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High Incidence of Gastric Cancer in El Salvador: A National Multisectorial Study 2000–2014

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Abstract

Background. Gastric adenocarcinoma (GC) is the fourth leading cause of global cancer mortality, and leading infection-associated cancer. GC has significant geographic variability, with a high incidence in East Asia and mountainous regions of Latin America. In the U.S., GC represents a marked disparity with incidence rates that are 2–3 times higher in Hispanics compared to non-Hispanic whites.

Methods. We conducted a national retrospective study of incident GC in El Salvador from to 2000–2014 to estimate the age-standardized incidence rate (ASIR) by using a combination of pathology and endoscopy databases. A unique multisectorial coalition was formed between the Ministry of Health (MINSAL) and ES Gastroenterology Society (AGEDES), representing public hospitals (n=5), governmental employee hospitals (ISSS, n=5), and private facilities

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(n=6), accounting for >95% of national endoscopy capacity. HER2 and EBV tumor status was ascertained in a representative sample during 2014–2016.

Results. 10,039 unique cases of GC were identified, 45.5% female, and mean age of 65. 21% and 9.4% were <55 and <45 years old, respectively. ASIRs (M, F) were 18.9 (95%CI;14.4–20.7) and 12.2 per 100,000 persons (95%CI;10.9–13.5), respectively, in the period 2010–2014 with all centers operational. Intestinal GC was 2.8 times more common than diffuse GC. 23.2% had partial or complete pyloric obstruction. The HER2 2+/3+ status was 16.7% and EBER positivity was 10.2%.

Conclusions. A high incidence of gastric cancer was confirmed in El Salvador, and nearly half of patients were female.

Impact. The findings have implications for cancer control in the Central America LMICs and for U.S. Latino populations.

Keywords

Gastric Cancer; Stomach Neoplasms; Incidence; Low-and-Middle Income Countries; Central America; El Salvador

Introduction

Gastric cancer (GC) is the fourth leading cause of global cancer mortality, and the leading infection-associated cancer. Globally, GC is one of the most common cancers, contributing to more than 1 million cases per year and 5.7% of all cancer diagnoses.(1, 2) (1)GC has significant geographic variability (15–20 fold) with a high incidence in East Asia, Eastern Europe, and the mountainous regions of the Pacific littoral of Latin America.(3–5) Immigrants from high incidence regions who emigrate to low incidence regions (North America, Western Europe) maintain the incidence rates and risk of their nations of origin.[6–9] In the U.S., GC represents a marked cancer disparity with 2–3 times the incidence rates among all non-white populations, including Latinos, and immigrant populations are a contributing factor.[10–13]

The World Health Organization (WHO) reports that approximately 70% of the global cancer burden occurs in lower- and middle-income countries (LMIC).[14],[15, 16] It is estimated that 30–50% of cancers in low/middle-income countries (LMICs) are preventable.(14, 15) Risk factors for GC in Latin America are multifactorial and include a high prevalence of *H. pylori* chronic infection, host genotypes and responses, and dietary, behavioral, and environmental factors. [17, 18]

The Central American Four (CA-4) is the geopolitical region of El Salvador, Honduras, Nicaragua, and Guatemala, and is the largest LMIC region in the western hemisphere with a population of >44 million and with >6 million U.S. immigrants. The CA-4 lacks population-based cancer registries (PBCR), although several are in process.(19) The International Agency for Cancer Research (IARC) usually imputes data for the region. The GC burden in the CA-4 region is projected to increase by 80% by the year 2030.(1) Although clinicians and health professionals are aware that GC is a daily and significant challenge, historically,

the lack of resources has precluded reliable data and PBCRs, in contrast to HIC/HIMCs (e.g., Costa Rica, Colombia, Chile).(19)

El Salvador (ES) lacks reliable GC incidence data. Based on the limited information reported, the WHO identified GC as the second most common cancer in El Salvador, which has an insufficient healthcare workforce and infrastructure. (7, 8) In 2015, El Salvador's Ministry of Health (MINSAL) recognized GC as the leading cause of cancer hospital discharge diagnosis. IARC currently estimates the ASIR in El Salvador of 11.9 and 9.2 in men and women, respectively, based upon imputation methods.(1, 20) The aim of this study is to estimate the ASIR of GC in El Salvador using all available endoscopy and pathology databases of the three sectors of the health system.

