The Salt Shock: Scarcity, Substitution, and Surprising Health Spillovers *

Ramiro Burga[†] Sisir Debnath[‡] Eric Robertson[§]
Sheetal Sekhri[¶]

August 6, 2025

Abstract

We study the long-run health impacts of a 19th-century colonial tax that sharply altered salt prices across a fiscal border in British India. To enforce the salt tax, the British built a 2,500-mile customs line, the *salt hedge*, which raised salt prices and limited access in eastern regions for several decades. Using a spatial regression discontinuity design around the historical hedge, we show that individuals east of the hedge, who faced prolonged exposure to salt scarcity, exhibit lower rates of hypertension and heart disease today. Historical archival records confirm sustained salt price gaps during the hedge's operation (1836–1879), and contemporary consumption data reveal persistent differences in salt use across regions. Our results uncover a surprising health spillover from an extractive institution, driven by persistent behavioral adaptation in consumption. We highlight a novel pathway through which fiscal policies can leave a long-lasting imprint on health, even after the policy itself has abolished.

Keywords: Long-run development, salt hedge, Colonial India, Coronary health

JEL Classification: D02, N25, N35

*We thank Andrew Foster for his insightful suggestions. We are also grateful to Stelios Michalopoulos for his comments.

†University of Virginia. rab9ze@virginia.edu
‡Indian Institute of Technology Delhi. sisirdebnath@iitd.ac.in
§University of Virginia. enr2ac@virginia.edu
¶University of Virginia. **Corresponding Author**: ssekhri@virginia.edu

1 Introduction

There is no article like salt outside water by taxing which the state can reach even the starving millions, the sick, the maimed and the utterly helpless. The tax constitutes therefore the most inhuman poll tax that ingenuity of man can devise.
–Mahatma Gandhi

Non-communicable diseases, particularly hypertension and cardiovascular illness, are now leading causes of global mortality. [1] A growing literature links these health burdens to the "nutrition transition", a shift in diets toward processed, calorie-dense, and nutrient-poor foods, especially during periods of economic and social transformation Popkin (2025). Yet little is known about the origins and persistence of the dietary preferences that underpin these transitions. Are such consumption patterns recent, responsive to current market conditions, or do they reflect deeper behavioral legacies rooted in historical shocks?

Related work, across a variety of social sciences, on the legacy of slavery and segregation in the United States shows that historical injustice can have enduring impacts on health outcomes (Coker Ross, 2024; Kramer et al., 2017; Logan and Parman, 2018). [2] These studies often face the challenge that historical exposures are deeply intertwined with persistent structural disadvantage, making it difficult to isolate causal mechanisms. In contrast, our setting offers a rare quasi-experimental case: a colonial tax policy that was sharp in time and space, but whose downstream effects played out in a context where present-day economic and institutional conditions are largely equalized. This enables us to isolate a novel behavioral mechanism—durable changes in consumption habits that have long-run health effects. Our study contributes to a growing understanding of how historical institutions, even when dismantled, can continue to shape modern health inequities through persistent behavior.

This paper explores a unique historical episode to investigate this question: the British colonial "salt hedge" in India. Constructed between 1834 and 1879, this 2,500-mile inland customs line was built to enforce a salt tax. Because salt was mined in western India and consumed widely in the east, the hedge served as a physical and fiscal barrier

[1] According to the World Health Organization, non-communicable diseases account for approximately 74% of all deaths globally as of 2021, with cardiovascular diseases alone responsible for 17.9 million deaths annually. See: *WHO Fact Sheet on Noncommunicable Diseases*, April 2021.

[2] The effect of slavery on human capital is also a subject of extensive interest. For example, citesacerdote2005 compares the education outcomes of later generations of slaves and free blacks pre-1865.

that raised the price and restricted the availability of salt in the eastern regions.[3] It represents a rare and well-documented institutional intervention that created a plausibly exogenous variation in commodity prices across space, with potential implications for long-term consumption patterns and health.

We leverage the geography of the salt hedge using a spatial regression discontinuity design (RDD). The hedge cut across existing administrative and geographic boundaries, allowing us to compare populations living just west and east of the hedge. Our empirical strategy exploits this discontinuity in historical exposure to salt taxation, using primary sampling units (villages and towns) on either side of the hedge while controlling for district fixed effects to net out broader institutional, infrastructural, or cultural factors. To validate the relevance of this historical shock, we compile archival data on salt prices, quantities, and tax revenue from 1836 to 1879. These records show that the hedge significantly raised salt prices in the eastern regions during its period of operation. This demonstrates that the institutional barrier successfully created a durable wedge in salt affordability and access, establishing the plausibility of long-term consumption responses.

We then turn to modern data on cardiovascular health. Using geo-referenced data from India's National Family Health Survey (NFHS-4, 2015–16), we examine the health outcomes of individuals born and residing near the historical hedge. Medical research consistently shows that excess dietary salt contributes to heart disease and hypertension. Consistent with this evidence, we find that individuals residing west of the hedge, where salt was historically cheaper, have significantly higher rates of cardiovascular disease and extreme blood pressure. We supplement this with data from recent waves of the National Sample Survey to show that salt consumption remains higher in the West today.

We conduct an extensive set of robustness checks to support our identification strategy. We show that populations are balanced across the hedge in observable characteristics such as demographics, economic status, and access to public goods. There is no evidence of sorting or bunching near the hedge, nor do we detect differential migration or mortality. Placebo tests using falsified hedge locations and unrelated health outcomes yield null results. Blood pressure readings were collected through direct measurement, mitigating concerns about differential reporting.

We also examine and rule out alternative mechanisms. One possibility is differential iodine intake, as salt is often iodized to prevent thyroid-related conditions (Feyrer et al., 2017). However, only minimal salt consumption is required for sufficient iodine intake,

[3] Salt taxation has long held fiscal and political importance for states. The infamous 'Gabelle' in pre-revolutionary France, for example, imposed a harsh salt tax that became a symbol of fiscal oppression and helped stoke revolutionary sentiment (Kiser and Linton, 2001).

and we find no cross-hedge differences in thyroid disease incidence or salt iodization rates using salt testing data from NFHS. Another potential mechanism is early-life or in-utero exposure to differing salt environments. The fetal origins literature documents that early nutritional shocks can have lasting health impacts (Almond and Currie, 2011a,b), and recent work links childhood diet to later-life morbidity (Hoynes et al., 2016; Sekhri and Shastry, 2020). However, our heterogeneity analysis finds similar effects across birth cohorts, suggesting that persistent behavior rather than early-life exposure is the dominant channel.

Our findings contribute to multiple strands of literature in economics and public health. First, we add new evidence to the literature on the origins of health disparities, particularly in cardiovascular outcomes. Prior work has shown that historical relics such as colonization, slavery, and segregation can shape health trajectories across generations (Kramer et al., 2017; Logan and Parman, 2018).[4] However, many of these settings conflate historical exposure with persistent structural disadvantage. In contrast, we study a case in which present-day conditions are similar across treatment and control groups, allowing us to isolate a behavioral mechanism rooted in historical exposure to price distortions. This highlights a new pathway through which history can contribute to modern health inequities.

Second, we contribute to the literature on the long-run consequences of extractive colonial institutions (Acemoglu et al., 2001; Althoff and Reichardt, 2024; Dell and Olken, 2020; Nunn, 2008). While much of this work emphasizes negative legacies, some studies suggest potential countervailing effects through infrastructure or public goods (Cagé and Rueda, 2016; Huillery, 2009; Jedwab and Moradi, 2016; Lowes and Montero, 2021; Valencia Caicedo, 2018; **?**). Our findings are consistent with this latter strand. A novel contribution of our work is identifying a behavioral channel for persistent changes. We show that even coercive institutions can induce persistent changes in consumption patterns that unintentionally improve long-run welfare.

Third, we contribute to research on taxation and health behavior. Extant studies show that commodity taxes on goods like tobacco can reduce consumption and improve health outcomes (Chaloupka and Warner, 2000; Friedson et al., 2023).[5] Our paper is the first to demonstrate that such effects can persist across generations and influence consumption even after the original tax has ended. This underscores the enduring power of price-induced behavioral change. Finally, we speak to the literature on cultural and

[4]Huillery (2009) finds persistence of colonial educational investments in improving education outcomes.

[5]There is an extensive medical literature that shows that taxing sugary drinks improves health outcomes

migrant preferences (Atkin, 2016; Bertocchi and Dimico, 2014), which documents the persistence of consumption habits across contexts. Our findings identify a complementary mechanism: not culture per se, but behaviors that originate in economic constraint. This mechanism helps explain how temporary historical shocks can become ingrained habits with long-run health consequences.

The rest of the paper is organized as follows: Section 2 provides the background on the salt tax and the salt hedge. Section 3 describes the data. We discuss the identification in Section 4 and present the main findings in Section 5. RD diagnostics and robustness tests are summarized in Section 6. Section 7 discusses the mechanism and 8 considers alternative possibilities. Section 9 offers concluding remarks.

2 Background: The Salt Hedge

2.1 Salt Tax, Production, and Prices

In this section, we rely on Moxham's book on salt hedge (Moxham, 2002) as a major source of information. We have cited other sources where applicable.

Salt was taxed in India, like many other parts of the world, since ancient times.[6] Under British, the salt manufacturing was brought under direct government control in 1780. The salt producing areas were put under a comptroller and divided into agencies.[7] Each agency was controlled by an agent who was a salaried government officer and also received a 10 percent commission on profits on salt made by the government. Local procurers sold salt to agents at a fixed price, and they, in turn, sold it to wholesalers at government determined prices. This was usually 2 rupees a maund or 82 pounds. Of this, 1.1 to 1.5 rupee was a tax levied on salt. In 1781, salt tax revenue was 2,960,130 rupees and it rose to 6,257,470 rupees in 1884.

The East India company became dependent on its revenue from salt tax. In 1788, the Company started selling to wholesalers through auction rather than a fixed price, further escalating the cost of salt. Tax was commensurately increased to 3.25 rupees a maund. The wholesale price of salt increased to 4 rupees a maund. To this the wholesaler added a profit and cost of transportation. So, salt became fairly expensive for consumers. A small family of two adults and three children needed at least half a maund of salt (roughly 41 pounds) per year. In 1788 this retailed for two rupees or more which was more than 2 months salary. In 1823, in many parts of the country, the price escalated to 12 rupees

[6]Evidence indicates salt tax was imposed systematically in 301 B.C

[7]Salt was either mined or generated using evaporation method from salty water from lakes or sea.

a maund. At this price, half a maund of salt would cost half a year's wages.

The majority of salt deposits occurred in Punjab (now in Pakistan), Rann of Kutch or central lakes.The Punjab mines located in Pakistan Punjab are still a major source of salt in Kalabagh (Mianwali), Warcha (Khushab), Noorpur (Nila Wahan, Chakwal) and Khewra (Jhelum). Khewra is the Himalayan sea salt source and was in the West Of India. While a trade route existed, it also crossed the hedge and significant duty had to be paid on salt (Bruce, 1863). Salt could also be produced from seawater. The Eastern part of non-coastal India could not rely on the sea because major rivers draining into the sea diluted the seawater and high humidity was not conducive for evaporation to leave behind salt. Orissa was an exception but the salt production there was controlled by British and suspended in 1863 (Siddiky, 2005). In addition, due to lack of extensive highway network around Orissa, salt could not be transported over long distances either. Bengal government passed Permanent settlement in 1793. This legislation fixed tax of hereditary landlords. As inflation grew over years, tax revenue stagnated. To generate income, Bengal presidency levied a higher tax on salt that was procured from the Khewra region. In 1869, the Salt tax in lower Bengal was 3.25 rupees a maund and in upper Bengal Presidency it was 3 rupees per maund. However, in Madras Presidency it was only 1.9 rupees a maund. These tax rates are reported in both Moxham (2002, p. 71) and the *The Review of Indian Statistics* by Danvers (1901).

2.2 The Salt Hedge: Great Custom Line of India

Before salt tax became a major source of revenue, there were posts scattered haphazardly along major roads. These certified that salt taxes had been paid. These posts failed to stop the infiltration of smuggled salt. In 1823, the Commissioner of Customs at Agra George Saunders proposed custom posts alongside the river Yamuna. These systematic custom posts laid the foundation of the great Custom Line or the 'Salt Hedge'. It extended slowly until 1834.

The Salt Hedge became a formidable inland customs line under the Commissioner of Customs G.H Smith, who took office in 1834. Initially, he was in-charge of the northern section but soon took over the entire line. Under him, tax on salt became a major source of revenue. The line was covered by a thick, thorny hedge raised sufficiently high to prevent being surmounted without breaking through, which created an alarm, and sentries could approach the area of commotion. The hedge was at least 8 feet high, reached up to 12 feet in some places, and was mandated to be 5 feet thick. In 20 years the customs line was consolidated as an effective barrier with trenches dug and many native species planted to form a live hedge. Some of the divisions also had a stone wall. The government actively planted seeds of a variety of dry thorny bushes. The budget to maintain the hedge grew to 790,000 rupees and was manned by 6,600 men in 1854. *Chowkis* or posts were erected one mile apart. Between these *Chowkis*, the land was cleared, and a raised path was constructed to connect them. Each mile was supervised by a non-commissioned officer called *Jemadar*. Men were posted every quarter of a mile. At night, men patrolled up and down their sections. These duties were run on a shift system and required ten men for guarding one mile. In addition to apprehending smugglers trying to cross, the guard had to sweep 2-3 miles around his section of the line when he took over using a large branch or a bamboo and grass frame over the bare earth. This section was then inspected for any footprints, and the guard was held responsible for any footprints that crossed it. The smugglers, if caught were fined 8 rupees on average when the monthly agricultural wage was 3 rupees. Default led to 6 months of rigorous imprisonment. Thousands of imprisonments occurred each year. In 1877, 6,077 people were convicted for smuggling salt. Of these 3,252 failed to pay the fine and were sent to prison for an average of 6 weeks.[8] Violence around the hedge became common between smugglers and officers.

In 1857, a mutiny broke out in India, but it was quelled, and the Indian territories were passed to the British Crown. All the territories imposed salt tax, but the Bengal Presidency levied a much higher tax (on East) than Bombay and Madras Presidencies on the Western side of the hedge. Hence, the prices on the East of the hedge were much higher. In 1869-70, Salt Tax collected on the Custom's line was 12,500,000 rupees. The agricultural wage was only 3 rupees a month. It enabled the department to employ 12,000 men who manned 1,727 guard posts.

After realignments, as more territory was annexed by the British, a 2,504 miles long continuous Customs line was established in 1869 as outlined in Figure 1. The great Customs Line ran from Torbela, which is now in Pakistan. The 1,428 miles long heavily guarded line followed the north bank of river Sutlej east to Fazilka now in India. From there, it ran south-east, keeping West of Delhi following South Bank of River Yamuna to Agra. It then turned south to Jhansi before terminating on the present-day border between Madhya Pradesh and Maharashtra south of Burhanpur.

