Suicide Rates in Greece: Comparing Mortality Data with Police Reporting Statistics and Investigating Recent Trends

ALEXANDRA TRAGAKI
KONSTANTINOS LENOS
Harokopion University of Athens, Greece

Abstract

This paper analyzes recent suicide trends in Greece. It relies on two separate databases, vital statistics and police records, the latter never having been explored before. Those datasets present a different picture about the suicide rates and trends, confirming the crucial importance of data reliability and consistency in time trend analysis. Frequencies and ratios were calculated and compared using paired sample t-tests. Overtime trend changes were detected applying segment regression analysis on both data collections. Our findings suggest that there are important differences between vital and police statistics on suicides. At national level, over the period 1990–2013, vital statistics reported an average of 7 percent more suicides, annually. Differences were more pronounced among women and younger ages. Both datasets confirm a change in total suicide trends during recent recession, but police data analysis supports that increases are less impressive than vital statistics claim.

Keywords: suicide, police statistics, data sources comparison, recession, Greece

Introduction

It is a common conviction that suicides increase with economic hardship. Sufficient empirical evidence has been provided over different time-periods from various cultural and social environments. During the years of Great Depression, in late 1920s, a large number of stockbrokers and bankers are said to have jumped to their death in Wall Street. Suicides rose dramatically in response to painful economic reforms implemented after the collapse of Soviet Union in early 1990s (Gavrilova et al. 2000). Likewise, the Asian financial crisis that occurred in 1997–1998, though considerably shorter in duration, has been associated with increasing suicide rates in most of the affected countries, especially in South Korea, Japan and Hong Kong (Kwon et al. 2009; Chang et al. 2009; Khang et al. 2005). A fast growing number of studies support that the latest re-

cession, especially the inexorable rise in unemployment rates, has sharply affected suicide trends in several industrialized countries (Phillips and Nugent, 2014; Blasco-Fontecilla et al. 2013; Chang et al. 2013; De Vogli et al. 2013; Lopez Bernal et al. 2013; Barr et al. 2012).

Greece, one of the hardest hit European countries, is repeatedly cited when it comes to the severe side effects of financial austerity. There is a widespread concern that country's traditionally low[1] suicide rates have spiked since the outburst of the economic recession. Domestic and international media have been nourishing this conviction with relevant stories running at the headlines of newspapers[2] or on the television news. Most of those reports are based on scientific research findings. From the very early and sometimes poorly justified papers (Economou et al. 2011; Madianos et al. 2011; Chang et al. 2013) to the more recent works (Rachiotis et al. 2015; Branas et al. 2015; Antonakakis and Collins 2014; 2015; Madianos et al. 2014; Gatopoulos 2013), suicides – in absolute numbers as well as in rates – have skyrocketed in response to increasing joblessness, serious income setbacks, health deterioration and depression. Yet this relationship is rather speculative, since neither the nature of the data nor the methods applied allow for establishing causality. Nevertheless, only sporadically have some researchers expressed skepticism about how adequately the "crisis-driven suicide increase"-hypothesis has been addressed (Branas et al. 2015; Rachiotis et. 2015).

Data quality and consistency, a crucial issue in trend analysis, has been largely overlooked by almost all previous studies on Greek suicides. All previous works on Greek suicides rely on vital statistics; it is, to our knowledge the first time, police data are explored. The scope of this work is to offer a complementary analysis in the already large relevant literature by bringing into the equation new data and by revealing issues that merit some closer attention. This paper aims to compare two different data sets on suicides and come up with some conclusions about data consistency; to investigate reasons behind data discrepancies and to identify to which extend those discrepancies might have an impact on recent trends.

The first part of this paper compares data supplied by vital and police statistics, estimates differences in reported numbers both in aggregate level as well as across different demographic subpopulations, and investigates potential explanations behind inconsistencies. This process helps identifying the weaknesses of each data collection.

