

Experience of Slavery, Transition to Freedom

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Impact of Enslavement Conditions on Families: Evidence from the French Caribbean

Abstract

How heterogeneity in the experience of slavery affected immediate post-emancipation disadvantages remains unexplored. This paper uses a novel, individual-level dataset covering all formerly enslaved people in the French West Indies (Guadeloupe and Martinique) before and after emancipation in 1848, and a unique institutional feature - whereby surnames of formerly enslaved can be quasi-perfectly associated with former place of enslavement. Before emancipation, I show sugarcane plantations were deadlier and more violent than others. After abolition, the transition to freedom between 1852 and 1856 was marked by high within-island mobility, widespread paternal absence, and improvements in living conditions - but gains depended on prior sugarcane exposure. While past exposure to sugarcane conferred relative economic advantages through skill acquisition, it also led to poorer intergenerational health through two non-economic channels. First, higher paternal absence, itself associated with lower child survival after emancipation. Second, when fathers were previously enslaved in the most sugarcane intensive places, their presence is associated with systematically lower survival of their children after emancipation - even compared to absent fathers. I find suggestive evidence that this driven by paternal violence and child neglect. To understand mechanisms, I exploit parish-cohort variation in childhood mortality exposure when parents were enslaved and show these social consequences stem purely from hardship exposure, not other plantation characteristics.

JEL: J12; J47; I15; O10; O54; N30; N36; Z10

Keywords: Slavery; Sugar; Violence; Emancipation; Transmission

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1 Introduction

The enduring impact of slavery on long run inequality is a central policy concern, which fueled debates regarding the implementation of reparations policies for formerly enslaved communities (Darity and Frank, 2003; Piketty, 2020; Darity et al., 2022). Existing research has primarily examined slavery at the *extensive margin*, documenting its negative association with long-run economic outcomes (Nunn, 2008; Acemoglu et al., 2012; Bertocchi and Dimico, 2014; Laudaes and Caicedo, 2023), and highlighting post-emancipation institutions—such as Jim Crow laws—as key mechanisms of persistence through systemic discrimination (Althoff and Reichardt, 2024). We know relatively much less about slavery at the *intensive* margin, its immediate consequences after emancipation, and its social - rather than economic - consequences.

Slavery was not a monolithic institution - sugarcane plantations were deadlier and more violent than coffee or cotton plantations¹ (Fogel and Engerman, 1974; Higman, 1977; Smith, 1982). Understanding the consequences of within-slavery heterogeneity holds particular relevance for historically enslaved societies such as the Caribbean, where 80% of the population were enslaved at the times of abolition (Smith, 1982). It also allows to investigate an understudied mechanism of slavery induced-inequality: the role of extreme hardship in shaping intergenerational transmission (Clark and Clark, 1950). Second, initial disadvantages caused by slavery were key in shaping the Black-White wealth gap in the long run (Derenoncourt et al., 2024). They are also likely to matter on a broader range of socioeconomic outcomes, yet, very little is known on the transition from slavery to freedom. Finally, slavery involved the forced uprooting of millions, extreme brutality, and the systematic denial of identity and social ties, with potentially profound and lasting social consequences for identity, family structures, and intergenerational transmission (Du Bois, 1908; Clark and Clark, 1950; Patterson, 1982). While these social consequences have been widely discussed in the social sciences, empirical evidence on their role in perpetuating intergenerational inequality remains scarce.

This paper investigates how heterogeneity in the experience of slavery affected post emancipation immediate disadvantages with a particular focus on family ties and childhood environment. I use a novel, individual-level dataset with granular information covering all formerly enslaved people in the French West Indies (Guadeloupe and Martinique) before and after emancipation in 1848. On these islands, sugarcane was cultivated in nearly all counties but at varying intensities, with

¹Enslaved workers on sugarcane plantations had machetes, and enslavers could also have been more prone to use violence to prevent any possible rebellion

important variation despite similar topographic and soil conditions. I use exposure to sugarcane as my main measure of the experience of slavery, which I observe at the parish of enslavement level. To identify where newly emancipated individuals were enslaved, I rely on a unique institutional feature - which is that surnames of formerly enslaved can be quasi-perfectly associated with former place of enslavement. My main findings are the following. While past exposure to sugarcane is associated with worse enslavement conditions during slavery, it conferred relative economic advantages post emancipation through skill acquisition. Despite these relative economic advantages, sugarcane exposure led to poorer intergenerational health through two non-economic channels. First, higher paternal absence, itself associated with lower child survival after emancipation. Second, when fathers were previously enslaved in the most sugarcane intensive places, their presence was associated with systematically lower survival of their children after emancipation - even compared to absent fathers -, with suggestive evidence that this is driven by paternal violence and child neglect. These social consequences of exposure to sugarcane are purely driven by exposure to hardship, rather than other components of sugarcane (such as plantation size or location).

This research is based on a large-scale digitization effort of 100,000 pages of handwritten administrative records covering the formerly enslaved population and their descendants. I first collect civil records of the enslaved population between 1837 and 1847, to create a parish² per year level dataset of all enslaved births and deaths in the decade leading up to abolition. This allows me to empirically test historical narratives about the intensity of hardship depending on crop types. For the post-emancipation period, I use two main primary data sources: (i) the 1848 census of the newly freed, which covers all emancipated individuals and includes information on their former parish of enslavement and their newly assigned surnames. Government officials systematically guided surname selection to ensure uniqueness and distinction from white settlers' surnames³ (Durand, 2011), providing a rare opportunity to precisely link families to their former parishes of enslavement and thereby their enslavement history; (ii) the universe of birth records between 1852 and 1856, which contain granular information on parents and newborns. This allows me to observe the universe of formerly enslaved individuals that had children between 1852 and 1856 (1st generation), and the universe of said children (2nd generation). I am able to precisely measure each child's survival before 1857 by matching all birth records to death records over the 5 year period.

I first exploit these newly collected and granular datasets to run a descriptive exercise, with

²a parish is called *commune* in French, and is the lowest administrative level. There are approximately 30 parishes per island.

³Official guidelines recommended the use of anagrams, mythological names, etc.

two main objectives. First, to confirm that sugarcane-intensive parishes had higher mortality and harsher living conditions during slavery. Second, to document the transition from slavery to freedom and initial disadvantages caused by slavery. Before slavery ended, I find quantitative support for worse enslavement conditions in the most sugarcane intensive areas: higher death to birth ratios, age at death distribution skewed towards the working age group, higher share of female births. I find, however, minimal differences in enslaved population composition (in terms of sex ratio, African origins, estimated monetary value), in line with previous historical work (Debien, 1974; Vanony-Frisch, 1987) ⁴, which limits concerns for systematic selection of enslaved workers into different crop types. After slavery ended, I observe that two-thirds of formerly enslaved individuals reside in a parish different from their plantation of enslavement's. Land access appears to drive mobility decisions: 20% gain access to land, particularly in counties with diversified crops and smaller sugarcane plantations. These changes in opportunities translated into improved living conditions, as suggested by aggregate statistics on death-to-birth ratios.

I then formally test how heterogeneity in sugarcane exposure drove post-emancipation initial disadvantages. I first focus on child mortality as a natural measure of living conditions, given its sensitivity to environmental factors and parental inputs. I use my precise measure of monthly survival for all children born between 1852 and 1856 and employ a Cox Proportional Hazard model (Cox, 1972) to estimate the effect of parental sugarcane exposure during slavery on children's monthly risk of death. I then examine parents' post-emancipation characteristics - both economic (occupation, literacy, land ownership) and social (partner characteristics, fertility) - based on their level of sugarcane exposure, to better understand parental inputs. In all analyses, my treatment variable is each parent's exposure to sugarcane, measured by the share of sugarcane cultivation in their parish of enslavement in 1820. This metric captures both the probability of being enslaved on a sugarcane plantation and the likelihood of being on larger, more violent plantations (which correlated with plantation size before emancipation). My empirical strategy compares families based on their historical enslavement conditions while controlling for parish of residence and year fixed effects. The widespread post-1848 migration allows me to separate origin effects (past slavery experience) from residence effects (current conditions). To further address endogeneity, I test the sensitivity of my results to focusing on movers only (which represents half of my sample).

I find that sugarcane exposure affects post-emancipation intergenerational health primarily through social rather than economic channels. Mothers with sugarcane exposure were more likely to have

⁴For this selection exercise, I use the [Manioc database](#)

children with unknown fathers, a factor typically associated with lower child survival. However, having an unknown father was actually protective compared to having a father who was enslaved in the most sugarcane intensive parish. Fathers with the highest sugarcane exposure levels increased their children's risk of death by 40%, even among higher-income fathers. This result cannot be explained by economic factors, as sugarcane-exposed fathers were actually more likely to have higher-earning occupations and own land.

To explore mechanisms, I test three hypotheses: (i) that sugarcane's social consequences stem from hardship exposure rather than a pure sugarcane effect (driven by location, plantation size, etc.); (ii) that men with extreme sugarcane exposure may have adopted violent and neglectful behaviors due to traumatic responses or violent norms; and (iii) that these men may have had very low involvement in child rearing (comparable to absent fathers) despite appearing in birth records, due to social norms limiting paternal involvement in the deadliest plantations.

To test the first hypothesis, I use a within-parish variation in individuals' exposure to death during childhood - a critical development period during which adverse events are likely to have long run consequences (Bellis et al., 2019). I exploit the time-variation in mortality peaks between parishes of similar sugarcane intensity and compare how higher exposure to death during childhood - among individuals of the same age and exposed to the similar sugarcane intensity - affects both intergenerational health and parents' trajectories after emancipation. I find that sugarcane's effect on social outcomes after emancipation (absent fathers, child mortality) is driven by worse exposure to hardship during formerly enslaved parents' childhood. Differences in economic trajectories, on the other hand, are best explained by a 'pure' effect of sugarcane (skill acquisition).

To test the second hypothesis, I use criminal records of individuals sent to the penal colony of French Guyana and explore the link between historical exposure to sugarcane and post-abolition behaviors. Conditional on being sent to French Guyana, I find that men most exposed to sugarcane during slavery were much more likely to be convicted for crimes against women and children: physical, sexual assault, or murder. I also find suggestive evidence that women from extreme sugarcane could adopt strategic matching decisions and avoid alike men, potentially explaining part of the higher share of absent fathers when they had children. While I cannot completely rule out the third hypothesis - that part of the relative effect of extremely exposed fathers on children stem from paternal absence rather than active harm -, the evidence suggests this explanation cannot fully account for the substantial impact on child mortality. The patterns are most consistent with a combination of negative paternal behaviors and lack of positive contributions to family well-being

driving the observed intergenerational mortality effects.

Overall, these findings suggest that extreme exposure to hardship during slavery had sizable intergenerational consequences, possibly through paternal trauma related violence and child neglect. Considering that child mortality is an extreme measure of poor health, and that experiencing a child death could have important negative spillovers on family members, my findings point to substantial inequality among descendants of formerly enslaved individuals, which would have been overlooked if we had just focused on economic outcomes.

This paper contributes to our understanding of how extractive institutions can negatively impact the outcomes of descendants Acemoglu et al. (2001), Dell (2010), Dell and Olken (2019) emphasize the role of persistent extractive institutions in driving adverse long-term outcomes. In the context of slavery, Acharya et al. (2018); Althoff and Reichardt (2024) document how oppressive institutions in the US south contributed to sustain systemic discrimination today, while Nunn and Wantchekon (2011) and Bertocchi and Dimico (2014) show that persistent changes in norms induced by coercion exposure may also play a crucial role. This paper introduces a novel mechanism by which income inequality resulting from slavery can have a lasting impact: the intergenerational transmission of trauma and violence. While psychologists and historians have long been studying intergenerational trauma among descendants of formerly enslaved communities (Clark and Clark, 1950; Halloran, 2018), economists have yet to explore this area. The findings in this paper highlight a significant effect of intergenerational transmission for inequality, underscoring the importance of further investment in this field.

While most of the literature on slavery's legacy has used country or regional level comparison (Nunn, 2008; Acemoglu et al., 2012; Bertocchi and Dimico, 2014; Acharya et al., 2018; Laudares and Caicedo, 2023), this paper contributes to a burgeoning literature on the impact of coercion on individual families (Althoff and Reichardt, 2024) which allows for measuring coercion's effect even when families relocate. Althoff and Reichardt (2024) show that exposure to discriminatory policies, rather than slavery *per se*, could in fact drive the large Black-White income gap in the US. I find that *enslavement conditions per se* can have substantial intergenerational effects. I thereby contribute to the sociological and historical debates on the social consequences of slavery (Patterson, 1982), more specifically on families (Du Bois, 1908; Higman, 1975, 1977; Trevon D. Logan, 2018), and provide the first empirical evidence on the interplay between enslavement conditions, family structure and child neglect. I also show that heterogeneity in the experience of slavery matters highly for its legacy on descendants.

My findings thereby expand on our understanding of the effects of parental inputs at early ages of children (Heckman et al., 2013). Prior research has stressed that the lack of inputs from one parent (because of divorce, incarceration, death) can have important negative consequences for affected children (Gay Painter and David I. Levine, 2000; McLanahan et al., 2013; Kalil et al., 2016; Dupraz and Ferrara, 2023). I offer the first analysis of fathers' influence for early childhood development within a coercive context. My historical findings align with recent causal evidence presented by Norris et al. (2021), who found that the imprisonment of fathers can in fact have positive effects on children, particularly when there is a risk of abuse.

Considering within-slavery variation for post-abolition trajectories is especially relevant in the Caribbean, where 70% of the overall populations were enslaved at the times of abolition (Engerman and Higman, 2003). I confirm the established narrative that enslavement conditions during slavery were strongly affected by planters' economic incentives, which varied with crop type (Fogel and Engerman, 1974; Higman, 1977; Smith, 1982).

2 Historical Context

This section provides historical context on the slave economy, enslavement conditions on sugarcane plantations, and the institutional changes at emancipation.

2.1 The Sugar Economy

Guadeloupe and Martinique are two former French colonies that are now among the poorest provinces (*départements*) in France⁵. These islands are typical examples of extractive colonies set up by European countries in the Caribbean. African slaves were imported massively between the 17th and 19th centuries to serve as labor in plantation systems, and made up 80% of the total population at abolition (Engerman and Higman, 2003). Slavery was abolished in 1848 during a political crisis that led to the re-establishment of the Republic following the revolution against the July Monarchy. By that time, the islands' population amounted to nearly 200,000 inhabitants across 60 parishes⁶.

The economy of the French West Indies centered on exportable crops: sugarcane (50% of cultivated land), coffee (15%), and other crops (35%, including cocoa, indigo, and subsistence agri-

⁵INSEE

⁶The lowest administrative unit, called *communes* in French.

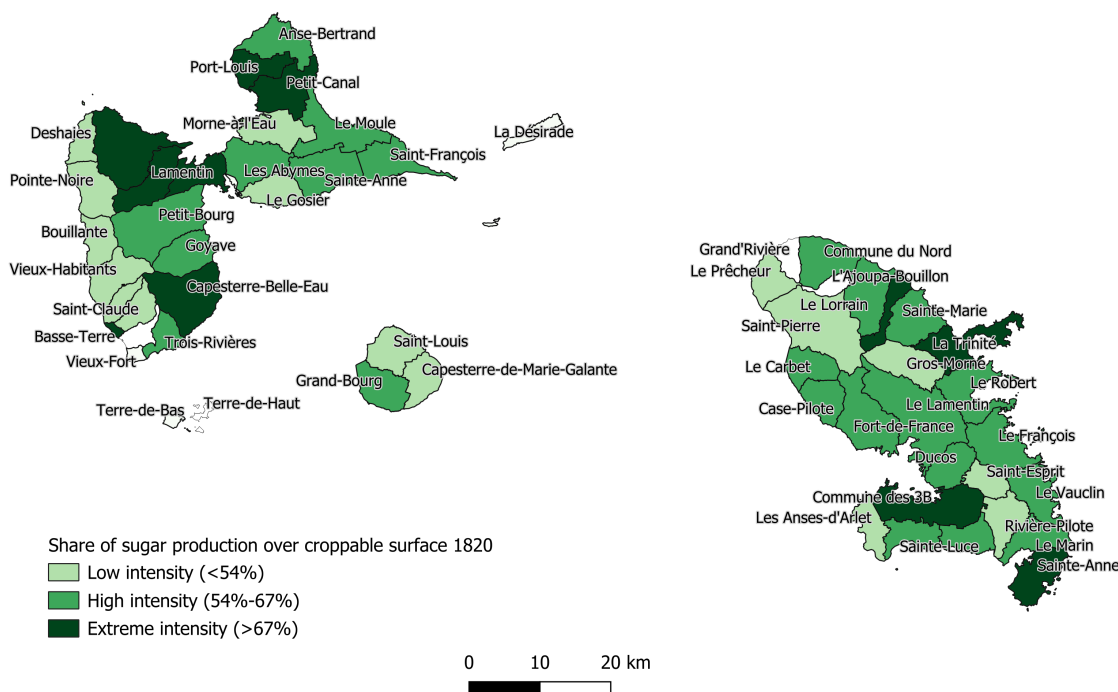
culture) (Schnakenbourg, 1977). The distribution of enslaved workers remained stable over time (Figure A7), with 60% attached to sugarcane, 30% to secondary crops, and 10% to city dwellers.

The economic unit of production was the plantation, operating under the “Exclusivity Regime”: planters could only export to the mainland in return for preferential tariffs and purchase guarantees (Fallope, 1983). However, sugarcane prices were determined competitively on the international market (Figure A6), with France’s production representing a small fraction of global output. Communication between plantations was minimal, with little within-island exchange of enslaved workers even after the 1831 slave trade ban (Schnakenbourg, 1968).

Sugarcane plantations in the French West Indies were small by international standards, averaging 80 enslaved workers in 1820 (compared to 15 in coffee plantations). These entities operated with considerable autonomy, with minimal government intervention. Larger plantations even had their own hospitals, prisons, and chapels.

2.2 Determinants of Sugarcane Intensity

Figure 1: Share of Sugarcane Over Cultivated Surface in 1820, in Guadeloupe (left) and Martinique (right)



Note: Share of sugarcane over cultivated surface as per 1820 census data (slavery was abolished in 1848), **Source:** Ministère de la Marine et des Colonies

The relative homogeneity of the islands' soil and climatic conditions made sugarcane production possible in nearly all parishes⁷. This was also true for subsistence agriculture, cocoa, and indigo. While initial suitability likely influenced early plantation establishment, sugarcane's high profitability from the 17th century onward led to its extensive cultivation. By 1820, sugarcane had become the primary crop in nearly all parishes, though with only a weak correlation between sugarcane cultivation share and initial suitability (Figure A3). Parishes with different sugarcane cultivation shares could thus be similar in geographic characteristics or disease environment. When dividing parishes by the median sugarcane share (52%), I find no statistically significant differences in soil suitability, sugarcane/coffee suitability, or enslaved population density (Table 1).

While sugarcane was the most profitable crop and could be produced in nearly all parishes, it required significant capital investment. As a result, not all plantation owners engaged in sugarcane production despite suitable conditions, leading to heterogeneity in crop produced across the islands (Lasserre, 1952).

Table 1: Descriptive statistics on parishes in 1820, by sugarcane intensity

Sugarcane over cultivated surf.	Intensive (>52%)		Non intensive (≤52%)		Difference in Means	
	Mean	(St. Dev.)	Mean	(St. Dev.)	Diff	P-value
Median Slope	4.53	(1.13)	5.18	(1.31)	-0.65	0.058
Soil suitability	2.94	(0.88)	2.77	(0.94)	0.17	0.499
Sugarcane suitability	5115.63	(3027.53)	4887.52	(3417.72)	228.11	0.798
Coffee suitability	3243.09	(1972.04)	3804.55	(2031.4)	-561.46	0.413
Total surface, hect.	3994.15	(1805.33)	2592.85	(1765.63)	1401.30	0.006
Sugarcane surf.	844.27	(456.83)	297.04	(341.99)	547.23	0.000
Sugarcane over total surf.,%	0.22	(0.08)	0.10	(0.08)	0.12	0.000
Sugarcane over cultivated surf.,%	0.64	(0.07)	0.29	(0.18)	0.34	0.000
Sugarcane plantations, N	24.50	(14.29)	12.52	(12.31)	11.98	0.002
Slave population	3497.85	(1670.26)	2498.44	(2439.05)	999.40	0.087
Total population	4250.23	(2214.48)	3329.89	(3466.72)	920.34	0.254
Enslaved population density	0.93	(0.44)	11.09	(52.64)	-10.15	0.326

Notes: This table displays descriptive statistics on cultivated crops, topographic characteristics and population, in sugarcane and non-sugarcane intensive parishes. Sugarcane intensive parishes are those whose share of sugarcane over cultivated surface in 1820 is above 52% (median value). The last two columns show the difference in means and associated p-values calculated using t-tests. **Primary sources:** *Tableaux de population et de cultures des Colonies Françaises*, *Ministère de la Marine et des colonies* and *FAO*

⁷See Figure A4 for the distribution of sugarcane suitability, calculated using FAO's suitability indexes (SI) for high-input sugarcane production.

2.3 Enslavement Conditions

"The planter is the sole arbiter of the law [...]. He judges and condemns as a sovereign feudal lord; he administers justice on his lands, and his judgments remain without appeal. Refusal to work, breaking doors, theft - everything falls under his jurisdiction [...]. What are we to think of a social state in which a man of human inclinations takes the whip himself and strikes a woman until she bears twenty bleeding wounds on her body!! If the righteous can stoop to such a level, imagine what the wicked will devise." (Victor Schoelcher, 1842, p.40, p.68)

Experience of Slavery Testimonies from abolition advocates like Victor Schoelcher paint an appalling picture of plantation life: exhausting workloads, physical abuse, poor nutrition, etc. (Victor Schoelcher, 1842). Planters held absolute power with near-total impunity. Physical abuse was often justified by false accusations, such as poisoning cattle.