British controlled the production of salt in their territories. They wanted a total monopoly on salt production, so they started leasing salt production units in princely states. Sambhar lake in Rajasthan, a major natural salt-producing lake, was leased by

[8] In early days of the line, when it was scantily patrolled, large-scale smuggling was common. Armed gangs with strings of camels laden with salt broke through weak sections.

the British in 1871. After this salt prices increased substantially in the East. In 1878 several salt agreements were struck with many small princely states in Rajasthan (West of the Customs line) to secure salt production. In the next ten years, an Inland Department of Customs was established. According to the officials, it deterred the smuggling of salt, which would have undermined the government's monopoly on salt.

The hedge played a crucial role in generating the salt tax revenue for the British. In 1877, the then Commissioner of Customs reported that 411 miles of the hedge were in perfect green condition, 298 were mixed green and dry, 471 were dry, and 6 miles were stone. In 1878, a famine stuck India, and salt prices soared again. Despite the introduction of a tax cut in Bengal, the price remained high East of the Customs line. However, by this time, salt production was completely in the hands of the British, and they introduced a salt tax at the production sites. The Customs Line was expensive to maintain and it was abandoned in 1879.

The hedge was constructed over time under several different commissioners. The placement of the hedge was not based on specific characteristics of the population as discussed above. Redistricting and urbanization over time led to the loss of this hedge. In independent India, this hedge could not be discerned as only bits and pieces remained over time. Hence, no interventions were ever implemented around the hedge.

2.3 Enforcement

In Figure 2, we plot the annual revenue from salt tax collected in India in million pounds. Between 1840 to 1858, it remained stable at around 3 million. Subsequently, as the hedge became a significant barrier at which tax had to be paid, the revenue steeply increased. By 1862, it doubled to around 6 million pounds. British set up an informant system o prevent clandestine salt trading (Siddiky, 2006). G.H Smith the commissioner of customs got taxes on lesser consumed items dropped such as tobacco so that customs officers could concentrate on salt smuggling (Calvert, 1919). By 1870, the customs line dedicated to the enforcement of tax collection employed 12,000 people (Choudhury, 1979).[9] Lieut Colonel Bruce wrote a report on the salt hedge, its operational cost, modalities of working, and its benefit in 1863. He called the customs line “stupendous” and documents that salt realizations increased manifold.

[9]There are some accounts that villagers living very close by to the hedge could take 2 pounds (or 0.9 kgs) for free. Wikipedia article on salt hedge states this with Moxham 2002, page 111 as the source. On the same page in the book, Moxham further clarifies that the customs officers had unchecked authority over allowing this and villagers were often frisked and searched as they crossed the line. This led to increased scope for bribe extraction.

2.4 Salt and Human Body: Salt, Heart Disease, and High Blood Pressure

The human body needs salt to function. It is a vital constituent of the blood. Loss of salt leads to a drop in the volume of blood in the body. With more salt in the body, the volume of blood increases which leading to higher blood pressure weakening the heart muscles. Continual high blood pressure can cause the heart to fail. High blood pressure also hardens the arteries which leading to kidney disease, strokes, and other coronary problems. High consumption of salt is associated with heart attacks and coronary disease and reduction is salt intake can reduce the risk of heart disease (Karanja et al., 2004; Mugavero et al., 2014) (National Center for Chronic Disease Prevention and Health Promotion, Division for Heart Disease and Stroke Prevention. US Centers for Disease Control). A seminal study using an experimental methodology also established that low salt diet leads to healthy blood pressure (Sacks et al., 2001). American public health policy recommends reduced salt intake as a strategy to prevent hypertension-chronic high blood pressure (Appel et al., 2006). A meta-analyses with data from 34 randomized public health trials concludes that modest salt reduction over a longer period (four or more weeks) reduces heart disease and hypertension (He et al., 2013). Systematic reviews of high and low salt diet comparisons also reveal that a high salt diet increases blood pressure and the risk of coronary disease whereas a low salt diet reduces BP and the risk of heart disease (Graudal et al., 2020). It is also important to take salt regularly: a surplus at one point cannot make up for shortage at another. The body cannot store salt for more than few days. Salt deprivation on the other extreme, can cause lassitude, headaches, fainting, vomiting, and in acute cases, even death. Plants and fruits do not have sufficient amounts of salt.

While disaggregated data on salt consumption from the late 1800s is not available, there is evidence that people in untaxed regions consumed lower salt due to salt tax. A doctor H.L. Marriott was asked to study the consumption patterns among soldiers in India. He documented that outside of line's vicinity, people in untaxed salt areas consumed 13 lbs every year. Taxation resulted in lower salt consumption, and for the poor it was reduced further. Salt tax led to much lower consumption of salt as per the investigation of army food intake in these areas.

2.5 Salt as a Medium for Iodine Supplementation

Salt is used in many parts of the world as a medium to provide iodine supplementation. Iodine can affect thyroid function and cognitive outcomes in humans. In India, iodised salt was introduced in 1962 under the 'National Goiter Control Programme (NGCP)'. All the identified and notified goiter endemic areas in the country were provided iodized salt under this policy. Initially, only public sector undertakings were permitted to produce iodised salt. The Government of India, with the help of WHO and UNICEF, set up Iodisation plants at Sambhar Lake (Rajasthan), Kharagoda (Gujarat), and Howrah (West Bengal). The sale of common salt for edible purposes was banned in the goitre-endemic areas by Notifications issued by the State Governments under the Prevention of Food Adulteration Act, 1954. In 1983, the private sector was allowed to enter this market. The Government of India decided to iodize the entire edible salt in a phased manner by 1992 and included this in the Seventh Five Year Plan (1985-1990). The Programmed was renamed in 1992 as 'National Iodine Deficiency Disorders Control Program (NIDDCP)'. In 1998-99, 71 percent of the households were consuming iodized salt, and 49 percent were consuming adequately iodized salt. Current dietary guidelines recommend that men and women ages 19 and older get 150 micrograms of iodine per day for the proper functioning of the thyroid gland and this can come from close to half a teaspoon of iodized salt. On the other hand, as discussed before, excess salt consumption can lead to heart conditions and coronary disease.

3 Data

The main source of data used is the National Family Health Survey 2015-16 of India (NFHS-4, 2017). This nationally representative survey is 4^{th} in the series that collects information about population, nutrition and health. The survey sample is a two-stage stratified sample. The 2011 census served as the sampling frame for the selection of primary survey units (PSUs) which were villages in rural areas and Census Enumeration Blocks (CEBs) in urban areas. The PSU's were selected using probability proportional to size. Then, a complete roster of households was created in every PSU. PSUs with fewer than 40 households were merged with the nearest PSU. If the number of households in the PSU exceeded 300, the PSU was divided into segments of 100-150 households and one segment was chosen for sampling using systematic sampling with probability proportional to the segment size. In the second stage, 22 households were then chosen for the survey. Overall, 28,586 PSUs were selected across the country in NFHS-4 and fieldwork was completed in 28,522 clusters. Comprehensive details about sampling and survey design are publicly available (International Institute for Population Sciences and ICF, 2017 (NFHS-4, 2017)).

A total of 628,900 households were selected for the sample and 601,509 were interviewed. In the interviewed households, 723,875 eligible women between 15-49 were identified for individual women's interviews. The survey was completed for a total of 699,686 women and 112,122 men. The individual surveys administered to the women covered a wide range of topics, including background, reproduction and fertility preferences, family planning, female hygiene, marriage and sexual activity, husband's characteristics, work and employment, attitudes and decision making, HIV, and other health issues including bio-markers.

3.1 Map of the Hedge

The map of the salt hedge is from the book "The Great Hedge of India" by Moxham Roy. Moxham traced the history of the salt hedge and its location consulting several historical sources referenced in the book, archives for original texts, papers kept for administrative purposes by the British and cite visits. We geocoded the map from this source and that gives us the location of the hedge. Figure 1 shows the location of the hedge superimposed on current districts of India.

3.2 Geocodes of the PSUs

The NFHS-4 released the geocodes of the PSUs for the first time. The earlier rounds did not release this information. However, to protect the privacy of the respondants a noise was added to the geocodes. This was 2 kms for the urban clusters and 10 kms for the rural clusters (i.e., villages). Figure 3 shows the location of these PSUs relative to the Salt Hedge.

3.3 Main outcome variables

A high sodium diet affects chances of heart disease and causes elevated blood pressure. The peak blood pressure reached during active cardiac contraction is called the *systolic blood pressure*. The *diastolic blood pressure* is the pressure reached in between the contractions of the heart. NFHS reports three readings for each for all respondents. We average the three readings and normalize the value (in SD terms). NFHS also identifies extreme blood pressure (BP) as systolic BP exceeding 160 mmHg and diastolic BP exceeding 110 mmHg. The normal values are 120 and 80 mmHg, respectively. We create an indicator 'Extreme BP or heart disease', which takes value one if the individual respondent either reports suffering from heart disease or the average values of BP readings exceed the threshold for 'extreme BP'. Heart disease is an indicator that takes value one if the individual suffers from a diagnosed heart disease. The indicator 'Extreme BP' takes value one if the individual's average of three BP readings exceeds the threshold for extreme BP as identified by the NFHS.

3.4 Salt Consumption Data

We use the 'Consumer Expenditure Surveys' (CES) conducted by the National Sample Survey Organization (NSSO) to examine salt consumption. Quinquennially conducted thick rounds of CES have a larger number of observations than the rounds in-between. The survey collects prices and units consumed for an exhaustive list of food items and other household expenses.

These surveys are carried out annually as successive 'rounds', and occasionally, the gap between the two rounds might be as small as six months. Since 1973, NSSO conducts CES with a large sample, referred to as 'thick' rounds, quinquennially, while the other rounds in between those five years collect data on a smaller sample surveying about 35-40% of the 'thick' sample. While the central theme of the surveys varies by round, it always collects information on prices and units consumed for almost an exhaustive list of items.

We use the 64th and the 68th rounds of CES conducted in 2007–08 and 2011–12, respectively, to estimate the difference in salt consumption for households across the custom's line. The household consumer expenditure schedule used for the survey collected information on the quantity and value of salt consumption with a reference period of the last 30 days. The lowest geographic unit for which we have identifiers in this data are districts. The CES is a repeated cross-section data. Hence, we pool the observations from these two rounds which gives us approximately 7.7 million observations.

3.5 Historical salt taxes and prices

Our data on historical salt prices comes primarily from Donaldson (2018), who digitized salt prices from various archival sources to obtain a panel of average salt commodity prices across markets within British districts annually over the period from 1861 to 1930. We expand the coverage of this panel dataset by digitizing additional archival records for years prior to the abolition of the customs line. These additional sources include salt prices reported in annual land revenue reports published by the Northwest Provinces

(1848-1853), as well as annual reports of the Inland Customs Department (1868-1872).[10]

The Inland Customs Department also reported on salt quantities and taxes collected from merchants crossing the customs line. We collected this aggregate data where it was available from their annual reports.

3.6 Historical district boundaries

The historical district boundary shapefiles were digitized from the 1871 census map published by the Office of the Registrar General et al. (2011) and kindly provided by the Indian Ocean World Center, McGill University.[11] These initial shapefiles contain only the 1871 district boundaries lying within the 2011 Indian international borders. We expanded the coverage of districts beyond those boundaries by digitizing additional district boundaries from British maps published alongside the Administration Reports of Bengal (1872-73) and the Punjab (1877-78).

We spatially merge the district boundaries to the high-tax region (east of the customs line). We calculate the share of each district's area within this region as a proxy for the share of its markets located within the catchment region of the salt tax.

3.7 Sample and Summary Statistics

Table 1 documents the summary statistics. There are 903 primary sampling units (PSUs) in the data which are villages in rural areas and wards in urban areas. Of these 455 are in the treated region. Our individuals sample comprises of 13,780 respondents residing in the treatment and 13,531 in the control PSUs. 75 percent of the individuals are married. In the table, we show demographic characteristics of individuals in Panel A and the PSU characteristics in Panel B by treatment and control status.[12] More formal tests of balance are documented in subsequent analysis.

[10] In the case of any duplicate district-commodity-years already included in the salt prices data from Donaldson (2018), we keep the records from Donaldson (2018). For duplicate district-commodity-years from any of our archival sources, we follow Donaldson (2018) by averaging prices across sources to obtain the final price estimate.

[11] This data is covered by a CC-BY license, conditional on including the following accreditation: "This material was created at the Indian Ocean World Centre, McGill University for its Partnership Project, Appraising Risk, Past and Present (www.appraisingrisk.com). This project is supported by the Social Sciences and Humanities Research Council (SSHRC) of Canada."

[12] Aridity Index (AI), is defined as the ratio of annual precipitation to annual potential evapotranspiration.

4 Identification

4.1 Modern effects on consumption and health

We utilize a spatial regression discontinuity design to study the effects of the salt hedge on diseases related to salt consumption. While the running variable is the distance from the *Salt Hedge* on either side, we restrict our sample to districts through which the *Salt Hedge* passes. By including district fixed effects, we compare PSUs within such districts on East and West of the *Salt Hedge*. Districts as an administrative unit are responsible for executing many local development policies. By comparing residents in PSUs within districts, we ensure that the PSUs are comparable in district administration, local culture, public goods, and public finance access. Figure 4 elucidates our empirical strategy. The hedge passes through two illustrative districts, Lalitpur and Sagar. The dark line indicates the *Salt Hedge*. There are PSUs in the sample on either side of the hedge in these districts. Ones on the West (treated) are marked by the dark dots, while the hollow circles indicate the East ones (control). The dashed lines indicate a 40 KM buffer around the *Salt Hedge*. SO, we vary the distance within the districts through which the Hedge passed. We vary the distance around the Hedge for robustness tests but cap this at 40 KMs as most of the within-district PSUs are within this distance form the Hedge.

We estimate the following empirical model:

$$y_{icd} = \alpha_0 + \alpha_1 \quad Treatment_c + \alpha_2 \quad G(d)_c + \alpha_3 X_{cd} + D_d + \epsilon_{icd} \tag{1}$$

where y_{icd} is the outcome of individual i in PSU c in district d. *Treatment* is an indicator variable equal to one if the PSU is to the West of the *Salt Hedge* where salt tax and price of salt was lower in the 1800s. $G(d)_c$ is the control function in distance d from the *Salt Hedge*. In our main specifications, we use linear function of d and an interaction of *Treatment* and d. We show robustness to alternative control functions. X_{cd} are characteristics of PSU c in district d. We show robustness to including or excluding these characteristics. D_d are the district fixed effects. We cluster the standard errors at the level of the PSU. We weigh the observations by the national weights provided by the NFHS.

It is worth highlighting that salt still crossed the customs line either by smuggling or after paying taxes. The identification relies on the fact that its price increased as it crossed the hedge on the average. The customs line was eventually abandoned after 50 years and was not a permanent feature of the landscape. Thus, if we still detect effects, they deliver the insight that an institution with a medium life span can have long-lasting effects.

As mentioned before, like other DHS surveys, noise has been added to the geocodes of the PSUs in NFHS. This is 10 kms for rural areas and 2 kms for urban areas. We conduct robustness tests where we use a doughnut RD specification excluding 10 KMS on either side of the *Salt Hedge*. The identifying assumption is that the PSUs on either side of the *Salt Hedge* within a district are similar except for their exposure to different access to salt, salt tax, and salt prices in the 1800s. In other words, PSUs in the close proximity of the *Salt Hedge* on the East are a good counterfactual for those on the West within a district through which the hedge passes. We conduct a variety of tests to corroborate this assumption. We also conduct sensitivity checks to bolster our identification.

