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Effects of Legal Status and Health Service Availability on Mortality

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Abstract

Using a straight-forward Differences-in-Differences approach, effects of the 1986 Immigration Reform and Control Act and the 1986 and 1987 Omnibus Budget Reconciliation Acts on mortality levels in California are examined. These acts had the effect ofl egalizing and granting healthcare coverage to millions of previously illegal immigrants. Utilizing data on all IRCA applicants and all California deaths within this time period, I find evidence of substantial declines in mortality correlated with the size of the legalized cohort by county. If we assume, for purposes of a back of the envelope calculation, that after the reform IRCA applicants' mortality rate is approximately equal to that of demographically similar California residents, this finding is consistent with IRCA applicants being subject to five to six times the mortality rate of California residents prior to the reform.

1 Introduction

This paper is motivated by a desire to observe the effect of incorporating a previously marginalized group into the healthcare system in the United States. Since illegal aliens are present in large numbers in the United States, they represent an important and difficult to study segment of the population. This study could aid in quantifying the effect of two policies, the 1986 IRCA and the 1986-1987 OBRA, which had drastic effects on their access to healthcare. In addition, federal policy in regards to legal immigrant access to federal medical care has also been subject to large-scale and abrupt change, and is subject to some of the same considerations as are investigated in this paper. Finally, to some degree this paper informs, more broadly, a swath of policy regarding effects of medical policy on health outcomes in the nation at large, as, due to the possibility of impending health care reform, a large number of citizens may soon be given access to non-emergency medical care which was not previously available to them.

As is amply demonstrated by qualitative studies and surveys, many illegal aliens do not utilize the medical system in the United States at all, due to factors such as much lower income levels, legal unavailability, or a mistrust of any medical or other official institution due to their illegal status. I seek to measure the effect on some health outcomes of removing this legal unavailability and mistrust by regularizing their status and setting these previously illegal aliens on the path towards citizenship. Mortality data presents a clear path of investigation, as it is a concrete outcome and is the outcome perhaps most likely to be measured and recorded by the state. Many other less extreme outcomes will be affected by the change in legal status, but they may go unrecorded, or at the least underreported, as treatment may only occur at home. A death will, presumably, be reported in the vast majority of cases, regardless of legal status of the person who died or that of their family. Additionally, while the average illegal alien in California is younger and probably healthier than the average native resident, the fertility rate among this group is higher, presenting one avenue by which higher mortality could be realized. Mortality will most likely be a lower bound to the general welfare effect, as hospital ERs can still be utilized by illegal aliens, though they still do not often do so, in cases of emergency.

2 Background on Legislation

The 1986 Immigration Reform and Control Act (IRCA) was a bipartisan effort to strengthen the nation's controls on illegal aliens and introduce greater amounts of regulation into the immigration

system. The primary purpose of the bill was to enhance the controls on the hiring of illegal aliens, as it was theorized that such financial penalties would reduce employment opportunities for illegal aliens and thus decrease the flow of illegal aliens into the United States. Prior to the bill's passage, there were essentially no laws regulating the ability of employers to knowingly hire illegal aliens, creating no incentive for employers to ascertain the legal status of their employees. The bill made it illegal to knowingly hire or recruit illegal aliens and also required employers to at least give a cursory investigation into their immigration status, as long as the business employed at least three employees. The bill also, and most importantly for the purposes of this study, granted 'amnesty', essentially permanent legal status, to certain groups of illegal aliens who had entered the United States prior to 1982 and lived here continuously, as well as to many agricultural workers.

The IRCA was subject to much debate in Congress and the media, beginning with its conception in the early 1980s. The first criticisms came from various opponents of the bill. Human rights groups and Hispanic groups actually rallied against the bill, despite its provisions for amnesty. They worried about the bill's labor market provisions, fearing it would greatly worsen discrimination against Hispanics, who would be the group most affected by the bill. Additionally, farmers and growers also strongly opposed the bill, fearing an end to their usage of illegal aliens as temporary agricultural workers, and the Chamber of Commerce opposed any financial sanctions on businesses. Over the following years, the furor over employer sanctions relented to some degree as requirements that employers diligently verify employment status were dropped. After this change, attention began to focus more intently on a compromise in terms of agricultural workers and the legalization provisions. Finally, in 1986, the bill was passed in its final form and was signed by President Reagan on November 6. From its inception, the bill seemed likely to pass at some point and in some form. However, its passage in this particular year and with these particular provisions was by no means certain, and I assert that it can be considered an unexpected event.

