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Food Insecurity Cost Estimates for El Paso: 2023

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Food Insecurity Cost Estimates for El Paso: 2023
The University of Texas at El Paso
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Abstract
Food insecurity is a fairly pervasive problem throughout the United States that is especially burdensome for low-income regions. While the latter is generally recognized, there have been very few efforts to quantify the dollar costs of food insecurity, especially at the regional level. This study attempts to do so for El Paso County, Texas. This is achieved by first adjusting for inflation cost estimates in a prior national level study. Regional differences with respect to the nation are then utilized to calculate comparable costs for El Paso. Results indicate that the economic damage wrought by food insecurity in El Paso during 2023 exceeded $745 million. That represents nearly 2 percent of total personal income in the county for that year.

Keywords
Food Insecurity; Regional Economics; Poverty

Acknowledgements

Introduction

Food insecurity is a recurring problem that continues to affect more than 10 percent of all households in the United States (Nord, 2013; Duffy and Zizza, 2016; Rabbitt et al., 2023). Difficulties associated with food insecurity include health and educational impairment (Guha, 2022). While food insecurity has existed throughout history, there is much that remains undocumented about the various burdens associated with this problem. El Paso County, Texas is a region that faces pronounced poverty and income limitations (UWT, 2024). Quantifying the costs associated with food insecurity will help illuminate some of the burdens affecting this metropolitan economy.

Among the burdens of food insecurity, the economic dimensions may be particularly salient. It is generally recognized that food insecurity incidence is more pronounced among low-income households and among certain ethnic groups (Gundersen, 2008). Regional characteristics of food insecurity incidence within the United States, and elsewhere, are far less quantified (Lazariu, Yu, and Gundersen, 2011). That includes financial costs associated with food insecurity. Regional and metropolitan data paucities contribute to those lacunae in this branch of study.

This study attempts to partially fill that gap in the regional hunger economics literature by applying one potential approach for circumventing the regional data breach in El Paso, Texas. El Paso faces relatively serious problems with food insecurity (Chakraborty, Aun, and Schober, 2023; Fullerton and Fullerton, 2024), but comprehensive cost estimates associated with confronting this issue have not previously been estimated. The approach selected is similar to what has been applied in other branches of regional economics when local data constraints are pronounced (Klein, 1969; Fullerton, 2001). Subsequent sections of the study include a review of the literature, a description of data and methodology, local cost estimates, and a conclusion.

Literature Review

Food insecurity is a fairly widespread problem throughout the United States. Shepard, Setren, and Cooper (2011) estimates that 48.8 million people faced food insecurity across the nation in 2010. That study also estimates the economic costs of hunger due to illness, sub-par educational achievement, and aggregate food donations. National hunger-induced costs are estimated at $167.5 billion, while the corresponding aggregate figures for Texas and New Mexico are $16.04 billion and $0.53 billion, respectively.

Several studies have examined the causes of food insecurity (Bernell, Weber, and Edwards, 2006; Duffy and Zizza, 2016; Gundersen and Ziliak, 2018). Among the contributing factors to the prevalence of hunger, several stand out. Household incomes, education, and homeownership tend to be inversely correlated with food insecurity. Counties with higher percentages of African-

American and/or Hispanic households generally observe higher rates of food insecurity than do other ethnic groups (Rabbitt et al., 2023). Counties along the border with Mexico also exhibit greater rates of food insecurity than do other regions within the United States.

In 2022, 12.8 percent of all U.S. households are estimated to be food insecure. That translates to more than 40 million people nationwide (Rabbitt et al., 2023). Because there is more variability at the state level, a 3-year moving average is utilized for individual state household estimates. The 2020-2022 average for Texas is 15.5 percent or 11.1 million households.

The 2023 population for El Paso County is estimated at 869,880 (USCB, 2024). Schober et al. (2023) conducts an extensive survey of food insecurity in this county. Results obtained indicate that 35 percent of the residents in this corner of Texas faced food insecurity in 2023.

Although regional and metropolitan data are fairly sparse, some studies have examined food insecurity costs at a national level of aggregation. Many of those efforts analyze national health care costs associated with food insecurity (Gundersen and Seligman, 2017; Gundersen, 2021). One study that specifically addresses annual costs associated with hunger across the United States is Shepard, Stern, and Cooper (2011). While it does not regionally disaggregate those costs, it is feasible to utilize those data to obtain regional and metropolitan estimates from the information contained therein.