4.2 Historical effects on prices

For analysis with historical data, we do not have spatially granular, market-level price data, but instead an average of prices across markets within each district annually. This panel dataset covers an eighty year period spanning much of the period during which the salt hedge was actively maintained, as well as the period after its abolition; our panel begins in 1848, more than thirty years before abolition of the customs line in 1879, and ends in 1930, around fifty years after the salt hedge was abolished. The British districts in the panel lie either partly or fully east of the salt hedge, so we calculate the share of each district's area lying east of the salt hedge as a proxy for the share of salt markets selling salt within the customs region. We estimate the following difference-in-differences specification:

$$y_{cdt} = \delta_1 \, share\text{-}east_d + \delta_2 \, share\text{-}east_d \times \mathbb{I}\{pre\text{-}1879\} + D_d + \gamma_c + \lambda_t + \epsilon_{cdt} \qquad (2)$$

where y_{cdt} is the average price of salt for salt commodity c in district d during year t, $share\text{-}east_d$ is the share of the historical district's area east of the salt hedge (i.e., lying within the catchment area of the salt tax), and $\mathbb{I}\{pre\text{-}1879\}$ is an indicator of whether the observation pertains to a year prior to abolition of the salt hedge in 1879 ($t < 1879$). We include fixed effects at the commodity and year level, γ_c and λ_t, respectively. We usually omit district fixed effects D_d as they are collinear with $share\text{-}east_d$, though for robustness we include these and report estimates of δ_2 only. We cluster standard errors by district, the level at which we calculate the continuous treatment variable: $share\text{-}east_d$.

5 Results

5.1 Main Results

In Figure 5, we first document graphical evidence showing that a discontinuity exists in heart conditions resulting from salt consumption around the *Salt Hedge*. Distance on either side of the hedge is the running variable on the X axis. Linear fit and averages in 2 point bins are shown along with confidence intervals.

Table 2 summarizes these results using a parametric RD specification where we restrict the distance to a window of 40 KMs. In all, there are 811 PSUs in this sample and around 24,400 individuals. In Column (1), we find a 0.7 percentage point increase in the likelihood of being diagnosed with heart disease. This is a large increase relative to a control mean of 0.009 and is statistically significant at the 5 percent significance level. In Column (4), extreme BP is positive and statistically significant. The likelihood of having either heart disease or extreme BP is higher by 1 percentage point in column (5) and it is statistically significant at the 1 percent significance level. The systolic and diastolic reading of blood pressure are positive (columns (2) and (3)) albeit imprecise. In Appendix Table A1, we present the results of a doughnut RD specification for cardiovascular conditions (extreme BP or heart disease). We exclude the PSUs which are within 5 kms from the Hedge on either side (columns 1 and 2) and 10 kms (columns 3 and 4), respectively. The results remain unaltered.

In addition, we estimate our preferred specification (analog of Column 5 in Table 2) varying the distance around the Hedge between 5 km to 40 km.

We allow for different distance windows and estimate the effect of treatment on likelihood of having either heart disease or extreme BP. Table 3 summarizes the results. In Columns (1), (3), and (5), we use distance windows of 40, 30, and 20 respectively and find similar results in all specifications. In columns(2), (4) and (6), we document results from analogous distance windows but with additional PSU level controls. These include: Longitude, latitude, slope (in degrees), elevation (in meters), average annual precipitation (in millimeters), aridity index (scale 0-300, 0 being most arid), average number of droughts between 1980 and 2000, average temperature (Celsius), proximity to surface water (in kilometers) and average number of days receiving rainfall in a year. Results are robust to inclusion of these controls and remain unencumbered. The donut RD estimation is summarized in Appendix Table A2. Results are unchanged.[13] In Appendix Table A3, we show that our results remain unaltered if we use different control functions in the

[13]This also addresses a concern that people very near the hedge were eligible for some free salt even if they did not receive it. These segments would be excluded in the donut RD.

parametric specifications (columns (1) and (2)) or if we use non-parametric specification with a triangle kernel in the 40 km distance bandwidth.[14]

Heart disease is a major morbidity with steep economic consequences. It can result in significant absenteeism from work (Stewart et al., 2003), lower productivity (Carter et al., 2019; Stewart et al., 2003), lead to early retirement from labor force (Kruse et al., 2009) and escalate health care costs. A medical study from Australia posits preventing heart disease in 10 years (around 28,000 cases) can save 10 billion dollars in GDP (Savira et al., 2021). Hypertension or very high BP is a risk for heart disease and itself detrimental to health and welfare.

5.2 Placebo Test: Other Diseases

We argue that different salt consumption due to higher salt tax, availability, and hence price on the different side of the *Salt Hedge* led to an increase in heart disease and extreme BP. If this is the case, we should not find any differences across the boundary for other diseases not impacted by salt consumption. We consider asthma, cancer, and thyroid disorder. The estimates with varying distance windows, with and without controls are shown in Table 4. Reassuringly, we do not detect any effects on these diseases.

5.3 Heterogeneity:Years of Exposure

There is a growing body of literature that documents in-utero or childhood exposure to a specific diet has long-lasting consequences both in developing and developed countries. In order to shed light on whether timing of exposure drives the health effects, we examine whether being born or growing up as a child in the treated areas has differential effects on our measure of cardio-vascular health within a band of 40kms around the hedge. Using our preferred specification, we summarise the results in Table 5. In the first two columns, we interact the treatment indicator with an indicator 'always', which takes the value one if the person has always lived in the current residence and zeros otherwise. In columns (3) and (4), we interact the treatment with an indicator 'childhood', which takes value one if the individual has lived in the current location since she/he was a child (younger than 13). In all the four columns, we find the treatment indicator is positive and statistically significant. The interaction coefficients are negligible and statistically insignificant indicating that in-utero or childhood exposure is not the key driver. In other words, early life exposure has the same effects as later life exposure.

[14]The outcome in the non-parametric specification is net of district fixed effects.

5.4 Historical salt prices

Evidence from our historical salt price data spans the period before and after abolition of the salt hedge, for several common salt commodities transacted in different British districts. While our historical salt price data is insufficiently granular to employ a spatial regression discontinuity design, we instead make use of our panel to employ a difference-in-difference specification outlined in Equation 2 which makes use of (1) the spatial variation in the share of the district's area lying east of the salt hedge as a continuous treatment and (2) the time-series variation induced by abolition of the salt hedge in 1879. If the salt hedge raised salt prices substantially, then we expect to see a reduction in relative price differences across districts post-abolition. We report coefficient estimates of δ_1 and δ_2 from Equation 2 in Table 7 for our panel dataset of historical salt prices. For interpretation, we consider the counterfactual effect on salt prices of moving a district entirely from the east of the hedge to the west (i.e., changing $share\text{-}east_d$ from 1 to 0). The coefficient estimates confirm qualitative claims that the salt hedge dramatically raised salt prices east of the hedge, with relative salt prices thirty log points higher east of the hedge (δ_2, column 1) pre-abolition and no difference in relative salt prices post-abolition (δ_1, column 1).

We iteratively restrict the sample to those districts whose centroids lie within a fixed bandwidth of the salt hedge, ranging from 300 kilometers (column 2) to 50 kilometers (column 5); coefficient estimates indicate that the relative differences in salt prices were fairly stable across space, consistent with the qualitative evidence suggesting that districts within the interior of the salt hedge sourced their salt primarily from mines west of the salt hedge and had few alternatives to purchasing these imported commodities. Moreover, these differences in relative prices do not seem to be driven by freight costs or other spatial frictions as they were transported further into the interior, as the central estimates are largest across districts nearest to the salt hedge. The coefficient estimates imply that, prior to abolition, the salt hedge raised prices by around 40 percent for districts lying within 100 to 300 kilometers from the salt hedge (δ_2, columns 2 through 4), and by up to 64 percent for those districts located in a narrow fifty-kilometer corridor of the salt hedge (δ_2, column 5). These relative price differences are noticeably absent after abolition of the salt hedge (δ_1, columns 1 through 5).

We report the share of each district's area lying within the customs line for each subset of the data from which we obtain coefficient estimates in Table 7. In the full panel, the majority of districts lie completely within the catchment area of the salt tax, which can be explained by the fact that most British districts were located east of the salt hedge, well within the interior of the customs line. In our most restrictive specification (column 5), we report coefficient estimates from a subset of data in which the average district lies almost equally on either side of the salt hedge ($share\text{-}east_d = 0.57$). Other differences across districts within this narrow corridor are unlikely to jointly explain the substantial differences in prices across districts pre-abolition and absence of these differences post-abolition. We further support this claim by estimating a version of Equation 2 with district fixed effects, which holds constant any permanent characteristics which may simultaneously determine the level of salt prices locally and be correlated with the share of the district east of the salt hedge.

We report coefficient estimates for this specification in Table A11. The difference-in-difference estimates mirror those from the specification without district fixed effects and are generally within five log points of the estimates reported in Table 7, further supporting our claim that the differences in salt prices pre-abolition were due to the taxes levied on imported salt as it crossed the customs line.

5.5 Smuggling and tax evasion

To calculate an effective tax rate net of various tax exceptions,[15] we use data from a panel of official salt imports and salt tax revenues published by the Inland Customs Department, the government administrative body which maintained the hedge and enforced customs duties on imports across the barrier. This data covers aggregate imports and tax collections by the Inland Customs Department for all but one year over the period from 1866 to 1875; we calculate an effective tax rate of 2.6 rupees per maund on salt crossing the customs border during this period. Given an average price of salt for districts with minimal salt tax coverage (20% or less of the district area lying east of the hedge) of approximately four rupees per maund pre-abolition, the difference-in-differences estimate suggests that the presence of the salt hedge raised relative prices by at least 1.3 rupees per maund (δ_2 in Table A11, column 1) and up to 2.5 rupees per maund (δ_2 in Table A11, column 5), implying that 50 to 95 percent of the effective salt tax was passed through to market prices. These figures may even be a lower bound of the true treatment effect of the salt hedge due to imprecision in measuring the exact share of markets lying on either side of the hedge within a district, as well as error in measuring average district prices or digitizing the precise location of district boundaries relative to the path of the salt hedge.

[15]Some regions outside of British control negotiated lower salt tax levies for certain commodities produced within their territory.

This suggests that, at least for the period covered by our panel of historical prices, the salt hedge was effective at deterring smuggling and other efforts to evade the salt tax. The observed price differences imply that a large fraction of final salt consumption east of the hedge reached market via official avenues, incurring the salt tax charged by government as it crossed the customs border. Our short panel of aggregate official salt imports and tax revenues maintained by the inland customs department further bolsters this conclusion, as these official accounts demonstrate that an average of nearly 200,000 tons of salt (4.8 million maunds) crossed the salt hedge annually through official customs stations in the decade from 1866 to 1875. We present these official statistics in Figure A7.

6 RD Diagnostics and Other Threats to the Validity

There are three main threats to the validity of our RD estimates. We address them sequentially.

6.1 Co-variate balance

We argue that the PSUs on the West of the *salt Hedge* in close proximity to it within districts through which the hedge passes are good counterfactuals for the treated units. Other than exposure to higher prices, taxes and lower availability of salt in 1800s, they are similar to the ones on the East side. To assess this, we compare a variety of PSU level characteristics across the *hedge* and within a pre-defined distance away from it. We consider a wide range of features: average temperature, average precipitation, aridity index, elevation, slope, proximity to water, growing season length, average number of droughts between 1980 and 2000, average number of rainfall days, time to reach a settlement of 50,000 people. In order to reduce the dimensions of comparison, we follow, Johnston and Mas (2018) and Sekhri (2020) and create an index of the predicted heart disease using these above mentioned features. We regress the heart disease on these features in three different samples: in the control group, in the distance window 50-75 kms on either side of the hedge, and a distance window of 75-100 kms. The predicted values from these separate regressions form the three indices. We use these generated indices as the outcome and compare them across the hedge. In Appendix Figures A1 to A3, we see that these indices are smooth around the *salt Hedge* and do not exhibit any discontinuity. We also document results from regression analysis in 40, 30, and 20 km windows in the Appendix Table A4. Columns (1)–(3) are based on the control sample index, columns (4)–(6) are based on the 50-75 kms sample index, and columns(7)–(9) are based on index generated from the 75-100 kms sample. These estimates are negligible and statistically insignificant in all but one specification where it is marginally significant at the 10 percent level. Panel A of the Appendix Figure 1 reveals this is because of one outlier bin average.

6.2 Smoothness of the Running Variable

One concern with RD estimation is that the running variable can be manipulated. PSUs on the East and West within 40 KMs are equidistant from the hedge on the average indicating absence of bunching of PSUs at any specific distance. Mcrary test reveals no discontinuity in the distance. Appendix Figure A4 provides evidence.

6.3 Random Location Change of the Hedge

If we arbitrarily shift the line representing the historical hedge to a random hypothetical location, we should not discern differences in the outcomes on the East and West side near this hypothetical hedge. We conduct this exercise moving the hedge 75 and 150 kilometers on the East and west, respectively. Appendix Figure A5 shows the East and West displacement of the actual line. We estimate our parametric RD specification with a 40 km window for the likelihood of being diagnosed with heart disease or extreme BP at these different hypothetical points. The results are reported in Appendix Table A5. The estimates are negligible and statistically indistinguishable from zero across all the columns.

6.4 Endogenous Sorting

Households sorting themselves across the hedge based on salt prices pose a threat to our identification. Rich people could have moved from West to East to access cheaper salt. This is highly unlikely as rich Indians were landowners, and they did not move as land was usually not sold due to social norms and thin markets. Another related concern might be that people may have deferentially out-migrated to other areas away from the hedge from the treatment and control PSUs. To allay this concern, we examine if there are population differences across the treatment and control PSUs in 40 KMs distance windows on either side of the hedge for the years 2000, 2005, 2010, and 2015. We do not find differential population trends ruling out endogenous sorting of the population. Also, Table 1 reveals, literacy and education of the household heads are balanced in

PSUs across the hedge which indicates there might not be composition differences either in the population.

6.5 Mortality

Differential mortality rates across the hedge is another concern. Our estimates will be attenuated if the severely ill patients in the treated PSUs survive for a shorter period than their counterparts in the control PSUs in the west. In that case, we will have measured at least a lower bound. Heart disease and BP are health condition that develop in later life. We test if there are differential mortality rates across the treated and control areas and whether they vary by age. The NFHS data documents PSU level mortality by age in the last two years. In Appendix Table A7, Column (1) reports any mortality. Columns (2) through (6) report the mortality broken down by age group. We do not find evidence of differential mortality across the *Salt Hedge*. The estimates are small and statistically insignificant. [16]

7 Mechanism : Salt Consumption

We claim that the differential salt consumption became an entrenched habit due to different historical availability and prices of salt due the salt taxation around the Hedge. As mentioned before, one caveat is that NSSO only reveals the district of residence of the individuals not villages or urban PSUs. There are two implications of this. One, we conduct this analysis at the district level instead of the PSU level. Two, we have to drop the districts through which the Hedge passes, as we cannot isolate with certainly whether households from such districts reside to the East or the West of the hedge. We summarize our RD estimation results in Figure 6 and Table 6. We normalize the distance by the distance to the closest district through which the hedge does not pass on either side. The figure depicts a jump in salt consumption near the hedge in the treated districts using a support of up to 200 Kms. Appendix Figure A6 shows this statistically significant jump using the full support of the distance in our sample on the East and West of the hedge.