Concurrently with the passage of the 1986 IRCA was the passage of a series of Omnibus Budget Reconciliation Acts (OBRA) which greatly extended the coverage of Medicaid and Medi-Cal in the state of California. Through the 1986 OBRA, the federal government made available to states, including California, money to cover expanded health services for newly legalized IRCA applicants with family incomes of less than 81% of the federal poverty line. A second OBRA, passed in 1987, gave states the ability to extend Medicaid or Medi-Cal coverage to all such groups with family incomes of less than 185% of the federal poverty line. This cutoff provided coverage to over 90% of IRCA applicants at that time. This increased level of coverage makes it almost certain that soon after the first IRCA applicants are legalized (the first large contingent were legalized in 1988), they

are also covered under California Medi-Cal or Medicaid.

In short, the 1986 IRCA and 1986 and 1987 OBRAs had the effect of treating both the legal availability and the mistrust inherent to possessing illegal status. Between 1986 and 1989, over 1.5 million people in California shifted from being illegal aliens without non-emergency public health service to legal aliens with a much greater availability of health options within the state.

3 Literature

The large presence of illegal immigrants in the United States has given rise to a large body of literature devoted to studying them, both before these programs and after them. The primary focus of the literature has been on studies relating to the effects of illegal immigrants on labor markets in the United States. Innumerable labor market studies have been conducted, a few of which are Espenshade (1995), Djajic Slobodan (1997), Winegarden and Boon (1991), Friedburg and Hunt (1995), and George Borjas (2003).

However, these studies could not separately study the effects of legal and illegal immigrants carefully, due to data constraints. The population of illegal immigrants could generally not be identified precisely, so analysis was confined to the larger population of all immigrants. This paper seeks to address this identification problem through utilizatin of precise IRCA data and thereby examine the effects of illegal immigrants in particular. The 1986 IRCA had the effect of legalizing over 2.6 million previously illegal immigrants throughout the nation between the years of 1987 and 1990, as seen in Figure 1. This legalization was a substantial shift in the lives of these immigrants, containing the possibility of producing large changes in behavior in a sizable portion of the residents of the United States.

One relevant paper is that of Linda Bailey (2002), who utilizes the 1986 IRCA data and its provisions for legalization to examine the effects of illegal immigrants on the labor market outcomes of natives. Bailey uses the IRCA data primarily for identifying illegal applicants by location, as I intend to do, in order to match the treated population to local labor market outcomes. She uses a standard difference-in-difference approach across metropolitan statistical areas to judge various labor market effects such as income, hours, and employment.

Also related is David Card's paper on the Mariel Boatlift (1990), which exploits the massive influx of Cubans into the Miami area as a natural experiment regarding the labor market. He uses the Boatlift to study the effect on labor market outcomes among various native groups. However, due to problems of identification and variation, Card cannot identify the exact locations of Cuban

immigrants within the city or in the larger area. He can only provide statistical comparisons between demographic groups within the city and between selected 'comparison' cities, a problem which my dataset solves through more precise locational data.

While there have been a number of papers regarding illegal immigrants, their usage of the medical system, and the impact of various medical reforms on them, these have all been case studies or qualitative examinations of possible effects. No research has centered on a quantitative examination of health outcomes related to illegal immigrants and their healthcare usage habits. While I do not seek to address the nature of healthcare usage among illegal immigrants, my estimates can give some gauge of change in some health outcomes as a result of full inclusion into the healthcare system. This goal is along the lines of previous work examining the mortality outcomes of large scale changes in healthcare avilability induced by government legislation. For example, Currie and Gruber (1996) look at the effects of Medicaid expansion on infant mortality and other birth outcomes, finding large decreases in infant mortality. Card et al. (2009) and Finkelstein and McKnight (2005) examine the effect of Medicare on mortality among the elderly. While Card et al. find significant drops in mortality at age 65 through regression discontinuity analysis, Finkelstein and McKnight find no effect of the introduction of Medicare in 1965 on health outcomes, though they find significant drops in out-of-pocket expenditures among those eligible.