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1 The very low suicide rates recorded in Greece had been repeatedly mentioned in relevant studies (see among others Värnik 2012; Chishti et al. 2003; La Vecchia et al. 1994) and have intrigued discussions about the social, institutional or even environmental factors behind them.

2 "Draconian austerity measures instituted as a result of Greek debt crisis have taken a dramatic toll on male suicides" (The New York Post, 23/4/ 2014), "Suicides in Greece rise by a third as financial crisis takes its toll" (Daily Mail Online, 15/8/2012), "Troubled Times: Wave of Suicides Shocks Greece" (Spiegel International, 15/8/2014) are only a few of the dramatic reports that have dealt with the issue. It is anything but surprising that all those reports have received deft political manipulation.

Discrepancies between datasets and overtime fluctuations may serve as a proxy of data inconsistency. At a second stage we perform joinpoint regression in order to examine overtime trends and identify discontinuities in age and sex specific suicide rates since 1990. Joinpoint analysis is applied on both datasets and findings are compared. Rather than juxtaposing those results, the aim is to bring them together in order to better seize the phenomenon and its overtime developments. It needs to be clarified that we do not advocate that police data on suicides are more reliable than vital statistics, neither the contrary. As described in next sections, both datasets have limitations and none of them captures the full size or time variations of the phenomenon. Yet, police data deserve to be further examined in order to make them tell their own story. Against the adverse economic background, this comparison acquires an additional importance, as it sheds new light on the skepticism about how adequately the "crisis-driven suicide increase" hypothesis has been addressed by previous studies and has been massively reproduced by the media.

Data and Methods

Official national data on suicides are provided by two independent systems. The first one is the vital statistics system, coordinated by the Hellenic Statistics Authority (EL.STAT.), which compiles national mortality data from the death certificates. The other system, the Police Statistics annually provided by the Hellenic Police Authority (EL.AS.), bases its information on summary reports filed by local law enforcement authorities. The two systems use the same definition about suicide, practically investigate the same cases but report their findings independently through separate channels that end up to two distinct databases.

Datasets comparability is only possible using frequencies for different sub-groups so as to identify discrepancies between the two data sources. Both datasets provide demographic and geographical information about suicidal events. Demographic information concerns the age and sex of the person involved. To make records match and facilitate comparison across different ages some data reorganization was necessary. On the contrary, data compatibility could not be achieved for geographical information. In police records, suicides are classified in respect to the place the event occurred, while in vital statistics suicides are presented on the basis of permanent residence. Therefore, our working data are tabulated by sex (males, females) as well as by three age groups (less than 30, from 30 to 40 and above 40 years of age). The period covered goes from 1990–2013 for vital statistics and from 1990–2014 for police data.

Crude suicide rates (CSR) are expressed as the number of suicides per 100,000 person years of the exposed population, using the estimated mean population of five-year interval age-group in each year. The exposed population refers to all persons above the age of 10, as the occurrence of suicides among Greek children equals to zero. Overall, male and female CSR have been calculated for each data set.

Based on the suicide frequencies, we produced the vital to police suicide ratio (thereafter V/P- ratio) by age and sex. A ratio above 1.0 suggests that the annual suicide rate deduced by the vital statistics is higher than that coming from the police statistics. As the V/P ratio moves away from 1.0 the gap between the reported numbers gets wider. All statistical analysis is performed using IBM SPSS Statistics 21.

To investigate time trends and examine their significance, we perform a segmented regression, a form of regression that allows multiple linear models to be fit to the data for different ranges of the explanatory variable (Ryan and Porth, 2007). Segmented regressions are performed using Joinpoint, the segmented regression analysis software program (available at http://srab.cancer.gov/joinpoint) that is widely used for characterizing trends, mostly in cancer rates. With the use of segmented regression we determine the number of breaking-points (segments) needed to adequately explain the relationship between the dependent variable (here suicide rates) and time defined as independent variable. Overall, male and female suicide rates have been tested separately. The main goal is to uncover changes in the suicidal behavior time trend and to assess the number (if any) and the location of those changes (known as join points). The number of join points is determined by performing several permutation tests (the default number of 4499 permutations has been adopted); the p-value of each permutation test is estimated using Monte Carlo methods, and overall asymptotic significance level (a=0.05) is maintained through a Bonferroni adjustment. The final selected model is the one with "the smallest number of join points such that, if one more join point is added, the improvement is not statistical significant" (Joinpoint Program 2014). The number of join points per regression is limited to a maximum of four, as recommended (Kim et al. 2001).