These extreme conditions resulted in high mortality, low fertility, but also a profound disruption of social ties among enslaved individuals (Du Bois, 1908; Davis, 1983; Patterson, 1982). While a parent and a child could have had a relationship, this relationship holds no legal standings or rights. Families were often sold apart, and individuals often uprooted from any family or community link - a phenomenon contributing to the social deaths of enslaved communities, as coined by Patterson (1982). The destruction of family link between parents and child was even more pronounced for paternal bonds - as children belonged to the mothers' enslavers. This led scholars to impute a long lasting effect of slavery on social ties, particularly on paternal absence (Du Bois, 1908). Yet, empirical evidence on the social consequences of slavery are still lacking.

Crop-specific conditions Historians argue that conditions were particularly severe on sugarcane plantations compared to coffee or cotton (Smith, 1982). Sugarcane work was more physically demanding, especially during harvest⁸, and required larger labor forces (50 on sugarcane vs. 15 on coffee plantations on average).

The higher ratio of enslaved to non-slaves on sugarcane plantations led to more frequent physical abuse to prevent collective action. The need for machetes during harvest may have further intensified violence to prevent rebellion. These conditions are reflected in mortality rates: in the British West Indies, Higman (1977) found 50 deaths per 1,000 enslaved on sugarcane plantations versus 30 per 1,000 on coffee plantations. While similar patterns likely existed in the French West

⁸Sugarcane required annual replanting and a lengthy manufacturing process with significant accident risks (crushed limbs, burns). The heavier workload left less time for subsistence gardening, impacting nutrition (Schnakenbourg, 1977).

Indies, systematic evidence by crop type remains limited⁹.

On the other hand, the need for skilled workers - for construction, sugar refinery, domestic work - on sugarcane plantations meant that a higher share of enslaved individuals occupied a non field worker position (13% vs. 3% on coffee plantations)(Vanony-Frisch, 1987; Fallope, 1987). Many of these skills (masonry, carpentry) were transferable, potentially giving formerly enslaved individuals from sugarcane plantations better economic prospects after emancipation.

Worker characteristics The demand for stronger labor may have led sugarcane planters to acquire more physically robust (and expensive) enslaved individuals. However, historical studies of plantation records show no systematic selection by sex, ethnicity, or age across plantation types (Debien, 1974; Vanony-Frisch, 1987). I further explore this question in the results part.

Table 2: Enslaved population characteristics by plantation type

	Secondary crop		Sugarcane		Difference	
	<i>mean</i>	<i>(std.)</i>	<i>mean</i>	<i>(std.)</i>	<i>mean</i>	<i>p-value</i>
”Value” (Fr.)	1545.32	(12.60)	1536.87	(13.23)	8.45	0.66
Age (mean)	25.02	(0.29)	26.09	(0.32)	-1.07	0.05
Women (%)	0.51	(0.01)	0.51	(0.01)	0.00	0.98
N	3772		3597			

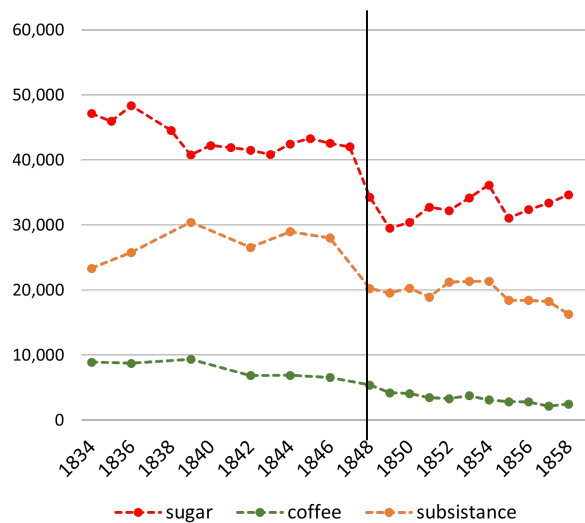
Notes: Own calculations using the [Manioc database](#), indexing over 3,200 notarial acts from the 18th century documenting over 14,700 enslaved individuals in Martinique. Statistics calculated for 7,500 workers where plantation type could be established.

2.4 Emancipation and the Institutional Legacy of Surname Giving

The 1848 abolition of slavery came abruptly with the revolution against the July Monarchy and the establishment of the Second Republic. Immediately after the declaration of the abolition of slavery, the new french government sought to assign civil identified to the newly freed individuals - hoping to secure their votes in the upcoming legislative elections. Government officials conducted an exhaustive census of the newly freed population (150,000 individuals), recording basic demographics, former places of enslavement, and assigning unique surnames. Official guidelines prohibited using white settlers’ surnames, instead recommending mythological names or transformations (anagrams, letter substitutions) to ensure distinctiveness (Durand, 2011).

⁹Régent (2010) reports late 18th century Guadeloupe fertility rates of 30-50 births per 1,000 and mortality rates of 50 per 1,000 across all plantation types.

Figure 2: Cultivated surface by crop type (1834–1858)



Notes: Total surface cultivated by crop between 1834 and 1858, in Guadeloupe and Martinique. The black line indicates the abolition of slavery in 1848. Source: Own data collection from *Statistiques du Ministère des Colonies*.

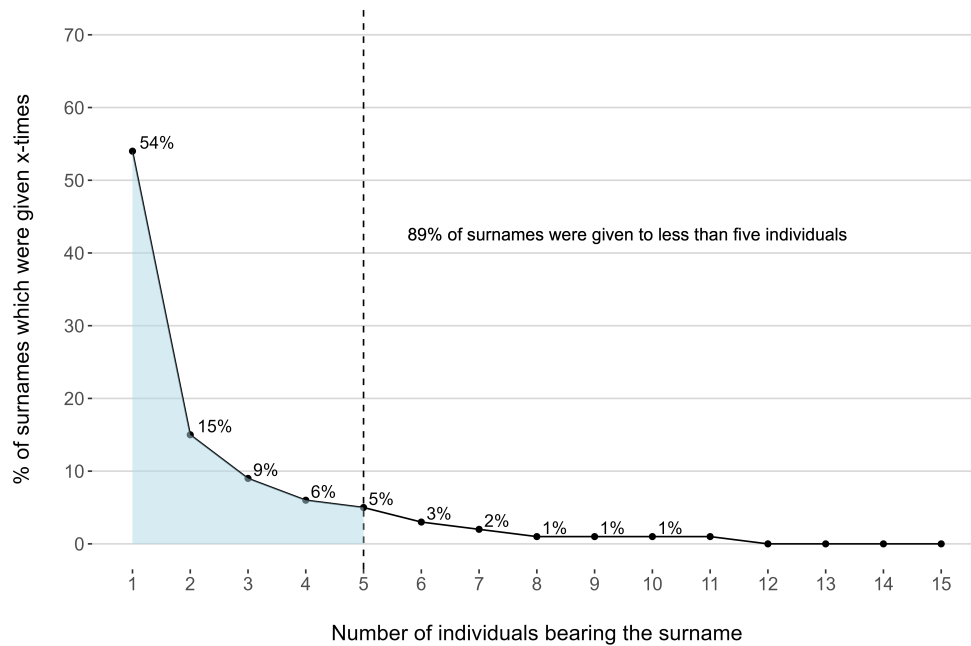
This process created a quasi-perfect identifier of enslaved ancestry across generation: 90% of surnames were assigned to fewer than 6 individuals (typically a mother and her children; Figure 3). The census was conducted primarily in 1848–1849, with some records extending to 1852. I further describe this source in the next section.

Despite the end of coercive labor, the sugarcane economy persisted until the 1860s when factory-produced sugar replaced plantation production (Schnakenbourg, 1987). After 1848, plantation owners adapted by offering wages, attracting some formerly enslaved workers back. The 1852 anti-vagrancy law further compelled workers to remain on plantations if they lacked alternative employment.

If emancipation didn't abruptly change the sugar economy system, our understand of what happened to the formerly enslaved - who represented 80% of the total population then. In other words: How much did lives actually improved, along which dimensions, and for whom? In particular, do initial disadvantages vary within former exposure to sugarcane?

From an economic perspective, all formerly enslaved individuals started with 0 wealth. Yet, given the heterogeneity in enslavement conditions, initial disadvantages may have depended on exposure to sugarcane cultivation. Did individuals with marketable skills fare better economically? How did exposure to violent environments affect post-emancipation outcomes?

Figure 3: Distribution of surnames given to the newly freed population in 1848



Notes: Distribution of surnames given to the newly emancipated individuals in 1848 by frequency of assignment. 89% of surnames were given to fewer than 6 individuals, typically from the same family. *Source:* own calculation and data collection from *Registres des nouveaux libres*

Our ability to answer these questions has so far been limited due to the absence of granular demographic data has limited our understanding of this transition. The next section presents novel data to study these questions.

3 Data: Measuring Experience of Slavery and Post-Emancipation Trajectories

The availability of a rich—but never yet digitized—set of administrative archives on enslaved populations and descendants, combined with the unique institutional feature of surname giving in the French West Indies, allows me to observe the universe of post-emancipation trajectories and link it to each individual’s previous experience of slavery (where they were enslaved, and how exposed to sugarcane they were).

I transcribe around 100,000 handwritten pages of never-yet-digitized administrative archival records (census and civil registries) to build novel and granular-level¹⁰ datasets on the universe of

¹⁰At the individual level.

formerly enslaved individuals and immediate descendants after emancipation.

3.1 Pre-Emancipation Data: Testing Historical Claims and Linking Individuals

To empirically test whether sugarcane exposure was associated with harsher enslavement conditions and to identify former experience of slavery based on surnames, I rely on two key sources:

Parish-Level Birth and Death Records (1837–1847) In 1837, the French government introduced the mandatory registration of death and birth of enslaved workers¹¹. These civil records provide a unique opportunity to approach living and working conditions through the lens of demographic events, and empirically test whether enslavement conditions were worse in sugarcane-intensive areas in the French West Indies. Records were available for approximately 40 parishes (over 56 in total), with some gaps in the covered years¹².

I construct a parish-level dataset on the number of enslaved deaths and births by parish and year from 1837 to 1848 (252 observations)¹³. To identify which subgroups were most affected by potential changes in mortality, I also collect individual-level information on all deceased individuals on a subsample of 7 parishes for the period 1843–1847¹⁴.

Census of the Newly Freed (1848) The “Census of the Newly Freed” was conducted in 1848¹⁵ to assign civil identities to 150,000 freed individuals. Government officials recorded individuals’ basic demographic characteristics, former place of enslavement, and assigned them surnames in a unique way—different from slaveholders’, and distinct from one another (Durand, 2011). My data collection efforts, combined with transcriptions from genealogists (“Anchoukaj”) and the Departmental Archives of Martinique and Guadeloupe, allowed for the collection of nearly 110,000 registries covering 70% of the newly freed population, with 45,000 distinct surnames. 90% of

¹¹Planters had to pay taxes according to the number of their enslaved workers, but could easily hide this information from the government. This mandatory registration was done to keep track of this tax base, and as a way to introduce more control over plantations. Incentives to declare deaths of enslaved workers were high, as taxes were proportional to the size of enslavers’ labor force.

¹²Which is why I do not use this mortality data to measure pre-abolition coercion exposure.

¹³I exclude parishes which had less than four available years between 1837 and 1848.

¹⁴These parishes all belong to Guadeloupe, and available registries covered the 1843–1847 period: Lamentin, Petit Bourg, Le Gosier, Deshaies, Les Abymes, Anse Bertrand, Vieux Fort. The individual-level dataset contains 4,000 death records (2,500 from sugarcane-intensive parishes, 1,500 from non-sugarcane-intensive parishes).

¹⁵Most of the census was done in 1848 and 1849, some last entries were made up to 1852.

these surnames were given to less than 6 individuals¹⁶ (Figure 3).

I construct a surname-level dataset from the 1848 Census, with the following information by surname: parish of enslavement, African origin, family size, list of occupations of individuals bearing the surname, and plantation of origin (the last two variables being available for 4% of the observations). For surnames given to several parishes (5% of the family names), I consider the parish with the majority of individuals bearing the surname as the parish of origin. This dataset is used to identify a family's former experience of slavery depending on surname. I also exploit it to describe the newly emancipated population in 1848 (e.g., African origin, family size, occupation), and observe other dimensions of the experience of slavery at the surname level, such as whether individuals experienced the slave trade (were born in Africa¹⁷).

The surname level dataset is then matched to 1820 parish of enslavement-level land and population characteristics: share of sugarcane over cultivated surface, share of coffee over cultivated surface, population density, ratio of enslaved population to free population, and sex ratio. This information was collected from the *Statistical Bulletin of the Ministry of the Colonies*.

Main Treatment: Sugarcane Intensity in Parish of Enslavement (1820). For a given surname, my main measure of experience of slavery will be the share of sugarcane over cultivated surface in 1820 in the parish of enslavement. This measure represents both the probability that individuals would have been enslaved on a sugarcane plantation, and the intensity of coercion, as larger sugarcane plantations were historically associated with higher mortality and violence. Indeed, I find a positive and large correlation between sugarcane intensity and the average size of the plantation parents were enslaved in before emancipation (Figure A10)¹⁸. Larger sugarcane plantations have been portrayed as particularly violent by historians—oriented towards intensive profits, with planters more likely to use violence to prevent rebellion from a larger labor force.

I consider two measures of sugarcane exposure: a continuous one (sugarcane intensity, i.e., the share of sugarcane over cultivated surface), a categorical one, defined as follows:

- *Lower exposure*: sugarcane intensity below the median (30 parishes). This corresponds to places where sugarcane is the minority crop.

¹⁶Individuals sharing the same surnames typically referred to a mother and her children. Indeed, marriages were uncommon, and children usually bore the surname of the mother.

¹⁷Precise place of birth in Africa is not indicated.

¹⁸Plantation size was calculated for a subset of parents for which information on the plantation they were previously enslaved in was given in the 1848 Census (N=2,000).

- *Intermediate to high exposure*: Median to 85th percentile (18 parishes). Sugarcane is the main crop, but there are also other plantations (coffee, cocoa, indigo).
- *Extreme exposure*: 85th to 100th percentile (12 parishes). Sugarcane is the sole exported crop, with the exception of subsistence agriculture. Plantations are the largest and potentially most coercive.

For a given surname s , originating from parish of enslavement c_s , the continuous treatment for exposure to sugarcane will be defined as:

$$T_s^{cont} = \frac{Hect_{sugar,c_s,1820}}{Hect_{cultivated,c_s,1820}} \quad (1)$$

For the categorical treatment, with Q_x referring to the quantile of the distribution of T_s^{cont} across all parishes:

$$T_s^{cat} = 1 \begin{cases} 0, & \text{if } T_s^{cont} < Q_{0.5} \\ 1, & \text{if } Q_{0.5} \leq T_s^{cont} < Q_{0.85} \\ 2, & \text{if } T_s^{cont} \geq Q_{0.85} \end{cases} \quad (2)$$

Testing for Selection : the Manioc database. The final pre-emancipation data source that I exploit is the *Manioc* database, constituted from 3,200 notarial acts from late 18th century in Martinique (mainly 1776-1799). This database covers 14,700 enslaved individuals, with characteristics justifying their estimated 'value' (age, gender, skin color, skills, wounds, etc.). I exploit this data-source to further test for the selection of enslaved workers across crop types.

3.2 Post-Emancipation Data: Tracking Trajectories After Freedom

To observe post-emancipation trajectories, I use never-yet-digitized civil records covering all birth and death events in the French West Indies population from 1852 to 1856. I transcribed 30,000 birth records and 25,000 death records with information on date, place of registration, name and gender of newborn or deceased, and parents (name, age, occupation, place of residence). Death records were exclusively used to identify children who died before 1857¹⁹. These records allow me to observe two generations of enslaved descent:

¹⁹In some parishes, death records were not available—this was the case for Pointe à Pitre, the main city of Martinique.

- The 1st generation—being formerly enslaved parents,
- The 2nd generation—being their immediate descendants born free.

Main Outcome: Child Mortality My main outcome of interest to observe how living conditions changed after emancipation is the under-5 mortality of the second generation—born after emancipation. Indeed, child mortality is widely regarded as a key indicator of overall living conditions and intergenerational disadvantages. It is therefore a natural entry point to study both the transition period from slavery to freedom, and to document heterogeneity in disadvantages after slavery ended.

I construct a precise monthly survival measure on the universe of children born over a five-year period by matching all birth and death records from 1852 to 1856. Matching was done based on the child’s information (name, gender, date of birth), but also mothers’. The recording of dates of birth and death allows for precise measurement of children’s survival, rather than relying on declared age at death (often imprecise).

One particular concern for the measurement of child mortality is that early days’ infant deaths might be underestimated. As births are usually declared a few days after the actual birth date (one week on average), any births and deaths occurring in the very early days of life are unlikely to be recorded. In my sample, 9% of children died before the age of 1, while 11% died between the age of 1 and 4. At the same period in mainland France, Vallin and Meslé (2001) found a 16% infant death rate—suggesting that I am indeed underestimating this age group’s death rates. I find, however, more similar death rates for the 1–4 age group: 10% in my sample, against 12% in mainland France at that time. Lower death rates in the French West Indies could be explained by the fact that mortality in the mainland was the highest in urban settings—because of water contamination, pollution, population density, and the absence of water sewage systems. These factors were much less of an issue in the French West Indies, as most individuals lived outside of such urban environments.

To see if this under-measurement could translate into systematic biases, I explore the relationship between time to declare a birth, and other variables (parish of birth, parents’ characteristics, parents’ exposure to sugarcane during slavery). I find a close to zero correlation between time to declare, and sugarcane intensity in the parish of birth. This suggests that any under-measurement of child mortality is unlikely to be correlated to heterogeneity in the experience of slavery, as driven by sugarcane exposure. In all empirical specifications, parish of birth fixed effects will account for

time-invariant local characteristics likely to affect the recording of birth and death events.

Secondary Outcomes: Parental Outcomes To better understand parental inputs and trajectories after emancipation, I observe as secondary outcomes a broad range of economic and social indicators related to formerly enslaved parents. In addition to detailed information on the newborn, birth records contain granular data on parents' socio-economic characteristics and key demographics (see an example in Figure 4). Age, parish of residence (sometimes, at the street/plantation level) and occupation are systematically recorded. I regroup occupations into five main categories: field workers; skilled workers and traders; domestic workers; public officials; navy/army. Landownership status is also recorded. I find that 20% of formerly enslaved are reported as *cultivateurs propriétaires*—field workers and landowners—in the records. Plantation owners, on the other hand, are referred to as *habitants propriétaires*. I am also able to measure literacy, as parents' ability to sign the record. Who signed is clearly stated at the end of each record, as well as the reason for not signing. Typical phrasing includes: *We [the official] alone signed the record, the father and witnesses having declared not knowing how to*, or *We signed the record together with Mr X, the father, and the two witnesses, the mother having declared not knowing how to*.

For each parent observed in the birth records data, I indirectly observe post-emancipation mobility by comparing their current parish of residence, and their surname's parish of origin. While maternal details are consistently recorded, paternity is unspecified in more than half of these registries. As official birth records serve as legal evidence of a child's lineage, the omission of paternal information implies that, legally, the child lacks a recognized father. To gain information on kin networks, I also exploit information on witnesses and who declares the birth—who is usually one of the two parents, but can also be kin, neighbor, or friend of the mother.

3.3 Final Datasets: Mapping Post-Emancipation Records to Experience of Slavery

I match all post-emancipation (1852–1856) birth records to the 1848 surname-level dataset to identify parents' former place of enslavement. As marriage rates in the French West Indies were low, mothers and fathers typically shared different surnames. I am therefore able to trace the mother's line independently from the fathers, which is a unique feature relatively to other intergenerational studies. In each birth records, parents' surnamesBirth record surnames were first extracted from full names by removing common first names using the INSEE historical first names database and

handling specific prefixes (e.g., “de la”, “du”). were matched to the 1848 surname-census database, which provided parish of enslavement, indicators of African origin, and parish-level characteristics such as sugarcane production intensity. The matching procedure was done in three steps using fuzzy string matching based on Levenshtein distance: first attempting matches within the same commune, then expanding to geographically proximate communes, and finally searching island-wide if no local match was found. Similarity thresholds were set at 95% to balance precision and recall given the prevalence of OCR errors in historical documents. Matching was first done on mothers. For children whose mother was identified as formerly enslaved, I then ran the matching for fathers. The final matched sample contains all births for which the mother and the father (unless no father is listed in the record) were formerly enslaved, and for whom we could determine the former exposure to sugarcane. Overall, this process achieves an 80% matching rate. I am able to achieve an 80% matching rate. I provide further details on the matching procedure in Appendix, Section B.3.

The final birth sample comprises 18,000 births, born of 15,000 mothers, and 9,000 known fathers. On average, mothers had 1.3 children over the 4 observed years, and represent 60% of the female population aged 17 to 40 years old in 1848.

3.4 Data Collection Methodology

The large number of handwritten pages (more than 100,000 pages) that I processed called for an automated approach. I developed a tailored optical character recognition pipeline for 19th-century French handwritten archives (civil records and convicts’ records), comprising three steps.

The initial stage involves layout parsing, wherein global images are segmented into smaller units, each containing a single line of text. This was done after training a custom YOLO model. The second stage consists in the actual optical character recognition of handwritten lines. For this, I trained a TrOCR (transformer OCR) model (Li et al., 2022), using manually transcribed ground truth samples from my archival sources, open-source datasets on French handwriting, and generated handwritten words. Both the layout and the $TrOCR_{Fr}$ are available in open source on HuggingFace and GitHub.