To date, very few studies examine food insecurity at the metropolitan level and almost never attempt to quantify the costs of food insecurity in those regions (Sriram and Tarasuk, 2016). Similarly, there are very few research efforts that analyze the economic costs of hunger in metropolitan economies or rural counties along the United States border with Mexico. This study takes a step toward partially filling that gap in the applied economic and public policy literature by compiling a partial empirical assessment of food insecurity costs in El Paso, Texas. Given the status of El Paso as one of 25 most impoverished urban economies and as an important border economy, it is a natural candidate for this type of research. The study data and methodology are discussed next.

Data and Methodology

The first step that is taken in the analysis to update the nominal dollar value of the cost estimates in Shepard, Stern, and Cooper (2011) prior to calculating any cost estimates for El Paso. Inflation has undoubtedly increased the nominal dollar costs of food insecurity between 2010 and 2023. For this purpose, the personal consumption expenditures price index, PCE_{2023}, is employed to update the original 2010 cost estimates. The personal consumption expenditures price index is widely regarded as one of the most accurate measures of inflation for the United States (Stock and Watson, 2016; Dunn, Grosse, and Zuvekas, 2018). Between 2010 and 2023, the personal consumption expenditures price index increased by 33 percent (Prakken, 2024).

Equation (1) shows how the adjustment for inflation is calculated. In Equation (1), $USCOST_{i,2023}$ stands for the 2023 national estimate of cost category i. $USCOST_{i,2010}$ is the value of the cost category i from 2010. PCE_{2023} is the 2023 price index number used to update the estimates reported in Shepard, Stern, and Cooper (2011). For purposes of this study, 2017 is the base year and $PCE_{2023} = 1$.

$$USCOST_{i,2023} \quad = \quad USCOST_{i,2010} * PCE_{2023} \tag{1}$$

Once the national costs have been updated, one approach to calculating regional hunger costs would be to simply multiply those estimates by a local to national population ratio as shown in Equation (2). In Equation (2), $REGCOST_{ij}$ is the regional estimate for cost category i in region j, $USCOST_i$ is the national estimate for cost category i, $REGPOP_j$ is the population of region j, and $USPOP$ is national population. For counties or states that closely match national averages for each of the sub-component cost categories, this procedure would likely provide acceptable estimates.

$$REGCOST_{ij} \quad = \quad USCOST_{i,2023} * REGPOP_j / USPOP \tag{2}$$

While the El Paso metropolitan economy is strongly influenced by national economic and demographic patterns, it differs notably from the rest of the country in numerous manners including per capita income levels (Fullerton and Fullerton, 2023). Consequently, adjustments to the national cost estimates that reflect regional heterogeneity are utilized to calculate the impacts for this border economy. Equation (3) shows the manner in which this is accomplished in this study. In Equation (3), $REGFACT_{ij}$ is the adjustment factor for category i in region j relative to the national estimate for that cost category.

$$REGCOST_{ij} \quad = \quad REGFACT_{ij} * USCOST_{i,2023} * REGPOP_j / USPOP \tag{3}$$

For some cost categories, there may be more than one adjustment factor. For example, a higher percentage of El Paso households suffer from poor health than in the rest of the country and the regional price parity estimate indicates that operating costs are lower in El Paso than elsewhere. The paragraphs that follow in the rest of this section discusses each of the county (regional) adjustment factors that account for differences between El Paso and the United States as a whole.

Nationally, 12.8 percent of all households are estimated to be food insecure. For Texas, the corresponding figure is 15.5 percent (Rabbitt et al., 2023). With a higher percentage of households living below the poverty line, El Paso County has a higher incidence of food insecurity than Texas. Schober et al. (2023) carefully examines this issue and estimates a 35 percent insecurity rate for 2022. That means that 304,067 residents of El Paso County suffered food insecurity at some point during 2022.

Income constrained persons are those who struggle to pay for housing, food, public utilities, and other basic necessities (Hoopes et al., 2024). The 35 percent food insecurity rate for El Paso is above the Texas state average and aligns with the 41 percent of adults falling into the lower income echelon calculated for the county by Bennett, Fry, Kochhar (2020). It is also compatible with the 53 percent of El Paso households who are estimated to be either income constrained or impoverished in other reports (Hoopes et al., 2024; UWT, 2024). It further aligns with estimates of the number of persons who receive food bank donations in El Paso (EPFH, 2024).

A common outcome associated with food insecurity is poor health (Vozoris and Tarasuk, 2003; Cook et al., 2004). For the United States as a whole, 19.5 percent of the population is estimated to experience health issues. In the case of El Paso County, the percentage of residents that suffer from poor health is 27.1 percent (USNWR, 2024). That 7.6 percentage point difference increases the dollar impacts of health related costs described in the next section.