Results

Comparing different datasets

When it comes to suicides, there is a large consensus among researchers that official statistics do not capture the real intensity of the phenomenon (Phillips and Ruth 1993). The discrepancy between actual and registered figures stems from different reasons, such as difficulties in detecting suicides (especially for certain modes of suicide), misclassification (usually in favor of undetermined deaths) or even deliberate concealment in order to appease the family from cultural and social prejudices (Tøllefsen et al. 2012; Linsley et al. 2001). For a suicide verdict to be returned there has to be clear evidence showing beyond reasonable doubt the person's intention to take his/her own life. But even if subsequent investigation determines that a death was actually a suicide, the death certificate may fail to reflect that. There seems to be enough evidence from different countries that medical examiners often carefully omit the word "suicide" and record the death circumstances rather than the real cause (i.e. "severe injuries due to falling from a height" or "poisoning") to spare the victim and his/her family the social

stigma often associated with this very specific cause of death (Cooper and Milroy 1995). In Greece, when a suicide is suspected, there is always an inquest involving a police officer, a physician and if necessary a coroner. As soon as the subsequent investigation determines the cause of death, the medical examiner signs the death certificate and returns the final verdict on the cause of death; vital records are thereafter compiled by the EL.STAT. Meanwhile, the police officer involved into the investigation provides a summary report where the event is registered and classified in respect to its nature (homicide, attempted or completed suicide, or accidental death). Police statistics are based on information provided by those reports.

Data provided by separate systems can hardly be expected to be identical. Four possible sources of differential ascertainment emerge from the analysis of the reporting practices and coverage of the procedures applied. The first source has to do with deliberate concealing of a suicide on death certificates. Given the country-specific social and cultural attitudes[3], this may be a good reason why vital statistics may lag behind police data. A second reporting difference may be generated by those incidences where substantial evidence on suicidal intention is discovered only after an in-depth inquest which may take long; it remains unclear whether and how often mortality or police data are revisited and corrected. A third source of differential ascertainment may be caused by differences in coverage. Both systems are supposed to reach the whole Greek population. Yet, a rather limited number of incidents are not investigated by the Police Authorities, for they are not within its competence. For instance, incidents occurring in open sea are investigated by the Port Police Authorities and are, thus, not included in police records. A forth source of differences appears to be due to timing. For a number of suicidal attempts, the outcome is not instantly fatal. Police statistics risk falling behind the actual number of suicides if those are not completed on the spot, but the death occurs latter in a hospital (such events are registered as suicidal attempts by police officers).

The first of the above mentioned differences in ascertainment is likely to decrease the number of suicides registered in vital statistics compared to those reported by the police. All other three sources of differences would make police data lag behind the actual number of suicides. It is of course hard to quantify the impact of each of those factors, but if registration were not subject to social pressures, vital statistics would be expected to better capture the full size of the phenomenon. On the contrary as long as suicides are stigmatized and kept into dark, death certificates may reflect only part of this phenomenon real dimensions. In such a case police data may be more reliable.