Three pertinent studies offer guidance, though no robust examination, of the availability of and usage of medical services among illegal aliens. Norton, Kenney, and Ellwood (1996) offer a look at Medi-Cal, California's Medicaid program, and its usage by immigrants and certain qualifying illegal aliens, finding some evidence to suggest a ban on all aid to illegal aliens would be detrimental. Chavez, Flores, and Lopez-Garza (1992) conduct surveys of Hispanic illegal aliens in San Diego and Dallas regarding their usage of medical care. They find a minority use private insurance, but a majority has no insurance and the people they survey utilize health services of any type at a much lower rate than natives or those with private insurance. They note several stories of unnecessary deaths due to avoiding or being unable to fully utilize health services. Finally, Hagan et al. (2003) examine the impact of new federal policy changing benefits for immigrants in several counties in Texas through interviews and household surveys. They report a large number of even legal immigrants withdrawing from the benefits, thinking that it would adversely affect their prospects in the United States or that it could cause problems with family members who are illegal aliens and subject to possible deportation or other sanctions if discovered.

This paper studies the effects of legalization on health outcomes, using the relatively exact identification from the IRCA application to do so. Unlike other evaluations of illegal aliens' and

their usage of the medical system, I provide some robust statistical findings instead of qualitative survey data or basic summary statistics. This paper has the advantage of superior identification and a large dataset comprising over 1.6 million illegal immigrants across California (on average approximately 6% of the state population, Figures 2 and 3) in order to allow for more robust tests. This paper complements the large literature on illegal aliens and the labor market with quantitative data on health outcomes. This paper attempts to inform policy debate regarding the provision of health services to illegal immigrants, as well as to contributing to a larger literature on the effects of provision of medical care on health outcomes in the wider populace.

4 Data

There are two principle sources of data used in this paper. The first is the 1990 Legalization Summary Tapes created by the Immigration and Naturalization Service (now US Citizenship and Immigration Service). The 1990 Legalization Summary Tapes give program details as well as demographic information on each applicant to the 1986 IRCA.

The primary purpose of this dataset is to quantify the number of IRCA applicants in each county in the United States. Well over 90% of the applicants to the 1986 IRCA were accepted into the program, so this list of applicants is a good measure of the number of illegal immigrants that were legalized in each of these counties and the year in which they were legalized. Due to privacy concerns, counties where fewer than 25 applicants resided are not listed, and only the state of residence is given. However, the IRCA applicants in these counties compose well under 10% of applicants, so the county level data are still relatively comprehensive. This dataset is useful in providing an accurate demographic and geographic portrayal of the illegal immigrants in question. While there have been many estimates of the size and distribution of the illegal immigrant population, such as Robinson (1980) and Hanson (2006), this paper sidesteps the need for such estimations as it uses the 1990 Legalization Summary Tapes, and can therefore accurately count every individual illegal immigrant who applied to the 1986 IRCA.

Also taken from the 1990 Legalization Summary Tapes is other demographic information used for weighting of health outcomes. Since the demographic composition of IRCA applicants differs greatly from that of the general population, it would be inappropriate to use only the absolute level or the ratio of immigrants in a county as our dependent variable. Mortality rates and fertility rates vary greatly with observables such as marital status, race, age, and income. In a brief examination of our applicant data, we find that the mean ratio of IRCA applicants to county

population in California is approximately 6 percent, with county ratios ranging from 0 to over 60 percent. The data also shows the applicant population is overwhelmingly male, at approximately 73% of total applicant population. In addition, the applicants, with a median age of 27.5 years old, are significantly younger than the state median, which was over 31 years. The average annual wage, when reported, is much lower than that of the average Californian. Almost 80% of applicants do report some information on earnings. On average, they report earning approximately $12,000 a year when reporting an annual wage, or $6 an hour when reporting an hourly wage, two reassuringly consistent values for self-reported pay. Finally, the applicants are overwhelmingly (over 94%) Hispanic and primarily originated from Mexico. All of these demographic differences will influence the weighting of health outcomes in each county, as, for example, in a county in which all applicants are young males, legalization will not be expected to have as large an impact on mortality as a county with primarily young women with newborns or a county possessing many more elderly immigrants.

Our outcome data is comprised of information from the California Death Index from San Francisco Genealogy. With it, we can observe more than 10 million deaths throughout California. The data of interest is comprised of birth date, death date, county of death, place of birth, Social Security Number (if available), and sex. Thus we can find all deaths in the years surrounding the IRCA and OBRAs by county, allowing us rich panel data to work with. This data also enables us to filter deaths by age, enabling a more precise view of deaths more likely to be among the IRCA applicant population. A fundamental assumption of this paper is that while illegal aliens may generally shun the medical establishment, their deaths are still reported and recorded at the same rate as the general population.