Materials & Methods

A unique collaboration was formed with the three sectors of the El Salvador hospitals and health system: public system (Ministry of Health, MINSAL), "Social Security" system for government employees (Instituto Salvadoreño de Seguridad Social, ISSS), and private gastroenterology groups through the national professional society (Sociedad de El Salvador de Gastroenterologia, AGEDES). A retrospective analysis of data from 16 different hospitals and centers in El Salvador was conducted to estimate the age-standardized incidence rate (ASIR) of GC. The hospitals and endoscopy facilities are located in three principal urban areas: San Salvador, Santa Ana, and San Miguel.

Population.

The Republic of El Salvador is located on the coast of the Pacific Ocean, occupying an area of 21,041 km^2. The estimated population for the year 2021 is 6.3 million inhabitants with an approximate demographic density of 323 inhabitants/km^2, which makes it the most densely populated country on the American continent. Its territory is organized into 14 departments, 262 districts and 44 municipalities. San Salvador is the capital and the most populated city in the country; Its metropolitan area includes 14 nearby districts and concentrates the political and economic activity of the republic. The cities of San Miguel and Santa Ana are other important centers of the country. Nearly 2.5 million Salvadorans live in the U.S., the equivalent of one third of the El Salvador population.

Population statistics.

The population structure by sex and five-year age groups for each calendar year was obtained from the Department of Census and Statistics in El Salvador (DIGESTYC). The estimates were based on the national population statistics and official population projections for 2005–2014 and the independent calculations for 2000–2004.((https://www.bcr.gob.sv/documental/Inicio/apartado/10). Eighteen 5-year age groups were considered, using the categories (e.g., 15–19, 20–24, etc.).

Case definition.

Men and women of any age, residents in San Salvador, with a histologically confirmed diagnosis of incident malignant tumor of the stomach were registered in the study. Included

patients had histologic and endoscopic (or surgical) data, per national standards. Given the retrospective nature of the study and general lack of electronic medical records, not all patients had available both endoscopy and pathology data (e.g., one public hospital lost several years of histology records due to a natural disaster). Each case represented a unique case, as the databases at each site were reviewed for duplication. Early gastric cancer (EGC) was defined as an invasive GC that is confined to the mucosa or submucosa, irrespective of lymph node metastasis (T1, any N). Proximal GC (PGC) versus distal GC (DGC), and the Borrman classification system were used to characterize the endoscopic findings of gastric cancer.(21) The Lauren classification system was used for the subtypes gastric cancer with a focus on intestinal and diffuse.(21) Malignant gastric outlet obstruction (MGOO) was classified as complete, incomplete, and absent, and was used as a surrogate for advanced disease as computed tomography was not generally available during the majority of the study period.,(21, 22)

Databases.

Endoscopy and pathology databases were reviewed at each endoscopy center to estimate the incidence of GC between 2000–2014. In the 5-year period of 2010–2014, all 16 facilities were operational and therefore provided the most robust data. The initial survey of national endoscopy volumes confirmed that these facilities represented >95% of national volumes and capacity determined by a pre-study survey of endoscopic volumes conducted by AEDES. For patients without pathology records, the endoscopy reports were independently adjudicated (LRC, DRM), as previously described. [19] In this time period, manual data extraction was required given the lack of electronic health records (EHR) and databases. Trained personnel used a standardized form for endoscopy and pathology, with unique identifiers. The ICD-10 coding system (RRID:SCR_010351) was used when data were available. Individuals at least 15 years of age were included, the age of adulthood in Central America. This methodology was previously used in a population-based study in rural Western Honduras, which demonstrated an ASIR three times greater than that reported by the IARC GLOBOCAN estimation.(19)

HER2/EBER.

