Cadastro Único as there is an overall lack of socio-territorial data collection. This affects access to local data that would be useful for planning and limits the reach of CRAS that function based on territorial needs.

The category of formalized standards procedures evaluates the existence of mechanisms that guarantee consistent and replicable performance for policy implementation. This relates to the existence of referral and counter-referral protocols and other formalized guidance and requirements for policy implementation. There is an overall lack of formalization in all three sectors, which can affect the ability to guarantee the provision of a homogenous quality of service. For example, in education, guidelines on how to work with students at high risk of dropping out would be beneficial. For health and social assistance, protocols could be developed to improve the coordination between basic service and complex or medium service provision.

The ability to work across sectors is related to the ability to implement policies that involve more than one sector. Despite the existence of multisectoral policies, those involved in their implementation have expressed difficulties in executing intersectoral work. Formalized procedures with clear goals and responsibilities would help to remedy this issue.

Finally, all sectors promote lifelong learning initiatives for staff, which are initiatives related to the continuous training and education of staff. However, specific areas need more attention than others including early childhood, breastfeeding, literacy, social protection, and social assistance system management.

Conclusion

**Human Capital as the
Engine for Change**

Human capital is the engine for change. This report has aimed to alert-on the significant amount of undeveloped talent in Brazil both before the pandemic and today. The purpose of promoting a measure of future productivity such as HCI is to guide policy action in the right direction. If no action is taken, children born today will be unable to develop at least 40 percent of their potential future productivity. This is a reality that Brazil cannot afford to ignore, and existing inequalities will widen if no systematic measures are taken. More than ever, it is the time to put people and in particular children at the center of the agenda.

The concept of many Brazils pointed to where policy intervention is needed. Brazil's great challenge in the coming years is to improve and recover its human capital performance without increasing regional inequalities. From 2007 to 2019, the increase in Brazil's HCI (7 HCI points) did not accompany a substantial reduction in geographical inequalities. Over this period of time, the worst- and best-performing municipalities tended to remain in the same position in rankings. This means that the recorded increase of human capital in the states came at the expense of greater inequality.

The concept of many inequalities showed that more vulnerable populations require further protection after the pandemic. Policies to build a stronger Brazil in the post-pandemic era should focus on inequalities, both geographically and between groups. Productivity gains seen between 2007 and 2019 were lower among Afro-descendants and the Indigenous population. The white population saw a 0.63-point annual increase while Afro-descendants and the Indigenous population saw a 0.43-point increase and a 0.04-point increase, respectively over the same time period. *While white people continue to prosper, Black and Indigenous people are being left behind.* Disadvantages for non-white groups begin before birth with insufficient prenatal care, and the effects endure throughout the life cycle, affecting all HCI components.

The concept of talent at work raises the challenges of the labor market to absorb talent, especially among women. Before the pandemic, individuals, both women and men, accumulated and utilized only 38.7 percent of their potential. For women and Afro-descendants, the toll was heavier. Women arrive at the labor market with more accumulated human capital than men but the labor market fails to utilize their productive potential, which is why there is such a disparity in the observed HCI and the utilized HCI of women. Several other factors augment the need to address labor market policies beyond low productivity such as the effects of an aging population on social welfare policies. Successful experiences in reversing the low fertility rate and improving the integration of women into the labor market are related to the combined provision of stable job markets and formal childcare services.

However, the report also shows that much has been done in Brazil in the last 12 years, which is reflected in better overall HCI performance over the years. Widely known examples of innovation in social policy around the world were replicated in Brazil given their proven impact¹. Social protection programs like PBF have reached those most in need and have had spillover effects on health and education, especially for children. Similarly, ESF has helped decrease mortality rates across age groups. Implementation of affirmative action programs in education have also helped increase access to education among low-income and Afro-descendant and Indigenous communities. At the subnational level, monitoring routines and data-oriented actions are examples of successful practices that were observed in municipalities that performed above the average for the period.

Despite these successful achievements, the government should not overlook the challenges ahead in ensuring all Brazilians enjoy better opportunities to develop their talent and become productive members of the society. These challenges have become urgent given the impacts of the COVID-19 pandemic, which set back human capital accumulation by more than a decade. Moving forward, Brazil must ensure that no one is left behind and that the trajectory towards a highly developed society accelerates.

HCI must be improved and recovered without increasing geographic inequalities

Arguably, Brazil's greatest challenge in the coming years is to improve and recover its human capital performance without increasing regional inequalities. The remarkable increase in Brazil's HCI observed between 2007 and 2019 was not accompanied by a substantial reduction in geographical inequalities. The northern versus southern gap remained relatively the same.