To extract structured information from the unstructured OCR text (step 3), I employed large language models, pattern matching, and validation algorithms. I first handled typical OCR errors which could cloud effective extraction of information by prompting OpenAI’s GPT-4 (via

OpenAI’s batch API) to remove duplicate words or sentences, noise, or correct misspellings of common words (*the, she, he, etc.*). I then applied a second layer of LLMs to extract structured information (names, dates, ages, occupations, places, and relationships). The use of LLMs rather than regular expressions outperformed variable extraction which involved the understanding of contextual information—such as the relationship of the declarant to the newborn. To complement the GPT extraction and handle specific patterns, regular expressions were used to identify well-defined structures such as date formats, stillbirth indicators, and name titles. For matching names and places across records and across databases (notably the 1848 census), fuzzy string matching using Levenshtein distance (fuzzywuzzy library in Python) with similarity thresholds of 80–95% was employed to account for spelling variations and OCR errors. Extracted values were then standardized through rule-based cleaning algorithms that validated age ranges, standardized occupation categories, normalized place names, and categorized family structures.

In addition to the data collection based on OCR, I manually transcribed information for 7 parishes (15% of the data). Table ?? in Appendix displays information on the share of missing information across parishes, as well as key descriptives, between manually transcribed and OCRed parishes. I find no detectable differences in data quality or average values between the two groups, suggesting that the OCR transcription is performing well. When focusing on the parish of *Pointe Noire*, which I transcribed both manually and with OCR, I also find no statistically significant differences in key variables in the dataset. I further test the sensitivity of the data collection method on results in robustness checks, and focus solely on the manually transcribed sample.

Figure 4: Example of birth record and extracted information

[Date and registration information]: L’an mil huit cent cinquante deux et le Vendredi, dix neuvième jour du mois de Mars, à dix heures du matin. Pardevant nous Numa Ithier Lavergneau Maire officier de l’état civil de la Commune Basse Terre Extra Muros (Ile Guadeloupe) est comparu le **[the Declarant / father (in this case)]** **[Sieur Charles Ramon]** âgé de quarante un ans, **[cultivateur]**, **[domicilié en cette commune]** Lequel nous a déclaré que le vendredi, **[Date of birth]** douze du présent mois de mars, à onze heures du soir, il est né **[Newborn]** un enfant du sexe masculin qu’il nous présente et au quel il a donné les prénoms de **[Charles François]** se reconnaissant pour être le père de cet enfant et l’avoir eu de la **[Mother]** **[demoiselle française Laboray]** âgée de trente quatre ans, **[cultivatrice]** **[domiciliée sur l’habitation Champflore]** en cette commune lequel enfant est né au domicile de sa mère ci indiqué. Les dites déclaration et présentation faites en présence des [...]

Notes: Purple rectangles contain information related to names; red to age; green to occupation, blue to residence.

4 Descriptives: From Slavery to Freedom

I exploit this newly collected and granular dataset to run a descriptive exercise, with two main objectives. First, to confirm that sugarcane-intensive parishes had higher mortality and harsher living conditions during slavery (subsection 4.1). Second, to document the transition from slavery to freedom; how living conditions changed for formerly enslaved and whether sugarcane exposure matters for the initial disadvantages.

4.1 Before Emancipation: Testing Historical Claims

Parish-level correlation coefficients between the census data and sugarcane intensity (σ_{sugar} , column 4) suggest that sugarcane exposure is associated with a slightly older population, which could reflect higher child or young adult mortality. To further explore this hypothesis, I exploit the pre-emancipation parish-yearly level data on enslaved deaths and birth. Individual-level transcriptions of birth and death records (N=500)²⁰ confirm higher death-to-birth ratios on sugarcane plantations, as well as a higher share of female births, suggesting worse in utero conditions and negative selection of boys. When dividing counties by the median of sugarcane intensity (which corresponds to 52% of sugarcane over cultivated surface), I find that the age at death distribution is skewed towards the working age group in sugarcane intensive counties (Figure A11). Interestingly, this pattern is observed both for men and women (Figure A13).

I finally explore the differences of the enslaved population depending on crop type, using the [Manioc database](#) of 18th-century Martinique notarial acts. Table 2 shows descriptive statistics for 7,500 enslaved workers where plantation type could be identified. Consistent with historical studies, I find minimal differences in population composition or assigned monetary values between sugarcane and other plantations.

4.2 After Emancipation: Documenting the Transition

Two-thirds of individuals reside in a parish different from their plantation of enslavement's. Land access appears to drive mobility decisions: 20% gain access to land, particularly in counties with diversified crops and smaller sugarcane plantations. Formerly enslaved individuals primarily work as field workers, either on their own land or for wages. 20% held skilled workers positions. Movers

²⁰These are individually transcribed record in which the type of the plantation is systematically recorded (e.g *Habitation sucrière Beauséjour*)

Table 3: 1848 population characteristics and correlation with sugarcane intensity

	Mean	Std dev.	Parish corr. σ_{sugar}	N
Sex ratio (share F)	0.54	0.04	0.12	115,083
Average age	25.33	1.99	0.33	113,349
African born	0.09	0.05	0.31	113,133
Mother indicated	0.53	0.28	0.19	115,518
Father indicated	0.01	0.02	0.11	115,518
Family size	4.86	1.45	-0.16	115,076
Field workers	0.63	0.36	-0.27	17,267
Skilled workers	0.16	0.20	0.28	17,267
Domestic workers	0.17	0.26	0.20	17,267

Note: This table displays correlation coefficients between the newly emancipated population characteristics in 1848, and their former exposure to sugarcane during slavery - σ_{sugar} . Exposure to sugarcane is the share of sugarcane over cultivated surface in the parish of enslavement, in 1820. Occupations are only reported in a subset of the census records (15%).

are positively selected in terms of potential earnings, literacy, and landownership. These changes in opportunities (wages, mobility, access to land) likely translated into improved living conditions. Indeed, aggregate statistics on the death-to-birth ratio suggest improved health conditions after 1848, driven by increased births and decreased deaths (Figure 5) This information cannot be disaggregated by former enslavement status..

Beyond economic trajectories, my data allows me to comment on social outcomes: both related to family structure and health. First, I find that fathers are widely absent from official records in the transition from slavery to Freedom. While mothers are indicated in 53% of the 1848 census records, fathers appear in only 1% (Table 3). When focusing on families that had a child between 1852 and 1856, 50% of children born from a formerly enslaved mother do not have a known father. Despite long lasting debates on the prevalence of female headed households and absent fathers among formerly enslaved communities, empirical evidence tracing this social phenomena to the immediate post abolition period was crucially lacking. My descriptive findings suggests, indeed, a very prevalent absentee father model immediately after emancipation, suggesting the importance of slavery related origins rather than post emancipation institutions or economic trajectories.

4.3 After Emancipation: Does Within-Slavery Heterogeneity Matter?

How much does heterogeneity in the experience of slavery matter for the post emancipation trajectories? One natural entry point to observe differences in post emancipation living conditions is child mortality - of children born free of formerly enslaved parents. I use the granular measure of child survival from 1852 to 1856, and describe its correlation to pre-emancipation enslavement conditions. The variance of child mortality represents W% of the mean, suggesting disparities in overall living conditions after slavery ended.

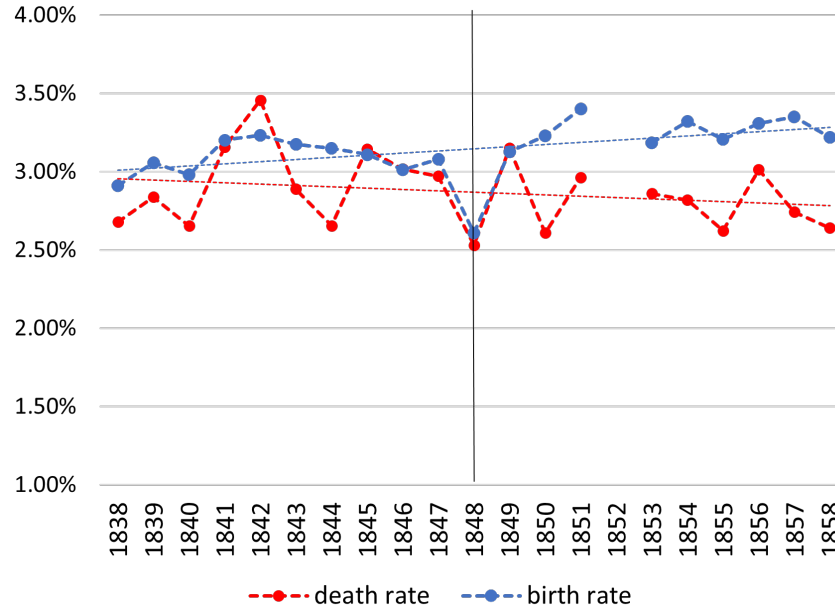
Binned scatterplots reveal a strong positive correlation between post-emancipation child mortality and sugarcane intensity in the parish of birth (Figures A20a and A20b). However, this relationship disappears when focusing on children whose parents emmigrated after emancipation (Figures A20b and A20c). This pattern suggests that *current* sugarcane exposure is not the key driver of post-emancipation child mortality; rather, parents' past exposure to sugarcane is.

Although parents' sugarcane exposure is correlated with higher child mortality, it is paradoxically associated with higher potential earnings after emancipation. Individuals from sugarcane-intensive areas were more likely to occupy non-field worker positions, own land, and experience geographic and social mobility. This likely reflects the transferability of skills accumulated on sugarcane plantations, which required a more diverse set of occupations than other crop types. I also find that mothers' past sugarcane exposure is positively associated with more absent fathers. Paternal absence, in turn, is negatively correlated with intergenerational health.

4.4 Synthesis

This section brings quantitative evidence to three previously unlinked narratives about within slavery heterogeneity: sugarcane is associated with worse exposure to hardship during slavery and worse post emancipation intergenerational health; while at the same time being associated with higher potential earning because of the transferability of sugarcane accumulated skills. Paternal absence appears as a predominant social feature among formerly enslaved communities, is positively associated with past sugarcane exposure, and has a large negative correlation with post emancipation intergenerational health. This suggests that sugarcane exposure could have had intergenerational consequences through non-economic channels: directly, through parents' exposure to hardship, and indirectly, through family structure. The next section will focus on disentangling the specific role of *skills*, *ties* and *hardship* exposure in driving worse intergenerational health after

Figure 5: Total population births and deaths rates before and after emancipation



Notes: The figure shows the total deaths and births over the total population before emancipation (free and enslaved) and after emancipation, with best first order linear fit. Population breakdown by formerly enslaved status is not available post 1848. Missing data in 1853. Own data collection from yearly *Statistiques du Ministère des Colonies*.

slavery ended.

5 Empirical strategy

I use parent's former place of enslavement, which I determine based on their surnames, as a plausibly exogenous variation in enslavement conditions to identify the effect of exposure to sugarcane during slavery on post emancipation outcomes.

5.1 Specifications

Parental exposure to sugarcane and child mortality. I measure children's survival using both Cox Proportional Hazard Models (CoxPH) and non parametric Kaplan Meier estimations.

CoxPH models are a specific class of survival models that estimate age-specific hazard-functions (probability of failure at age t conditional on having survived at $t - dt$), while taking into account data censoring: that is, when the hazard (death) can only be observed up to a certain date, which is the case in my setting (I am able to observe children's death up to the 31st of December 1856)

(Cox, 1972).

The empirical specification used to estimate the effect of parents' former enslavement conditions on child mortality is the following:

$$\lambda_{i,m,f,y,c}(t) = \lambda_0(t) \cdot \exp(\beta_m T_m + \beta_f T_f + \gamma_m X_m + \gamma_f X_f + \gamma_i \text{Gender}_i + \eta_c + \theta_y + \zeta_t + \varepsilon_{i,m,f,y,c}) \quad (3)$$

Where $\lambda_{i,m,f,y,c}(t)$ is the hazard rate for individual i at time t , born in parish c and year y of mother m and father f . $\lambda_0(t)$ is the baseline hazard rate, in comparison to which the coefficients of the model are estimated in relative terms²¹. X_m and X_f are vectors of parents' individual characteristics (age, African origin, occupation) In baseline specifications, only the age and origin of parents is included, as post emancipation outcomes are likely endogenous to former sugarcane exposure. I include such controls in alternative specifications for sensitivity testing.. β_m and β_f represent the effects of mothers and fathers' exposure to sugarcane (continuous or categorical) on the hazard ratio, as defined in equations 1 and 2. In all specification, I control for the gender of the child, as well as year θ_y , month of birth ζ_t , and parish of birth η_c fixed effects. I use robust standard errors.

An important assumption of the CoxPH model is that the effect of each covariate on the risk of death should be constant at each age. While children's health has been shown to be primarily determined by mothers' inputs in the first months of life (Lee, 2005; Zhao et al., 2017) broader inputs (environmental, paternal) start having a more prominent role when children start walking or stop being breastfed. To account for the possibility that parental inputs might not have a constant effect overtime, and to visualise changes in survival probabilities by month of age, I use the non-parametric Kaplan-Meier probability function²². I estimate the survival probability separately for groups defined by parents' exposure to sugarcane, while accounting for parish clustering.

Parental exposure to sugarcane and trajectories To better understand parental inputs, I also explore how exposure to sugarcane shaped post emancipation outcomes of parents using the following specification: I study both men and women's economic outcomes (occupation, landown-

²¹The baseline hazard represents the hazard at time t for a reference group (e.g., individuals with all covariates set to zero). It is not directly estimated by the model, but represents the reference point against which all other hazard rates are compared. It allows to evaluate the effect of covariates on the relative hazard without having to specify a parametric form for the baseline hazard.

²²The Kaplan-Meier function calculates the product of the conditional probabilities of survival up to time t for all distinct event times t_i that are less than or equal to t . $S(t) = \prod_{i:t_i \leq t} \left(1 - \frac{d_i}{n_i}\right)$ Where: $S(t)$ is the survival probability at time t ; t_i represents the distinct event times observed in the dataset; d_i is the number of events (e.g., deaths) that occur at time t_i ; n_i is the number of individuals or subjects at risk of experiencing an event at time t_i . I estimate the Kaplan Meier estimator for each value of mothers' coercion exposure, and fathers' coercion exposure, separately.

ership, literacy), partners' characteristics, and family structure (whether individuals have several partners, if they live in the same parish, etc.). I run logistic regressions for binary outcomes, and OLS for continuous outcomes. I use parish of residence and year fixed effects, and use robust standard errors. The general specification for a given outcome Y , for parent p living in parish c is:

$$Y_{p,c,y} = \alpha + \beta_m T_m + \gamma_m X_m + \eta_c + \theta_y + \varepsilon_{p,c,y} \quad (4)$$

T_p is parent p 's exposure to sugarcane during slavery. It is equal to $\beta_m T_m = \sum_{k=1}^2 \beta_{f,k} T_{k,m}$, where the reference category is *high exposure* - $k = 2$ - (vs low or extreme exposure). X_p is a vector of individual characteristics (age, African origin, occupation in alternative specification). η_c refers to parish of residence fixed effects. If I observe the parent several times, I take the last residence; θ_y is the year-at-last-birth fixed effect. Standard errors are clustered at the parish of residence level.

5.2 Approach

Movers' design. To net out the effect of enslavement conditions from place-of-residence effects, I rely on the fact that more than half of formerly enslaved parents relocated from their parish of enslavement (see Table A4 and A5). I adopt alternative specifications to assess the robustness of my results to potential selection into mobility: (i) focusing solely on individuals that moved from their former parish of enslavement; (ii) excluding parish specific effects.

Exogeneity assumption. *Enslaved workers were not selected into different crop types*

As per external sources, there was no apparent evidence of selection bias across crop types concerning ethnicity, gender, age composition, or price upon purchase (Fallope, 1983, 1987). I also find no significant differences in assigned values of slaves on either sugarcane or coffee plantations, suggesting little initial selection into crop types (Table 2). Finally, since labor conditions were more demanding on sugar plantations and sugar planters tended to be wealthier, I expect that any selection bias on enslaved workers' initial health endowments should be positive. A negative effect of enslavement conditions on child health should, therefore, be interpreted as a lower bound of the actual impact of coercion on the quality of childhood environment.

Selection - who becomes a parent. I find no selection into parenthood depending on former sugarcane exposure. Binned scatterplots relating the share of formerly enslaved individuals who

became parents between 1852 and 1856, with former enslavement conditions (sugarcane intensity in parish) (Figure A18) show a close to 0 linear relationship between the two, both for mothers and fathers. I find that both mothers and fathers are similar in terms of age in 1852, number of children between 1852 and 1856, and occupation.

6 Exposure to Sugarcane and Post Emancipation Trajectories

6.1 Sugarcane Exposure and Post Emancipation Child Mortality

Relative importance of past experience of slavery in driving child mortality How much does past experience of slavery explain intergenerational outcomes after emancipation, relatively to post emancipation conditions? I first run an exploratory analysis to compare how much parents' past experience of slavery (driven by where they were enslaved) affects intergenerational health, relative to current environment and economic inputs. Table 4 shows the contribution of the most important controls to post emancipation child monthly survival. It is obtained from a CoxPH regression with the following controls: parents' age, occupation, african origin, landownership status, as well as the following fixed effects: parents' parish of enslavement, year of birth, month of birth, parish of birth fixed effects. Variables which are not indicated in the table contribute for less than 3% to the outcome variance. The current parish of birth is the main contributor to the child death variance (35%). It is very closely followed than parents' parish of origin, which is different than the parish of birth in 50% of the cases. Interestingly, fathers characteristics matter more than mothers'. Importantly, the contribution of fathers' own experience of slavery on their children's risk of death is 7 percentage point higher than mothers. This result is surprising given that mothers are usually the primary drivers of early life childhood outcomes, while fathers' contribution is mostly detected later in children's lives (Almond and Mazumder, 2011; Breierova and Duflo, 2004).

Overall, this variance decomposition exercise suggests that parents' experience of slavery (past parish of enslavement) is a major driver of child mortality differences after slavery ended.

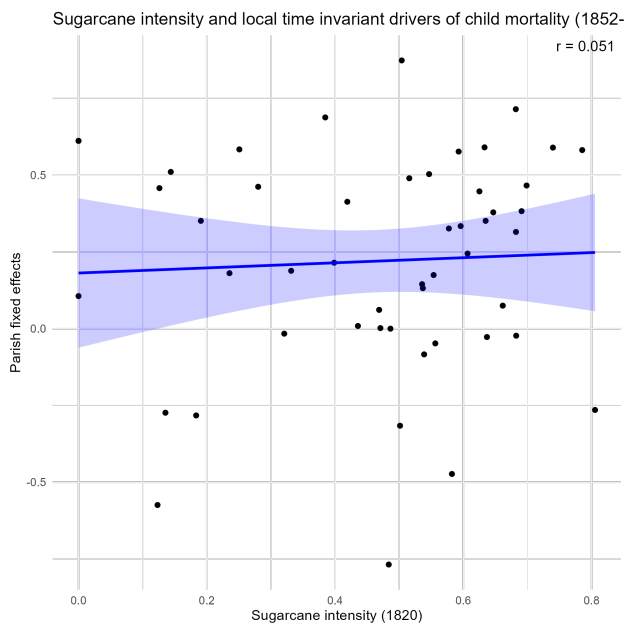
Paternal absence and extreme sugarcane exposure are the strongest predictors of child mortality I now formally explore how much exposure to sugarcane is driving this heterogeneity. Table 5 displays the CoxPH regression coefficients when regressing children's monthly risk of death on parents' former exposure to sugarcane - controlling for basic demographic characteristics. I find that mothers' former exposure to sugarcane - whether continuous or categorical - does

Table 4: Variance of children's monthly risk of death (τ) between 1852 and 1856, explained by place of birth, past exposure to sugarcane, and parents' characteristics

	Contribution to τ	
	(1)	(2)
Parish of birth	43.10%	35.18%
Father's parish of origin	20.20%	17.65%
Mother's parish of origin	11.47%	10.94%
Year of birth	6.82%	5.62%
Month of birth	6.69%	6.77%
Father's occupation category		7.38%
Mothers' occupation category		4.14%

Notes: This table displays the contribution of covariates to the variance τ in children's monthly risk of death between 1852 and 1856, for children born in that time period. Results are obtained using a cox proportional hazard model of children's monthly survival, with the following controls: parents' age, occupation, African origin, landownership status, as well as the following fixed effects: parents' parish of enslavement, year of birth, month of birth, parish of birth fixed effects. Variables which are not indicated in the table contribute for less than 3% to the outcome variance. Without controlling for parents' occupation, the contribution of the parish of birth to the variance of child mortality is 43%. When controlling for parents occupation, its contribution falls to 35%.

Figure 6: Correlation between parish fixed effects on children's survival between 1852 and 1856, and sugarcane exposure in parish of birth



Notes: This figure is a binned scatterplot at the parish of birth level between: parish fixed effects estimated from the main cox proportional hazard (Table 5, specification 2), which estimates children's survival born immediately after emancipation (between 1852 and 1856); and the sugarcane intensity of the parish. This graph shows a close to 0 relationship between the two variables, suggesting that geographic characteristics driving sugarcane intensity are not the ones driving child mortality after emancipation. In other words, sugarcane intensive counties do not seem to be deadlier because of time invariant characteristics.

not explain differences in child survival after emancipation. Paternal absence, on the other hand, increases the average risk of child death by 19%.

When considering fathers' characteristics, I find an average null effect of linear sugarcane exposure on descendants' health. This, however, hides an important heterogeneity. In fact, fathers extremely exposed to sugarcane - parishes where only sugarcane was produced - have a larger deteriorating effect on children's health than absent fathers do, compared to children with intermediately exposed fathers. These results are robust to controlling for mothers and fathers age, as well as post emancipation occupation and landownership status (specifications 4 and 5). Table A9 further details the contribution of parents' socio-economic characteristics after emancipation, compared to past exposure to sugarcane. While these controls are likely endogenous, I find that introducing the post emancipation economic status does not change the effect of parents' past exposure to sugarcane, and is not correlated to children's risk of death. On the other hand, social controls and indicators of past experience of slavery do (experiencing slave trade, extreme exposure to sugarcane in the case of fathers). Results are robust to focusing on movers only (Table A12 and A11), using a different threshold for the extreme sugarcane intensity treatment category (Table A13).