The prevalence of HER2 and EBER in GC was assessed in an independent cohort of patients in the period to 2014–2016. Formalin-fixed paraffin-embedded (. High quality FFPE samples for the IHC assessments. Tissues were considered to be HER2-positive when assessment revealed either an IHC score of 2+ or 3+. The Roche Ventana® IHC platform was used (RRID:SCR_021254), performed in El Salvador. The number of subgroups for HER2 and EBER was 275 and 97, respectively. Fluorescence in situ hybridization (FISH) was not performed due to the lack of in-country expertise and budget constraints.

Rate Estimation.

Crude incidence rates of gastric cancer were calculated for males and females. Two independent statistical analyses were performed to calculate the crude rates and age-standardized incidence rates (ASIR) for males and females for each year in the study period using SAS 9.4 (RRID:SCR_008567) and SEER*Stat software (RRID:SCR_003293), respectively. Incidence rates are expressed as annual average rates for a five-year observation

period; the denominator (total population or specific stratum) provides an estimate of person-years of observation. Individuals of the opposite sex were excluded from the denominator of sex-specific cancer rates. Crude rates, standardized rates, and age-specific rates are expressed per 100,000 person-years. Standardization by age was done with the direct method using the world standard population proposed by Segi (RRID:SCR_005422). To describe the incidence the acronyms ASIR-W (I) will be used. (23)

Rate trend analysis.

The trend of the gastric incidence rates through 2000–2014 was examined using the annual percentage change in the rates (APC) with 95% confidence intervals (95% CI). It was used the weighted least squares method, implemented by default in the SEER *Stat program (RRID:SCR_003293). To identify trend changes over time, the JoinPoint (RRID:SCR_018129) regression model was used. The (APC) represents the average annual percentage increase or decrease in cancer rates during a specific period. In describing the change, the terms “increase” or “decrease” were used when the APC was significantly different from zero (two-sided p-values <0.05); otherwise, the term “stable or flat” was used.(24)

This study and data collection were approved by the Institutional Review Board of Vanderbilt University (DRM) and the El Salvador Ministry of Health (LRC).

Data Availability:

The data generated in this study are available upon request from the corresponding author.

Results

A total of 10,039 unique incident cases of GC were identified during the period 2000–2014 (Table 1). A total of 54.5% (n=5484) were male and 45.5% (n=4566) were female, with a mean age of 65 +/− SD 14.5. Seventy-nine percent (n=7913) of the patients were 55 years or older and 9.4% were 45 years or less. Of the 10,039 patients with confirmed GC, detailed data was available for endoscopy (60.1%, n=6,031), pathology (27.1%; n=2,725), and both endoscopy and pathology 12.8% (n=1,283) databases, respectively.

Gastric Cancer Clinical Characteristics

The endoscopic evaluation documented 83.4% (n=2,560) of cancers were classified as Borrman Type III or IV (49.7% and 33.7% for Borrman III and Bormann IV, respectively). The rates of early GC and Bormann type I were 2.3% (n=71) and 5.6% (n=171), respectively. The size of the tumors was 3.1+/−1.7 cm (mean± SD). Among the 4,008 cases with detailed histology data GC, 82% (n= 3,288) were classified as adenocarcinoma. The Lauren histological subtypes of adenocarcinomas were intestinal (55.6%, n=2220), diffuse (19.9%, n=797), mixed (0.2%, n=10), and indeterminate (6.5%, n=261). (Table 1). The most common other tumor types, comprising 18% (n=720) of non-adenocarcinoma gastric cancers, were lymphoma (n=120, 16.6%), GIST (n=77, 10.7%), squamous cell carcinoma (n=11, 1.5%), neuroendocrine tumors (n=11, 1.5%), and not otherwise specified (NOS) tumor types (n=496, 68.9%). Nearly one-quarter of the patients (23.2%) had an element of

pyloric obstruction, either complete (13.2%, n= 960) or incomplete (10.0%, n= 733). Pyloric obstruction served as a surrogate for advanced-stage disease, given the lack of availability of CT imaging.