The greatest inequalities were observed within regions rather than between regions. In order to recover from the 12-year HCI loss caused by the COVID-19 pandemic, policies to enhance human capital should be designed for the municipal level. Directing public policies towards the low-performing regions (the North and Northeast) will not be sufficient. Policies must be designed to concentrate on the needs of specific municipalities that are falling behind in human capital performance. This goes hand in hand with the need to establish processes that allow for homogenous service provision with standards and quality control between different municipalities. The coordination of multisectoral initiatives will also play a key role in rebuilding human capital at the municipal level. Because multisectoral actions enhance the flow of information, they will be important for improving service access for the most vulnerable populations.

Afro-descendants and Indigenous people should be a top priority in policies

Overall, policies to rebuild human capital should focus on decreasing disparities between racial groups. Productivity gains seen between 2007 and 2019 were less observable for Afro-descendants and the Indigenous population, which had already a significant HCI gap in 2007. But instead of convergence, while the white population saw a 0.63-point annual increase in its human capital performance in the 12 pre-pandemic years, Afro-descendants and the Indigenous population saw a 0.43-point increase and a 0.04-point increase, respectively, over the same time period. *While white people are prospering, Black and Indigenous people are being left behind.* Disadvantages for non-white groups begin even before birth, with precarious prenatal care, the effects of which endure throughout the life cycle, affecting all HCI components. The difference in homicide rates between the Afro-descendant and white populations is worrying and explain most of the differences observed in adult survival rates. Moreover, the pandemic disproportionately affected the Afro-descendant population. Black households are more frequently exposed to harmful living and working conditions, making them more susceptible to COVID-19 infections. Also, the barriers to connectivity for remote learning are more significant for the Black community. In that sense, the human capital recovery path should include race-specific policies.

Human capital accumulation and use must be made equal across genders

Men have systematically lower HCI scores than women, which are mainly explained by lower adult survival rates and lower expected years of schooling. Policies aimed at reducing the gender gap in human capital should focus on reducing mortality due to external factors, such as aggression and transport accidents, which are more prevalent in men. Dropout rates and repetition among boys are other factors that explain why HCI is lower for men than women. During the COVID-19 pandemic, however, dropout rates increased among all students. While there is no evidence so far of gender differences, the reasons for leaving school tend to be different for boys and girls. While having to work is the leading cause of boys dropping out of school, teenage pregnancy and household chores play a larger role for girls. Thus, education policies need to target the specific behaviors driving school dropout in the context of the COVID-19 crisis.

The HCI measures the potential productivity of a person in a scenario where they find a place in the labor market. Since unemployment rates in Brazil are high, this is not necessarily a safe assumption. In fact, before the pandemic, individuals accumulated and utilized only 38.7 percent of their potential. For women and Afro-descendants, the toll is heavier. Women accumulate more human capital than men, but they are not equally recognized in the labor market, which is why there is such a disparity in the observed HCI and the utilized HCI. Several aggravating factors point to the urgency to address labor market policies beyond low productivity, such as the aging population and its consequence on social welfare policies. Successful experiences in reversing the low fertility rate, as well as better integrating women into the labor market, are related to the combined provision of stable job markets and formal childcare services.

HCI improvements can be driven by well-established policies

The analysis shows that the variation in income per capita explains only around one-fifth of the HCI. This indicates that there is plenty of room for policies to increase HCI performance. The establishment of a universal healthcare system, a new national core curriculum in primary education as well as a comprehensive upper secondary education reform, have all paved the way for Brazil to improve its HCI performance.

Despite the achievements of notable policies like PBF, ESF, and education reforms across levels, more efforts are needed. Quantitative analysis shows that full-time schools and policies aimed at reducing teenage pregnancy can enhance HCI education performance. Anti-violence policies can improve adult survival rates if they target homicide rates. Moreover, policies that promote young adult and adult educational attainment may improve HCI performance as parents' educational attainment is linked to improvements in child survival indicators and directly improve expected years of school.