To explore whether time-invariant characteristics of sugarcane intensive counties (disease environment, topography, climate, etc.) could drive post emancipation differences in child mortality, I use a scatterplot between the estimated parish of birth fixed effects, and the sugarcane intensity in the parish of birth in Figure 6. This graph shows a close to 0 relationship between the two variables, suggesting that geographic characteristics driving sugarcane intensity are not the ones driving higher child mortality. In other words, sugarcane intensive counties do not seem to be deadlier *per se*.

Paternal effect is the strongest when children are two years old or older To account for the possibility that parental inputs might not have a constant effect overtime, and to visualize changes in survival probabilities by month of age, I use the non-parametric Kaplan-Meier survival curves²³. I estimate the survival probability separately for groups defined by parents' coercion exposure, while accounting for parish clustering. Fathers' extreme exposure to sugarcane has the largest

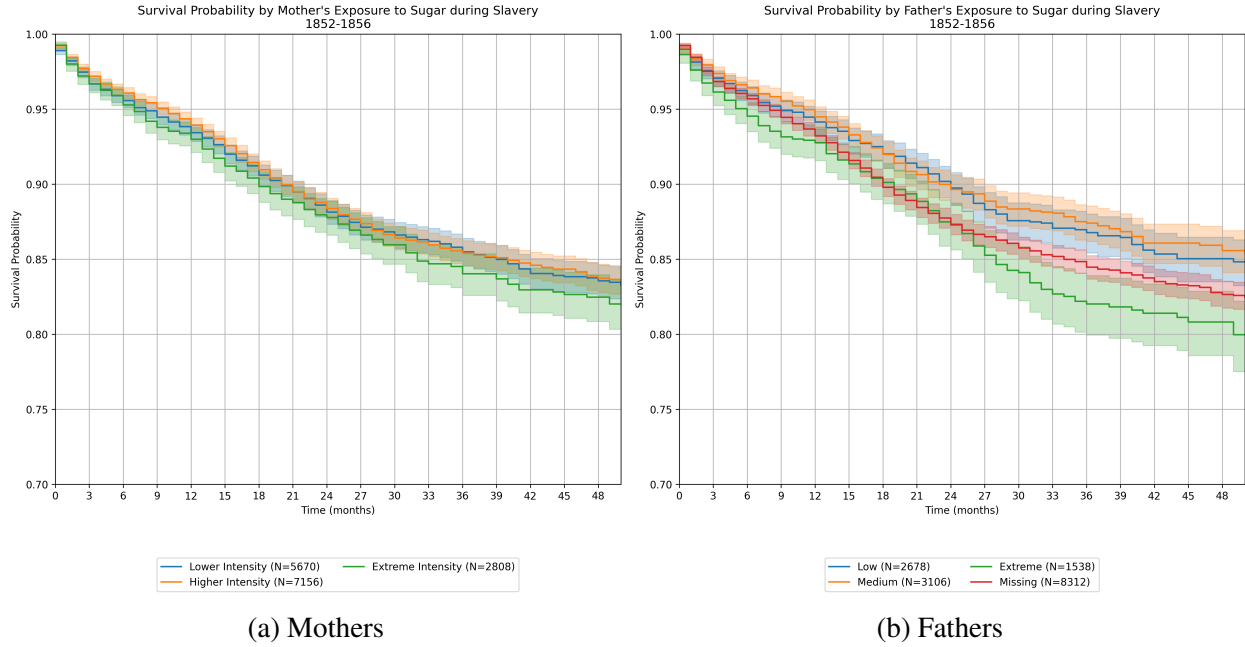
²³The Kaplan-Meier function calculates the product of the conditional probabilities of survival up to time t for all distinct event times t_i that are less than or equal to t . $S(t) = \prod_{i:t_i \leq t} \left(1 - \frac{d_i}{n_i}\right)$ Where: $S(t)$ is the survival probability at time t ; t_i represents the distinct event times observed in the dataset; d_i is the number of events (e.g., deaths) that occur at time t_i , n_i is the number of individuals or subjects at risk of experiencing an event at time t_i . I estimate the Kaplan Meier estimator for each value of mothers' coercion exposure, and fathers' coercion exposure, separately.

Table 5: Cox proportional hazard model of children's monthly risk of death between 1852 and 1856 - full sample

	(1)	(2)	(3)	(4)	(5)
Mother: low vs int	0.01 (0.06)		0.004 (0.06)	-0.02 (0.06)	-0.07 (0.11)
Mother: extreme vs int	0.04 (0.08)		0.03 (0.08)	0.004 (0.09)	-0.09 (0.14)
Father: low vs int		0.04 (0.08)	0.04 (0.08)	0.14 (0.09)	0.22** (0.10)
Father: extreme vs int		0.19* (0.10)	0.19* (0.10)	0.22** (0.11)	0.34*** (0.13)
Father: absent vs int		0.17*** (0.06)	0.17*** (0.06)	0.15** (0.07)	
Mother controls	No	No	No	Yes	Yes
Father controls	No	No	No	No	Yes
Death rate	0.12	0.12	0.12	0.12	0.11
N	16,316	16,316	16,316	14,470	6,271

Notes: This table displays the Cox proportional hazard estimated effect of parental exposure to sugarcane on children's risk of death before 1857, for children born of formerly enslaved parents between 1852 and 1856. For λ a coefficient, the hazard ratio associated with a one-unit increase in the corresponding predictor variable increases by a factor of $\exp(\lambda)$, or $(\exp(\lambda)-1)\%$. Year, county of birth, month of birth fixed effects are included in all regressions. Standard errors are robust. *** $p < .01$; ** $p < .05$; * $p < .1$

Figure 7: Monthly-Survival Probability of Children, Depending on Mothers' (left) and Fathers' (right) Past Exposure to Sugarcane during Slavery



Notes: These figures display the Kaplan-Meier non-parametric survival probabilities of children born between 1852 and 1856, which are estimated separately depending on the coercion history of the mothers (left) and the fathers (right). Shaded areas represent robust 95 percent confidence bands.

negative effect after 24 months (Figure 7). That is, when children's health is not solely dependent on maternal inputs (start walking, stop being breastfed), but becomes also affected by external care, and potentially fathers.

6.2 Sugarcane's Intergenerational Effect is Mediated by Social Factors

6.2.1 Examining Paternal Inputs

Men extremely exposed to sugarcane tend to have higher potential income. To better understand parental inputs, I investigate in more details their post emancipation trajectories depending on past exposure to sugarcane. I find evidence that lower economic inputs is not driving the effect of paternal extreme exposure to sugarcane on child mortality. First, fathers with extreme exposure are less likely to be field workers and more likely to have land, though the latter is not statistically significant (Table 6). Second, focusing on higher-earning households (non-field workers) does not attenuate the effect of paternal exposure on child mortality (Table A10). Finally, heterogeneity analyses reveal no differences based on parental occupation (Figure A21).

Table 6: Father's exposure to sugarcane during slavery and post emancipation outcomes

	(1) Field worker	(2) Skilled	(3) Literate	(4) Has land	(5) Moved
Father from Africa	0.04 (0.06)	-0.09 (0.07)	0.02 (0.06)	0.08 (0.07)	0.47*** (0.06)
Sugar: low vs. high	0.12* (0.07)	-0.10 (0.07)	-0.03 (0.07)	-0.12 (0.08)	-0.12* (0.06)
Sugar: extreme vs. high	-0.05 (0.08)	-0.01 (0.09)	-0.12 (0.09)	0.01 (0.09)	0.11 (0.07)
Mean	0.67	0.21	0.58	0.17	0.62
N	9710	9710	10146	9854	10170

Notes: This table displays the estimated effect of men's former exposure to sugarcane during slavery, on their post emancipation economic outcomes between 1852 and 1856, using logistic regressions. Robust standard errors in parentheses. For λ a coefficient, the effect of a one-unit increase in the corresponding predictor variable increases by a factor of $\exp(\lambda)$. Fixed effects for parishes of residence and year included in all specifications. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Results are unlikely explained by a lack of paternal inputs. I now explore whether fathers extremely exposed to sugarcane could be in worse health and more likely to die - causing a removal of inputs and increase in children's risk of death. Whether a father died before the child was born, or died, is listed in the birth and death records. Among children who did not survive before 1857, I do not find that paternal extreme sugarcane exposure increases the likelihood that fathers disappear or die between the time of birth and death. In addition, extreme exposure to sugarcane is uncorrelated to fathers' probability to be different among siblings - suggesting that paternal disappearance is not driving the child mortality results (Table A16). Finally, I observe that extremely exposed fathers' negative effect on children's health is only observe when they reside in the same parish as the mother and the child (Table A14). Results are therefore likely to reflect *negative inputs*, rather than an absence of.

Paternal effect persists when controlling for broader network and environment Finally, while fathers' effect on child mortality cannot be explained by extremely exposed fathers being poorer, or not being around, it could be that families might be residing in higher mortality areas or have lower kin/community support in child rearing. I find that this is not the case. Indeed, results are robust focusing on low mortality parishes of birth²⁴. Second, controlling for the number of siblings in the household, and kin presence, does not change the magnitude of the results.

²⁴Identified by negative fixed effects in the main CoxPH regression results.

6.2.2 Family structure

I now explore sugarcane exposure's contribution to driving paternal absence, which would indirectly contribute to increased child mortality. Regression results relating mothers' family structures and partners' presence to mothers' exposure to sugarcane are displayed Table 7. Mothers extremely exposed to sugarcane are 18% more likely to have a child with an unknown partner, compared to intermediate exposure mothers. Extended kin and family members are on the other hand more likely to be present (although coefficients are not significant), which could suggest different family structures with lower father involvement in the largest, deadlier plantations.

Table 7: Mothers' exposure to sugarcane during slavery and partners' presence after emancipation

	(1) Partner unknown	(2) Different partners	(3) Different residence	(4) Family presence	(5) Kin presence
Sugar: low vs. int	0.07 (0.05)	-0.24 (0.15)	-0.00 (0.21)	-0.06 (0.15)	0.00 (0.07)
Sugar: extreme vs. int	0.18*** (0.06)	-0.20 (0.19)	0.12 (0.27)	0.24 (0.18)	-0.02 (0.09)
Mother from Africa	-0.01 (0.04)	0.22 (0.14)	-0.07 (0.20)	-0.05 (0.15)	0.05 (0.07)
Mean	0.45	0.02	0.02	0.03	0.19
N	15322	15322	8147	11201	11201

Notes: This table displays the estimated effect of women's former exposure to sugarcane during slavery on partner and kinship presence, in the birth records of their children born between 1852 and 1856. Partner unknown refers to father of the child being unknown; different partners refers to women having had several children between 1852 and 1856, with known and different partners; different residence means that the mother and the known father do not reside in the same parish; family presence indicates that a family member was present at the birth registration; kin presence indicates that a friend or extended family member was present at the birth registration. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors. Fixed effects for parishes of residence and year at last birth included in all specifications

I therefore find that extreme sugarcane exposure leads to higher intergenerational child mortality through two non mutually exclusive channels: negative inputs from fathers; absence of fathers. These two channels are unlikely to be mutually exclusive : women could prefer having a child without an official father, because extremely exposed men seem to have a negative contribution to children's health. Likewise, norms leading to more absent fathers could also generate lower and possibly negative involvement of fathers. Overall, this mediating analysis suggests that extreme exposure to sugarcane has a sizable effect on post emancipation initial disadvantages through social - rather than economic - channels. The next section investigates the mechanisms driving these

social consequences.

7 Testing Mechanisms: What Slavery Did to Families

I test the following (non mutually exclusive) hypotheses.

- (H1) First, that the social consequences of exposure to sugarcane are driven by exposure to hardship and violence, rather than a pure effect of sugarcane - such as size.
- (H2) Second, that men extremely exposed to sugarcane could adopt violent and neglectful behavior because of traumatic response or violent norms. Should that be the case, I expect to find indicators of violent behavior, particularly in the family setting, from these men; and women steering away from these men.
- (H3) Third, that men extremely exposed to sugarcane could have a very low involvement in child rearing (comparable to absent fathers) despite being listed in the birth records, because of social norms that limited fathers' involvement in the deadliest plantations. Should that be the case, I would expect fathers to be more likely to have children with different mothers, or to reside in different areas.

7.1 Exposure to Hardship Drives the Social Consequences of Slavery

To explore mechanisms through which exposure to sugarcane could affect post-emancipation outcomes, I use a within-parish variation in individuals' exposure to death during childhood - a critical development period during which adverse events are likely to have long run consequences (Bellis et al., 2019).

I exploit the time-variation in mortality peaks between parishes of similar sugarcane intensity and compare how higher exposure to death during childhood - among individuals of the same age and exposed to the similar sugarcane intensity - can affect post emancipation outcomes. I use the median death to birth ratio in the parish of enslavement when individuals were less than ten years old²⁵. To do so, I exploit information on pre-emancipation parish deaths and births, from 1834 to 1848: I select parishes for which at least five years of demographic data was available between 1834 and 1847 (30%), and calculate the median death to birth ratios before age 10 of individuals originating from these parishes. By construction, this alternative treatment can only be

²⁵Using a lower age would restrict the sample to very young parents' after emancipation

calculated for relatively young parents, leading to a skewed distribution of age towards the left: in this subsample, fathers are aged on average 24 years old between 1852 and 1856, against 32 for the full post-emancipation sample. To correct for this bias, I weight observations based on age categories in all analyses using this alternative treatment. I am able to calculate this exposure to adverse event during childhood for 4,000 mothers, and 1,200 fathers. However, only 500 couples have information on *both parents*.

I now investigate the effect of parents' exposure to hardship during their childhood on their descendants' survival. Results are presented Table 8. While I find an average negative baseline effect of fathers' exposure to sugarcane on child mortality²⁶, its interaction with fathers' exposure to adverse event during childhood has a large positive effect on children's risk of death before age five. In other words, within a given sugarcane intensive parish of origin, children whose father experienced *more* hardship during childhood are those dying more. This suggests that a key driver of the negative effect of extreme exposure to sugarcane is driven by men who were *most* exposed to hardship during childhood.

I then adopt a similar exercise for parental outcomes. Results on mothers' exposure to hardship effect on partnership presence are displayed Table A15. Similarly to the results on fathers' exposure to hardship and intergenerational health, I find that sugarcane exposure *per se* is not associated with a higher probability of unknown fathers. However, the interaction of hardship during childhood with sugarcane exposure is positive - although non significant.

Overall, I find that sugarcane exposure's social consequences on intergenerational health and family structure is most likely driven by the worse enslavement conditions on sugarcane, rather than other components of sugarcane plantations (size, location).

7.2 Men Extremely Exposed to Sugarcane Could Be More Violent

Framework. Gender-differences in the expression of trauma could give rise to the sizable deterioration of children's health when more traumatized fathers are around, but not mothers. Indeed, men's exposure to violent environment during their childhood has been shown to increase their probability of violent behavior in later life (Couttenier et al., 2019). In addition, fathers have been shown to face greater challenges in shielding their parenting practices from trauma compared to mothers in studies on Holocaust survivors (Levav et al., 1998; Kestenberg, 1980; Harkness, 1993).

²⁶Against a non significant positive effect in the full sample, potentially reflecting the positive selection of this subsample

Table 8: CoxPH: Fathers' exposure to hardship and children's risk of death

	(1)	(2)	(3)	(4)
Father: sugar exp	-4.22* (2.27)	-14.84** (7.05)	-16.04** (6.93)	-16.13** (6.98)
Father: sugar exp x mortality under 10		11.14 (6.89)	11.66* (6.63)	11.69* (6.67)
Father: mortality under 10	-0.09 (1.43)	-6.24 (4.10)	-6.27 (4.03)	-6.27 (4.06)
Mother: mortality under 10	0.87 (1.70)	0.51 (1.71)	1.16 (1.76)	1.11 (1.80)
Mother exposure	Yes	Yes	Yes	Yes
Mother controls	No	No	Yes	Yes
Father controls	No	No	No	Yes
Death rate	0.09	0.09	0.09	0.09
N	487	487	478	478

Notes: This table displays the Cox proportional hazard estimated effect of parental exposure to hardship during childhood, on their descendants' risk of death after emancipation, between 1852 and 1856. Parents exposure to hardship during childhood is calculated as follow: I use the median death to birth ratio in the parish of enslavement when individuals were less than ten years old. I am using the continuous sugarcane exposure measure because of the limited sample size for which this hardship measure could be calculated (500 couples). While fathers' sugarcane exposure has a negative effect on children's risk of death, we see that the interaction of fathers' sugarcane exposure with exposure to hardship is associated with a large, positive effect on children's risk of death. This suggests that the effect of extreme sugarcane exposure previously documented stems exclusively from hardship exposure, rather than a pure effect of sugarcane. For λ a coefficient, the hazard ratio associated with a one-unit increase in the corresponding predictor variable increases by a factor of $\exp(\lambda)$, or $(\exp(\lambda)-1)\%$. Year, county of birth, month of birth fixed effects are included in all regressions. Standard errors are robust. ***p < .01; **p < .05; *p < .1

It is also possible that men might have been *more* exposed to violence in the most sugarcane intensive parishes. While both genders undertook physically demanding tasks (Davis, 1983), the strongest workers, often assigned to strenuous work like cane harvesting, may have faced more violence, potentially explaining part of the observed gender differences in response to exposure to sugarcane during slavery. A complementary interpretation is that the most violent places shaped more unequal gender norms, favoring male-based violence or negative contribution in the familiar setting. In contrast with matrilineal and matriarchal societies in which women hold central positions in the private sphere, colonial slavery took place within a patriarchal system of norms - where men's identity is associated to the typical bread winner model, and power position in the private and public sphere. This led scholars to argue that slavery might have generated a masculinity crisis among formerly enslaved men (Mulot, 2013), which could in turn translate into deteriorating, potentially violent behavior (Akerlof and Kranton, 2000; Grosjean, 2014).

To test whether fathers most exposed to hardship could be more violent and neglectful, I use two sets of evidence: direct evidence on men's behavior using criminal records; indirect evidence on child neglect (seasonality of deaths, sensitivity of results to including number of siblings), and women avoiding extremely exposed men.

Men are more likely to be violent against women and children when extremely exposed to sugarcane. I use criminal records of individuals sent to the penal colony of French Guyana to investigate mechanisms and explore the link between historical coercion and post-abolition behaviors. Using the Overseas French National Archives search engine²⁷, I compiled a list of *all* French convicted criminals sent to the French colony of Guyana between 1850 and 1950, totaling 100,000 individuals. Within this comprehensive list, including convicts from both the French mainland and the colonies, I identified 3,500 surnames unique to the French West Indies. I employed this newly collected data to examine whether surnames originating from these areas were disproportionately represented among transported criminals. In addition to the surname dataset, I digitized the records of 4,000 convicts residing in the French West Indies between 1850 and 1890 (see Image A17 for an example). Among this group, 1,000 were formerly enslaved on the islands, and had information on their parish of birth. I use this subsample of detailed criminal records to explore differences in the type of crime committed.

To test whether extreme exposure to sugarcane and hardship might have triggered negative be-

²⁷ Accessed via "Registres des bagnards" with surname-based search available at [IREL](#)

havioral response from men, I examine descriptive evidence on the types of crime committed by prisoners who were formerly enslaved, and were sent to the penal colony of Guyana between 1850 and 1890 (2,000 observations). I plot the share of convicted prisoners per 1000 formerly enslaved individuals²⁸ according to the sugarcane intensity in their former parish of enslavement Figure 8 for different types of crimes. Interestingly, while the relationship between overall crime rates and harsh enslavement conditions is negative, it becomes positive when I focus on violent crimes, and more specifically crimes against women and children - which mostly refer to sexual crimes or murder of partner.

Regression results Table A17 reflect the U shaped effect of fathers' sugarcane exposure on child mortality. Conditional on being sent to French Guyana, exposure to sugarcane has a negative effect on convicts' probability of committing a violent crime (and a non significant effect of committing property crime). Yet, when extremely exposed (squared treatment), men are much more likely to be convicted for crimes against women and children: physical, sexual assault, or murder. Results using the categorical treatment categories are displayed in appendix, and reflect the same U shaped pattern. I run a similar exercise using the list of all 100,000 French transported criminals between 1850 and 1900, and plot the share of surnames found among transported individuals, by parish of origin of the surname in Figure A22. I also find a positive association between a surname' coercion history, and its prevalence among transported criminals. This descriptive evidence suggests that worse enslavement conditions might be at the origin of persistent violent behavior.