We report the estimates from the parametric estimation of household salt consumption in Table 6. We control for number of the number of household members, religion,

[16] With chronic diseases more prevalent on the west, higher mortality is expected too. We do not have data to discern whether other behavioral changes or market forces counteract this. For example, doctor quality could be better due to disease probability being high. But we cannot test this.

and distance of the district from the sea in these regressions. Standard errors are clustered at the district by year of the NSSO survey. In column (1) , we report the results limiting to 60 Kms from the hedge. In subsequent columns we increase the distance sequentially. We observe a positive and significant estimate across these specifications. This cements the claim that there is higher consumption of salt in the treated areas (districts on the west) close to the hedge.

7.1 Alternative Possibilities

7.1.1 Iodization and Thyroid

Differential access to iodized salt across the hedge might affect household health, possibly confounding our findings.[17] In India, salt has been used to provide iodine supplementation since the 1990s. Iodine can affect IQ and the functioning of the thyroid gland, which affects health. But it is not likely that there is differential iodized salt access within a district. In order to speak to this possibility, we examine the salt access data from the NFHS. Salt samples were taken from the households and tested for iodine in the laboratories. We examine if the salt testing sample was differentially available or tested across the Hedge and conditional on testing, was differential iodine present in the sample. We report the results in Appendix Table A8. We find no evidence of selection into testing (Columns (1) through (4)) and no evidence of different iodine conditional on testing (Columns(5) and (6)). We already documented that thyroid disorders are not differentially prevalent in treated and control areas (Panel C of Table 4). Hence, we do not think this is a tenable alternative explanation.

7.1.2 Utilization of Healthcare

An alternative possibility is that the treated and control areas differ in the utilization of healthcare and hence treated area residents are better informed about their health. The blood pressure measure in the data is based on actual biomarkers and not self-reported health. So, this explanation is less likely to be the main driver of our findings. We also shed direct light on this possibility by examining if there is a differential rate of health care utilization or health insurance. This data is available in the NFHS-4. In Table A9, we summarize our findings. The effect on health care access and health insurance is negligible, and statistically insignificant reassuring that the main effects are not driven by differential utilization of healthcare.

[17] Salt is often fortified with iodine to provide iodine supplementation.

7.1.3 Income effect

If households on the West of the hedge in its close proximity were richer within the same districts, then they could be consuming more salt due to an income effect. We test this by examining if the average luminosity (nightlights) in the PSUs with a buffer of 10 in rural and 2 km in urban is different across the hedge. We do not find corroborating evidence (Appendix Table A10).

7.1.4 Salt Availability or Distribution

Different availability of salt at the time of the survey could also be a potential reason for different salt consumption and hence health. The hedge is nebulous from the current perspective in the day-to-day operations of market forces. Hence, we do not perceive a supply differential in PSUs within the same district across the hedge. The NFHS-4 inquired if salt was available in the house as samples were to be taken for testing for iodine. We examined if there is a difference in the availability of salt among households across the hedge within the same districts and find no difference (Appendix Table A8).

7.1.5 The Famine of 1873

There was a pressing famine in 1873 in Bihar and West Bengal which are to the east of the hedge. People reduced consumption of all products including salt. There were also significant deaths. However, our identification relies on looking within districts through which the salt hedge passed. None of these are in Bihar or Bengal.

8 Conclusion

Our paper addresses whether extractive institutions can affect dietary habits such that they result in benign effects on chronic health. We find evidence that historical distortionary salt taxation in India around the customs line, erected to collect the salt tax and prevent evasion, led to lower consumption of salt even 150 years later. This affected the individual health and resulted in a lower incidence of cardiovascular disease. Our findings indicate that extractive institutions per-se are not necessarily detrimental to better development outcomes. Context and the underlying channel through which they matter for long-run outcomes are crucial in mediating long-run consequences.

References

Acemoglu, D., S. Johnson, and J. A. Robinson (2001). The colonial origins of comparative development: An empirical investigation. *American economic review 91*(5), 1369–1401.

Almond, D. and J. Currie (2011a). Chapter 15 - human capital development before age five. Volume 4 of *Handbook of Labor Economics*, pp. 1315–1486. Elsevier.

Almond, D. and J. Currie (2011b). Killing me softly: The fetal origins hypothesis. *Journal of economic perspectives 25*(3), 153–72.

Althoff, L. and H. Reichardt (2024, 07). Jim crow and black economic progress after slavery*. *The Quarterly Journal of Economics 139*(4), 2279–2330.

Appel, L. J., M. W. Brands, S. R. Daniels, N. Karanja, P. J. Elmer, and F. M. Sacks (2006). Dietary approaches to prevent and treat hypertension: a scientific statement from the american heart association. *Hypertension 47*(2), 296–308.

Atkin, D. (2016). The caloric costs of culture: Evidence from indian migrants. *American Economic Review 106*(4), 1144–1181.

Bertocchi, G. and A. Dimico (2014). Slavery, education, and inequality. *European Economic Review 70*, 197–209.

Cagé, J. and V. Rueda (2016). The long-term effects of the printing press in sub-saharan africa. *American Economic Journal: Applied Economics 8*(3), 69–99.

Calvert, A. F. (1919). *Salt and the salt industry*. Pitman.

Carter, H. E., D. Schofield, and R. Shrestha (2019). Productivity costs of cardiovascular disease mortality across disease types and socioeconomic groups. *Open Heart 6*(1), e000939.

Chaloupka, F. J. and K. E. Warner (2000). The economics of smoking. In A. J. Culyer and J. P. Newhouse (Eds.), *Handbook of Health Economics*, Volume 1, pp. 1539–1627. Elsevier.

Choudhury, S. (1979). *The Economic History of Colonialism: A Study of British Salt Policy in Orissa*. Inter-India Publications.

Coker Ross, C. (2024, 06). 13slavery and race-based trauma: The impact of historical and intergenerational trauma on health. In *Antiblackness and the Stories of Authentic Allies: Lived Experiences in the Fight Against Institutionalized Racism*. Oxford University Press.

Dell, M. and B. A. Olken (2020). The development effects of the extractive colonial economy: The dutch cultivation system in java. *The Review of Economic Studies 87*(1), 164–203.

Donaldson, D. (2018). Railroads of the raj: Estimating the impact of transportation infrastructure. *American economic review 108*(4-5), 899–934.

Feyrer, J., D. Politi, and D. N. Weil (2017). The cognitive effects of micronutrient deficiency: Evidence from salt iodization in the united states. *Journal of the European Economic Association 15*(2), 355–387.

Friedson, A., M. Li, K. Meckel, D. I. Rees, and D. W. Sacks (2023). Cigarette taxes, smoking, and health in the long run. *Journal of Public Economics 222*, 104877.

Graudal, N. A., T. Hubeck-Graudal, and G. Jurgens (2020). Effects of low sodium diet versus high sodium diet on blood pressure, renin, aldosterone, catecholamines, cholesterol, and triglyceride. *Cochrane Database of Systematic Reviews* (12).

He, F. J., J. Li, and G. A. MacGregor (2013). Effect of longer term modest salt reduction on blood pressure: Cochrane systematic review and meta-analysis of randomised trials. *Bmj 346*.

Hoynes, H., D. W. Schanzenbach, and D. Almond (2016). Long-run impacts of childhood access to the safety net. *American Economic Review 106*(4), 903–34.

Huillery, E. (2009). History matters: The long-term impact of colonial public investments in french west africa. *American Economic Journal: Applied Economics 1*(2), 176–215.

Jedwab, R. and A. Moradi (2016). The permanent effects of transportation revolutions in poor countries: evidence from africa. *Review of economics and statistics 98*(2), 268–284.

Johnston, A. C. and A. Mas (2018). Potential unemployment insurance duration and labor supply: The individual and market-level response to a benefit cut. *Journal of Political Economy 126*(6), 2480–2522.

Karanja, N., T. P. Erlinger, L. Pao-Hwa, E. R. Miller, and G. A. Bray (2004). The dash diet for high blood pressure: from clinical trial to dinner table. *Cleveland Clinic journal of medicine 71 9*, 745–53.

Kiser, E. and A. Linton (2001). The french revolution and the politics of government finance. *American Sociological Review 66*(4), 505–531.

Kramer, M. R., N. C. Black, S. A. Matthews, and S. A. James (2017). The legacy of slavery and contemporary declines in heart disease mortality in the u.s. south. *SSM - Population Health 3*, 609–617.

Kruse, M., J. Sørensen, M. Davidsen, and D. Gyrd-Hansen (2009). Short and long-term labour market consequences of coronary heart disease: a register-based follow-up study. *European Journal of Preventive Cardiology 16*(3), 387–391.

Logan, T. D. and J. M. Parman (2018). Segregation and mortality over time and space. *Social Science Medicine 199*, 77–86.

Lowes, S. and E. Montero (2021). The legacy of colonial medicine in central africa. *American Economic Review 111*(4), 1284–1314.

Moxham Roy (2002). *The great hedge of India.*

Mugavero, K. L., J. P. Gunn, D. O. Dunet, and B. A. Bowman (2014). Sodium reduction: an important public health strategy for heart health. *Journal of public health management and practice: JPHMP 20*(1 0 1), S1.

NFHS-4 (2017). National family health survey (nfhs-4), 2015–16. *International Institute for Population Sciences (IIPS), Mumbai, India.*

Nunn, N. (2008). The long-term effects of africa's slave trades. *The Quarterly Journal of Economics 123*(1), 139–176.

Office of the Registrar General, I., A. Singh, D. R. General, C. Chandramouli, et al. (2011). *Administrative Atlas of India.* Office of the Registrar General & Census Commissioner, India, Ministry of Home Affairs, Government of India.

Popkin, B. M. (2025). *The Nutrition Transition: A Global Challenge.* Oxford University Press.

Sacks, F. M., L. P. Svetkey, W. M. Vollmer, L. J. Appel, G. A. Bray, D. Harsha, E. Obarzanek, P. R. Conlin, E. R. Miller, D. G. Simons-Morton, et al. (2001). Effects on blood pressure of reduced dietary sodium and the dietary approaches to stop hypertension (dash) diet. *New England journal of medicine 344*(1), 3–10.

Savira, F., B. H. Wang, A. R. Kompa, Z. Ademi, A. J. Owen, D. Liew, and E. Zomer (2021). The impact of coronary heart disease prevention on work productivity: a 10-year analysis. *European Journal of Preventive Cardiology 28*(4), 418–425.

Sekhri, S. (2020). Prestige matters: Wage premium and value addition in elite colleges. *American Economic Journal: Applied Economics 12*(3), 207–25.

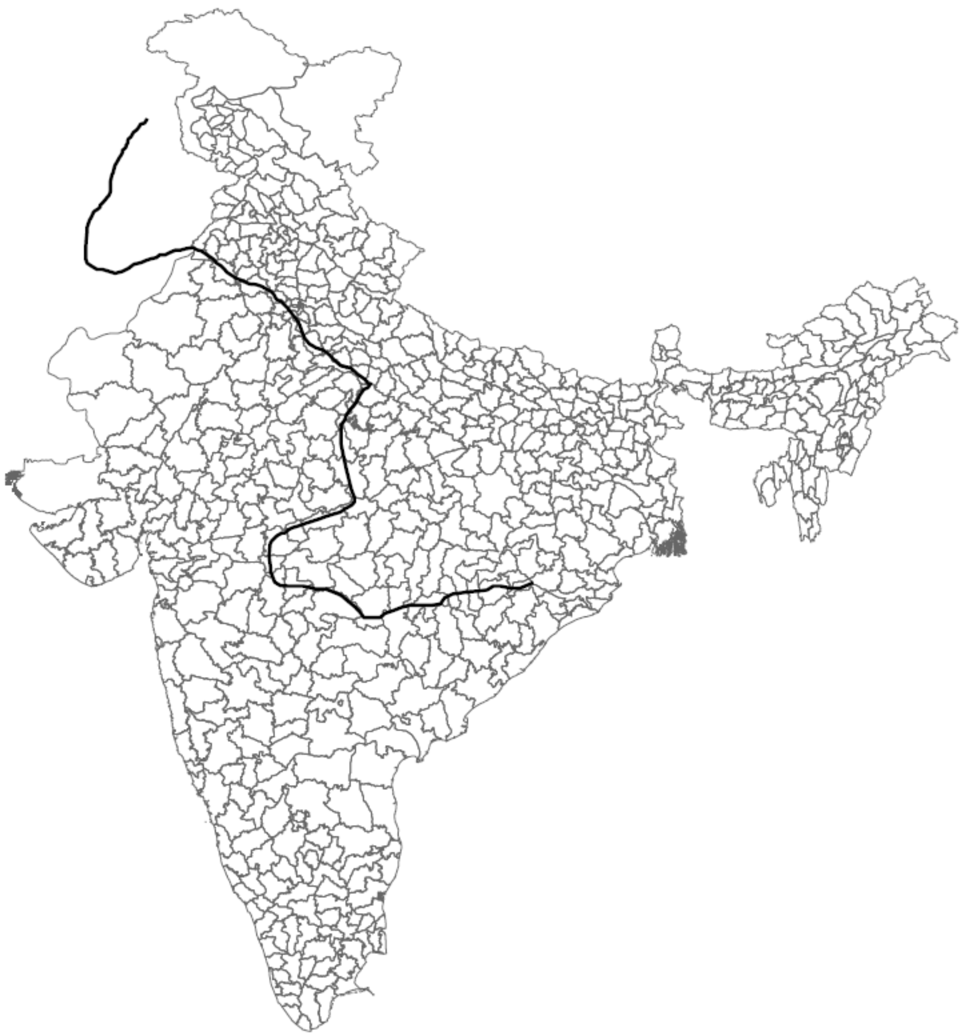
Sekhri, S. and K. Shastry (2020). The curse of plenty: Early childhood roots of the rise in chronic disease. Technical report.

Siddiky, C. I. A. (2006). Mahatma gandhi and the prisoner's dilemma: Strategic civil disobedience and great britain's great loss of empire in india. In *Public Choice Society Conference.*

Stewart, W. F., J. A. Ricci, E. Chee, and D. Morganstein (2003). Lost productive work time costs from health conditions in the united states: results from the american productivity audit. *Journal of occupational and environmental medicine 45*(12), 1234–1246.