Age Standardized Incidence Rates

The 15-year average crude incidence rates among males and females were 12.3 and 9.2 per 100,000 persons, respectively, annually between 2000 and 2014. (Table 2). After direct standardization, the average 15-year age-standardized incidence rate (ASIR) for males during the study period was 15.8 (95%CI: 14.2–17.5) and 10.4 (95%CI: 9.2–11.6) for females per 100,000 person-years. (Figure 1).

The ASIR showed an increasing trend during the three 5-year periods. In 2000–2004, the ASIR were 12.0 and 7.9 for males and females, respectively. In 2005–2009, the ASIR were 15.3 and 10.1 for males and females, respectively. The 5-year ASIR during 2010–2014, with all facilities operational, was 18.9 (95%CI: 14.4–20.7) and 12.2 (95%CI; 10.9–13.5) per 100,000 person-years for males and females, respectively. The highest ASIR in males was observed in 2012 (21.1) and in females in 2008 (14.0) per 100,000 person-years. (See Supplementary Table S1 and Supplementary Table S2 for the observed events, population times, crude rates, standard errors, and ASIR with 95%CI per year by sex). The mean annual increase in gastric cancer incidence rates was 4.4% in males; and 4.3 % in females. The Annual Percent Change (APC) was significantly different from zero at the alpha = 0.005, (Figure 2).

Distribution of cases

Overall, more than half of the cases were diagnosed in the public hospitals (53.7%). Nearly one-third (31%) of the cases were diagnosed in private facilities and 15.3% in the “Social Security” system hospitals (ISSS). The mean number of cases increased annually, with an average of 492 cases per year in the first 5-year period (2000–2004) to 811 in the last period (2010–2014). This trend is due in part to the increased number of endoscopy facilities, with a reduction in patients expiring without diagnosis, as well as an aging and growing population. Public hospitals accounted for nearly two-thirds (62.2%) of the cases in the first 5-year period, decreasing to 47.1% in the final 5 years, potentially related to the increase in ISSS governmental endoscopy facilities. (Table 3). Data availability per center type can be found in Supplementary Table S3.

HER2/EBER Status

The prevalence of HER2 and EBER GC was assessed in an independent cohort of patients in the period to 2014–2016. (Table 4). The HER2 subgroup included 275 patients: 148 (53.8%) males and 127 (46.2%) males. 195 (60%) patients were over 60 years old. The HER2 status was reported Negative “0” in 182/275 (66.2%), negative “+1” in 47/275 (17.1%), “+2” in 18/275 (6.5%) and “+3” in 28/275 (10.2%). The EBER subgroup included 97 cases: 46 (47.4%) males and 51 (52.6%) males. 78 (80.4%) patients were 60 years. The EBER status was negative in 79 (81.4%) patients, positive in 9 (9.3%), and unknown (unsatisfactory specimen) in 9 (9.3%). In summary, 16.7% were HER2 2+/3+ positive and 10.2% were EBER positive.

Discussion

Gastric cancer is a leading cancer in northern Central America and one of the few LMIC areas globally with a high incidence. In addition, the CA-4 region and El Salvador in particular account for a large U.S. immigrant population. This retrospective study of GC incidence for the 15-year period of 2000–2014 confirms the high incidence in males and females. The ASIRs (M, F) were 18.9 (95%CI; 14.4–20.7) and 12.2 (95%CI; 10.9–13.5) per 100,000 person-years, respectively, in the final 5-year reporting period with all of the current endoscopic facilities operational. In El Salvador, despite the global downward trend, there has been a significant increase in cases, with an annual percentage change (APC) of 4.4% for males and 4.3% for females. This is attributed to the growing and aging population at-risk, as well as the expanded number of facilities responsible for reporting cases. The majority of patients presented with advanced-stage disease, as summarized by a Borrmann Type III or IV tumor (83.4%), partial or complete pyloric obstruction (23.3%), and mean tumor size >3 cm.