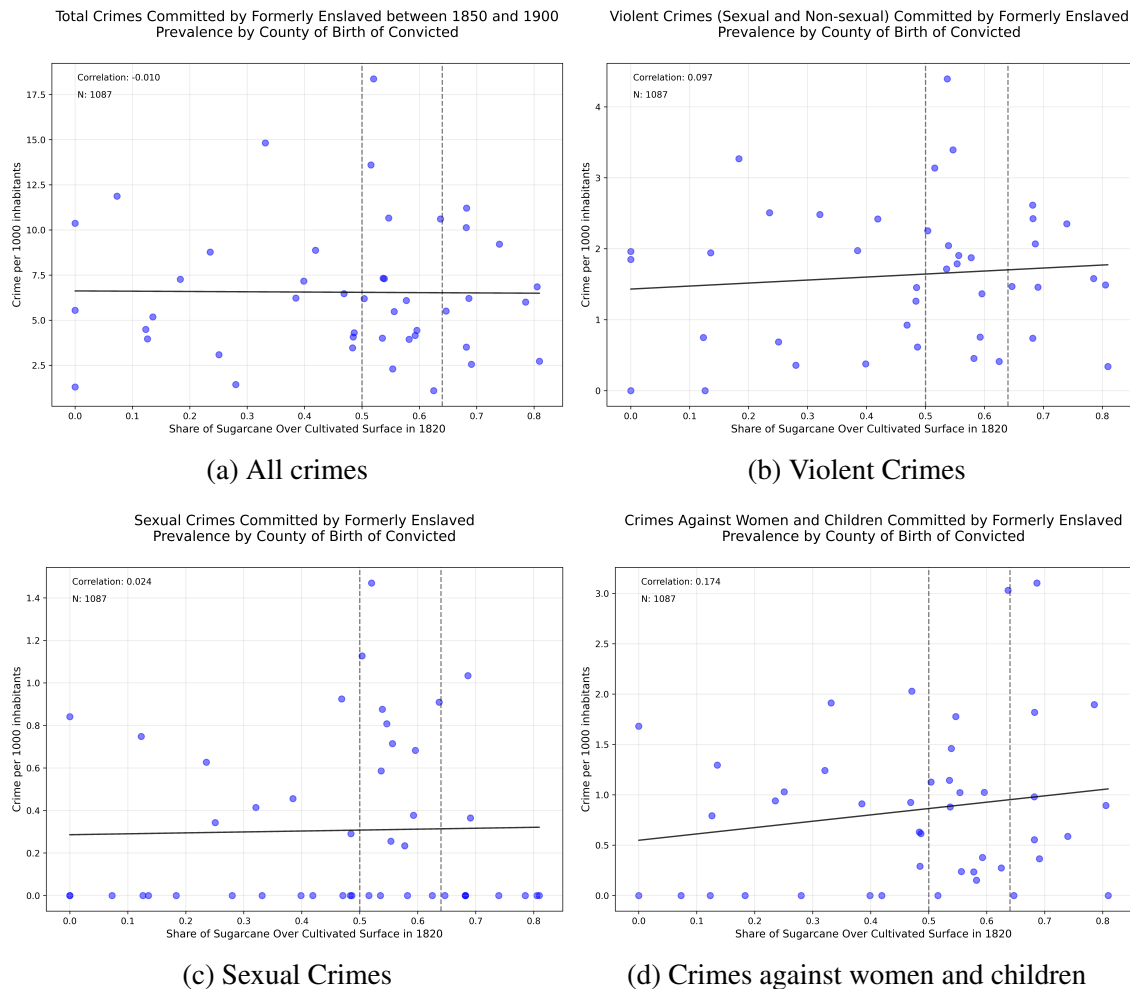
Mothers extremely exposed to sugarcane could avoid alike men An another indirect indicator of men's negative behavior in the household when originating from extreme sugarcane is mothers' matching decision. Controlling for the pool of men and women of different sugarcane exposure groups, I regress the probability that women would have a child with a man exposed to the same sugarcane intensity as them, conditional on these men being known (Table A19). I find that women from extreme sugarcane area are much less likely to have a child with alike men - which could indicate an avoidance strategy.

7.3 Exposure to sugarcane and absentee fathers' norm

The high prevalence of female headed households and unknown fathers among formerly enslaved communities in the Caribbean and the United States has fueled a century long debate on what

²⁸I use the population data from the 1848 Census to calculate crime rates by former place of enslavement

Figure 8: Prevalence of Formerly Enslaved Prisoners Sent to Guyana 1850-1890, by type of Crime and Former parish of Enslavement



Notes: These figures are binned scatterplot with one bin corresponding to a former parish of enslavement. They relate the number of prisoners sent to Guyana between 1850 and 1890 per 1,000 formerly enslaved individuals, related to the sugarcane intensity in the former parish of enslavement. The first graph displays the number of prisoners per 1,000 inhabitants convicted for violent crimes (murder, sexual assault, physical assault); the second graph, for sexual crimes only. Black lines are linear fits between the two variables, weighted by the enslaved population in 1848.

slavery did to families. While empirical evidence on the matter is lacking, scholars agree that slavery likely affected fathers' involvement because of the following structural reasons. First, because fathers had no administrative existence - children were 'owned' by the mother's enslaver, and families were often sold apart. Second, both the extremely high mortality and women's exposure to rape made paternal presence and paternity highly uncertain (Du Bois, 1908; Du Bois and Eaton, 1899; Smith, 1982; Patterson, 1982). Scholars also argued that women's willingness to attach themselves to a male partner might have been limited, considering their vulnerability to rape from enslavers, and the limited inputs (protection, economic) enslaved men could provide (Gautier, 2010, 2000). Because the largest sugarcane plantations were also the deadliest and the most violent, there are reasons to believe that norms related to absent fathers might be stronger when communities originate from more sugarcane intensive places (Du Bois, 1908).

I now test whether men extremely exposed to sugarcane could have a very low involvement in child rearing (comparable to absent fathers), possibly stemming from absentee father norms that were intensified in the deadliest plantations (third hypothesis, 7). Should that be the case, I would expect fathers to be more likely to have children with different mothers, or to reside in different areas. I do not find that this is the case (Table A18). If anything, I find that fathers extremely exposed to sugarcane are more likely to reside in the same area as the mother. I also do not find that they are more likely to have different partners relatively to other men. I note, however, that only a small share of parents actually have children with different partners (2%). Results should therefore be interpreted with caution.

While I cannot completely rule out that part of the negative effect of extremely exposed fathers on children stem from paternal absence rather than active harm -, the evidence suggests this explanation cannot fully account for the substantial impact on child mortality. The patterns are most consistent with a combination of negative paternal behaviors and lack of positive contributions to family well-being driving the observed intergenerational mortality effects.

7.4 Conclusion

This paper provides the first empirical evidence on how heterogeneity in the experience of slavery affects immediate disadvantages among the formerly enslaved. I thereby bring large scale quantitative evidence on several previously unlinked narratives; provide novel evidence on the transition from slavery to freedom; and the mechanisms driving slavery-induced inequality.

First, that within-slavery heterogeneity depending on crop type was a key determinant of post emancipation trajectories. Second, that while past exposure to sugarcane is indeed associated with worse enslavement conditions during slavery (Follett, 2005; Sanford, 2012), it also conferred relative economic advantages post emancipation because of the transferability of sugarcane-acquired specific skills. Third, that higher exposure to hardship during slavery had sizable intergenerational consequences. Among the first generation of children born free after emancipation, I find that those whose fathers were most exposed to hardship are much more likely to die before the age of 5 relatively to other fathers, or absent fathers. Fourth, that this negative intergenerational effect of exposure to hardship is best explained by men's violent or neglectful behavior, an explanation in line with previous evidence from the literature (Couttenier et al., 2019). Finally, that the absence of fathers is a predominant feature of newly emancipated families immediately after emancipation, suggesting an important role of slavery in shaping absentee father norms among formerly enslaved communities. This observation contributes to a century long debate on what slavery did to families (Du Bois, 1908; Du Bois and Eaton, 1899; Smith, 1982; Patterson, 1982), with limited empirical evidence up to this day.

Overall, this research points to the importance of exposure to hardship during slavery as a key driver of intergenerational transmission, and thereby slavery-induced inequality. It bridges the gap between, on the one hand, a large body of research in the social sciences on the social consequences of slavery in the social sciences (Clark and Clark, 1950; Patterson, 1982), and recent economic research showing the long run, persistence negative effect of slavery on inequality.

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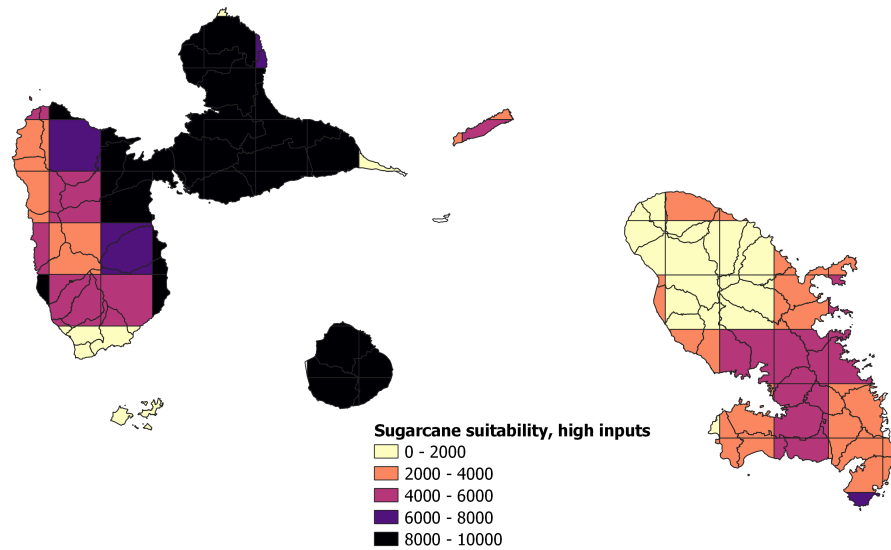
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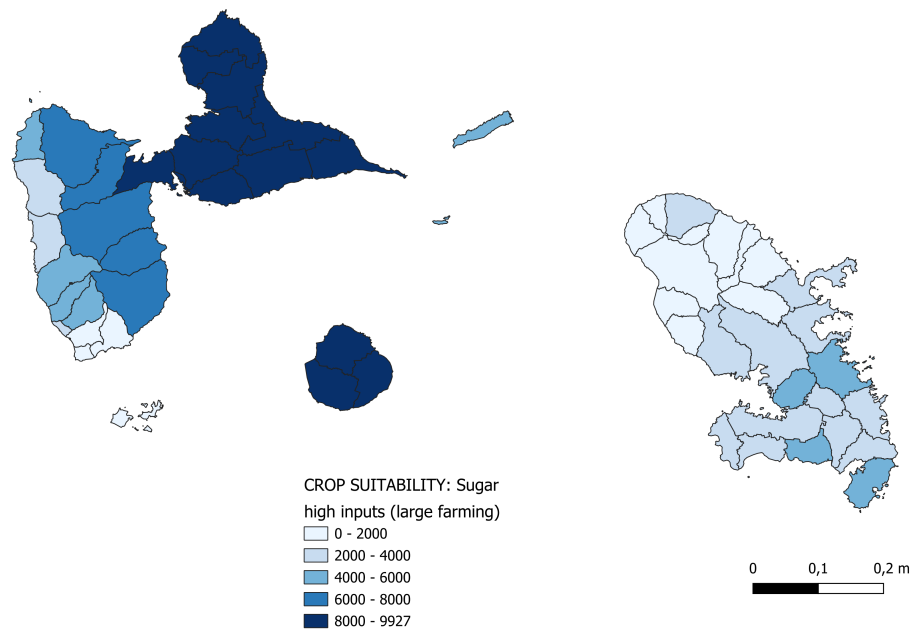
A Context

A.1 Descriptive Statistics

Figure A1: Sugar Suitability by County, original FAO and re-calculated indices



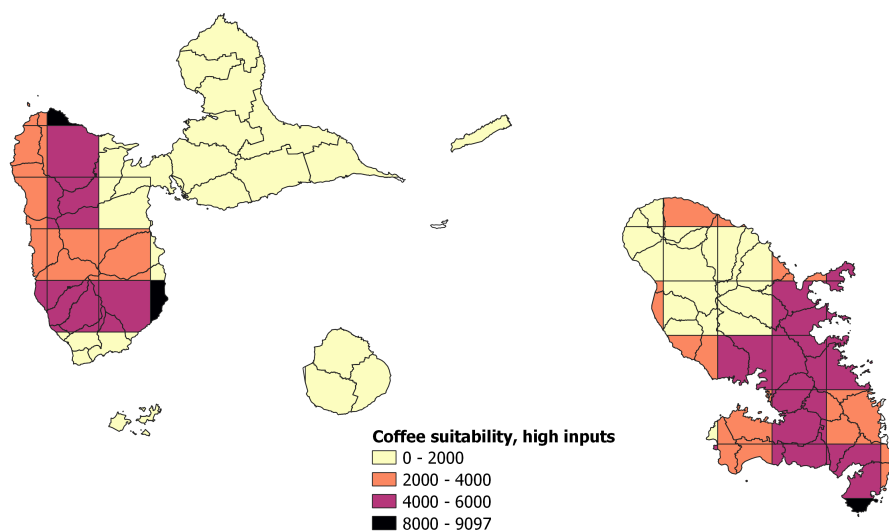
(a) Original values (high inputs)



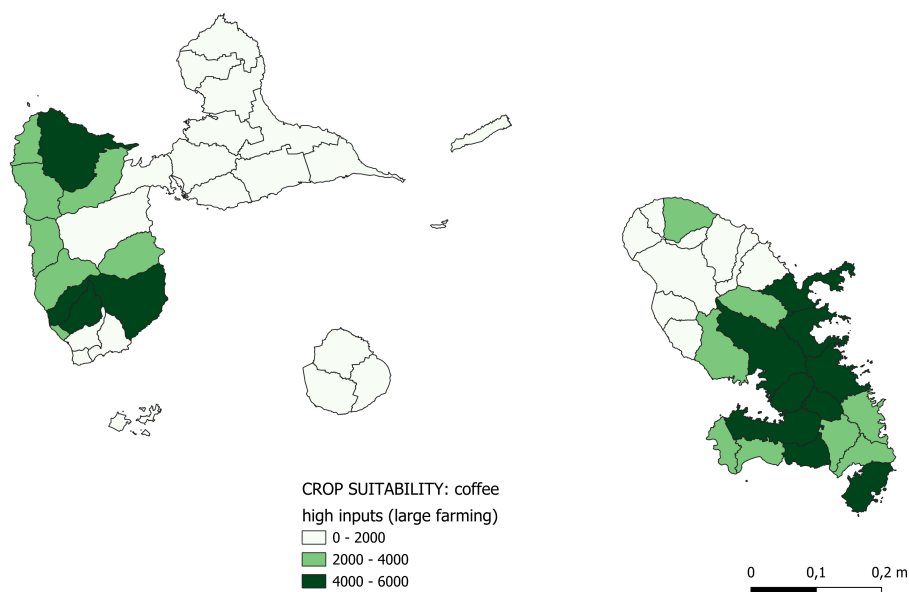
(b) Re-calculated values (average by county)

Source: FAO. The re-calculated values are averages of the grid-FAO values in each county (where the weight associated with a grid-value is equal to the share of the county surface covered by the grid)

Figure A2: Coffee Suitability by County, High and Low Inputs



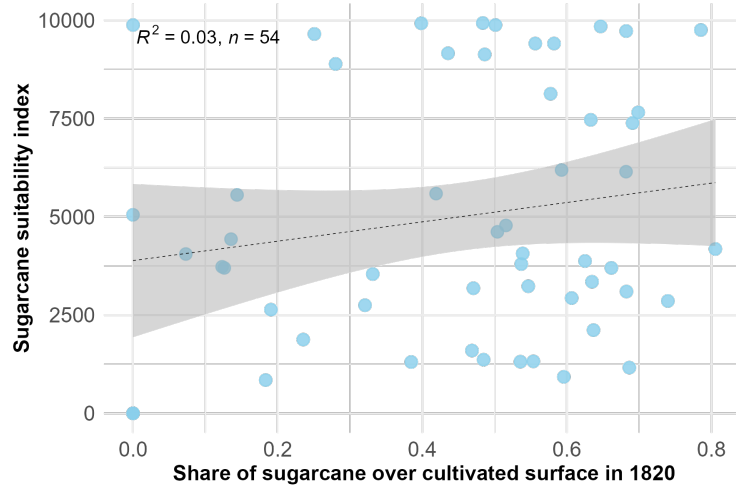
(a) Original values (high inputs)



(b) Re-calculated values (average by county)

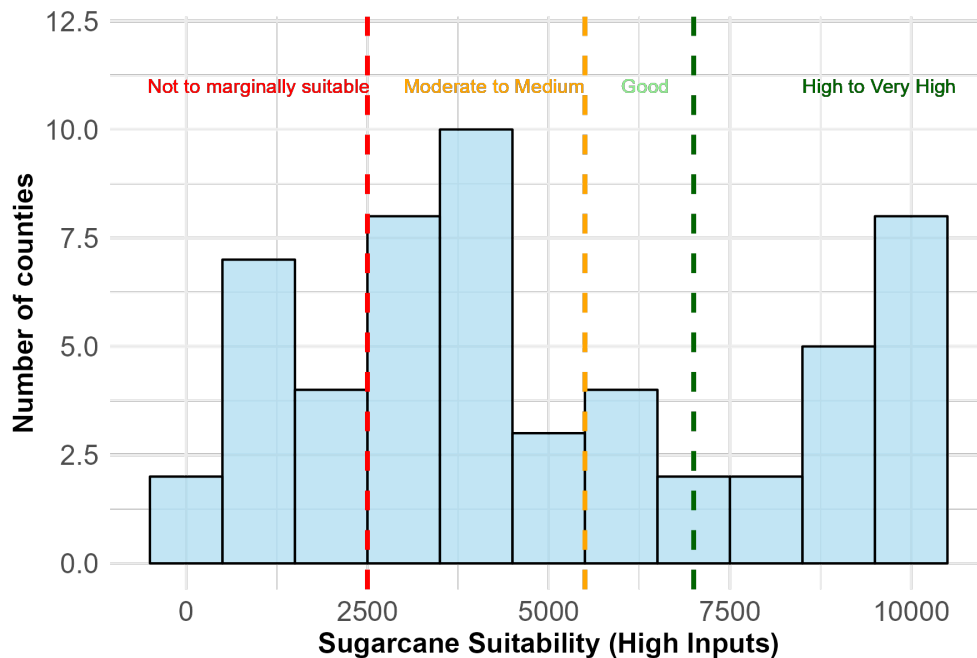
Source: FAO. The re-calculated values are averages of the grid-FAO values in each county (where the weight associated with a grid-value is equal to the share of the county surface covered by the grid)

Figure A3: Share of sugarcane over cultivated surface in 1820, and sugarcane suitability



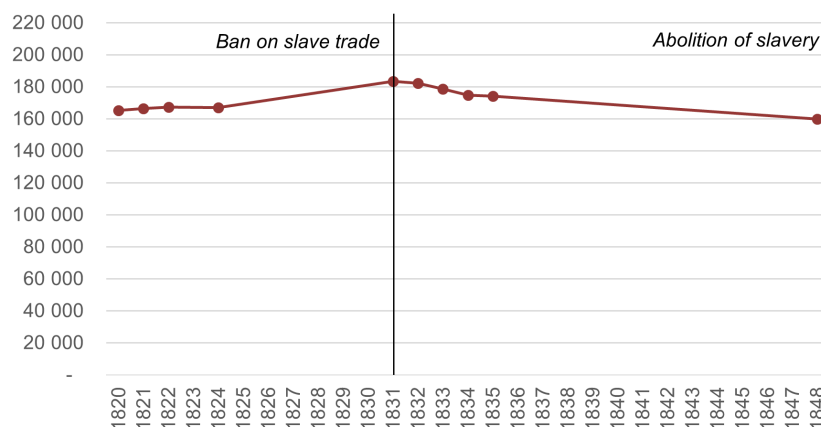
Note: Own sugarcane SI calculated based on FAO's suitability indexes for sugarcane, for high inputs (large plantations). The black line represents the linear fit between the two variables, for a R^2 of 0.03.

Figure A4: Distribution of sugarcane suitability index (SI) and suitability classes



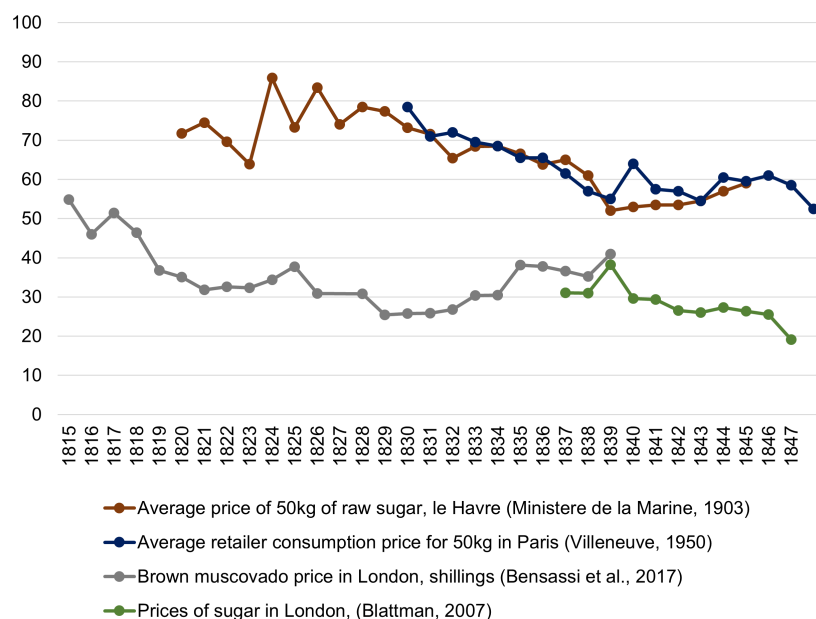
Note: Sugarcane suitability is calculated based on FAO's suitability indexes for sugarcane, for high inputs (large plantations). Said indexes are available by grid cells that are typically larger than the counties. I re-calculate the county sugarcane suitability values as follow: for each county, I take the average of all FAO-grid values, weighted by the share of the county surface covered by the grid. The lines delimit the different suitability classes used by the [FAO](#): (1) Very high, when $SI \geq 8500$; (2) High, when $7000 \leq SI < 8500$; (3) Good, when $5500 \leq SI < 7000$; (4) Medium, when $4000 \leq SI < 5500$; (5) Moderate, when $2500 \leq SI < 4000$; (6) Marginal, when $1000 \leq SI < 2500$; (7) Very marginal, when $0 \leq SI < 1000$; and (8) Not suitable, when $SI = 0$.