5 Methodology

The desired strategy would be to compare the mortality rates in 1986 and 1989 of population ineligible for Medi-Cal and Medicaid in 1986 who were then made eligible by the 1986 and 1987 OBRAs. However, exact counts of this population are not available, so another group who most closely meets this criteria is desirable. Simply utilizing numbers in poverty do not offer the best proxy, as many of the poor already had some access to healthcare from state and federal programs. IRCA applicants offer a good proxy because, as illegal immigrants, they were all ineligible for Medicaid and Medi-Cal prior to the reforms, and due to their almost uniform poverty, they were mostly eligible for Medicaid or Medi-Cal after the reforms. Also, as exact mortality rates of this

group are not available at the individual level, another way of quantifying the impact of healthcare and immigration reforms must be found. To circumvent this problem, I utilize the rich county-level information in both datasets. From this, I can construct measures of which counties will be more or less affected by the reform, as a function of the percentage of the population which is part of the IRCA applicant group. This allows me to gauge the relative impacts of the OBRAs as it varies across counties.

In addition to the primary independent variable of ratio of IRCA applicants to a county's population, I utilize other county-level demographic and economic variables as controls for the impact of the OBRAs on the county's mortality rate. In particular, I will use county poverty rates and average household income to control for lack of access to healthcare outside of its IRCA population. I will also strip out IRCA applicants whos reported incomes place them above the new Medi-Cal and Medicaid thresholds. This will help control for existing county level variation in healthcare coverage rates among native Californians before the reforms, as county level insurance coverage information is not available until 2000 and after. This control is necessary as there is a positive relationship between county poverty level and the number of IRCA applicants per capita in that county.

My empirical approach utilizes a difference-in-differences methodology to examine effects on mortality at a county level. The primary specification will use as the dependent variable the differnce in mortality per capita between 1986 and 1991. The independent variable of interest will be the weighted difference in legalized IRCA applicants per capita between these two years, that is, the entirety of the IRCA applicant pool within a county weighted by demographic characeristics. This specification will attempt to capture the entirety of the effect, β_1, of the IRCA legalization and expansion of healthcare on mortality changes between these years.

$$(DeathsPerCap_{i1991} - DeathsPerCap_{i1986}) =$$
$$\beta_0 + \beta_1(ApplicantsPerCap_{i1991} - ApplicantsPerCap_{i1986}) + \beta_3 W_{it} + u_{it}$$

$i = 1, 2, \ldots, 58$
W_{it} = Other demographic and county level controls

The weighting of numbers of IRCA applicants is done to provide a truer measure of their impact on county level mortality, as their demographics differ so radically from those of native Californianas. It is not expected that the cohort of IRCA applicants would have equal levels of mortality as native Californians, even given identical healthcare access, as they many many times

fewer elderly and infants among them. Thus, the average IRCA applicant that we are using as treatment is expected to have a much lower level of mortality than a native Californian given the same level of care. I construct this weighting by county as different counties will have differing compositions of IRCA applicants.

I utilize CDC data to construct average mortality levels for 5 and 10 year age buckets for both males and females, as seen in Figure 4. I then apply this weighting by county, matching the mortality rates to the exact numbers of IRCA applicants by age and sex. In doing so, I can construct a weighted number of IRCA applicants by county which is a statistical approximation of the number of average Californians that group of IRCA applicants is equivalent to in terms of mortality. On average, a given county's IRCA applicant population of 1000 will be statistically equivalent to approximately 300 Californians in terms of expected mortality rate, due to the applicants' far lower numbers of elderly and infants.

I also examine a measure of differenced mortality per capita that only takes into account deaths of those between the ages of 6 and 60. As the IRCA applicant population contains so few outside of this range (1.5% of the total), it is implausible that legalization and healthcare reform would cause drastic changes in the number of deaths among these groups. Restricting the data to this range of ages focuses on a more realistic potential treatment effect of legalization and healthcare reform.

6 Regression Results

Table 1 presents results from this empirical specification. As demographic and economic characteristics differ so widely between counties, both demographic and economic controls are included in the primary specification. I find that an increase of one point in the percentage of weighted IRCA applicants in a county is associated with an excess decline in mortality per capita of .047%, compared to an average pre-reform mortality rate of .85%. This number is suggestive of a pre-reform rate of death among IRCA applicants of approximately 5 times as great as natives, given they have equal rates of mortality in the post-reform years. I also examine the impact of the unweighted population of IRCA applicants, finding a much smaller effect consistent with their lower average mortality as compared to California natives.