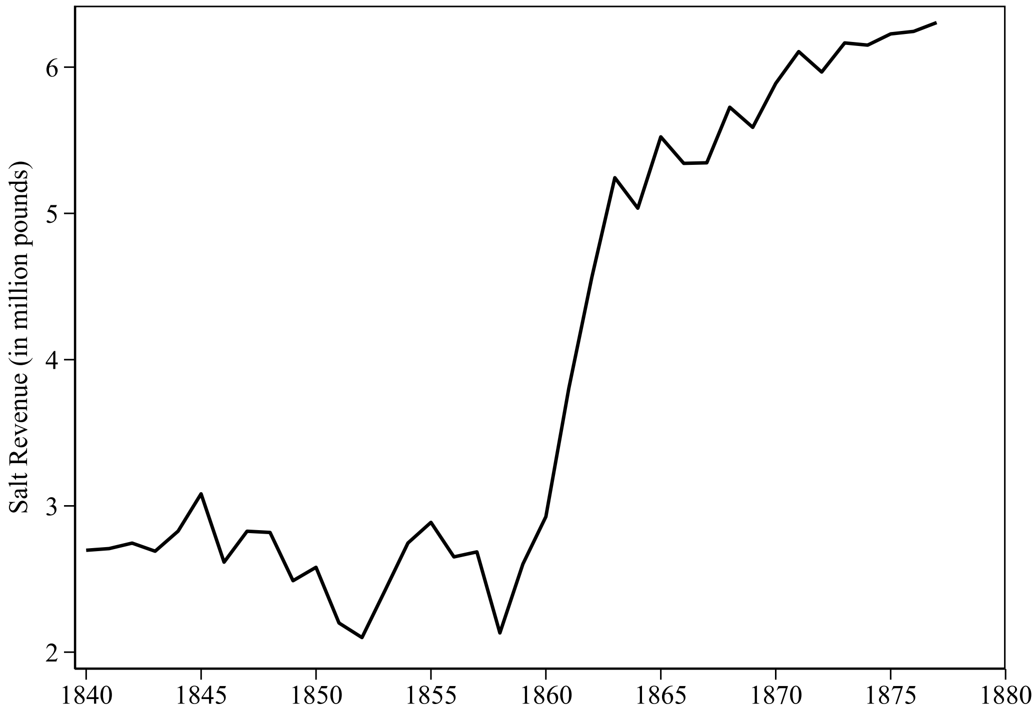
Valencia Caicedo, F. (2018). The mission: Human capital transmission, economic persistence, and culture in south america. *The Quarterly Journal of Economics 134*(1), 507–556.

Figure 1: The route of the Inland Customs Line (Indian Salt Hedge) in 1870



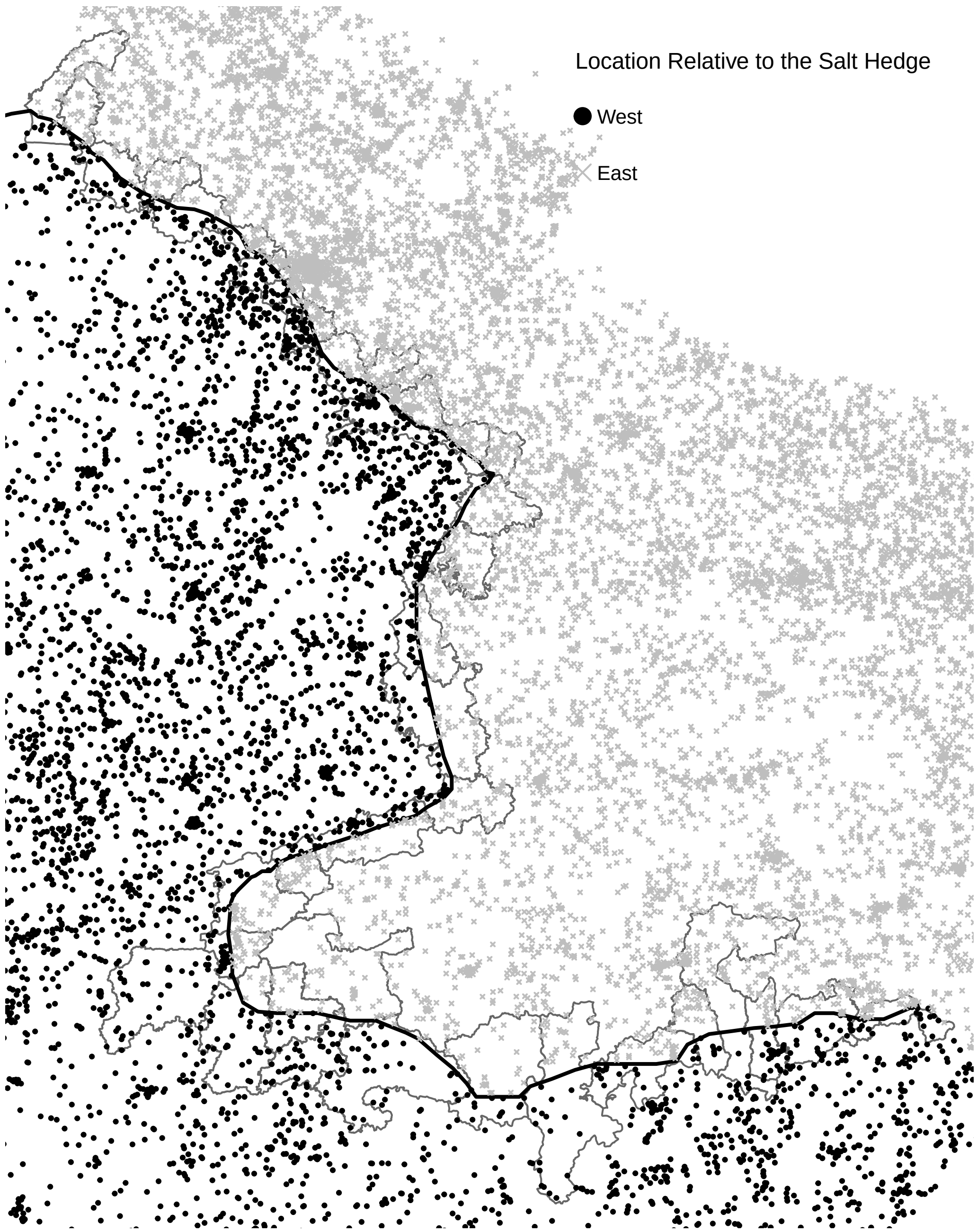
Notes: We digitized the outline of the salt hedge from Moxham Roy (2002) using rubbersheeting technique.

Figure 2: Salt Revenue over Time



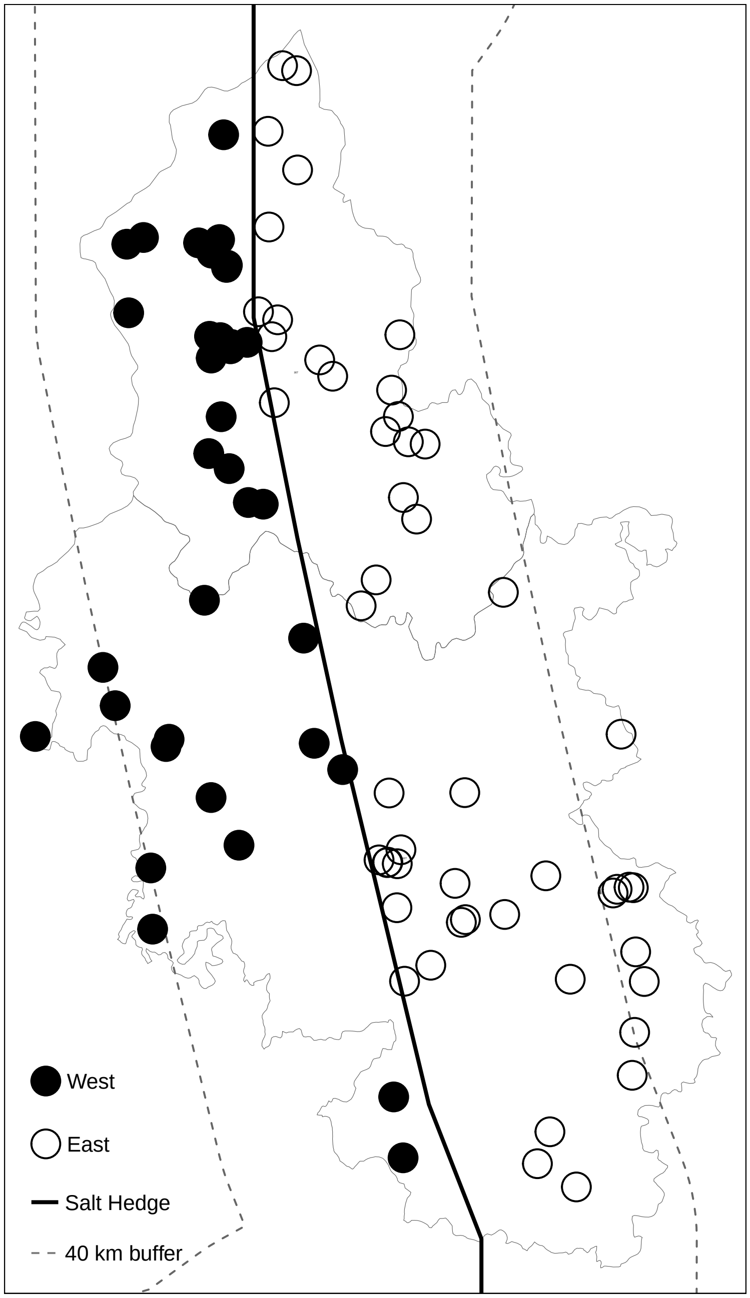
Notes: Digitized historical records from the South Asian Library at the University of Chicago.

Figure 3: Location of NFHS-4 (2017) Primary Sampling Units around the salt hedge



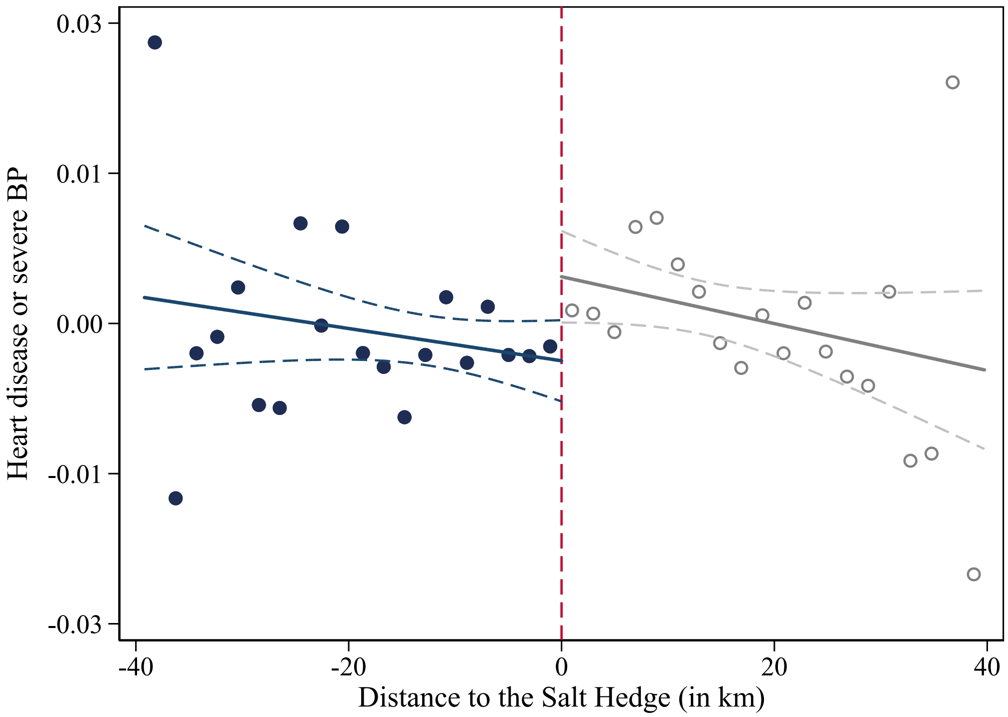
Notes: The figure illustrates the PSUs around the hedge and the districts through which the hedge passes.

Figure 4: Location of NFHS-4 (2017) Primary Sampling Units in two randomly selected districts around the salt hedge



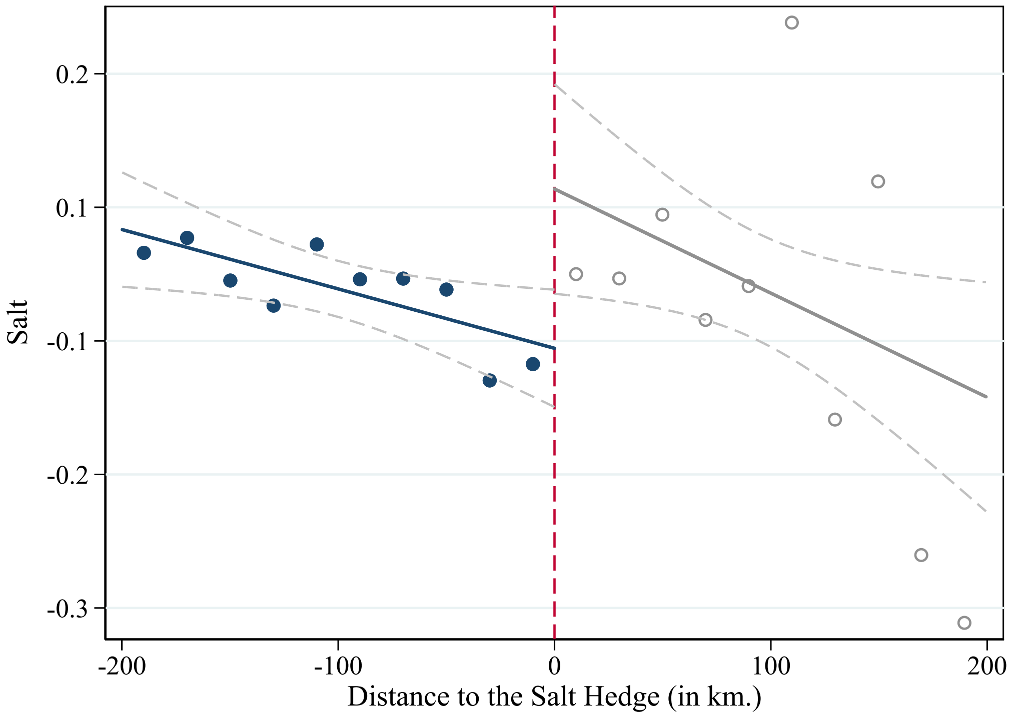
Notes: This figure elucidates our empirical strategy. The hedge passes through two illustrative districts, Lalitpur (lower district) and Sagar (upper district), both located in Uttar Pradesh. The dark line indicates the Salt Hedge. There are PSUs in the sample on either side of the hedge in these districts. Ones on the West (treated) are marked by the dark dots, while the hollow circles indicate the East ones (control). The dashed lines indicate a 40 KM buffer around the Salt Hedge.

Figure 5: The incidence of Heart disease or severe BP by Distance to the Salt Hedge.



Notes: The figure presents the discontinuity plot for our main outcome measured at the PSU level, which has been created using the user-written Stata command *cmogram*. Mean values are calculated at each 2 km bin along the running variable (distance to Salt Hedge) and a local linear trend is estimated separately on each side of the discontinuity. Each regression is estimated using a 40 KM bandwidth. Regressions control for district fixed effects. The figure shows 95% confidence intervals.

Figure 6: Household salt consumption



Notes: The figure presents the discontinuity plot for salt consumption created using the user-written Stata command *cmogram*. The analysis is conducted at the district level. Districts through which the Hedge passes have been dropped, as we cannot isolate whether households from such districts reside to the East or the West of the Hedge. The running variable—distance to the hedge—has been normalized by the distance to the closest district through which the hedge does not pass on either side. Mean values are calculated at each 20 km bin along the running variable (distance to Salt Hedge) and a local linear trend is estimated separately on each side of the discontinuity. Each regression is estimated using a 200 KM bandwidth. The figure shows 95% confidence intervals.