Figure A5: Enslaved Population in Martinique and Guadeloupe, from 1820 to 1848



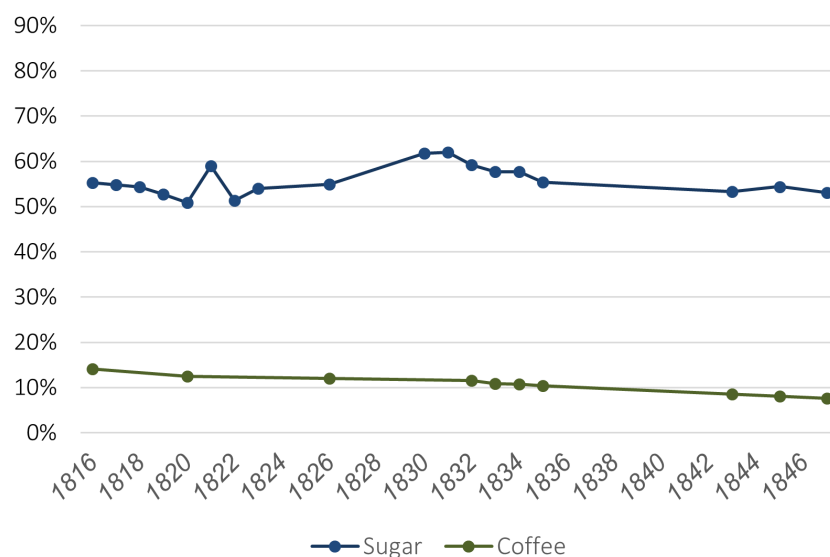
Notes: This figure displays the total enslaved population between 1820 and 1848 in both Guadeloupe and Martinique at different points in time, taken from Schnakenbourg (1977). **Primary sources:** *Tableaux de population et de cultures des Colonies Françaises, Ministère de la Marine et des colonies*

Figure A6: Yearly price series for sugarcane in France and Great Britain



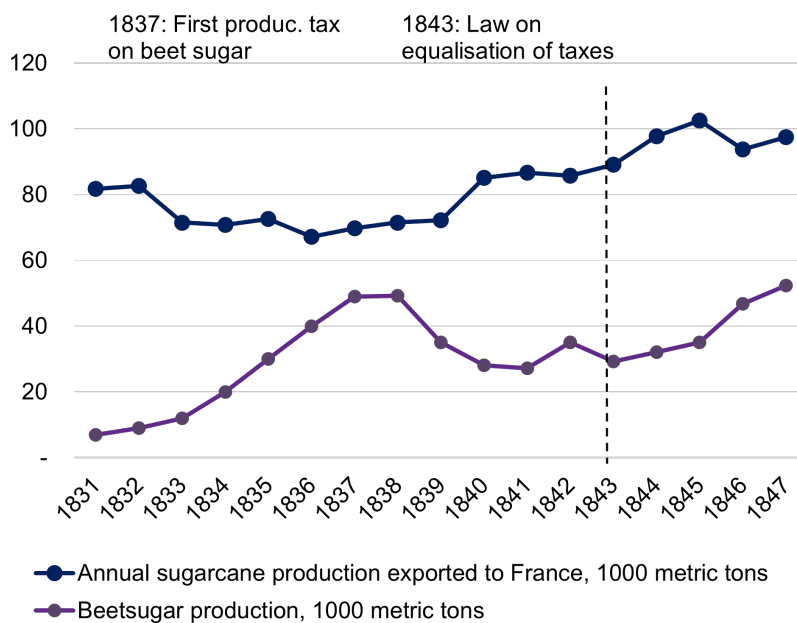
Notes: This figure displays yearly series of sugarcane prices from different sources in France and Great Britain

Figure A7: Share of Sugarcane and Coffee Over Cultivated Surface



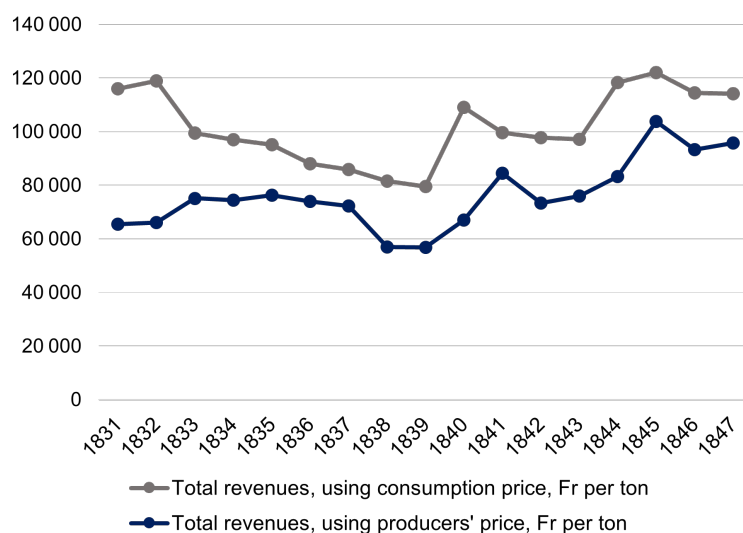
Notes: This figure displays the aggregate share of sugarcane and coffee over cultivated surface in Guadeloupe and Martinique, taken from Schnakenbourg (1977). **Primary sources:** *Tableaux de population et de cultures des Colonies Françaises, Ministère de la Marine et des colonies*

Figure A8: Yearly Sugarcane (Blue) and Beetsugar production (Purple)



Notes: This figure displays the yearly aggregate exports in sugarcane, and beetsugar production in France (Source: *Tableaux Statistiques du Ministère de la Marine*)

Figure A9: Yearly revenues based on consumption prices and production prices



Notes: This figure displays the yearly product of total sugarcane production and price of sugar per ton, using either the consumption price (which would vary with import taxes), and producers price (which did not vary with import taxes).

Source: consumption price series are taken from Villeneuve (Villeneuve, 1960), total production and producers price series are taken from official statistics on exports (*Annuaire officiel de la Guadeloupe, 1903*)

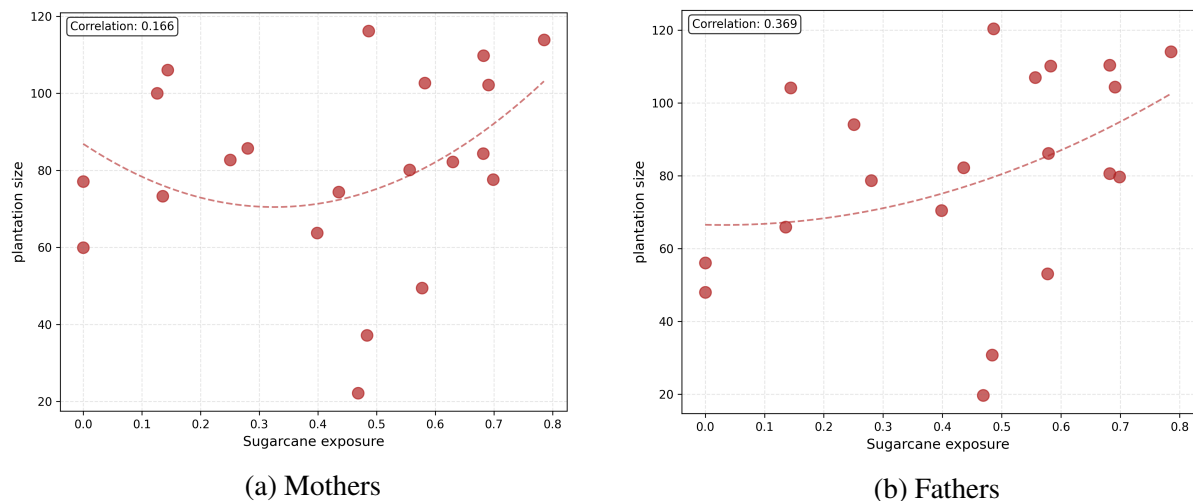
Table A1: Descriptive Statistics on Counties in 1820

	Min	Median	Average	Std.dev	Max
Median Slope	2.5	4.8	4.9	1.3	7.0
Soil suitability	1.0	3.0	2.9	0.9	4.0
Sugarcane suitability	0.0	3,962.3	4,936.6	3,206.3	9,927.0
Coffee suitability	186.0	3,176.5	3,609.8	2,042.7	7,303.4
Total surface, hect.	13	3,081	3,280.3	1,904.2	8,480
Cultivated surface, hect.	13	949	1,055.8	742.4	3,320
Sugarcane surf.	0	401	565.5	484.9	1,980
Sugarcane over total surf.	0.0	0.12	0.24	0.13	0.43
Sugarcane over cultivated surf.	0.0	0.51	0.52	0.21	0.83
Sugarcane plantations, N	0	17	18.6	14.5	64
Coffee plantations*, N	0	36.5	32.5	24.3	84
Slave population	337	2,793	2,988.7	2,137.8	13,170
Total population	447	3,472	3,781.4	2,929.6	18,394
Slaves per hect. (density)	0.3	0.8	6.1	37.6	274.5

Notes: This table displays key summary statistics on the distribution of crops by county in 1820, over total surface and cultivated surface. Number of coffee plantations are calculated over Guadeloupe only, as information was not available for Martinique. **Primary sources:** *Tableaux de population et de cultures des Colonies Françaises, Ministère de la Marine et des colonies*

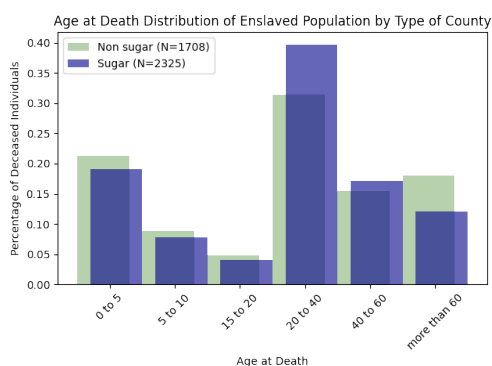
Figure A10: Correlation between sugarcane exposure and average plantation size during slavery

Sugarcane intensity in county of enslavement and plantation size, mothers Sugarcane intensity in county of enslavement and plantation size, fathers



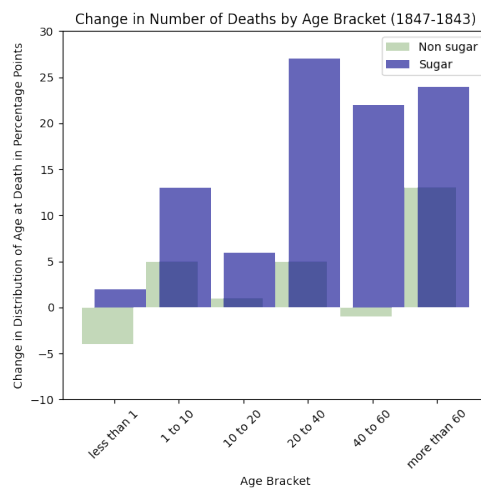
Notes: sugarcane intensity is the share of sugarcane over cultivated surface in parent's county of enslavement before emancipation. Plantation size was calculated for a subset of parents for which information on the plantation they were previously enslaved in was given in the 1848 Census of the Newly Freed (N=1,000).

Figure A11: Distribution of Age at Death, Average between 1843 and 1847



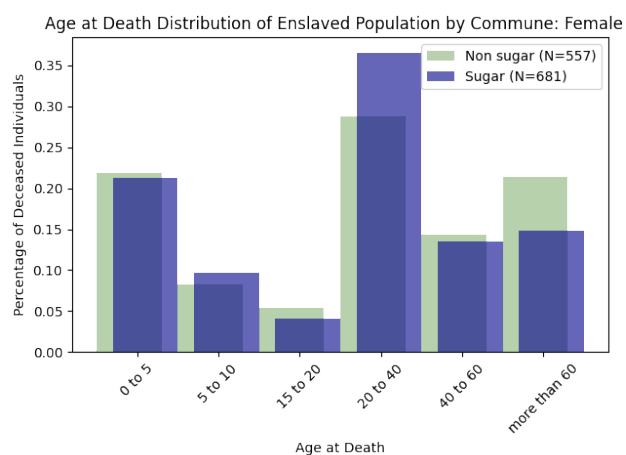
Notes: This figure displays the average distribution of age at death among deceased enslaved workers, between 1843 and 1847. Sugarcane intensive counties (in blue) are those whose share of sugarcane over cultivated surface is above the median in 1820 (52%). **Source:** Own computation and data collection from Civil Records of the Enslaved Population in 7 counties.

Figure A12: Changes in Average Number of Deaths, between 1843 and 1847

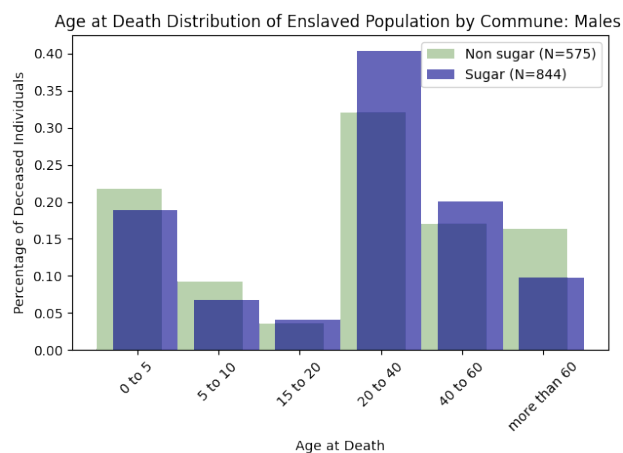


Notes: This figure displays the difference between the number of deceased workers in 1847 and 1843, for each age group and type of county (sugarcane intensive and non sugarcane intensive). Sugarcane intensive counties are those whose share of sugarcane over cultivated surface is above the median (52%). **Source:** Own computation and data collection from Civil Records of the Enslaved Population in 7 counties.

Figure A13: Distribution of Age at Death, By Gender, between 1843 and 1847



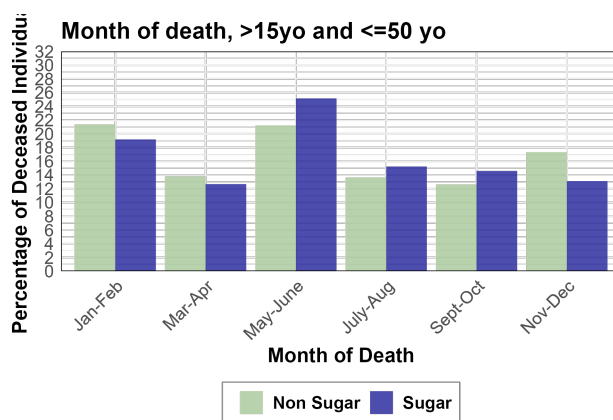
(a) Girls and Women



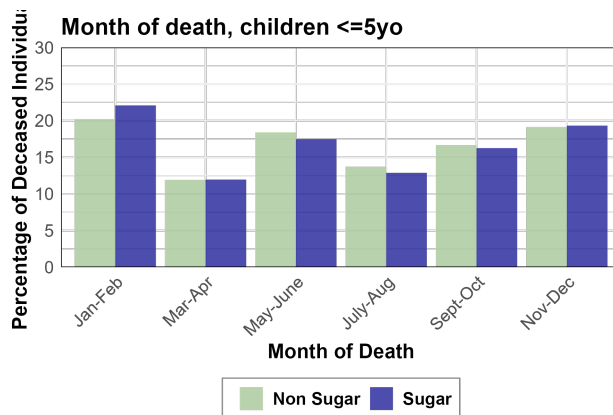
(b) Boys and Men

Notes: This figure displays the average distribution of age at death among deceased enslaved workers, by gender, between 1843 and 1847. **Source:** Own computation and data collection from Civil Records of the Enslaved Population.

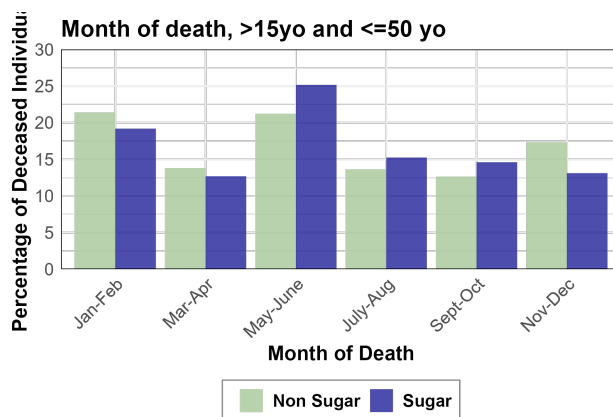
Figure A14: Distribution of Month of Death, between 1843 and 1847



(a) All



(b) < 5 years old



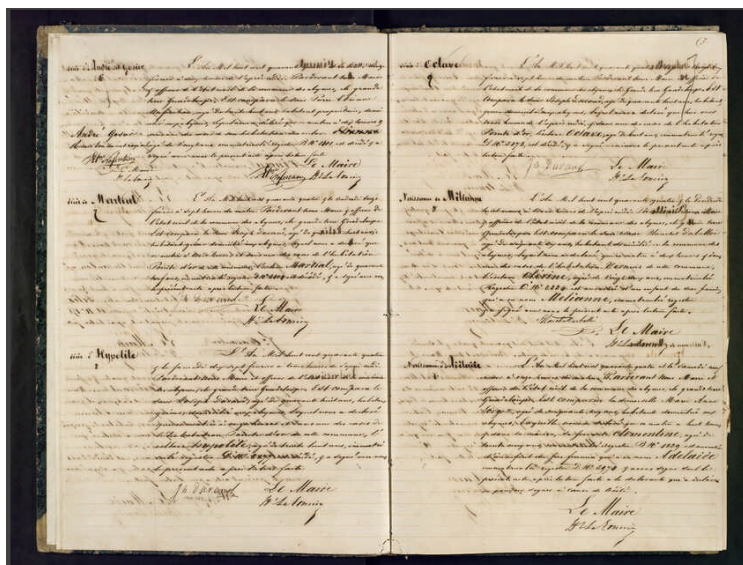
(c) > 15 yo to 50 yo

Notes: This figure displays the seasonality of month of death, by age and crop type. **Source:** Own computation and data collection from Civil Records of the Enslaved Population.

B Archives

B.1 Data sources

Figure A16: Example of post abolition civil registries



Source: French Overseas National Archives, *Registres d'Etat civil*

Figure A17: Example of convicts' record

NUMERO DE LA COMMISSION DE CRASSEMENT NUMERO MATRICULAIRE DE LA GILDE 3890		Le nommé <i>Adamis</i> <i>François des Charles H. Galt</i> <i>des Saint-Yves</i> est de <i>Martinique</i> né à <i>Robert</i> arrondissement d département d <i>Martinique</i> âgé de <i>32</i> ans, domicilié à <i>Robert</i> arrondissement d département d <i>Martinique</i> condamné le <i>20 jbe 1895</i> - <i>1^{er} de St. Pierre</i> <i>vol. - 6 mois de prison et la rélegation.</i> <i>Décidé, le 11 Oct 1914.</i>
RENSEIGNEMENTS DIVERS Embarqué le <i>13 xbe 1895</i> sur l à destination de la <i>Guyane Française</i> Arrivé au débarcad le <i>13 Janvier 1896</i>		

Source: French Overseas National Archives, *Registres des bagnards*

B.2 Variables

Table A2: Outcomes, data Sources, time Period, and constructed variable

Category	Data Sources	Time Period	Variable
Parents: 12,000 mothers and 6,000 fathers			
Mobility	Birth records	1852–1856	binary
Occupation	—	—	binary (1 if skilled, etc.)
Landownership	—	—	binary
Literacy: can sign	—	—	binary
Partners' occupation, literacy, etc.	—	—	binary
Partnership presence: fathers known, different, etc.	—	—	binary
Kin presence at birth	—	—	binary
Fertility: age at birth, number of children	—	—	continuous
Criminal Behavior	Convicts sent to Guyana	1850–1890	binary
Children: 17,000 children			
Gender	Birth records	1852–1856	binary
Age at Death	Birth matched with death records	—	survival (months)
Paternal presence	Birth records	—	binary

Men and women that have several children can be observed several times over the 1852-1856 time period. For parent specific analyses, I aggregate parents' information as follow: I consider the latest residence as place of residence; the highest occupation, landownership status; highest occupation, landownership status, literacy.. among their different partners. More details on the definition of each variable used across different regressions is given in Appendix, table X.

B.3 Matching procedure

For each birth record, I matched the surnames of both mothers and fathers with the Census of the Newly Freed to determine parents' former place of enslavement. To achieve this, I first isolated the surname from the parents' full names. In 20% of cases, the parents' full names only included common names (e.g., Marie Louise Elizabeth), making it difficult to pinpoint the surname. To ensure accurate matches, I excluded most common names from parents' full names using official statis-

tics on names given at birth in the French West Indies between 1870 and 1910 (French National Statistics Institute, INSEE).

Next, I matched the remaining components with the surname database of the Census of the Newly Freed, employing Fuzzy matching techniques. I used the Levenshtein distance which quantifies the minimum number of single-character edits needed to transform one string into another. I considered as a potential match surnames where the similarity exceeded 90%, meaning that the share of single-character edits over the string's length did not surpass 10%. In cases of multiple matches for a given name, I selected the one with the highest similarity ratio. If several matches still existed, I chose the one who originated from the county closest to the parents' current residence. In total, I was able to match 50% of the births to an enslaved mother in the census. Considering that 30% of non-matched births likely originate from non-formerly enslaved mothers²⁹, this represents a matching rate of 80%.

The remainder of unmatched surnames could stem from spelling disparities between census and civil records that exceeded the 10% matching threshold, along with incomplete records in the Census of the Newly Freed. Given the impossibility to identify unmatched parents as either non-former slaves, unregistered slaves, or former slaves with incorrect surnames, I exclude these observations from my analyses.