In addition, I present a specification in which the per capita mortality considers only deaths of those whose age is between 6 and 60 as an alternative to the weighting procedure. I do this using both age-restricted, unrestricted, and weighted IRCA applicant data. Using this specification, I again find a significant negative effect on mortality, but this effect is drastically smaller than that

of the unrestricted mortality data, reflecting the much smaller average mortality rate among this group. Among this group, I find that an one point increase in the percentage of weighted IRCA applicants in a county is associated with a decline of .001% in the absolute mortality rate. This is equivalent to the average mortality rate among this age group dropping by approximately 6%. This again suggests a large degree of excess mortality among this group prior to legalization and healthcare reforms, or, due to perhaps an implausibly large effect, an unknown omitted variable

Presented in Table 2 are results from placebo tests, regressing the same differences in legalized IRCA applicants per capita on differences in mortality rates for non-treatment years. I test for effects on mortality rates between 1984 and 1986, as well as between 1991 and 1993. I find no significant effects on differences in mortality rates between these years, suggesting that it was not simply a trend in counties with higher levels of IRCA applicants around this time.

While I examine mortality outcomes due to changing legality and eligibility of IRCA applicants, I cannot precisely determine the channel by which such changes took place. There exist a myriad of possible paths through which these reforms could have substantially reduced mortality rates among the affected population. Though I posit that much of the change occurred due to changes in healthcare eligiblity, there were also non-healthcare related channels that could have effected mortality rates. Since the 1986 IRCA took place at the same time, the effects could have been due to changes in working conditions and higher incomes attained by IRCA applicants through their newly legal status. With such higher incomes, this population could have changed to more secure and healthy neighborhoods. In addition, higher incomes could be used to purchase private care which was previously unaffordable, no matter their legal status, and would have reduced mortality even in the absence of the OBRAs. In contrast to these channels which magnify mortality outcomes, there exist a number of channels which greater access to healthcare would crowd out and thereby mitigate observed decreases in mortality. Things such as private spending on healthcare, healthy or careful behavior to avoid having to visit doctors or hospitals, or travelling back to an immigrant's home country for medical work or child delivery, would all be effected by these reforms.

One extension that I would like to explore further would be the effect of legalization on migration within the state and the country. Legalization of immigration status would most likely lead to an increase in migration, as immigrants felt freer to look for jobs openly or travel within the country with greater ease. This would also effect my analysis of mortality outcomes if migrants systematically moved from or moved to certain counties, thereby reducing the accuracy of my locational data.

7 Conclusion

In this paper, I find evidence that the 1986 IRCA and the 1986 and 1987 OBRAs, which legalized and provided healthcare to the vast majority of illegal immigrants residing in California, had the effect of significantly lowering mortality rates among this group. On the assumption that IRCA immigrants possessed mortality rates equal to those of natives with the same income levels, I find that these reforms helped to reduce excess mortality rates which were on the order of five to six times higher than those of native Californians. Though I cannot determine the exact channels through which these reforms reduced mortality rates, these results are robust to a number of placebo tests, controls, and restrictions. While an intuitive result, that access to healthcare generally reduces mortality rates, I hope to further explore this result with further work to include migration and explore more specific channels through which this effect occurred.

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Table 1: Effect of Difference in IRCA Applicants on Difference in Deaths Per Capita, 1986-1991

Effect on Difference in Deaths per Capita, by County								
					Age Restricted Death Ratios (6-60)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Weighted Legalized IRCA applicants	-.0473		-.0188				-.0011	-.0003
	(.0226)**		(.0189)				(.0005)**	(.0002)
Unweighted Legalized IRCA applicants		-.0102		-.0042		-.0002		
		(.0053)*		(.0046)		(.0001)*		
Age Restricted (6-60) IRCA applicants					-.0013			
					(.0006)**			
County Poverty Controls	X	X			X	X	X	
County Demographic Controls	X	X			X	X	X	

Table 2: Placebo Year Testing

Placebo Tests for Effects on Difference in Deaths per Capita, by County								
					Age Restricted Death Ratios (6-60)			
	1984-86		1991-93		1984-86		1991-93	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Weighted Legalized IRCA applicants	-.0065		-.0086		-.0007		.00014	
	(.021)		(.013)		(.0009)		(.0009)	
Age Restricted (6-60) IRCA applicants		-.0016		-.0022		.00002		-.0002
		(.0049)		(.003)		(.0002)		(.0002)
County Poverty Controls	X	X	X	X	X	X	X	X
County Demographic Controls	X	X	X	X	X	X	X	X