Table 1: Summary Statistics and Treatment-Control Group Balance

	Control		Treatment	
	N	Mean/SD	N	Mean/SD
	(1)	(2)	(3)	(4)
A: Demographic characteristics				
Male	13531	0.14	13780	0.13
		(0.34)		(0.34)
Age	13531	30.08	13780	29.92
		(9.97)		(10.01)
Married	13531	0.75	13780	0.75
		(0.43)		(0.43)
Literate	13460	0.65	13727	0.63
		(0.48)		(0.48)
Highest Level of Education: Primary	13531	0.15	13780	0.14
		(0.36)		(0.35)
Highest Level of Education: Secondary	13531	0.49	13780	0.47
		(0.50)		(0.50)
Highest Level of Education: Higher education	13531	0.12	13780	0.12
		(0.33)		(0.33)
B: PSU controls				
Elevation (mts.)		273.43		250.94
		(105.15)		(90.29)
Avg. precipitation (mm.)		63.35		59.32
		(19.55)		(21.09)
Aridity index (0-300)		14.00		13.14
		(4.35)		(4.64)
Avg. number of droughts (btw.1980-2000)		7.61		7.35
		(0.86)		(0.98)
Avg. temperature (celcius)		26.36		26.33
		(0.71)		(0.69)
Proximity to water (kmts.)		292.44		289.78
		(98.97)		(77.76)
Slope (degrees)		0.42		0.45
		(0.43)		(0.58)
Avg. number of days receiving rainfall		3.34		3.18
		(0.83)		(0.86)
Growing season length		5.84		5.62
		(0.95)		(1.12)
Time to reach a settlement of 50 000 (min.)		95.31		90.27
		(65.95)		(80.71)
Number of PSUs		450		453

Notes: Standard deviations and standard errors (clustered at the PSU level) are reported in parenthesis and brackets, respectively. Sample is restricted to districts included in analytic sample through which the 'Salt Hedge' passes. Panel A is at the individual level, Panel B is at the Primary Survey Unit (PSU) level. Statistics for demographics characteristics are weighted using national sample weights.

Table 2: Heart conditions: Parametric RD estimates

	Heart disease	Systolic (SD)	Diastolic (SD)	Extreme BP	Extreme BP or Heart disease
	(1)	(2)	(3)	(4)	(5)
Treatment	0.007	0.034	0.024	0.004	0.010
	(0.003)**	(0.035)	(0.038)	(0.002)**	(0.003)***
Mean depend. variable	0.009	8.322	7.949	0.004	0.013
Observations	24438	24471	24468	24468	24655
Number of PSUs	811	811	811	811	811
District FEs	Yes	Yes	Yes	Yes	Yes
Controls	No	No	No	No	No

Notes: The analysis is restricted to a window of 40 kilometers around the *Salt Hedge* boundary. Each regression includes distance in kms and the interaction of distance with treatment as the control function. Sample comprises of individuals residing in the PSUs in districts through which 'Salt Hedge' passes. Treatment is an indicator which takes value 1 for PSUs on the West side of the 'Salt Hedge' where salt tax and price of salt were lower in the 1800s. Heart disease in Column (1) takes value 1 if the individual suffers from a diagnosed heart disease. The peak blood pressure reached during active cardiac contraction is called the systolic blood pressure. Diastolic blood pressure is the pressure reached in between the contractions of the heart. Column (2) reports the results using normalized value (in SD terms) of the average of three readings for the systolic blood pressure and column (3) reports the analogous value for the diastolic pressure. NFHS identifies extreme blood pressure (BP) as systolic BP exceeding 180 mmHg and diastolic BP exceeding 110 mmHg. The normal values are 120 and 80 mmHg respectively. Extreme BP in column (4) takes value 1 if the individual's average of three BP readings exceeds the threshold for extreme BP as identified by NFHS of India. Extreme BP or heart disease in column (5) takes the value 1 if the individual surveyed either reports suffering from a heart disease or the average values of BP readings exceed the threshold for 'extreme BP'. Standard errors are reported in parenthesis and are clustered at the NFHS PSU level. *** is significant at the 1 percent significance level, ** at the 5 percent, and * at the 10 percent significance level. Observations are weighed using weights provided by the NFHS.

Table 3: Heart Disease or Extreme Blood Pressure: Parametric RD estimates within Different Distance Windows

	Within					
	40 km		30 km		20 km	
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	0.010	0.010	0.008	0.008	0.008	0.007
	(0.003)***	(0.003)***	(0.004)**	(0.003)**	(0.004)*	(0.004)*
Mean depend. variable	0.013	0.013	0.013	0.013	0.013	0.013
Observations	24655	24655	22892	22892	19485	19485
Number of PSUs	811	811	749	749	633	633
District FEs	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: Sample comprises of individuals residing in the PSUs in districts through which 'Salt Hedge' passes. Each regression includes distance in kms and the interaction of distance with treatment as the control function. Treatment is an indicator which takes value 1 for PSUs on the West side of the 'Salt Hedge' where salt tax and price of salt were lower in the 1800s. NFHS identifies extreme blood pressure (BP) as systolic BP exceeding 160 mmHg and diastolic BP exceeding 110 mmHg. The normal values are 120 and 80 mmHg respectively. Extreme BP or heart disease in column takes the value 1 if the individual surveyed either reports suffering from a heart disease or the average values of BP readings exceed the threshold for 'extreme BP'. Columns (2), (4), and (6) also control for the following PSU characteristics: Longitude, latitude, slope (in degrees), elevation (in meters), average precipitation, aridity index, average number of droughts, average annual temperature (Celsius), proximity to surface water (in kilometers) and average number of days receiving rainfall. Standard errors are reported in parenthesis and are clustered at the NFHS PSU level. *** is significant at the 1 percent significance level, ** at the 5 percent, and * at the 10 percent significance level. Observations are weighed using weights provided by the NFHS.

Table 4: Placebo Tests: Parametric RD estimates within Different Distance Windows for Other Diseases Not Affected by Salt Consumption

	Within					
	40 km		30 km		20 km	
	(1)	(2)	(3)	(4)	(5)	(6)
	A: Asthma					
Treatment	0.001	0.001	0.001	0.001	-0.001	0.000
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)
Mean depend. variable	0.014	0.014	0.014	0.014	0.014	0.014
Observations	24395	24395	22654	22654	19335	19335
	B: Cancer					
Treat	-0.001	-0.001	-0.002	-0.002	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Mean depend. variable	0.001	0.001	0.001	0.001	0.001	0.001
Observations	24432	24432	22700	22700	19369	19369
	C: Thyroid disorder					
Treat	0.001	0.001	-0.002	-0.001	-0.001	-0.001
	(0.004)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)
Mean depend. variable	0.013	0.013	0.014	0.014	0.014	0.014
Observations	24399	24399	22673	22673	19343	19343
Number of PSUs	811	811	749	749	633	633
District FEs	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: Sample comprises of individuals residing in the PSUs in districts through which ‘Salt Hedge’ passes. Each regression includes distance in kms and the interaction of distance with treatment as the control function. Treatment is an indicator which takes value 1 for PSUs on the East side of the ‘Salt Hedge’ where salt tax and price were higher in the 1800s. Columns (2), (4), and (6) also control for the following PSU characteristics: Longitude, latitude, slope (in degrees), elevation (in meters), average precipitation (in millimeters), aridity index (0-300 scale, 0 being most arid), average number of droughts, average annual temperature (Celsius), proximity to surface water (in kilometers) and average number of days receiving rainfall. Standard errors are reported in parenthesis and are clustered at the NFHS PSU level. *** is significant at the 1 percent significance level, ** at the 5 percent, and * at the 10 percent significance level. Observations are weighed using weights provided by the NFHS.

Table 5: Heterogeneity analysis for Heart Disease or Extreme Blood Pressure by Degree of Exposure

	Always		Childhood		Nr. of years in current place	
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	0.011	0.011	0.010	0.010	0.001	0.001
	(0.004)**	(0.004)***	(0.005)**	(0.005)**	(0.006)	(0.005)
× Exposure	-0.002	-0.002	-0.001	-0.000	0.001	0.001
	(0.006)	(0.006)	(0.006)	(0.006)	(0.000)*	(0.000)*
Observations	24271	24271	24271	24271	24271	24271
Number of PSUs	811	811	811	811	811	811
Controls	No	Yes	No	Yes	No	Yes
District FEs	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Sample comprises of individuals residing in the PSUs in districts through which 'Salt Hedge' passes. Each regression includes distance in kms and the interaction of distance with treatment as the control function. Treatment is an indicator which takes value 1 for PSUs on the East side of the 'Salt Hedge' where salt tax and price were higher in the 1800s. Columns (2), (4), and (6) also control for the following PSU characteristics: Longitude, latitude, slope (in degrees), elevation (in meters), average precipitation (in millimeters), aridity index (0-300 scale, 0 being most arid), average number of droughts, average annual temperature (Celsius), proximity to surface water (in kilometers) and average number of days receiving rainfall. Standard errors are reported in parenthesis and are clustered at the NFHS PSU level. *** is significant at the 1 percent significance level, ** at the 5 percent, and * at the 10 percent significance level. Observations are weighed using weights provided by the NFHS.

Table 6: Household Salt Consumption

	Within 60 km	80 km	100 km	120 km	140 km
	(1)	(2)	(3)	(4)	(5)
Treatment	0.181	0.139	0.129	0.049	0.103
	(0.090)**	(0.071)*	(0.068)*	(0.061)	(0.058)*
Mean depend. variable	1.201	1.204	1.216	1.232	1.225
Observations	7190	10697	13059	16098	18096
Number of year-districts	76	110	132	164	186
Controls	Yes	Yes	Yes	Yes	Yes

Notes: Each regression includes average household size, the share of Hindu households, and distance from the coast.

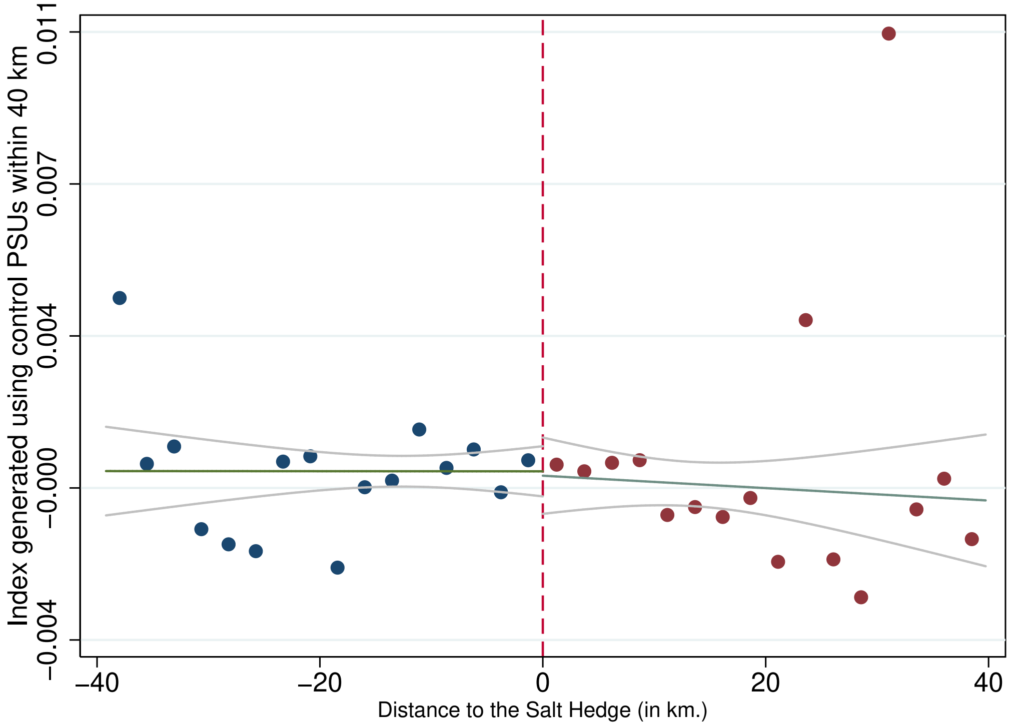
Table 7: Log salt prices and district area east of hedge, before and after abolition

	(1)	(2)	(3)	(4)	(5)
Share of district within customs line (δ_1)	-0.00898	-0.0372	-0.0663	-0.0848	-0.120
	(0.0592)	(0.0599)	(0.0645)	(0.0705)	(0.0930)
Share of district $\times$ pre-abolition (δ_2)	0.294*	0.352**	0.348**	0.397**	0.493*
	(0.149)	(0.158)	(0.171)	(0.195)	(0.280)
Average price differential, pre-abolition	0.285***	0.315***	0.282**	0.312**	0.373*
	(0.109)	(0.117)	(0.125)	(0.146)	(0.216)
Observations	8242	5370	4252	2481	1520
Max distance to line, kilometers	All	300	200	100	50
Share within customs line, mean	0.91	0.87	0.83	0.72	0.57
Commodity FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ Standard errors are reported in parentheses, clustered by district. The share of district within the customs line is the share of the district's area which lies within the catchment area of the customs line, east of the hedge. The average price differential pre-abolition is the sum of δ_1 and δ_2, and accounts for any observed price differences by share within the customs line, across both pre-abolition (1878 or earlier) and post-abolition (1879 and later) periods (δ_1), as well as the estimated effect of the salt hedge on relative prices (δ_2). Each district's distance to the customs line is calculated from the district centroid to the nearest point of the salt hedge. Commodity refers to the type of salt, named after the source from which it originates on the subcontinent, each with a different quality or concentration of minerals.