²⁹30% of the total population were not enslaved in 1848

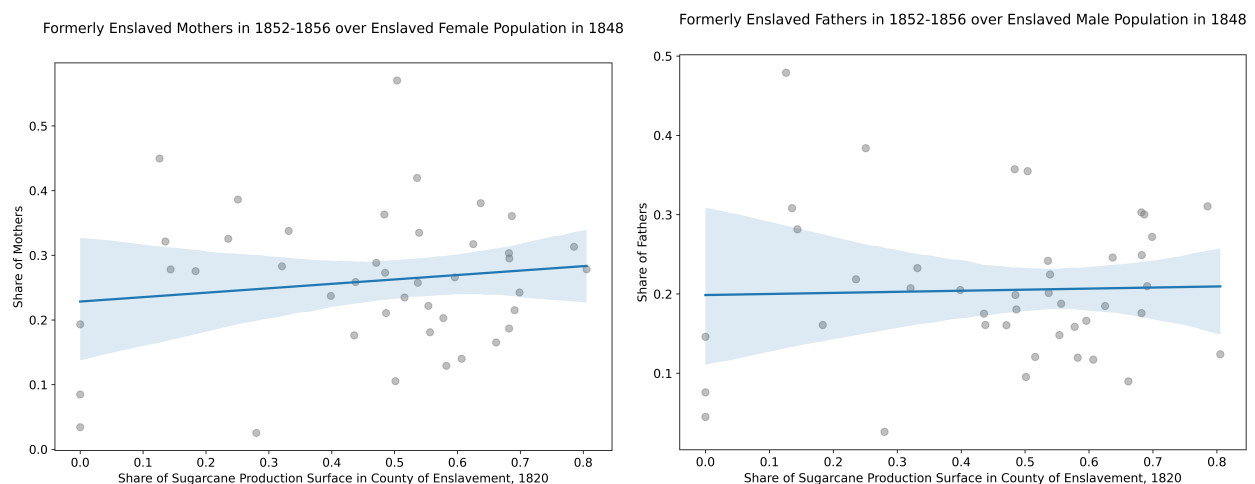
C Additional Descriptive Statistics After Abolition

Table A3: Birth and death statistics by plantation type (1837-1847)

Type	N	Average births/year	Average deaths/year	Death to birth ratio	F/M at birth
Coffee	2	2.3	2.3	1.17	0.52
Sugar	18.6	23.2	23.2	1.25	0.55

Source: Own data collection from birth and death records of the enslaved population (1837-1847, N=4000).

Figure A18: Selection into Parenthood Depending on Former Enslavement Conditions



Note: These figures are binned scatterplots relating the share of formerly enslaved individuals who became parents between 1852 and 1856, with the share of sugarcane over cultivated surface in their former county of enslavement. One dot corresponds to a unique county. The share of sugarcane reflects the intensity of coercion exposure. Each point represents a county. For a given county, the y-value is equal to the number of mothers (resp. fathers) who were enslaved in this county, divided by the total formerly enslaved female (resp. male) population aged 17-40 (resp. 17-65) enslaved in this county as per the 1848 Census. The blue line is a linear fit of the relationship between share of parents and sugarcane intensity, the shaded area represents 95 percent confidence bands.

Figure A19: Descriptive Statistics on the Newly Freed Population in 1848, by Share of Sugarcane over Cultivated Surface in Former County of Enslavement

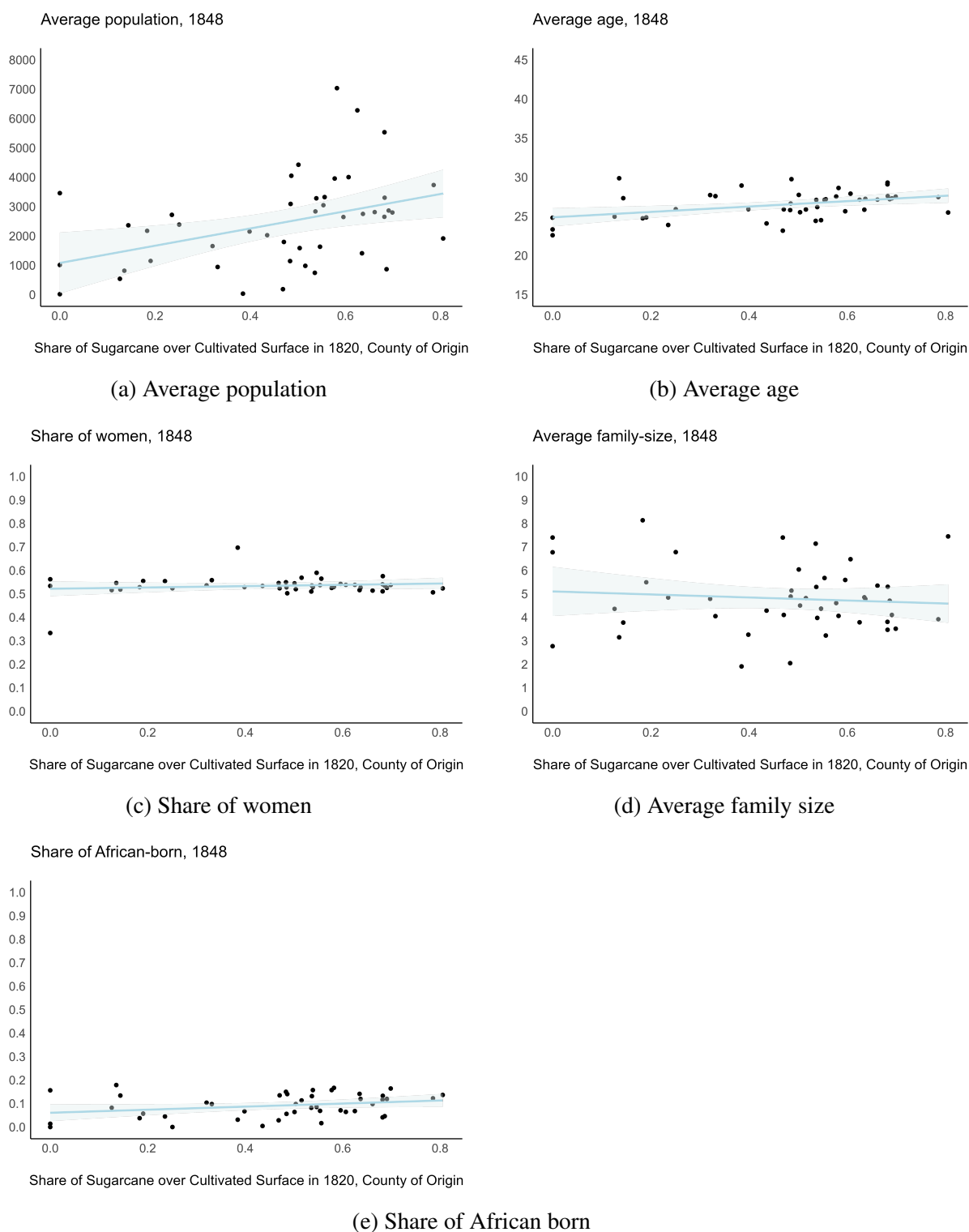


Table A4: Descriptive Statistics on Mothers Who Had a Child between 1852 and 1856, According to Former Sugarcane Exposure and Place of Birth

Statistic	All	<i>Exposure to Sugarcane</i>			<i>Place of birth</i>	
		Low	High	Extreme	Africa	Islands
N	33603	7428	8002	3364	3838	15058
Mother, age	25.03	25.08	24.77	24.62	24.75	24.89
Mother, number of children	1.23	1.30	1.30	1.28	1.29	1.30
Mother, landowner	7.98	8.02	8.26	7.87	8.57	7.95
Mother, experienced stillbirth	3.37	3.27	3.69	3.03	3.49	3.37
Mother, experienced child death	14.74	14.61	15.81	15.64	16.18	15.07
Mother, literate (signed)	15.90	14.43	16.88	15.86	17.12	15.36
Mother, moved	61.70	62.08	62.07	59.96	68.50	59.96
Mother, from Africa	20.31	16.21	23.04	23.37	100	0
Mother, low sugarcane exposure	22.11	100	0	0	31.37	41.33
Mother, high sugarcane exposure	23.81	0	100	0	48.05	40.90
Mother, extreme sugarcane exposure	10.01	0	0	100	20.48	17.12
Mother, plantation size during slavery	86.40	78.90	83.28	102.22	81.98	87.50
Mother, age of partner	31.82	31.71	31.79	31.24	32.18	31.51
Mother, number of partners	1.04	1.06	1.05	1.06	1.06	1.06
Mother, field Worker / Laborer	59	65	64	71	64	66
Mother, no occupation	15	11	13	10	12	11
Mother, skilled Workers / Artisans	13	10	12	8	11	11
Mother, domestic Workers	7	8	6	7	7	7
Mother, public Officials / Skilled Employees	2	2	2	1	2	2
Mother, traders / Employees	2	2	2	2	2	2
Mother, landlords	1	1	1	1	1	1
<i>Characteristics of fathers with whom mothers had children</i>						
Father, distinct	1.34	1.64	1.64	2.02	1.90	1.65
Father, unknown	41.43	40.40	47.76	36.47	43.36	42.59
Father, Africa	21.29	19.13	23.23	20.88	25.98	19.67
Father, low sugarcane exposure	13.16	21.84	8.55	12.40	12.69	14.98
Father, high sugarcane exposure	14.01	10.58	20.61	9.63	14.98	14.62
Father, extreme sugarcane exposure	7.03	6.38	3.59	21.73	7.97	7.92
Father, literate (signed)	38.14	37.25	32.69	38.30	34.93	35.78
Father, plantation size during slavery	85.88	86.06	85.70	93.02	86.81	87.94
Father, landlords	20.21	17.34	20.82	17.45	20.41	18.23

Notes: Average statistics computed on the sample of formerly enslaved mothers who had a child between 1852 and 1856. * Fathers of unknown status are those whose former enslavement status could not be determined based on their surnames: either because they were not slaves, or because they were slaves whose surname could not be linked to a former place of enslavement.

Table A5: Descriptive Statistics on Births with Known Fathers, Depending on Fathers' Exposure to Sugarcane, 1852-1856

Statistic	All	<i>Exposure to Sugarcane</i>			<i>Place of birth</i>	
		Low	High	Extreme	Africa	Islands
Observations	20302	4458	4689	2325	2424	9138
Father, age	31.9	31.74	31.88	31.6	32.4	31.6
Father, children	1.25	1.3	1.32	1.27	1.28	1.31
Father, land ownership	20.32	17.1	20.38	16.09	19.32	17.88
Father, stillbirth	2.01	1.79	2.71	1.89	1.98	2.22
Father, child death	13.44	13.95	13.82	15.23	12.75	14.45
Father, literate (signed)	61.42	58.12	58.45	56.05	58.11	57.97
Father, moved	63.92	62.47	66.6	61.12	71.82	61.82
Father, from Africa	20.97	17.05	24.42	21.38	100	0
Father, low sugarcane exposure	21.96	100	0	0	31.35	40.47
Father, high sugarcane exposure	23.1	0	100	0	47.24	38.78
Father, extreme sugarcane exposure	11.45	0	0	100	20.5	20
Father, number of partners	1.04	1.05	1.05	1.05	1.05	1.05
Father, plantation size during slavery	85.86	79.71	81.62	100.29	80.16	87.35
Father, Field Worker / Laborer	56	65	62	63	62	64
Father, Skilled Workers / Artisans	16	13	15	16	15	14
Father, Landlords	8	5	7	5	6	6
Father, Maritime	5	5	4	5	5	4
Father, Traders / Employees	5	4	5	4	4	4
Father, Public Officials / Skilled Employees	4	3	3	3	4	3
Father, Domestic Workers	2	3	2	3	2	2
Father, No occupation	2	1	2	1	1	1
Father, Military	1	1	1	1	1	1
Father, Other	0	0	0	0	0	0
<i>Characteristics of mothers with whom fathers had children</i>						
Mother, age	25.79	26.07	25.58	25.23	25.9	25.64
Mother, distinct	3.98	4.89	4.82	5.42	4.66	5.06
Mother, land ownership	7.66	7.02	8.79	8.27	7.82	8.03
Mother, from Africa	20.34	18.11	21.06	21.45	24.64	18.71
Mother, low sugarcane exposure	22.36	36	16.14	19.4	22.15	25.09
Mother, high sugarcane exposure	21.82	15.66	35.19	12.17	24.75	22.29
Mother, extreme sugarcane exposure	10.98	9.62	6.93	31.18	12.46	13.02
Mother, literate (signed)	7.63	5.96	7.8	4.14	6.99	6.15
Mother, plantation size during slavery	87.88	87.34	87.2	93.08	89.98	88.74
Notes: Average statistics computed on the sample of formerly enslaved fathers who had a child between 1852 and 1856.						

Table A6: Descriptive Statistics on Parents, according to Mobility and Sugarcane Exposure

		All		Lower		High		Extreme	
		stayer	mover	stayer	mover	stayer	mover	stayer	mover
<i>Mothers</i>									
N	33603	7238	11658	2817	4611	3035	4967	1347	2017
Average, age	25.03	24.84	24.87	25.27	24.96	24.71	24.8	24.29	24.86
Average, children	1.23	1.33	1.27	1.35	1.26	1.34	1.28	1.29	1.27
%, unknown fathers	41.43	47.26	39.94	44.34	38	53.74	44.11	39.64	34.36
%, land ownership	7.98	7.96	8.15	7.9	8.09	7.87	8.5	8.29	7.55
%, stillbirth	3.37	3.51	3.33	3.05	3.4	3.76	3.64	3.93	2.43
%, child death	14.74	15.93	14.9	14.66	14.57	16.21	15.56	18.34	13.83
%, literate (signed)	15.9	14.68	16.35	14.69	14.27	13.11	19.14	18.55	14.12
%, from Africa	20.31	16.7	22.55	13.6	17.81	17.53	26.41	21.75	24.44
%, Field Worker	59	82	55	79	56	84	51	86	60
%, No occupation	15	4	17	4	16	3	18	3	16
%, Skilled Workers	13	6	14	6	13	5	16	6	10
%, Domestic Workers	7	5	8	7	9	4	7	5	8
%, Public Officials	2	2	2	2	2	2	2	1	2
%, Traders / Employees	2	1	3	1	3	1	3	0	2
%, Landlords	1	0	1	0	2	0	1	0	1
<i>Fathers</i>									
Observations	20302	4172	7390	1673	2785	1566	3123	904	1421
Average, age	31.9	31.59	31.87	31.51	31.88	31.71	31.96	31.46	31.7
Average, children	1.25	1.33	1.29	1.35	1.28	1.34	1.31	1.29	1.26
%, land ownership	20.32	13.67	20.91	13.81	19.2	15.05	23.25	11.14	19.5
%, stillbirth	2.01	1.87	2.34	1.37	2.05	2.23	2.95	2.21	1.69
%, child death	13.44	14.53	13.84	13.57	14.18	14.05	13.7	17.48	13.79
%, literate (signed)	61.42	45.24	65.19	47.3	64.63	46.23	64.55	38.21	67.42
%, from Africa	20.97	16.37	23.56	13.69	19.07	18.39	27.44	17.81	23.65
%, Field Worker	56	79	54	80	55	82	52	73	56
%, Skilled Workers	16	10	17	8	16	9	18	15	17
%, Landlords	8	2	8	2	7	2	9	1	8
%, Maritime	5	3	5	3	6	2	5	5	5
%, Traders / Employees	5	2	6	2	6	2	6	2	5
%, Public Officials	4	2	4	1	4	2	4	2	4
%, Domestic Workers	2	2	2	3	2	1	2	2	3
%, No occupation	2	0	2	0	2	0	2	0	1
%, Military	1	0	1	0	1	0	1	0	1

Notes: Average statistics computed on the sample of formerly enslaved parents, depending on their former exposure to sugarcane and whether they moved from their county of enslavement. Descriptive statistics suggest that movers tend to be more skilled across all coercion group, with a lower share of field workers relatively to stayers who had a child between 1852 and 1856.

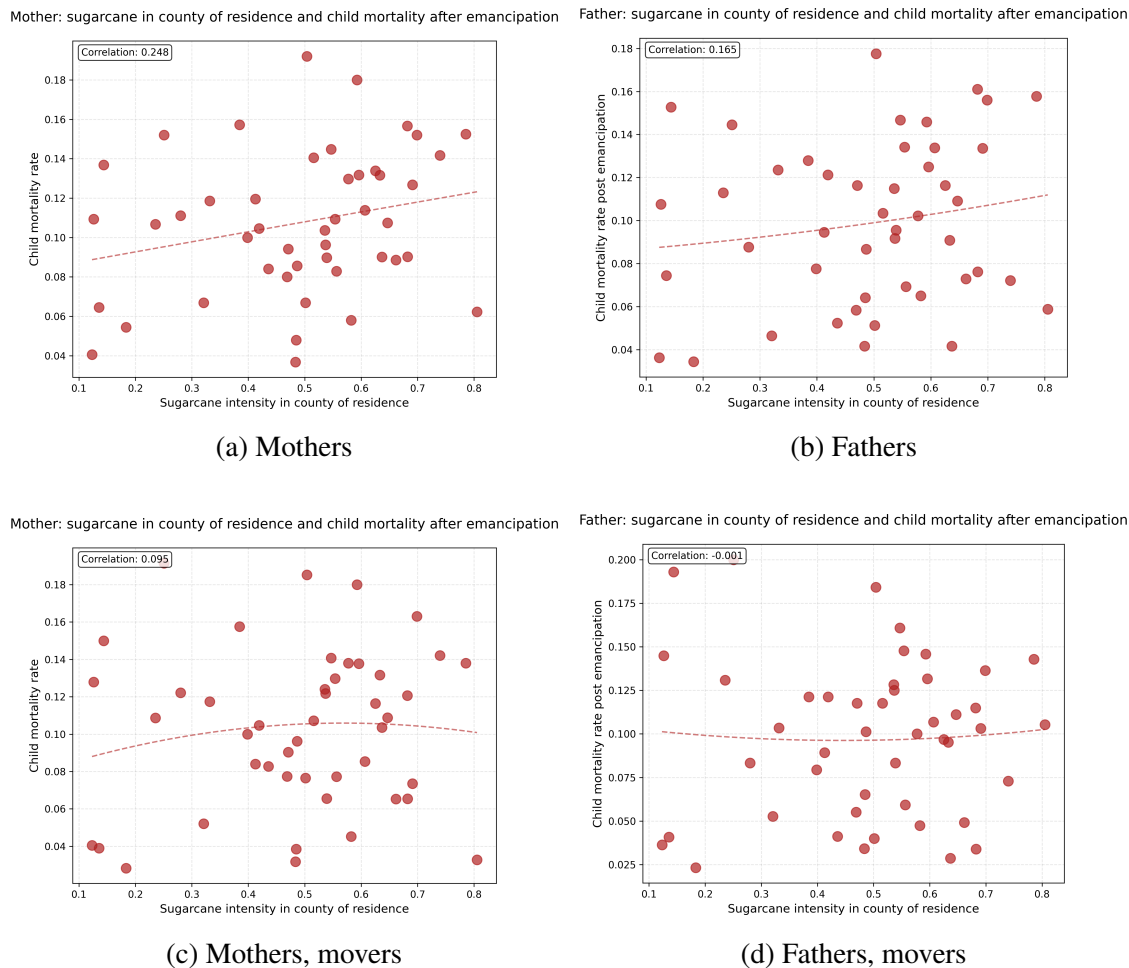


Figure A20: Sugarcane intensity in county of birth and child mortality - all formerly enslaved parents, and movers only

Notes: The figures are binned scatterplots of the pre-emancipation child mortality rates with the sugarcane intensity in the county of birth. One bin corresponds to one parish of birth. For each bin, child mortality rate is the share of children born between 1852 and 1856 that die within that time period. Linear correlation coefficients are indicated on the top left corner of each subgraph. While the relationship between child mortality and sugarcane intensity in parish of birth is positive on the full sample, it goes to 0 when focusing solely on children whose fathers were not enslaved in the parish of birth (movers). This suggests that pre-mobility parental characteristics, rather than pre-emancipation local characteristics, might be driving differences in child mortality after emancipation.