Food insecurity can lead to depression (Hernandez et al., 2004). Some evidence indicates that El Paso suffers a lower incidence of depression than the national as a whole (Best, 2023). Under-reporting may affect that and other estimates (O'Connor et al., 2008). Given that, no county specific adjustment is made and the national per capita incidence is employed for the cost estimate reported in the next section.

Food insecurity is also associated with increased rates of suicide. Latinx communities and the State of Texas have lower suicide rates than the nation (CDC, 2023). Given that, a lower rate of 80 percent of the national self-inflicted death rate is employed in the calculation shown in the next part of the study.

The lack of food security is also correlated with higher rates of anxiety (Ejiohuo et al., 2024). The incidence of anxiety disorders is estimated to be approximately 5 percent higher in El Paso and in Texas than it is nationally (Martinez, 2023). A variety of factors contribute to that in El Paso and food insecurity complicates this situation further (Mallonee et al., 2023).

Food insecurity also raises in-patient and emergency room hospitalizations (Berkowitz et al., 2018). It further exacerbates the probability of hospitalizations of patients suffering from respiratory and other illnesses (Ariya et al., 2021). With a higher rate of food insecurity incidence than the nation, El Paso County is likely to have a greater rate of food insecurity-related hospitalizations. That rate is calculated at 1.869 percentage points above the national rate.

Upper gastrointestinal disorders frequently accompany unhealthy eating patterns. These disorders cause reduced productivity through workday absences and inflict quality of life deterioration (Camilleri et al., 2005). Regional data on upper gastrointestinal illness are sparse, but these problems are estimated to occur more often in El Paso than in the nation as a whole. The national per capita rate is increased by the El Paso County poor health rate of 7.6 percent.

Other consequences of food insecurity include increases in cold, migraine, and iron deficiency problems (Skalicky et al., 2006). El Paso has a low incidence rate for migraines (Dumas, 2022). Because of a relatively high rate of poverty, El Paso probably has higher cold and iron deficiency rates than those of the nation (Venkatarmani et al., 2020). For this cost category, the national per capita rate is applied without any local adjustment.

In addition to illness, there are two other aggregate categories of financial damage associated with hunger (Shepard, Setren, and Cooper, 2011). In dollar terms, the next most expensive group is comprised by education and related costs. It includes three sub-categories.

Food insecurity harms school performance. In some cases, student achievement is hampered to the point of requiring grades to be repeated. Grade retention is associated with increased dropout rates. Food insecurity is also correlated with higher rates of absenteeism and secondary school non-completion. Special education is similarly associated with hunger and increased dropout rates (Stearns and Glennie, 2006). The percentage of adults over the age of 25 who have not graduated from high school in El Paso County in 2020 was 17.8 percent, nearly double the 9.4 percent rate of the nation as a whole (USCB, 2020).

The last aggregate cost category covers charitable contributions to alleviate the effects of hunger. It contains four sub-categories. The first sub-category is coordination and support costs. Unlike other items in this study, actual administrative expense data from audited food bank financial statements are utilized rather than calculated (CRRC, 2023). Regional food banks is the biggest sub-category in this group. It includes both food and cash donations. Audited expense data are also employed for these costs, obviating the need to create an estimate for this item (CRRC, 2023).

Because prices tend to be lower in El Paso than elsewhere in the country, a downward adjustment of 0.91211 is applied for estimating the value of community volunteers (BEA, 2024). The higher local rate of food insecurity requires that the national per capita estimate be adjusted upwards, partially offsetting the lower regional price parity estimate for El Paso. The cost of hunger estimates that result from following all of the steps outlined above are presented in the next section.

El Paso Cost Estimates

Table 1 compares the incidence of food insecurity between the United States and El Paso County. The population estimates are for 2023 (USCB, 2024). The national food insecurity estimate is based on the hunger incidence ratio reported in Rabbitt et al. (2023). The El Paso food insecurity estimate of 304.5 thousand persons is based on Schober et al. (2023). These numbers are used in several of the cost calculations summarized below.

Table 1
Population and Food Insecurity in 2023

Variable	USA Estimates	El Paso Estimates
Population	334,915,895	869,880
Food Insecurity Incidence, Persons	42,658,741	304,458

Table 2 summarizes the health related costs that are estimated to result from food insecurity in the United States and El Paso County for 2023. Health damages in El Paso collectively add up to $452.9 million. Almost one-third of that is due to poor health with more than one-fifth resulting from depression.