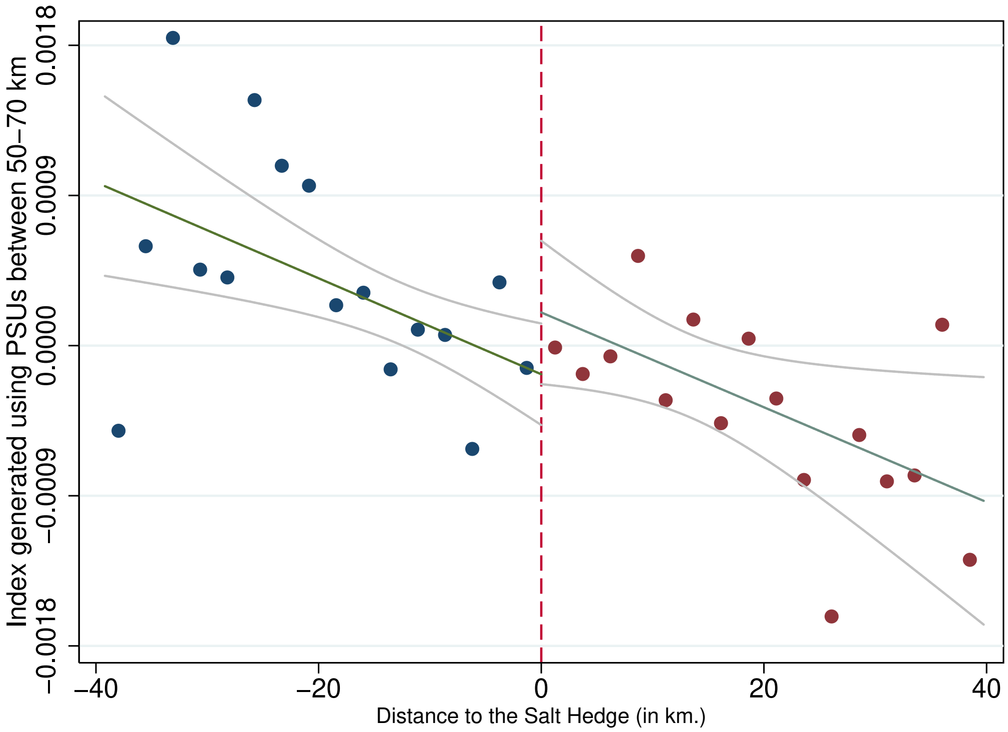
Appendix

Figure A1: Covariate Balance Index Based on Control Group



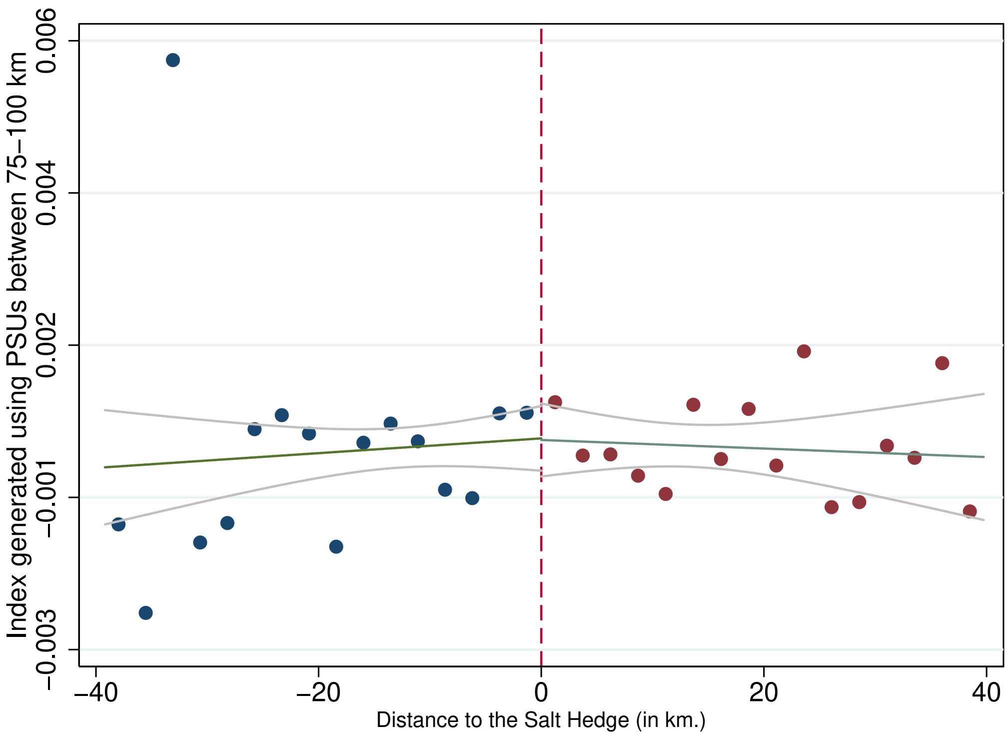
Notes: The figure presents the regression discontinuity plot using the predicted values of our main outcome variable averaged at the PSU level as the dependent variable. For the prediction exercise, we regress our main outcome variable on a set of PSU covariates using only the control PSUs located within 40 KMs to the hedge. The set of covariates includes the following PSU characteristics: slope (in degrees), elevation (in meters), average precipitation (in millimeters), aridity index (0-300 scale, 0 being most arid), the average number of droughts, average annual temperature (Celsius), proximity to surface water (in kilometers) and the average number of days receiving rainfall. The figure shows 95% confidence intervals.

Figure A2: Covariate Balance Index Based on Distance 50-75 KMs on Either Side of the Salt Hedge



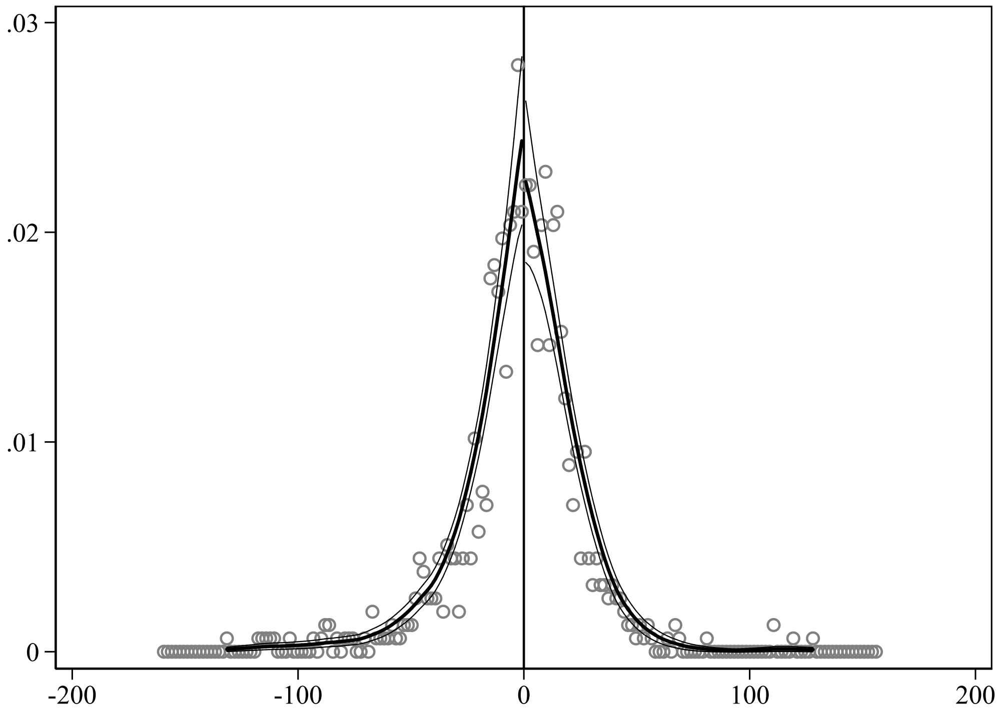
Notes: The figure presents the regression discontinuity plot using the predicted values of our main outcome variable averaged at the PSU level as the dependent variable. For the prediction exercise, we regress our primary outcome variable on a set of PSU covariates using PSUs located 50-75 KMs away from and on either of the Salt Hedge. The set of covariates includes the following PSU characteristics: slope (in degrees), elevation (in meters), average precipitation (in millimeters), aridity index (0-300 scale, 0 being most arid), the average number of droughts, average annual temperature (Celsius), proximity to surface water (in kilometers) and the average number of days receiving rainfall. The figure shows 95% confidence intervals.

Figure A3: Covariate Balance
Index Based on Distance 75-100 KMs on Either Side of the Salt Hedge



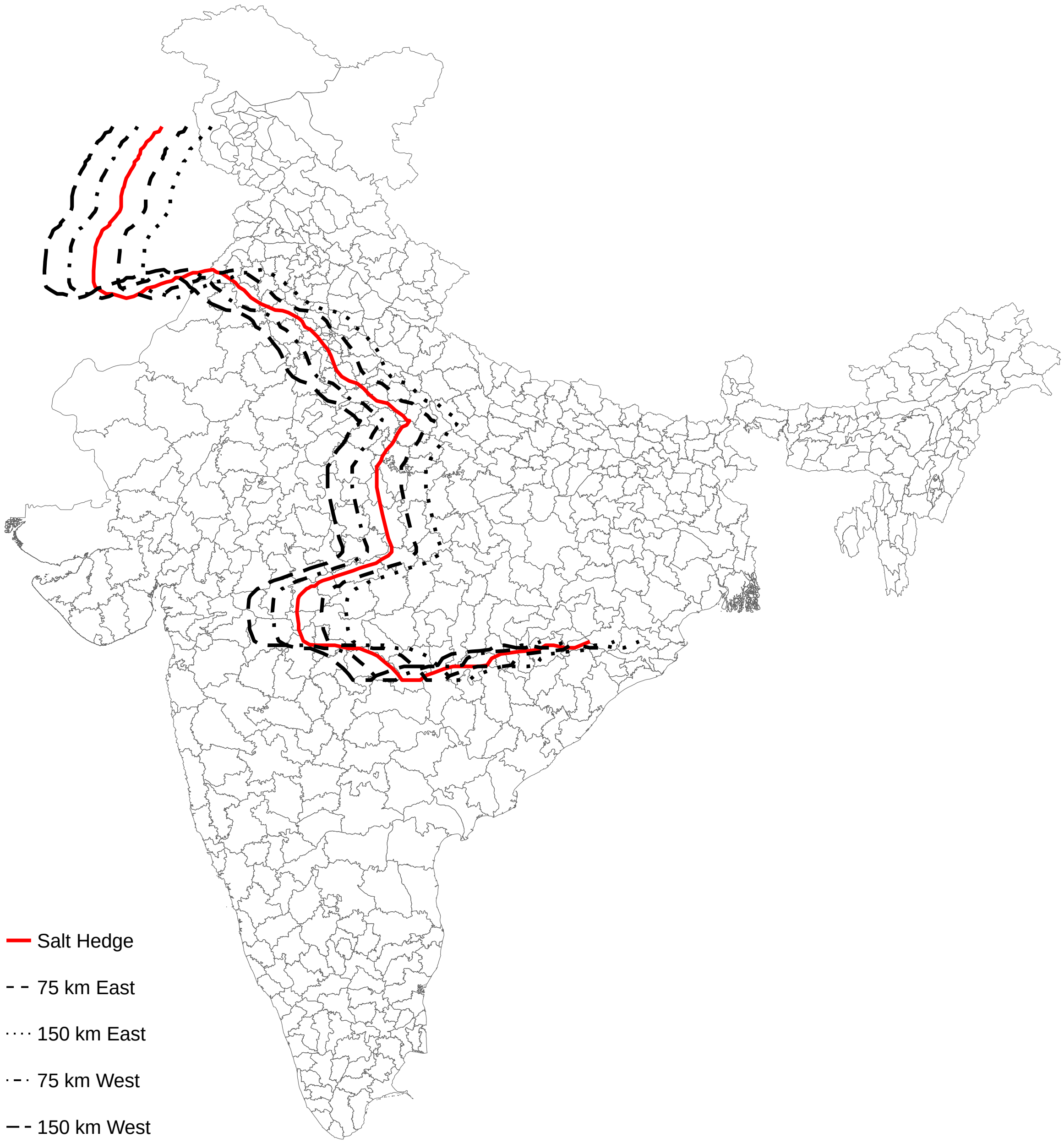
Notes: The figure presents the regression discontinuity plot using the predicted values of our main outcome variable averaged at the PSU level as the dependent variable. For the prediction exercise, we regress our primary outcome variable on a set of PSU covariates using PSUs located 75-100 KMs away from and on either of the Salt Hedge. The set of covariates includes the following PSU characteristics: slope (in degrees), elevation (in meters), average precipitation (in millimeters), aridity index (0-300 scale, 0 being most arid), the average number of droughts, average annual temperature (Celsius), proximity to surface water (in kilometers) and the average number of days receiving rainfall. The figure shows 95% confidence intervals.

Figure A4: Smooth Running Variable



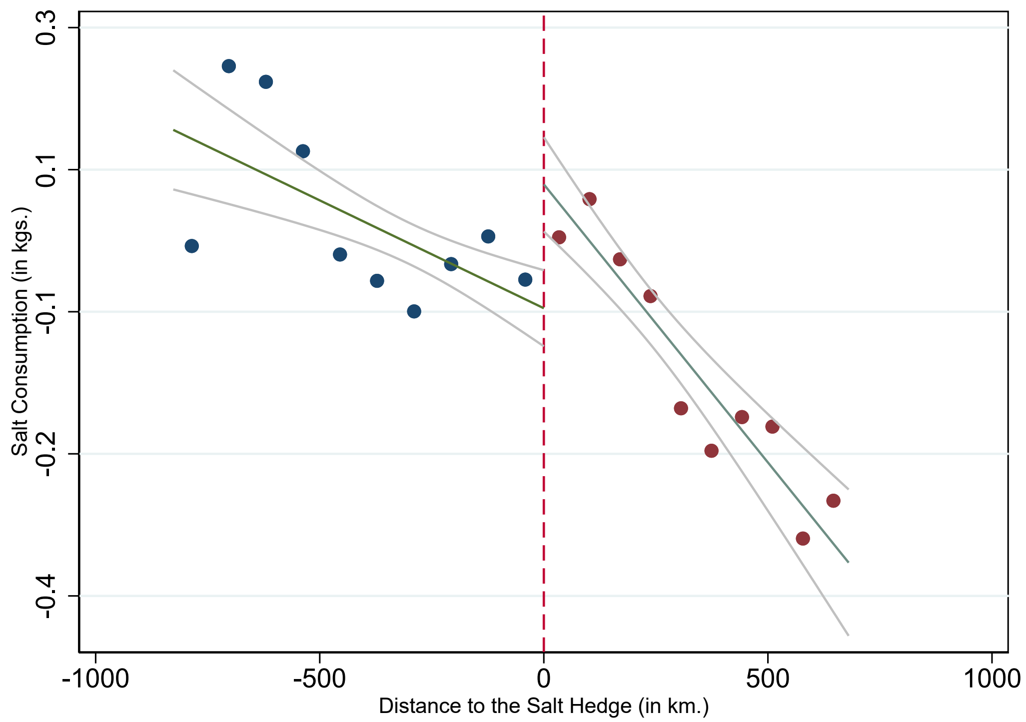
Notes: The figure illustrates the McCrary density test where the running variable is the distance to the Salt Hedge. The analysis includes only PSUs located in districts through which the Hedge passes.