For the 24-year period here examined, the overall V/P ratio is 0.93 which means that vital statistics reported about 7 per cent fewer cases than police records. For the

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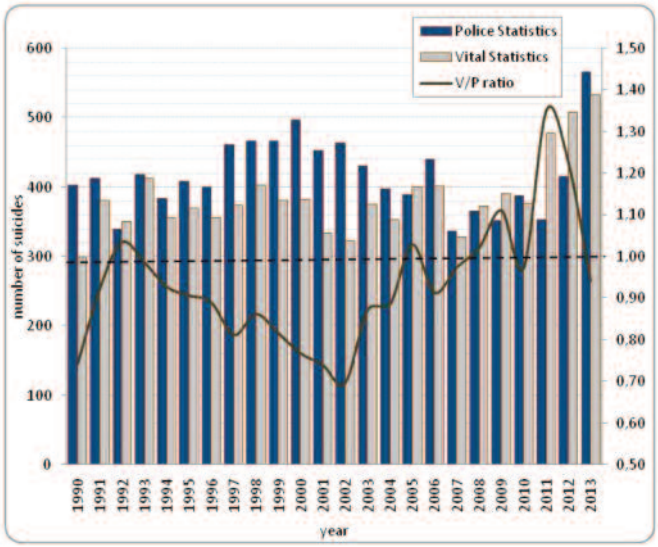
3 Suicidal behavior had for long been stigmatized, as the Greek Orthodox Church strongly condemns suicidal behavior and refuses a burial ceremony to those who take their own lives.

whole period, this ratio is 0.99 for men and just 0.72 for women, suggesting a higher "female evasion" from vital statistics. The annual V/P ratio varies in a non-systematic way: up to 2008, suicides reported in Police Statistics steadily – and for some years largely – outnumbered those in vital statistics (Figure 1 and Table 1). This discrepancy implies that a number of deaths although certified as suicides by the police process is not registered as such on death certificates. For no obvious reason, in 2008, the difference reversed and the gap has been widening ever since: suicides reported in vital statistics are substantially higher than those in police records. According to 2011 and 2012 official data, the annual excess was 35% and 22%, respectively. This gap is too wide to be justified by the above mentioned reporting, coverage, or timing effects. As no changes in suicide definition or reporting process within any of the two systems have occurred during those years, this development raises serious concerns about data consistency. This "over-reporting" in vital statistics coincides with the recession years. Therefore, a recession effect on recording efficiency, as implied by Rachiotis et al. (2015), may not be excluded.

Figure 1. Vital Statistics versus Police Secords about suicides in Greece, 1990–2013



Note: $\frac{V}{P} = \frac{number\ of\ suicides\ (per\ year)\ reported\ on\ Vital\ Statistics}{number\ of\ suicides\ (per\ year)\ reported\ on\ Police\ Records}$

The left axis refers to the number of suicides per year.
The right axis refers to the V/P ratio.

Source: EL.STAT. Mortality Statistics 1990-2013; EL.AS. Annual Volumes 1990-2013.

Table 1. Comparison of Vital Statistics and Police Records on suicides, Greece, 1990–2013

	Number of Suicides				V/P ratio
	Vital Statistics		*Police Records*		
	Mean	Stan. Dev.	Mean	Stan. Dev.	
Total population	387.04	52.15	416.96	52.15	0.93
Males	313.71	43.22	318.21	43.36	0.99
Females	73.33	16.19	98.75	21.92	0.74
<30	62.04	13.12	72.92	19.53	0.85
30-40	61.83	2.30	69.79	11.58	0.89
40+	263.17	45.72	274.25	40.29	0.96

Source: EL.STAT. Mortality Statistics 1990-2013; EL.AS. Annual Volumes 1990-2013.

It needs to be investigated whether differences between vital and police statistics on suicides are statistically significant. To test this hypothesis, a dependent sample t-test was performed on each of the six separate pairs (males, females, total, < 30 years, 30 to 40 years and above 40 years of age) created. Prior to conducting the analysis, the assumption of normally distributed difference scores (vital – police statistics) was examined and considered satisfied as the Saphiro-Wilk test p-value was in all six cases above 0.05. The null hypothesis of non-statistically significant difference between numbers of suicides reported by different sources was rejected for females ($t(24)=-5.896$, $p=0.00$), for persons below 30 years of age ($t(24)=-4.686$, $p= 0.00$) and for those in their 30s ($t(24)=-2.864$, $p<0.01$). Thus, results suggest that police statistics annually report statistically significant higher numbers of suicides for women and younger persons. Differences were not proved to be statistically significant for men neither for persons above 40 years of age (Table 2).