Data is needed to make problems visible

Brazil has a wealth of administrative data with disaggregated information that enables the construction of a detailed portrait of human capital in the country. There are, however, some data limitations worth summarizing so that further progress can be made. The first limitation is regarding gender-sex data. The National Basic Education Assessment System (Sistema Nacional de Avaliação da Educação Básica, SAEB) stopped releasing its disaggregated data by sex in 2019. As a result, the analysis disaggregated by sex goes only until 2017. Additionally, the gender analysis was conducted in terms of sex as data regarding gender is not widely available in the databases. Second, combining datasets may lead to inconsistencies regarding race. In some databases, race is self-identified, and in others, it is reported by a third person. Third, data about the Indigenous population are often underreported. For example, Indigenous people's employment rate data is not representative. If there is no data, the problem becomes invisible. Policymakers should be attentive in generating reliable and disaggregated data to produce evidence that mirrors the "many Brazils" and provides pathways to improvement.

TABLE 10.1 Policy Challenges and Recommendations

Lifecycle	Challenge	Federal Government	State and Municipalities
Early Years	Reducing inequality in terms of access to early childhood education	<ul style="list-style-type: none"> Establish partnerships between the public sector, NGOs and private sector Set licensing guidelines for minimum standards Provide frameworks to control, monitor, and regulate joint management models in schools 	<ul style="list-style-type: none"> Supervise and guarantee guidelines adherence
Early Years	Quality control for ECD	<ul style="list-style-type: none"> Develop specific curricular guidelines with age-appropriate activities to enforce quality standards 	<ul style="list-style-type: none"> Organize knowledge-sharing networks on what works in their territory (e.g., working groups on ECD)
Children and Adolescents	Retain students at risk of school dropout	<ul style="list-style-type: none"> Provide a framework for local governments to implement an early warning system 	<ul style="list-style-type: none"> Monitor student enrollment to avoid new upsurges in dropout rates Manage the quantity and the quality of school meals Offer efficient school transportation for all students regardless of their distance from school Offer extra-curricular classes for students falling behind (Teaching at the Right Level)
Children and Adolescents	Facilitate youth with school-to-work transition	<ul style="list-style-type: none"> Develop programs that directly integrate youth into the labor market that: <ul style="list-style-type: none"> Include in-person training and internships in local industries Target young people from poor households with low educational levels Provide a stipend lower than the minimum wage to guarantee transportation and meals 	

Children and Adolescents	Teacher quality provision	<ul style="list-style-type: none"> • Establish a national exam to certify graduates before teaching in to the classroom • Provide a framework for municipalities and states to identify teacher weaknesses using performance measurements (PISA, IDEB, ENEM) 	<ul style="list-style-type: none"> • Incorporate a diagnosis for training needs based on the subject areas and the teachers that need the most help • Implement a reward system for high-performing teachers
Adulthood	Inclusive education and labor market access for women, Afro-descendants, the Indigenous population, and people with disabilities	<ul style="list-style-type: none"> • Increase affirmative action in the private sector through incentives for diversity in workplaces • Implement vocational programs that prioritize minorities and discourage occupational segregation • Establish proper enforcement mechanism for anti-discrimination policies • Adopt the guidelines suggested by the Washington Group Short Set on Functioning (WG-SS) in the national Census and household surveys to collect more nuanced and harmonized data on PWDs 	<ul style="list-style-type: none"> • Create targeted programs to increase school permanence of disabled, Afro-descendant and Indigenous students, such as cash transfers, subsidies and other forms of aid/support • Implement programs to help minorities and women build skills for a competitive market • Provide training opportunities for school staff on ethno-racial issues and diversity • Invest more in infrastructure, school-related expenses, and digital inclusion in schools heavily attended by Black and Indigenous students • Improve and expand local childcare and long-term care services • Provide labor-market intermediation services, such as search and employment placement assistance in social assistance centers
Adulthood	Expanding the monitoring of non-communicable disease	<ul style="list-style-type: none"> • Broaden the scope of practice of nurses to extend coverage for primary healthcare 	
All Ages	The fragmentation of the SUS network results in significant inefficiencies and service duplication	<ul style="list-style-type: none"> • Provide a system for shared electronic medical records with a permanent identification number for patients 	
All Ages	Municipalities and states have difficulties making adjustments to policy delivery according to monitored variables	<ul style="list-style-type: none"> • Provide adjustment guidelines for states and municipalities to help adapt their policies to relevant monitored indicators (education, health, and social assistance) • Provide templates for situational diagnosis 	<ul style="list-style-type: none"> • Train and qualify public sector employees on data literacy
All Ages	Difficulties implementing multisectoral policy	<ul style="list-style-type: none"> • Provide a policy framework for multisector policy planning with clear goals and responsibilities for each sector • Provide referral and counter-referral frameworks to improve the communication flow between different sectors and institutions 	<ul style="list-style-type: none"> • Train public sector employees on monitoring processes

Policy recommendations should be tailored to each of the many Brazils

The report highlighted lifecycle challenges that potentially affect current HCI performance across age groups. For children under five, the salient challenge relates to the expansion and quality control of the education network. The main challenge for school-aged children is how school appeals to the younger generation, which relates to school retention and labor market transition policies. When considering adulthood, challenges that need to be addressed relate to the inclusion of minorities in the labor market to improve the use of the accumulated human capital. Finally, there is a growth in non-communicable disease incidence that can significantly affect life expectancy and productivity in adulthood in addition to a greater demand for healthcare services that corresponds with an aging population.