D Additional Results

D.1 Post-Emancipation Outcomes

Table A7: Mother's past exposure to sugarcane during slavery and partner's characteristics after emancipation

	(1) Partner has land	(2) Is skilled	(3) Non slave	(4) Literate
Sugar: low vs. int.	-0.17* (0.10)	-0.03 (0.09)	-0.26* (0.14)	-0.04 (0.06)
Sugar: extreme vs. int.	-0.26** (0.13)	-0.08 (0.12)	-0.08 (0.19)	-0.06 (0.08)
Mother from Africa	0.08 (0.09)	-0.04 (0.08)	0.12 (0.14)	-0.15*** (0.06)
Mean	0.15	0.19	0.08	0.28
N	6707	6640	4769	12910

Notes: This table displays the logit estimated effect of mothers' exposure to sugarcane during slavery, on their partner's characteristics after emancipation. Robust standard errors in parenthesis. For λ a coefficient, the estimated effect of a covariate on each outcome is equal to $(\exp(\lambda)-1)\%$. Fixed effects for parishes of residence and year included in all specifications. Standard errors are robust. *** $p < .01$; ** $p < .05$; * $p < .1$

D.2 Robustness Analyses on Child Mortality

Table A8: Cox proportional hazard model of children's monthly risk of death between 1852 and 1856 - full sample, mothers' characteristics only, both treatment

	(1)	(2)	(3)	(4)
Male birth	0.09*	0.09*	0.09*	0.09*
	(0.05)	(0.05)	(0.05)	(0.05)
Mother, age	-0.01***	-0.01***	-0.01***	-0.01***
	(0.004)	(0.004)	(0.004)	(0.004)
Mother, from Africa	0.10*	0.12*	0.12*	0.12*
	(0.06)	(0.06)	(0.06)	(0.06)
Father absent	0.09*	0.10*	0.10*	0.10*
	(0.05)	(0.06)	(0.06)	(0.06)
Mother is field worker		-0.07	-0.07	-0.07
		(0.06)	(0.06)	(0.06)
Mother, signed		-0.02	-0.02	-0.02
		(0.08)	(0.08)	(0.08)
Mother, moved		-0.09	-0.09	-0.09
		(0.06)	(0.06)	(0.06)
Mother, landowner		0.02	0.02	0.01
		(0.11)	(0.11)	(0.11)
Mother, sugarcane exp.			-0.02	
			(0.15)	
Mother, sugarcane exp. (cat): low vs. int				0.01
				(0.06)
Mother, sugarcane exp. (cat): extreme vs int.				0.04
				(0.09)
County FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Mother's occupation	No	No	No	No
Death rate	0.12	0.12	0.12	0.12
N	15,083	14,079	14,079	14,079

Notes: This table displays the Cox proportional hazard estimated effect of parental exposure to sugarcane on children's risk of death before 1857 for all children born between 1852 and 1856. This table displays the contribution of mothers' characteristics (occupation, age, etc.) together with their past sugarcane exposure, on their children's average monthly risk of death. Results for both the continuous sugarcane exposure (specification 2) and the categorical one (specification 3) are displayed. For λ a coefficient, the hazard ratio associated with a one-unit increase in the corresponding predictor variable increases by a factor of $\exp(\lambda)$, or $(\exp(\lambda)-1)\%$. Year, county of birth, month of birth fixed effects are included in all regressions. Standard errors are robust. ***p < .01; **p < .05; *p < .1

Table A9: CoxPH model of children's monthly risk of death between 1852 and 1856 - full sample, both parents' characteristics

	(1)	(2)	(3)
Male birth	0.04 (0.07)	0.04 (0.07)	0.04 (0.07)
Mother: age	0.005 (0.01)	0.005 (0.01)	0.01 (0.01)
Father: age	-0.01* (0.005)	-0.01* (0.005)	-0.01* (0.005)
Mother is field worker	0.08 (0.12)	0.08 (0.12)	0.09 (0.12)
Father is field worker	-0.01 (0.10)	-0.01 (0.10)	-0.02 (0.10)
Mother: from Africa	0.13 (0.09)	0.13 (0.09)	0.13 (0.09)
Father: from Africa	-0.09 (0.09)	-0.09 (0.09)	-0.08 (0.09)
Mother: sugarcane exp. (continuous)		-0.04 (0.22)	
Father: sugarcane exp. (continuous)		0.06 (0.22)	
Mother, sugarcane exp. (cat): low vs. int			-0.08 (0.11)
Mother, sugarcane exp. (cat): extreme vs int.			-0.07 (0.13)
Father, sugarcane exp. (cat): low vs int.			0.20* (0.10)
Father, sugarcane exp. (cat): extreme vs. int.			0.32** (0.13)
County FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Death rate	0.11	0.11	0.11
N	6,857	6,857	6,857

Notes: This table displays the Cox proportional hazard estimated effect of parental exposure to sugarcane on children's risk of death before 1857 for all children born between 1852 and 1856. This table displays the contribution of parental characteristics (occupation, age, etc.) together with their past sugarcane exposure, on their children's average monthly risk of death, when both parents are known. Results for both the continuous sugarcane exposure (specification 2) and the categorical one (specification 3) are displayed. For λ a coefficient, the hazard ratio associated with a one-unit increase in the corresponding predictor variable increases by a factor of $\exp(\lambda)$, or $(\exp(\lambda)-1)\%$. Year, county of birth, month of birth fixed effects are included in all regressions. Standard errors are robust. *** $p < .01$; ** $p < .05$; * $p < .1$

Table A10: Cox proportional hazard model of children's monthly risk of death between 1852 and 1856 - fathers non field workers

	(1)	(2)	(3)
Mother: low vs int	0.03 (0.16)	-0.03 (0.18)	0.05 (0.20)
Mother: extreme vs int	0.22 (0.19)	0.12 (0.22)	0.14 (0.24)
Father: low vs int	0.23 (0.14)	0.23 (0.17)	0.20 (0.18)
Father: extreme vs int	0.46*** (0.18)	0.39* (0.20)	0.48** (0.21)
Mother controls	No	Yes	Yes
Father controls	No	No	Yes
Death rate	0.11	0.11	0.11
N	2,711	2,083	1,830

Notes: This table displays the Cox proportional hazard estimated effect of parental exposure to sugarcane on children's risk of death before 1857, focusing on children of higher income fathers (non field workers). This robustness checks aims at identifying whether fathers' negative effect on children's health, when most exposed to sugarcane during slavery, could be driven by these fathers being poorer. I find similar results to the main specifications Table 5, suggesting results cannot be fully explained by lower economic inputs. For λ a coefficient, the hazard ratio associated with a one-unit increase in the corresponding predictor variable increases by a factor of $\exp(\lambda)$, or $(\exp(\lambda)-1)\%$. Year, county of birth, month of birth fixed effects are included in all regressions. Standard errors are robust. ***p < .01; **p < .05; *p < .1

Table A11: CoxPH model of children's monthly risk of death between 1852 and 1856 - mothers moved from parish of enslavement

	(1)	(2)	(3)	(4)	(5)
Mother: low vs high	0.01 (0.06)		0.001 (0.06)	-0.05 (0.07)	0.04 (0.15)
Mother: extreme vs high	-0.07 (0.13)		-0.09 (0.13)	-0.17 (0.14)	-0.24 (0.23)
Father: low vs high		0.08 (0.12)	0.08 (0.12)	0.19 (0.13)	0.21 (0.14)
Father: extreme vs high		0.34** (0.15)	0.35** (0.15)	0.38** (0.16)	0.50*** (0.18)
Father: absent vs high		0.25** (0.11)	0.25** (0.11)	0.27** (0.10)	
Mother controls	No	No	No	Yes	Yes
Father controls	No	No	No	No	Yes
Death rate	0.11	0.11	0.11	0.11	0.1
N	8,340	8,340	8,340	7,339	2,988
R ²	0.85	0.85	0.85	0.85	0.76

Notes: This table displays the Cox proportional hazard estimated effect of parental exposure to sugarcane on children's risk of death before 1857, when mothers moved out of their parish of enslavement. This robustness check aims at assessing the sensitivity of the results to parents' mobility decisions. Results are robust to focusing on mothers that moved (this table), or fathers that moved (Table A12): we still observe that children of extremely exposed fathers die systematically younger than others. For λ a coefficient, the hazard ratio associated with a one-unit increase in the corresponding predictor variable increases by a factor of $\exp(\lambda)$, or $(\exp(\lambda)-1)\%$. Year, county of birth, month of birth fixed effects are included in all regressions. Standard errors are robust. ***p < .01; **p < .05; *p < .1

Table A12: CoxPH model of children's monthly risk of death between 1852 and 1856 - fathers moved from parish of enslavement

	(1)	(2)	(3)	(4)	(5)
Mother: low vs high	-0.11 (0.11)		-0.14 (0.12)	-0.18 (0.13)	-0.14 (0.15)
Mother: extreme vs high	-0.07 (0.19)		-0.12 (0.19)	-0.21 (0.24)	-0.15 (0.26)
Father: low vs high		0.16 (0.12)	0.17 (0.13)	0.19 (0.15)	0.23 (0.15)
Father: extreme vs high		0.34** (0.15)	0.36** (0.15)	0.32* (0.17)	0.40** (0.18)
Mother controls	No	No	No	Yes	Yes
Father controls	No	No	No	No	Yes
Death rate	0.1	0.1	0.1	0.1	0.1
N	3,872	3,872	3,872	3,163	2,949
R ²	0.78	0.78	0.78	0.78	0.78

Notes: This table displays the Cox proportional hazard estimated effect of parental exposure to sugarcane on children's risk of death before 1857, when fathers moved out of their parish of enslavement. Results are robust to focusing on fathers that moved (this table), or mothers that moved (Table A11): we still observe that children of extremely exposed fathers die systematically younger than others. For λ a coefficient, the hazard ratio associated with a one-unit increase in the corresponding predictor variable increases by a factor of $\exp(\lambda)$, or $(\exp(\lambda)-1)\%$. Year, county of birth, month of birth fixed effects are included in all regressions. Standard errors are robust. ***p < .01; **p < .05; *p < .1

Table A13: CoxPH model of children's monthly risk of death between 1852 and 1856 - extreme category at 90th percentile of sugarcane intensity

	(1)	(2)	(3)	(4)	(5)
Mother: low vs int.	0.04 (0.06)		0.03 (0.06)	0.01 (0.06)	-0.03 (0.10)
Mother: extreme vs int.	0.07 (0.14)		0.05 (0.14)	0.02 (0.15)	-0.11 (0.19)
Father: low vs int.		0.06 (0.11)	0.06 (0.11)	0.14 (0.12)	0.23* (0.14)
Father: extreme vs int.		0.23* (0.13)	0.23* (0.13)	0.26* (0.14)	0.36** (0.16)
Father: absent vs int.		0.18** (0.08)	0.18** (0.07)	0.14* (0.08)	
Mother controls	No	No	No	Yes	Yes
Father controls	No	No	No	No	Yes
Death rate	0.12	0.12	0.12	0.12	0.11
N	15,603	15,603	15,603	14,000	5,867
R ²	0.88	0.88	0.88	0.88	0.83

Notes: This table displays the Cox proportional hazard estimated effect of parental exposure to sugarcane on children's risk of death before 1857 for all children born between 1852 and 1856. This alternative specification uses a different "extreme exposure" category, using the 90th percentile of the share of sugarcane over cultivated surface in 1820 as threshold. Results are very similar in magnitude to the baseline model displayed Table 5, suggesting little sensitivity of the results to the definition of the coercion categories. For λ a coefficient, the hazard ratio associated with a one-unit increase in the corresponding predictor variable increases by a factor of $\exp(\lambda)$, or $(\exp(\lambda)-1)\%$. ***p < .01; **p < .05; *p < .1

Table A14: Cox proportional hazard model of children's monthly risk of death between 1852 and 1856 - Father lives in same *commune* as child (right), or in a different one (left)

Fathers' residence	Same		Distinct	
	(1)	(2)	(1)	(2)
Mother: low vs int.	-0.10 (0.09)	-0.13 (0.11)	0.07 (0.06)	0.05 (0.07)
Mother: extreme vs int.	-0.08 (0.15)	-0.10 (0.19)	0.08 (0.14)	0.05 (0.13)
Father: low vs int.	0.14 (0.13)	0.23 (0.15)	0.55 (0.96)	0.56 (0.96)
Father: extreme vs int.	0.28** (0.12)	0.31** (0.13)	0.91 1.01 (0.75)	1.05 0.94 (0.75)
Father: absent vs int.				
Mother controls	No	Yes	No	Yes
Death rate	0.11	0.11	0.12	0.12
N	6,583	5,594	8,358	7,943
R ²	0.85	0.83	0.88	0.88

Notes: This table displays the Cox proportional hazard estimated effect of parental exposure to sugarcane on children's risk of death before 1857, depending on whether the father resides in the same parish as the mother and the child. This robustness checks aims at identifying whether fathers' negative effect on children's health, when most exposed to sugarcane during slavery, could be driven by these fathers being absent/away. Interestingly, I find that the negative effect of fathers when extremely exposed to sugarcane *only* appears when fathers reside in the same parish as the child and mother, suggesting results cannot be explained by a *lack* of inputs, but rather negative inputs. For λ a coefficient, the hazard ratio associated with a one-unit increase in the corresponding predictor variable increases by a factor of $\exp(\lambda)$, or $(\exp(\lambda)-1)\%$. Year, county of birth, month of birth fixed effects are included in all regressions. Standard errors are robust. *** $p < .01$; ** $p < .05$; * $p < .1$

D.3 Mechanisms

Table A15: Mother's exposure to hardship and probability that fathers would be absent

	(1) Partner unknown	(2) Different partners	(3) Different residence	(4) Family presence	(5) Kin presence
Mother: hardship exp. during childhood	-0.62 (0.63)	1.43 (2.53)	4.76** (2.14)	-0.70 (1.34)	-0.59 (0.85)
Mother: sugar exp.	-0.54 (1.15)	0.56 (4.73)	8.05 (5.03)	-2.56 (2.94)	-0.13 (1.49)
Mother: sugar exp. x hardship exp.	0.85 (1.12)	-0.71 (4.31)	-7.54* (4.14)	1.88 (2.66)	0.26 (1.50)
Mean	0.48	0.02	0.02	0.03	0.19
N	4208	4208	2112	3154	3154

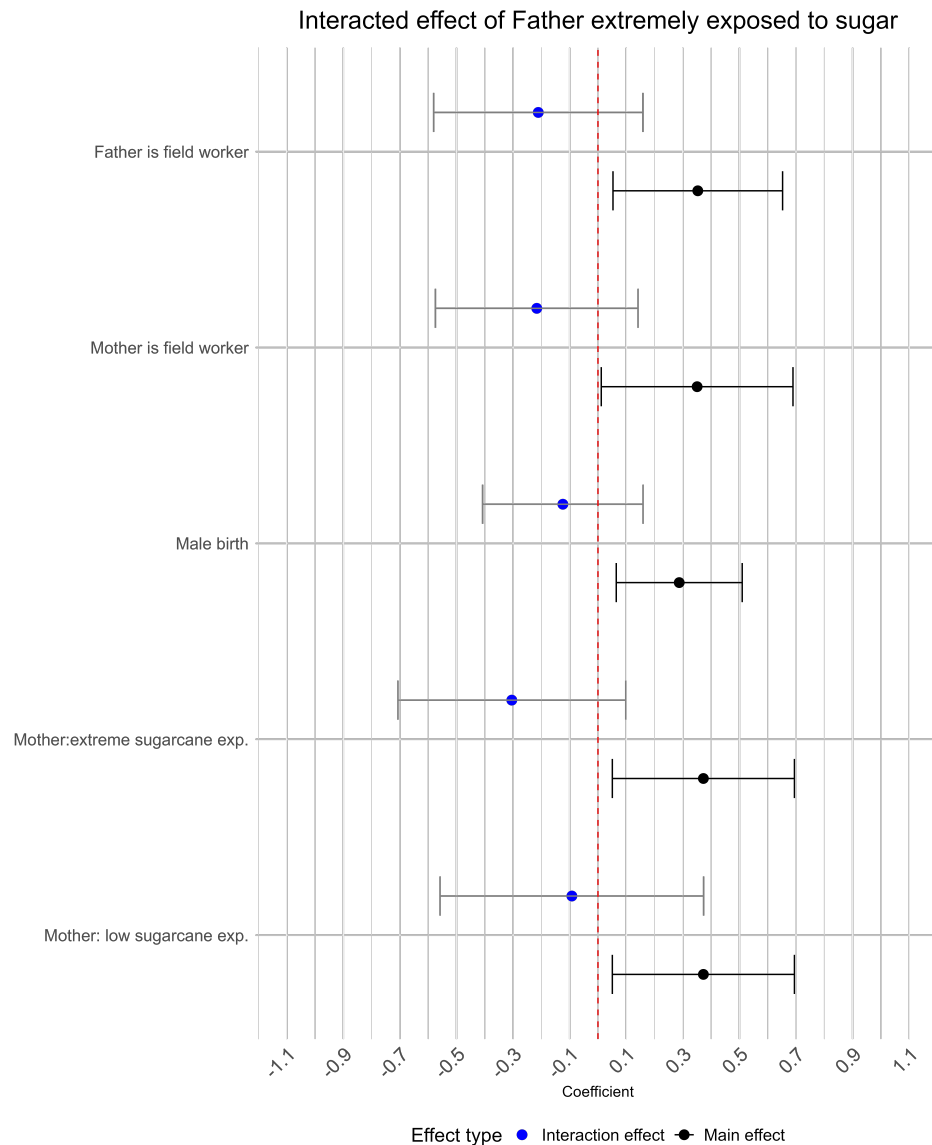
Notes: This table displays the logit estimated effect of mothers' exposure to hardship during childhood, on partner's presence after emancipation, between 1852 and 1856. Exposure to hardship during childhood is calculated as follow: I use the median death to birth ratio in the parish of enslavement when individuals were less than ten years old. For λ a coefficient, the hazard ratio associated with a one-unit increase in the corresponding predictor variable increases by a factor of $\exp(\lambda)$, or $(\exp(\lambda)-1)\%$. Year, county of birth, month of birth fixed effects are included in all regressions. Standard errors are robust .***p < .01; **p < .05; *p < .1

Table A16: Probability for Fathers to be Different, Conditional on First Father Being Known

	(1)	(2)	(3)	(4)
First father: High Coercion vs. Low	−0.29 (0.44)	−0.30 (0.42)	−0.33 (0.43)	−0.18 (0.43)
First father: Extreme Coercion vs. Low	0.45 (0.39)	0.51 (0.40)	0.44 (0.39)	0.52 (0.39)
Number of Births		0.71* (0.38)	0.71* (0.38)	0.69* (0.39)
Mother's age			0.02 (0.03)	0.02 (0.03)
County FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Mother's occupation	No	No	No	No
Mother's coercion exposure	Yes	Yes	Yes	Yes
Mean	0.08	0.08	0.09	0.09
<i>Observations</i>	643	643	622	609
<i>Akaike information criterion</i>	401.61	400.36	400.09	394.55

Notes: The sample used to estimate these coefficients are mothers who had several children between 1852 and 1856, and where the father of the first child is known. Coefficients reflect the logit estimated effects of each covariate on the odds that the next father(s) would be different than the first father. For λ a coefficient, the hazard ratio associated with a one-unit increase in the corresponding predictor variable increases by a factor of $\exp(\lambda)$, or $(\exp(\lambda)-1)\%$. ***p < .01; **p < .05; *p < .1

Figure A21: Additional Effect of Having a Father Extremely Exposed to Sugarcane during Slavery on Child Mortality



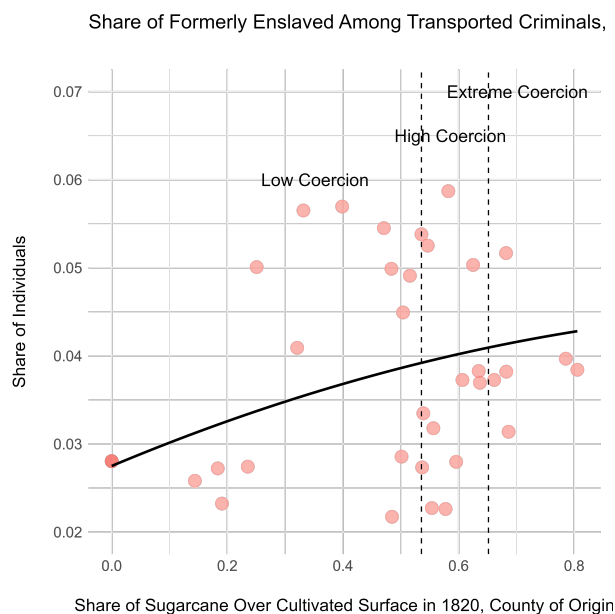
Notes: This figure displays the estimated Cox Proportional Hazard effect of having an extremely coerced father (relative to less coerced or absent) interacted with different variables. The Main effect corresponds to the average effect of fathers' extreme exposure to sugarcane on children's risk of death in the regression. All interaction coefficients are non-statistically different from 0 and less than 0.2 in absolute value. This suggests that having an extremely coerced father always has a significant impact on children's risk of death, across all sub-groups. Confidence intervals are defined at the 95% level.

Table A17: Probability to be Sent to Guyana for a Violent Crime, By Type of Crime

	Continuous Treatment Share of Sugarcane Prod. Surface		
	Violent Crime	Against Women/Child	Property Crime
	(1)	(2)	(3)
Sugar exposure	-0.619 (1.763)	-4.743* (2.674)	0.235 (0.353)
Sugar exposure ²	1.245 (1.686)	5.978*** (1.860)	-0.730 (0.580)
Average	0.298	0.124	0.618
Island FE	Yes	Yes	Yes
Decades	Yes	Yes	Yes
<i>Observations</i>	1024	1024	1024
Pseudo R ²	0.113	0.053	0.109

Notes: probability for convicts' to be incarcerated for (1) a violent crime (murder, sexual assault, physical assault) (2) a sexual crime (3) a violent crime against women or children. ***p < .01; **p < .05; *p < .1. Standard errors clustered by island in parentheses.

Figure A22: Share of surnames found among convicted criminals between 1850 and 1900, by surnames' county of origin



Notes: This figure displays the share of formerly enslaved surnames found among all french transported criminals between 1850 and 1950, by the county of origin of the surname. The line is a second order polynomial fit between the two variables

Table A18: Partnerships and kin presence, by fathers' exposure to sugarcane

	(1) Different partners	(2) Different residence	(3) Family presence	(4) Kin presence
Father from Africa	-0.01 (0.14)	0.09 (0.17)	0.14 (0.25)	-0.14 (0.24)
Sugar: low vs. high	0.05 (0.13)	-0.23 (0.23)	-0.26 (0.26)	-0.31 (0.18)
Sugar: extreme vs. high	0.19 (0.18)	-0.47* (0.23)	-0.07 (0.30)	0.13 (0.24)
Mean	0.04	0.02	0.02	0.06
N	9745	8945	3415	3415

Notes: This table displays the estimated effect of men's former exposure to sugarcane during slavery on partners and kinship presence in the birth records of their children born between 1852 and 1856. Different partners refers to men having had several children between 1852 and 1856, with known and different partners; different residence means that the father did not reside in the same parish as the mother at the time of at least of the birth; family presence indicates that a family member was present for at least one of the birth registration; kin presence indicates that a friend or extended family member was present for at least one of the birth registration. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors. Fixed effects for parishes of residence and year at last birth included in all specifications

Table A19: Probability for mothers to have child with father from same sugar exposure

	(1)	(2)
	Same sugar	Same sugar
Sugar: low vs. int.	-0.14 (0.11)	-0.16 (0.11)
Sugar: extreme vs. int.	-0.30* (0.17)	-0.31* (0.18)
Pop controls	No	Yes
Mother controls	Yes	Yes
Mean	0.21	0.21
N	13187	12374

Notes: This table displays the logit-estimated effect of mothers' former exposure to sugarcane on their probability of having a child with a man as exposed to sugarcane as they were (low; intermediary; or extreme exposure), controlling for the number of mothers and fathers of each sugarcane exposure group in the county of residence of the mother. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Robust standard errors. Fixed effects for parishes of residence and year at last birth included in all specifications