Table 2. Comparing differences in annually reported number of suicides between Vital Statistics and Police Records using Paired Sample test.

	Paired differences					*t*	*df*	*p-value*
Vital-Police Statistics	Mean	St. deviation	St. error of mean	95% confidence interval of the difference				
				Lower	*Upper*			
Males	-4.5	44.5	9.01	-23.28	14.28	-0.496	23	0.625
Females	-25.4**	21.1	4.31	-34.33	-16.50	-5.896	23	**0.000**
Total	-29.9*	61.3	12.52	-55.81	-4.02	-2.390	23	**0.025**
Below 30 years	-10.9**	11.4	2.32	-15.68	-6.07	-4.686	23	**0.000**
30-40 years	-8.0**	13.6	2.78	-13.07	-2.21	-2.864	23	**0.009**
Above 40 years	-11.1	42.7	8.72	-29.11	6.946	-1.272	23	0.216

Note: * statistically significant at 0.05 confidence level.
** statistically significant at 0.01 confidence level.
Source: EL.STAT. Mortality Statistics 1990-2013; EL.AS. Annual Volumes 1990-2013.

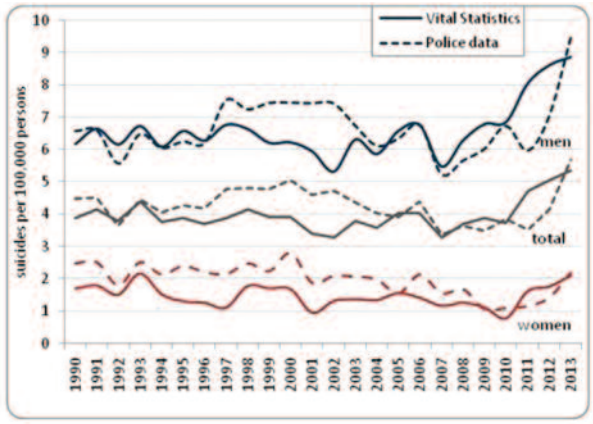
This is another interesting finding. A possible explanation may lie behind the fact that means chosen to commit a suicide are highly related to age and gender. Women are more likely to complete suicide using ambiguous means (like poisoning) while young people's suicides can be camouflaged as accidents.

Overtime trends and changes in suicide rates

Overall crude suicide rate fluctuates from 3 to less than 6 completed suicides per 100,000 persons above 10 years of age (Figure 2). Crude rates among men are about three times higher than among women, with more accentuated fluctuations. Based on police data, since the onset of the new millennium, male suicide rates varied from 5.2 to 9.4 while female rates fluctuated within a narrower range, from 1.1 to 2.8. Both overall and male suicide rates register their highest levels in 2013 (9.42 and 5.71 per 100,000 respectively) followed by 2014. It should not pass unnoticed, however, that the total number of suicides that occurred in Greece during the years of recession 2009–2014 was 2,588, by 5% lower than the 2,709 suicides registered during the so-called prosperous period 1999–2004, when the country was accepted into the EMU (2000), participated in the first wave of countries to launch the euro (2002) and hosted the Olympic Games (2004).

The joinpoint regression program is used to identify whether and when a statistically significant change overtime in linear slope of the trend occurred. This method chooses the best-fitting points where the rate increases or decreases significantly. Segmented regression analysis has been applied separately to each of six data series. Results are summarized on Table 3; it shows the years when suicide trends changed (join points),

Figure 2. Crude Suicide Rates by gender based on vital statistics and police records, 1990–2013



Source: EL.STAT. Mortality Statistics 1990-2013; EL.AS. Annual Volumes 1990-2013.

Table 3. Joinpoint analysis of trends in suicide rates for all ages by sex from 1990–2013 (vital statistics) and 1990-2014 (police records).