The road ahead will involve policy innovations and experimentations based on successful models that can help Brazil recover and accelerate human capital accumulation. Policy implementation that can be taken by different levels of governance (federal, state, and municipal) is recommended. This will be particularly important in the provision of support and encouragement for the adoption of formalizing procedures. It is also recommended that policies that have proven to diminish inequality be replicated. An analysis of the elements that are fundamental to their success will be necessary so that they can be adapted to different contexts.

Human Capital in Brazil: Moving Towards a Future of Recovery and Prosperity

The report has indicated pathways that could lead to better HCI performance. Socioeconomic conditions are closely associated with human capital accumulation. Increasing parental education should be a priority that would have a cascade effect on both education components (HLO, EYS) and not-stunting and child survival rates. Action needs to be taken with a short-term and long-term perspective, as the results of some of these policies may take a generation to achieve. The quality of provision targeted for the poor should also be prioritized.

Right now, the most urgent items on the policy agenda are (i) recovering from current losses with inclusive education policies and (ii) providing a resilient healthcare system with services designed to reach the most in need. Successful federal and subnational experiences during the COVID-19 pandemic have provided valuable lessons moving forward. Government should take advantage of these lessons and work towards equitable progress by making sure that policies reach those who are systematically in disadvantaged positions.

Although there is much work to be done, it is possible for Brazil to get on the path towards full recovery and to envision a more prosperous future. The COVID-19 pandemic has deeply exacerbated pre-existing public policy challenges, and unfortunately, there are no quick solutions in remedying this situation. Health and learning losses will not be reversed through a business-as-usual approach. Is a return to the past the solution? Probably not. As Brazil's story shows, a large part of the gains in human capital that states achieved within the past decade have been at the expense of greater inequality. When it comes to municipalities, a similar pattern appears: improvements in HCI have not led to a decrease in inequality. Thus, while it may be possible to return to pre-pandemic HCI growth levels, Brazil will have much more to gain if this time around it can be achieved in an equitable way.

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How much talent is lost in Brazil because of unideal education and health conditions? The Brazil Human Capital Review is part of the Human Capital Project, a global initiative of the World Bank Group that aims to raise attention on the importance of investing in people. Its focus relies on the conditions hindering children to flourish their potential labor productivity in Brazil. As a first step, this report proposes the Human Capital Index (HCI) to estimate the expected productivity of a child born today by the age of 18 when education and health conditions remain unaltered. Or simply, the HCI estimates the productivity level of the next generation of works. The results are alarming.

A Brazilian child born in 2019 was only able to achieve 60 percent of all their full potential. That is, forty percent of all talent remains invisible to Brazilian society. Disaggregating the national index shows that many Brazils coexist. In the North, children develop about half of their full productivity, 10 percentage points less than the Southeast. In the Northeast, some municipalities reach HCIs similar to developed countries while others are close to African countries. In general, women accumulate more human capital than man by the age of 18, white-black HCI differences are high and enlarging. After weighting the HCI by employment rates, Brazilians only achieve 38% of their full potential. The COVID-19 pandemic, in turn, made the human capital index to be 54 percent in 2021, a loss equivalent to a decade of progress. If the pre-pandemic pace is maintained, Brazil would only reach the 2019 HCI level by 2035.

How can Brazil recover from a decade lost in terms of human capital formation? Mitigating the effects of the pandemic should be a priority. In the short-term; Brazil should: (a) adapt and strengthen policies already in place that have proven effects on human capital; (b) use the national conditional cash transfer program to support those more heavily affected by the pandemic; and (c) set as utmost priority a learning recovery and acceleration plan for the coming years. This strategy might: (i) bring students back to school; (ii) guarantee that vulnerable students stay in school; (iii) (re)learn effectively; not forgetting (iv) socioemotional effects. Building resilient school networks and replicating its own cases of success seems good alternatives for Brazil. The future starts today.