Table 2
Health Related Food Insecurity Costs in 2023 $

Sub-Category	USA Estimates	El Paso Estimates
Poor Health	$51.7 Billion	$144.6 Million
Depression	$38.8 Billion	$100.9 Million
Suicide	$26.2 Billion	$54.4 Million
Anxiety	$23.1 Billion	$63.1 Million
Hospitalizations	$21.4 Billion	$56.7 Million
Upper Gastrointestinal Disorders	$7.6 Billion	$21.2 Million
Cold, Migraine, & Iron Deficiency	$4.7 Billion	$12.1 Million
Total Costs due to Illnesses	**$173.6 Billion**	**$452.9 Million**

The impacts from the education costs inflicted by food insufficiency are presented in Table 3. Increases in the numbers of dropouts due to more grade retentions and higher absenteeism sum to $44.2 million. Special education costs are calculated at $24 million across the county.

Table 3
Education Related Food Insecurity Costs in 2023 $

Sub-Category	USA Estimates	El Paso Estimates
Grade Retention Dropouts	$8.0 Billion	$22.5 Million
Absenteeism Dropouts	$7.7 Billion	$21.7 Million
Special Education	$8.5 Billion	$24.0 Million
Total Education Costs	**$24.2 Billion**	**$68.2 Million**

Table 4 reports cost estimates related to charitable efforts that help alleviate food insecurity. In Column 3, the first two items for El Paso County are actual expense data from audited information rather than estimates (CRRC, 2023). As with the national data, the biggest sub-category is the aggregate expenditure amount for regional food bank costs in El Paso at $190

million. The second highest sub-category is the $24.4 million estimate for community organizations.

Table 4
Charity Related Insecurity Costs in 2023 $

Sub-Category	USA Estimates		El Paso Estimates	
Coordination and Support	$0.1	Billion	$5.9	Million
Regional Food Banks	$14.4	Billion	$190.0	Million
Community Organizations	$7.8	Billion	$24.4	Million
Value of Community Volunteers	$1.3	Billion	$4.5	Million
Total Charity Costs	**$23.7**	**Billion**	**$224.7**	**Million**

Total food insecurity mitigation costs for 2023 are compiled in Table 5. The sum of all three categories in El Paso County is $745.9 million. That amount represents more than 1.9 percent of total personal income for the county that year (Fullerton and Fullerton, 2023). On a per capita basis, that figure translates to $857.47 and highlights the burden imposed by lower productivity, charitable contributions, and higher tax costs.

Table 5
Total Food Insecurity Costs in 2023 $

Category	USA Estimates	El Paso Estimates
Illness Costs	$173.6 Billion	$452.9 Million
Education and Related Costs	$24.2 Billion	$68.2 Million
Charity Costs	$23.7 Billion	$224.7 Million
Total Costs	**$221.4 Billion**	**$745.9 Million**

Conclusion

It is widely recognized that food insecurity imposes multiple damages on the national economy and communities across the country. In spite of that, there have been very few efforts to quantify the dollar value of those damages. Data constraints make completing such an exercise difficult, especially for regional economies where statistical information limitations can be severe.

This study attempts to partially address that breach in the regional hunger economics field by estimating the 2023 cost of food insecurity in El Paso County, Texas. A two-step procedure is employed for achieving this objective. The first step is to update prior estimates of the various costs of food insecurity for the national economy. The second step is to calculate the corresponding costs for El Paso by adjusting for differences between the nation and the county.

The national cost of food insecurity in 2023 is estimated at $221.4 billion and the corresponding regional estimate for El Paso is $745.9 million. These estimates help underscore the serious burden imposed by food insecurity. Completion of additional analyses for other regions of the United States can help emphasize the importance of addressing this important issue that impedes economic growth and development.

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Announces

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UTEP is pleased to announce the 2020 edition of its primary source of Borderplex long-term historical economic information. Topics covered include demography, employment, personal income, retail sales, residential real estate, transportation, international commerce, and municipal water consumption. These data comprise the backbone of the UTEP Border Region Econometric Model developed under the auspices of a corporate research gift from El Paso Electric Company and maintained using externally funded research support from El Paso Water and Hunt Communities.

The authors of this publication are UTEP Professor & Trade in the Americas Chair Tom Fullerton and UTEP Border Region Modeling Project Associate Director & Economist Steven Fullerton. Dr. Fullerton holds degrees from UTEP, Iowa State University, Wharton School of Finance at the University of Pennsylvania, and University of Florida. Prior experience includes positions as Economist in the Executive Office of the Governor of Idaho, International Economist at Wharton Econometrics, and Senior Economist at the Bureau of Economic and Business Research at the University of Florida. Steven Fullerton has published research on Major League Baseball, the National Football League, and housing price fluctuations in Las Cruces.