	Segment 1		JP 1	Segment 2		JP 2	Segment 3	
	APC	95% CI		APC	95% CI		APC	95% CI
Vital Statistics (1990-2013)								
Total	-0.5	(-1.1, 0.1)	2009	10.9	(4.4, 17.7)	-		
Male	-0.3	(-0.9, 0.3)	2008	8.3*	(4.3, 12.5)	-		
Female	-0.0	(-1.6, 1.6)	-			-		
Police Statistics (1990-2014)								
Total	1.57	(-.5, 3.6)	2000	-3.94*	(-6.7, -1.1)	2009	9.96*	(3.9,16.4)
Male	1.82*	(.0, 3.6)	2001	-4.43*	(-8.6, -.1)	2008	8.94*	(4.5, 13.6)
Female	-2.07*	(-3.1, -1.0)	-					

Note : Annual Percent Changes (APC), Joinpoints (JP) and 95% confidence intervals as calculated using the Joinpoint regression program.
*APC is two-tailed significant at 0.05 level (p-value <0.05)

Source: EL.STAT. Mortality Statistics 1990-2013; EL.AS. Annual Volumes 1990-2013.

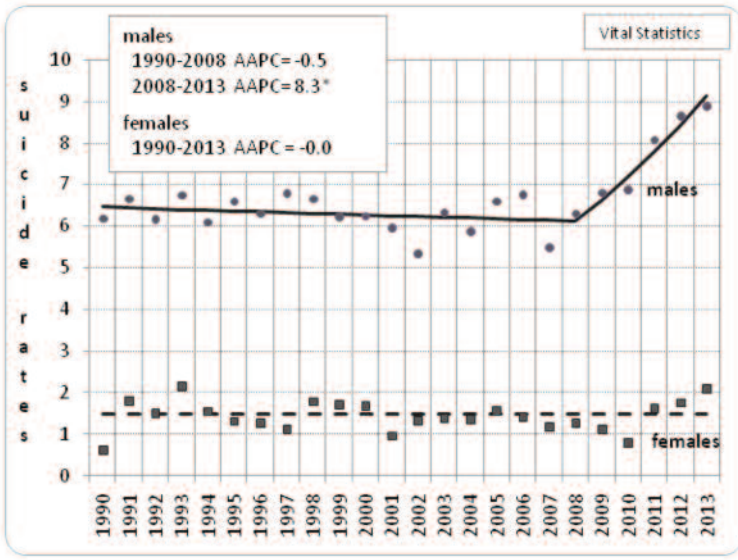
gives the annual percent change (APC) between join points and tests the assumption about this APC against the null hypothesis of zero annual change. Figures 3 and 4 illustrate gender differentiations for vital statistics and police dataset respectively.

Vital and police datasets have two different stories to tell; they share, however, some common results. First, both datasets confirm that suicide rates among males are about three times higher than among females. Second, they indicate a significant change in overall suicide trend in 2009 and in male suicide trend one year earlier, in 2008. A third common finding shows no significant trend change in suicide rates among females. Despite those common findings some interesting differentiations emerged concerning the timing and the intensity of changes, mostly among men.

Segmented regression applied on vital statistics data indicates that overall suicide rate decreased though not significantly during the years 1990 to 2009 (APC= -.5%; p-value=0.1) and has been increasing since (APC= 10.9%; p-value=0.0); the latter trend was statistically significant. Among males, suicide rates decreased (but not significantly) from 1990 to 2008 (APC= -.3%; p-value=0.3) and increased significantly from 2008 to 2013 (APC=8.3%, p-value<0.001). Female suicide rates followed a marginal though not statistically significant downward trend (APC= -.0, p-value=0.3). The absence of join-points indicates no significant trend changes in female suicide rates during the years 1990–2013.