Table 3: Summary Statistics

	Applicants	California
Male	.663	.499
Female	.337	.501
Median Age	27.5	31.3
1-5 years	.0002	.080
6-10 years	.025	.075
11-15 years	.048	.067
16-20 years	.138	.069
21-25 years	.226	.084
26-30 years	.200	.096
31-35 years	.144	.095
36-40 years	.088	.084
41-45 years	.053	.072
46-50 years	.033	.054
51-55 years	.021	.043
56-60 years	.011	.038
61-65 years	.005	.037
66+ years	.006	.105

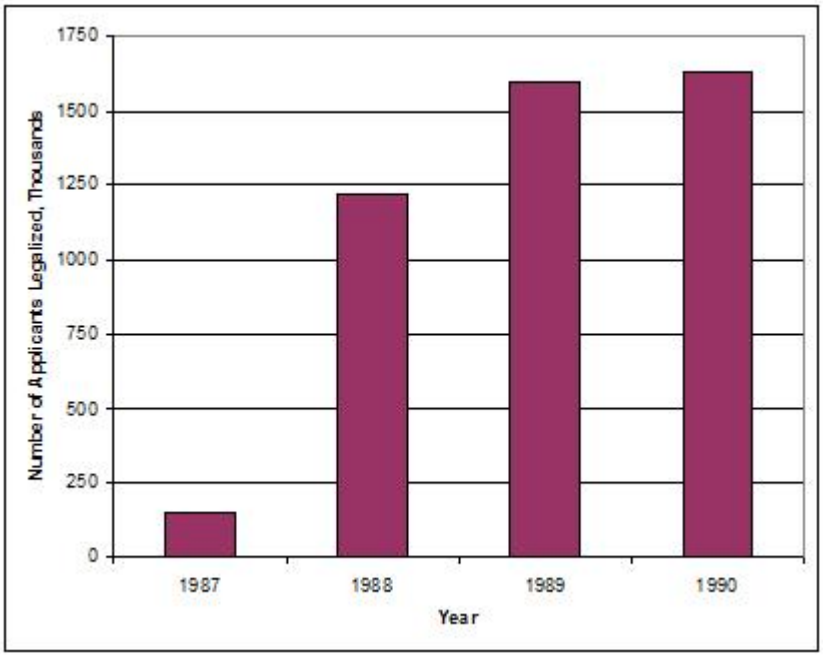

Figure 1: Cumulative Number of IRCA Applicants Legalized

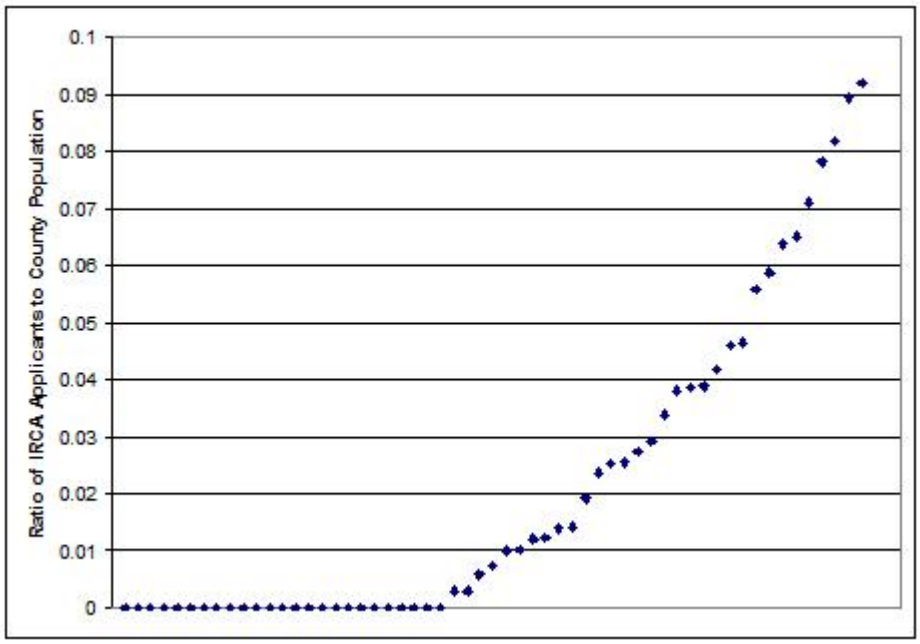

Figure 2: Ratio of IRCA Applicants to Population, by County

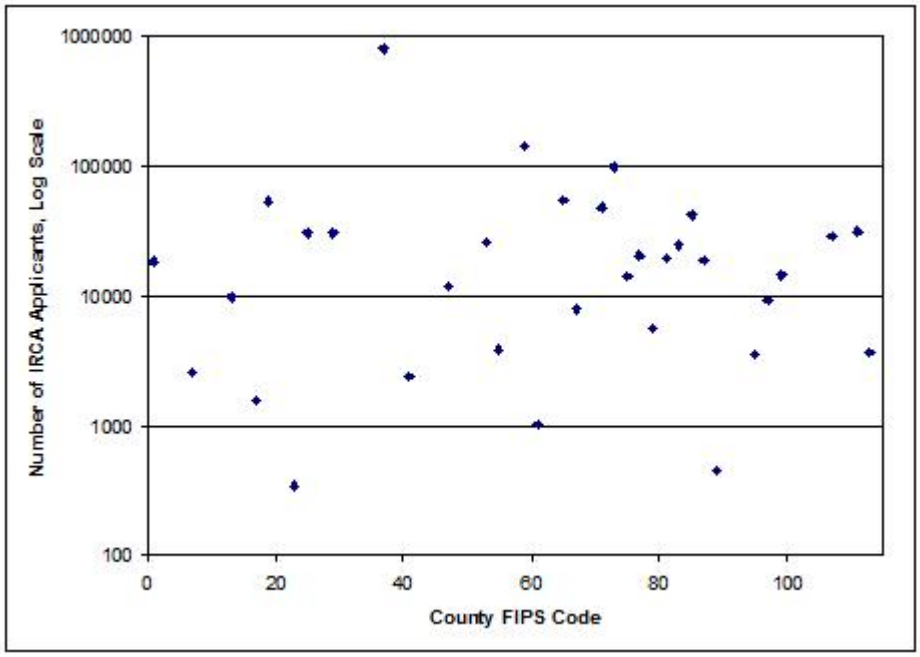

Figure 3: Number of IRCA Applicants, by County

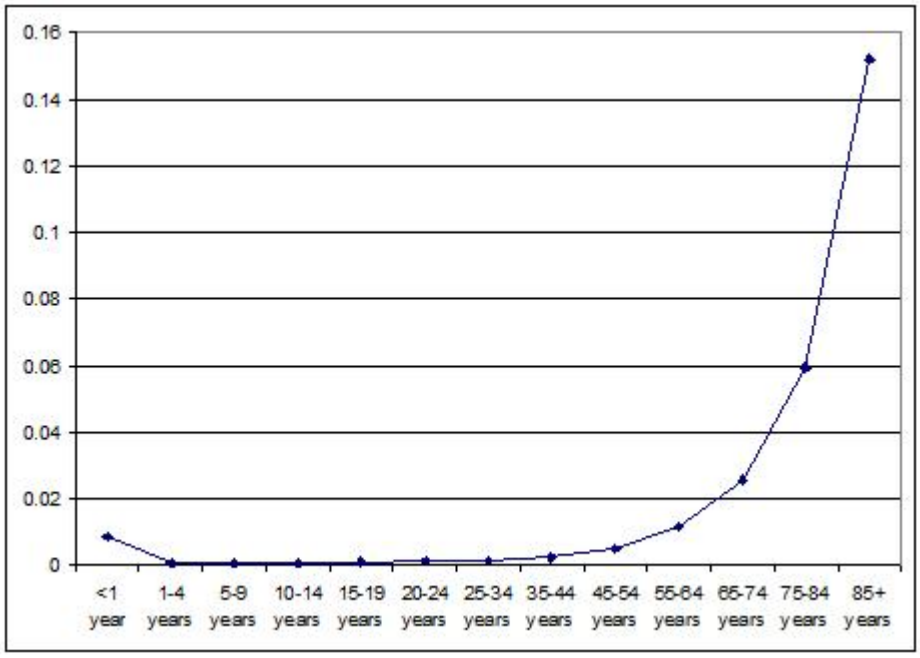

Figure 4: Annual Mortality Rate by Age