Figure A5: Hedge Displacement as Placebo Test



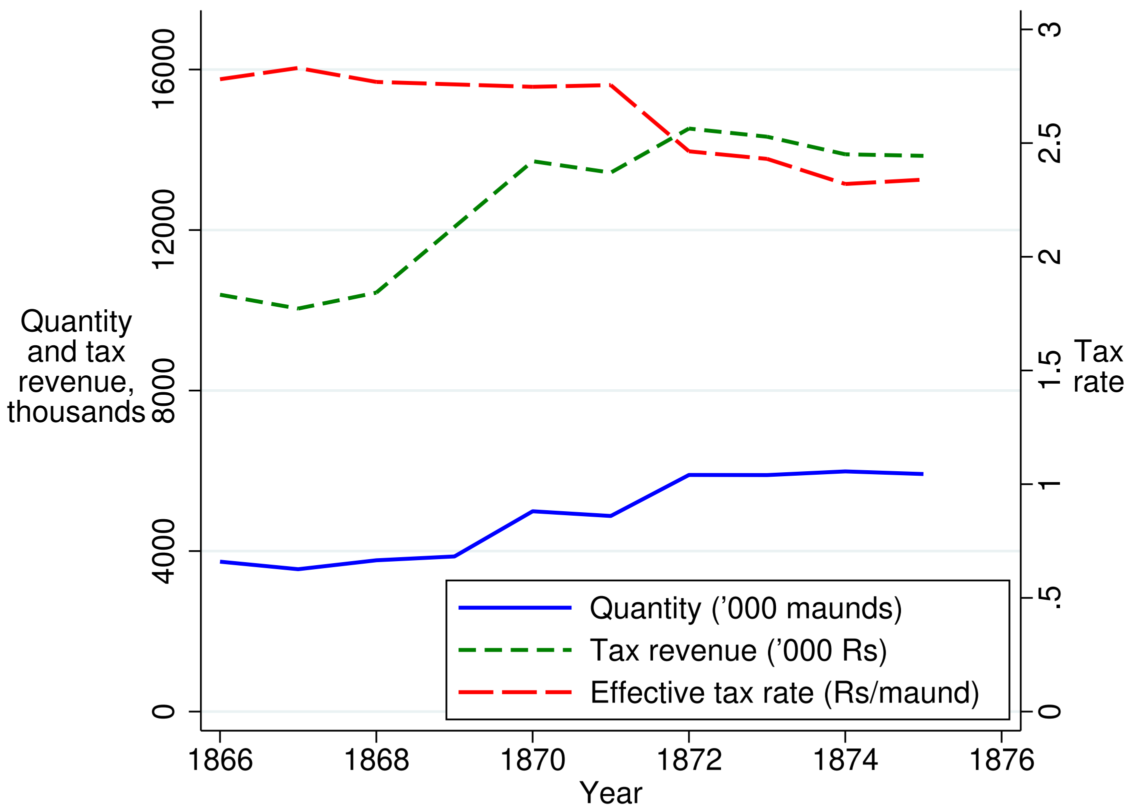
Notes: The solid line in this figure represents the actual hedge, while dashed and dotted lines represent parallel displacements.

Figure A6: Household salt consumption over the Full Distance Support



Notes: The figure presents the discontinuity plot for salt consumption created using the user-written Stata command *cmogram*. The analysis is conducted at the district level. Districts through which the Hedge passes have been dropped, as we cannot isolate whether households from such districts reside to the East or the West of the Hedge. The running variable—distance to the hedge—has been normalized by the distance to the closest district through which the hedge does not pass on either side. Mean values are calculated at each 20 km bin along the running variable (distance to Salt Hedge) and a local linear trend is estimated separately on each side of the discontinuity. Each regression is estimated using over the full distance support. The figure shows 95% confidence intervals.

Figure A7: Annual imports, tax revenues, and effective tax (1866-1875)



Notes: The figure presents the annual quantity of salt which crossed the customs line (in thousands of maunds), tax revenues from those imports (in thousands of rupees), and effective tax rate per unit (rupees per maund). Data is from annual statistics published by the Inland Customs Department, the government agency which maintained and operated the customs line. Each year in the figure refers to the beginning of the financial year (i.e. 1866 refers to financial year 1866-1867).

Table A1: Parametric Donut RD Overall

	Dependent Variable: Heart Disease or Extreme BP			
	>5 km		>10 km	
	(1)	(2)	(3)	(4)
Treatment	0.016	0.015	0.019	0.019
	(0.005)***	(0.005)***	(0.007)**	(0.008)**
Observations	18517	18517	13295	13295
Number of PSUs	613	613	444	444
District FEs	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes

Notes: Sample comprises of individuals residing in the PSUs in districts through which 'Salt Hedge' passes but excludes PSUs in the 10 KMs closest to the Hedge on either side and PSUs more than 40 Kms on either side. Each regression includes distance in kms and the interaction of distance with treatment as the control function. Treatment is an indicator which takes value 1 for PSUs on the East side of the 'Salt Hedge' where salt tax and price were higher in the 1800s. Columns (2) and (4) also control for the following PSU characteristics: Longitude, latitude, slope (in degrees), elevation (in meters), average precipitation (in millimeters), aridity index (0-300 scale, 0 being most arid), average number of droughts, average annual temperature (Celsius), proximity to surface water (in kilometers) and average number of days receiving rainfall. Standard errors are reported in parenthesis and are clustered at the NFHS PSU level. *** is significant at the 1 percent significance level, ** at the 5 percent, and * at the 10 percent significance level. Observations are weighed using weights provided by the NFHS.

Table A2: Parametric Donut RD within Different Distance Windows

	Within					
	40 km		30 km		20 km	
	(1)	(2)	(3)	(4)	(5)	(6)
	> 5km					
Treatment	0.016	0.015	0.013	0.011	0.017	0.015
	(0.005)***	(0.005)***	(0.006)**	(0.006)*	(0.009)*	(0.009)*
Observations	18517	18517	16754	16754	13347	13347
Number of PSUs	613	613	551	551	435	435
	> 10 km					
Treatment	0.019	0.019	0.018	0.016	0.035	0.038
	(0.007)**	(0.008)**	(0.009)**	(0.008)*	(0.018)*	(0.018)**
Observations	13295	13295	11532	11532	8125	8125
Number of PSUs	444	444	382	382	266	266
District FEs	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: Sample comprises of individuals residing in the PSUs in districts through which 'Salt Hedge' passes. Each regression includes distance in kms and the interaction of distance with treatment as the control function. Treatment is an indicator which takes value 1 for PSUs on the West side of the 'Salt Hedge' where salt tax and price of salt were lower in the 1800s. NFHS identifies extreme blood pressure (BP) as systolic BP exceeding 160 mmHg and diastolic BP exceeding 110 mmHg. The normal values are 120 and 80 mmHg respectively. Extreme BP or heart disease in column takes the value 1 if the individual surveyed either reports suffering from a heart disease or the average values of BP readings exceed the threshold for 'extreme BP'. Columns (2), (4), and (6) also control for the following PSU characteristics: Longitude, latitude, slope (in degrees), elevation (in meters), average precipitation, aridity index, average number of droughts, average annual temperature (Celsius), proximity to surface water (in kilometers) and average number of days receiving rainfall. Standard errors are reported in parenthesis and are clustered at the NFHS PSU level. *** is significant at the 1 percent significance level, ** at the 5 percent, and * at the 10 percent significance level. Observations are weighed using weights provided by the NFHS.

Table A3: Sensitivity Tests for Specifications

	Parametric-Quadratic		Non-parametric	
	(1)	(2)	(3)	(4)
Treatment	0.010	0.010	0.008	0.008
	(0.003)***	(0.003)***	(0.004)**	(0.003)**
Observations	24655	24655	24655	24655
Number of PSUs	811	811	811	811
District FEs	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes

Notes: Columns 1-2: linear distance, squared distance, and linear distance interacted with treatment are included. Column 3-4: Non parametric estimates with triangle Kernel. Because the RD command does not accomodate FEs, I residualized the dependent variable on district fixed effects and then used the RD STATA command. Bw=40km applies to all regressions.

Table A4: Smooth Covariates Across the Salt Hedge

	Index Generated Using								
	Index derived from Control PSUs within 40 km			Index derived from PSUs between 50 km & 70 km			Index derived from PSUs between 75 km & 100 km		
	40 km (1)	30 km (2)	20 km (3)	40 km (4)	30 km (5)	20 km (6)	40 km (7)	30 km (8)	20 km (9)
Treatment	-0.001	0.000	-0.000	-0.001	0.000	-0.000	-0.001	-0.000	-0.001
	(0.000)*	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)
Mean depend. variable	0.011	0.010	0.017	0.011	0.010	0.017	0.011	0.010	0.018
Observations	24655	24655	24655	22892	22892	22892	19485	19485	19485
Number of PSUs	811	811	811	749	749	749	633	633	633
District FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Each regression includes distance in kms and the interaction of distance with treatment as the control function. Treatment is an indicator which takes value 1 for PSUs on the West side of the 'Salt Hedge' where salt tax and price of salt were lower in the 1800s. *** is significant at the 1 percent significance level, ** at the 5 percent, and * at the 10 percent significance level. Observations are weighed using weights provided by the NFHS. The outcome variable is an index which is the predicted value from a regression of heart disease/or extreme blood pressure on covariates in the control sample (Columns (1) to (3)), PSUs falling within 50 Km to 75 Km of the Hedge on either side (Columns (4) to (6)), and PSUs falling within 75 Km to 100 Km on either side of the Hedge (Columns (7) to (9)). The covariates used are: average temperature, average precipitation, aridity index, elevation, slope, proximity to water, growing season length, average number of droughts between 1980 and 2000, average number of rainfall days, time to reach a settlement of 50,000 people.

Table A5: Hypothetical Placement of Salt Hedge

	75 km				150 km			
	East		West		East		West	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment	0.003	0.002	-0.002	-0.000	-0.004	-0.004	0.001	0.000
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.005)	(0.005)
Observations	15166	15166	17605	17605	22077	22077	16236	16236
Number of PSUs	507	507	587	587	751	751	535	535
District FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	No	Yes

Notes: Each regression includes distance in kms and the interaction of distance with treatment as the control function. Treatment is an indicator which takes value 1 for PSUs on the East side of the 'Salt Hedge' where salt tax and price were higher in the 1800s. Columns (2),(4), (6) and (8) also control for the following PSU characteristics: Longitude, latitude, slope (in degrees), elevation (in meters), average precipitation (in millimeters), aridity index (0-300 scale, 0 being most arid), average number of droughts, average annual temperature (Celsius), proximity to surface water (in kilometers) and average number of days receiving rainfall. Standard errors are reported in parenthesis and are clustered at the NFHS PSU level. *** is significant at the 1 percent significance level, ** at the 5 percent, and * at the 10 percent significance level. Observations are weighed using weights provided by the NFHS.

Table A6: Population count in logs

	2000		2005		2010		2015	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treatment	0.280	0.186	0.279	0.184	0.278	0.183	0.276	0.181
	(0.214)	(0.174)	(0.214)	(0.174)	(0.214)	(0.174)	(0.213)	(0.174)
Mean depend. variable	75.2	75.2	83.0	83.0	90.9	90.9	98.6	98.6
Number of PSUs	811	811	811	811	811	811	811	811
Controls	No	Yes	No	Yes	No	Yes	No	Yes
District FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: PSU level regressions. Dependent variable: The UN-adjusted count of people within the 2 km (urban) or 10 km (rural) buffer surrounding the PSU. Means for population count are in levels (in thousand).

Table A7: Mortality (last two years)

	Any	Age group				
	member	0-5	6-20	21-40	41-60	61-older
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	-0.014	-0.002	-0.004	0.001	0.001	-0.010
	(0.012)	(0.005)	(0.003)	(0.004)	(0.005)	(0.008)
Mean depend. variable	0.118	0.016	0.008	0.012	0.023	0.060
Observations	17441	17441	17441	17441	17441	17442
Number of PSUs	811	811	811	811	811	811
District FEs	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Sample comprises of deaths in the PSUs in districts through which 'Salt Hedge' passes. The distance is restricted to 40 Kms on either side. Each regression includes distance in kms and the interaction of distance with treatment as the control function and the following controls: Longitude, latitude, slope (in degrees), elevation (in meters), average precipitation (in millimeters), aridity index (0-300 scale, 0 being most arid), average number of droughts, average annual temperature (Celsius), proximity to surface water (in kilometers) and average number of days receiving rainfall. Treatment is an indicator which takes value 1 for PSUs on the East side of the 'Salt Hedge' where salt tax and price were higher in the 1800s. Standard errors are reported in parenthesis and are clustered at the NFHS PSU level. *** is significant at the 1 percent significance level, ** at the 5 percent, and * at the 10 percent significance level. Observations are weighed using weights provided by the NFHS.

Table A8: Salt Testing and Iodine Detection

	No Salt in HH		No Salt or not tested		Iodine present	
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	0.000	0.000	-0.000	-0.000	-0.000	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.009)	(0.009)
Observations	17442	17442	17442	17442	17384	17384
Number of PSUs	811	811	811	811	811	811
District FEs	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes

Notes: Sample comprises of individuals in the PSUs in districts through which 'Salt Hedge' passes. The distance is restricted to 40 Kms on either side. Each regression includes distance in kms and the interaction of distance with treatment as the control function. Columns(2), (4) and (6) also control the following: Longitude, latitude, slope (in degrees), elevation (in meters), average precipitation (in millimeters), aridity index (0-300 scale, 0 being most arid), average number of droughts, average annual temperature (Celsius), proximity to surface water (in kilometers) and average number of days receiving rainfall. Treatment is an indicator which takes value 1 for PSUs on the East side of the 'Salt Hedge' where salt tax and price were higher in the 1800s. Standard errors are reported in parenthesis and are clustered at the NFHS PSU level. *** is significant at the 1 percent significance level, ** at the 5 percent, and * at the 10 percent significance level. Observations are weighed using weights provided by the NFHS.

Table A9: Accessing Health Facilities and Insurance

	Health insurance (household)		Individual visited health facility	
	(1)	(2)	(3)	(4)
Treatment	0.007	0.005	0.010	-0.002
	(0.017)	(0.017)	(0.022)	(0.021)
Observations	17356	17356	22399	22399
Number of PSUs	811	811	811	811
District FEs	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes

Notes: Sample comprises of individuals in the PSUs in districts through which 'Salt Hedge' passes. The distance is restricted to 40 Kms on either side. Each regression includes distance in kms and the interaction of distance with treatment as the control function. Columns(2), (4) and (6) also control the following: Longitude, latitude, slope (in degrees), elevation (in meters), average precipitation (in millimeters), aridity index (0-300 scale, 0 being most arid), average number of droughts, average annual temperature (Celsius), proximity to surface water (in kilometers) and average number of days receiving rainfall. Treatment is an indicator which takes value 1 for PSUs on the East side of the 'Salt Hedge' where salt tax and price were higher in the 1800s. Standard errors are reported in parenthesis and are clustered at the NFHS PSU level. *** is significant at the 1 percent significance level, ** at the 5 percent, and * at the 10 percent significance level. Observations are weighed using weights provided by the NFHS.

Table A10: Nightlights Composite

	(1)	(2)
Treatment	0.384	0.859
	(0.961)	(0.791)
Mean depend. variable	5.681	5.681
Number of PSUs	811	811
Controls	No	Yes
District FEs	Yes	Yes

Notes: Nightlights Composite: The average nighttime luminosity of the area within the 2 km (urban) or 10 km (rural) buffer surrounding the DHS survey cluster location. Year: 2015.

Table A11: Log salt prices and district area east of hedge, before abolition

	(1)	(2)	(3)	(4)	(5)
Share of district × pre-abolition (δ_2)	0.345**	0.394**	0.385**	0.405*	0.484
	(0.164)	(0.171)	(0.177)	(0.202)	(0.295)
Observations	8242	5370	4252	2481	1520
Max distance to line, kilometers	All	300	200	100	50
Share within customs line, mean	0.91	0.87	0.83	0.72	0.57
Commodity FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ Standard errors are reported in parentheses, clustered by district. The share of district within the customs line is the share of the district's area which lies within the catchment area of the customs line, east of the hedge. Pre-abolition refers to the period prior to abolition of the salt hedge, 1878 and earlier, when taxes were levied on salt imported east across the customs line. Each district's distance to the customs line is calculated from the district centroid to the nearest point of the salt hedge. Commodity refers to the type of salt, named after the source from which it originates on the subcontinent, each with a different quality or concentration of minerals.