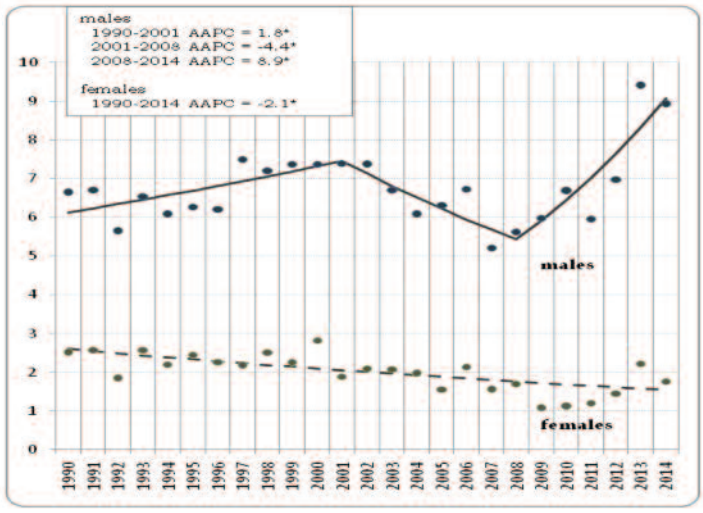
Police data are available up to 2014 and therefore cover a somewhat larger part of the ongoing recession. Results are illustrated in a wavier graph. After an upward trend during the 1990s, overall completed suicide rate started declining in early 2000, at a statistically significant rate of -3.94% annually, and then rebounded in 2009. Since 2009

Figure 3. Results of fitted segmented lines on annual male and female suicide rates (per 100,000 persons) applying Joinpoint regression analysis on Vital statistics for the period 1990–2013



Note : Annual Average Percent Change (AAPC)
* statistically significant at a=0.05 level
Source: EL.STAT. Mortality Statistics 1990-2013.

Figure 4. Results of fitted segmented lines of annual male and female suicide rates (per 100,000 persons) applying Joinpoint regression analysis on Police statistics for the period 1990–2014.



Note : Annual Average Percent Change (AAPC)
* statistically significant at a=0.05 level
Source: EL.AS. Annual Volumes 1990-2013.

increases in suicide rates are both high and statistically significant (APC=9.96%, p-value <0.01). Clearly, changes in suicidal behavior have been by far more pronounced for men than women (Figure 3). The joinpoint analysis depicts two points of trend change in male suicide rates, the first one in 2001 and the second one in 2008. The suicide rates for men presented a significant increase of 1.82% between 1990 and 2001, a significant decrease during the years 2001 to 2007, and another increase from 2008 onwards. The average annual rate of change of 8.49% observed since 2008 is statistically significant (p-value<0.01). Those high values confirm concerns about considerable changes in suicidal frequency among male population. In contrast, no significant trend changes have been identified in female suicide rates: they have been following an uninterrupted and significant fall since 1990 (APC= -2.88, p value<0.05).

Segmented regression applied on police statistics data shows that the suicidal behavior and its overtime trends vary considerably with age and sex (Table 4).

Although suicides are more frequent among men, not all men are at equal risk. Both data sets suggest that from 1990 till mid-2000s, the suicide risk among Greek men used to be strongly related to the age: it used to increase with age and peaked among elders above the age of 70. However, a change in male suicide pattern is probably underway. During 1990s and up to mid-2000s suicide rates of all age groups were decreasing, but sometime between 2007 and 2011, men of all ages experienced a significant change in trends. Recent increases have been steep and statistically significant for most age-groups, but for the very young (below 20) and the middle-aged (40–49) men. Of all

Table 4. Joinpoint analysis of trends in suicide rates by age and sex for 1990–2014 (police records).