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Announces

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UTEP is pleased to announce the 2024 edition of its primary source of border business information. Topics covered include demography, employment, personal income, retail sales, residential real estate, transportation, international commerce, and municipal water consumption. Forecasts are generated utilizing the 275-equation UTEP Border Region Econometric Model, with the addition of Santa Teresa Port of Entry traffic and Las Cruces residential real estate. The inclusion of the UTEP Border Region Econometric Model is supported by El Paso Water and Raiz FCU.

The authors of this publication are UTEP Professor & Trade in the Americas Chair Tom Fullerton and BRMP Economist Steven Fullerton. Dr. Fullerton holds degrees from UTEP, Iowa State University, Wharton School of Finance at the University of Pennsylvania, and University of Florida. Prior experience includes positions as Economist in the Executive Office of the Governor of Idaho, International Economist in the Latin America Service of Wharton Econometrics, and Senior Economist at the Bureau of Economic and Business Research at the University of Florida. Steven Fullerton holds degrees from New Mexico State University and UTEP. He has published research in the areas of border, housing, international, and sports economics.

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Announces

Borderplex Long-Term Economic Trends to 2049

UTEP is pleased to announce the 2020 edition of its primary source of long-term structural trend border economic information. Topics covered include demography, employment, personal income, retail sales, residential real estate, transportation, international commerce, and municipal water consumption. Forecasts are generated utilizing the 250-equation UTEP Border Region Econometric Model developed under the auspices of a corporate research gift from El Paso Electric Company and maintained using externally funded research support from El Paso Water and Hunt Communities.

The authors of this publication are UTEP Professor & Trade in the Americas Chair Tom Fullerton and UTEP Border Region Modeling Project Associate Director & Economist Steven Fullerton. Dr. Fullerton holds degrees from UTEP, Iowa State University, Wharton School of Finance at the University of Pennsylvania, and University of Florida. Prior experience includes positions as Economist in the Executive Office of the Governor of Idaho, International Economist at Wharton Econometrics, and Senior Economist at the Bureau of Economic and Business Research at the University of Florida. Steven Fullerton has published research on Major League Baseball, the National Football League, and housing price fluctuations in Las Cruces.

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The UTEP Border Region Modeling Project & Editorial UACJ

Announce the Availability of

Basic Border Econometrics

The University of Texas at El Paso Border Region Modeling Project is pleased to announce **Basic Border Econometrics**, a publication from Universidad Autónoma de Ciudad Juárez. Editors of this new collection are Martha Patricia Barraza de Anda of the Department of Economics at Universidad Autónoma de Ciudad Juárez and Tom Fullerton of the Department of Economics & Finance at the University of Texas at El Paso.

Professor Barraza is an award winning economist who has taught at several universities in Mexico and has published in academic research journals in Mexico, Europe, and the United States. Dr. Barraza currently serves as Research Provost at UACJ. Professor Fullerton has authored econometric studies published in academic research journals of North America, Europe, South America, Asia, Africa, and Australia. Dr. Fullerton has delivered economics lectures in Canada, Colombia, Ecuador, Finland, Germany, Japan, Korea, Mexico, the United Kingdom, the United States, and Venezuela.

Border economics is a field in which many contradictory claims are often voiced, but careful empirical documentation is rarely attempted. **Basic Border Econometrics** is a unique collection of ten separate studies that empirically assess carefully assembled data and econometric evidence for a variety of different topics. Among the latter are peso fluctuations and cross-border retail impacts, border crime and boundary enforcement, educational attainment and border income performance, pre- and post-NAFTA retail patterns, self-employed Mexican-American earnings, maquiladora employment patterns, merchandise trade flows, and Texas border business cycles.

Contributors to the book include economic researchers from the University of Texas at El Paso, New Mexico State University, University of Texas Pan American, Texas A&M International University, El Colegio de la Frontera Norte, and the Federal Reserve Bank of Dallas. Their research interests cover a wide range of fields and provide multi-faceted angles from which to examine border economic trends and issues.

A limited number of **Basic Border Econometrics** can be purchased for $10 per copy. Please contact Lic. Luz de Lourdes Ortiz Quintana of Universidad Autónoma de Ciudad Juárez at luz.ortiz@uacj.mx to order copies of the book.

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