	Segment 1		JP 1	Segment 2	
	APC	95% CI		APC	95% CI
Males					
< 19 years	-13.49*	(-19.8, -6.7)	2009	15.24	(-8.5, 4.52)
20-29	-5.76*	(-8.2, -3.3)	2010	20.44*	(7.2, 35.2)
30-39	-5.03*	(-9.3, -0.6)	2007	6.67*	(1.9, 11.6)
40-49	-1.20	(-3.6, 1.3)	2011	15.41	(-2.1, 36.1)
50-59	-4.57	(-9.5, 0.6)	2007	12.26*	(7.2, 17.5)
60-69	-5.42*	(-9.6, -1.1)	2008	9.52*	(2.7, 16.8)
70+	-2.17	(-4.6, 0.3)	-		
Females					
< 19 years	na				
20-29	2.14	(-2.2, 6.7)			
30-39	-6.08	(-12.4, 0.7)	2010	24.4	(-4.0, 61.2)
40-49	-2.89	(-6.9, 1.3)			
50-59	-7.12*	(-11.9, -2.8)			
60-69	-9.90*	(-14.5, -5.0)			
70+	-17.45*	(-30.2, -2.3)	2005	3.03	(-4.0, 10.6)

Note : Annual Percent Changes (APC), Joinpoints (JP) and 95% confidence intervals as calculated using the Joinpoint regression program.
*APC is two-tailed significant at 0.05 level (p-value <0.05)

Source: EL.AS. Annual Volumes 1990-2014.

age groups, men between 50 and 59 years of age seem to be the more vulnerable: they were among the first to experience a reverse in trends, in 2007, and currently register the higher suicide rate.

Trends in female suicide rates are less conditioned by age. Only for women in their thirties has there been a significant change in trends; yet that increase in suicide rates observed since only 2010 is not statistically significant.

Conclusions and Discussion

This work proposed a complementary approach in analyzing suicide trends in Greece. Our analysis relied on the comparison of two different data collections on suicides – vital statistics and police records, and came up with some interesting findings about data irregularities as well as age and sex specific differentiations in overtime trends.
This paper has a number of strengths. First, it brings into the discussion a valuable, though largely overlooked, data source and examines temporal variations according to police statistics. Second, the comparison of suicide levels and overtime trends using those alternative data sources allows for better seizing the phenomenon. Third, it offers some points of reflection about how adequately the "crisis-driven suicide increase" hypothesis has been addressed. There are also some limitations. Data comparability was only possible for specific population sub-groups. It was unfortunate that provided data did not allow for a more detailed comparison by narrower age-groups, by socio-economic characteristics, or by geographic level. Although that was out of the scope of this work, it would be interesting for future analysis to proceed with data matching techniques so as to improve data quality and results reliability.

Our analysis came up with some intriguing findings on data reliability as well as on recent trends and their variations across genders and age. Comparing mortality statistics with police records reveals how subtle an issue suicide is, how cautiously any conclusions should be drawn as well as how carefully results should be communicated. Data set comparison shed the light on striking data irregularities. Inconsistencies turned out to be gender and age related, as police statistics were found to be higher than vital statistics estimates for women and persons below the age of 40. Additionally the annual differences between police records and mortality statistics randomly vary with time, without following a particular pattern. However, police data outnumber vital ones in earlier years, but this is not the case during the last years of the period examined. This is a surprising and certainly worth mentioning finding that may suggest a recession effect on recording efficiency, if a pre-crisis underreporting practice is assumed. In future research, it would be interesting to investigate whether official registration process has been improved during the years of recession.

When examining recent trends, both datasets confirm a change in total suicide trends in 2008, two years before the country was bailed out by the international community and recession officially started. In line with other studies, our findings suggest that the

age and gender diversification is a crucial factor that needs to be stressed. Men are more vulnerable than women and certain age-groups are more prone to suicidal behavior than others. Men in their sixth decade are according to our analysis the most vulnerable of all population groups. Female suicide rates follow an uninterrupted downward trend, quite irrelevant to economic cycles. Nevertheless a trend change is underway for women in their thirties that are progressively becoming the most vulnerable age-group within female population. Moreover our analysis supports that there are also other factors but bad economy behind recent increases in suicide rates. Other parameters relevant to changing social attitudes as well as to improved registration process may have intervened and pushed suicide figures up.

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