In the sub-study, 2014–2016, 16.7% were HER2 2+/3+ positive, and 10.2% were EBER positive. This is an expected prevalence, and is instructive for therapy planning (e.g., HER2+ treatment resources for breast and GC, in the context of WHO essential medicines list). This provides invaluable baseline data for future epidemiology studies, as historically, the lack of resources has precluded reliable data and PBCRs. The identification of HER2-positive gastric cancers has therapeutic implications, as these patients may benefit from emerging HER2-targeted therapies.(21) The documentation of GC HER2 prevalence provides synergistic data with breast cancer, to ensure that HER2-targeted therapies are available in the public sector through the Ministries of Health in this LMIC region. EBV-associated gastric cancer (EBV-GC) accounts for 10% of cases globally and has a distinct pathogenesis and opportunity for targeted therapies (e.g., PD-L1 expression).(25–27)

The incidence rates of GC were comparable to those reported in Central America and South America. Direct comparisons require caution owing to variations in the study design and population. A study in Costa Rica reported ASIRs of 15.7 and 10.2 per 100,000 person-years in males and females, respectively. (28) In neighboring Western Honduras, a rural area, ASIRs of 30.8 and 13.9, respectively, for males and females, respectively, are reported for the period 2000–2009.(19) In South America, rates are variable, with the highest rates in the Andean nations. (28) Globally, the incidence of GC is decreasing owing to screening programs (e.g., East Asia) and decreased *H. pylori* infection prevalence and tobacco use, although stable or increased rates are projected in some areas of Latin America, as in the case of El Salvador herein.(29) Notably, in neighboring western Honduras, the *H. pylori* and CagA seroprevalence rates are >80%.(30)

Relevance to Cancer Control Plans

The high GC incidence rates have implications for national cancer control plans in El Salvador and Central America as well as for U.S. immigrants and cancer control in Latino populations. The equivalent of over one third of the El Salvador population now lives in the U.S., nearly 2.5 million.(31) This represents the third largest Latino community in the U.S. The majority are foreign-born, having emigrated since 1980 due to the civil war

followed by endemic gang violence. Immigrants from high-incidence regions who migrate to low-incidence regions (North America, Western Europe) have been shown to maintain the incidence rates and risk of their nations of origin. Thus, as guidelines and policies emerge for GC screening and surveillance programs in the U.S. for high-risk groups, El Salvador would be a priority.(32)

Limitations

There are inherent limitations to a retrospective study of GC which utilized endoscopy and pathology records and databases to identify incident cases. A rigorous protocol was established with trained personnel for the manual review of records. The endoscopy/pathology facilities included >95% of national volumes, based on the AEDES capacity survey, and only a handful of small endoscopy private clinics (e.g., single endoscopist) were excluded. The number of facilities nearly doubled by the end of the study, and we emphasize the discussion around the data from the 2010–2014 period, where all centers were operational, being the most robust. The study findings likely represent an underestimation of the incidence, particularly in the early time period, given the lack of diagnostic facilities and the reality that many individuals would expire without a diagnosis (e.g., rural areas). Nonetheless, this provides the best available data, in the absence of national systems for cancer reporting and statistics, and a lack of PBCRs, as is usual in LMICs. The partnership among the three sectors (MINSAL, ISSS, and AGEDES) is unique.

Conclusions

The high GC incidence rates in El Salvador underscore the burden of disease in Mesoamerica, as well as in immigrant populations from the region. This has immediate implications for cancer control planning in El Salvador, Central America, and the U.S. Latino populations. Notably, the equivalent of one third of the El Salvador population lives in the U.S.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Conflict of interest:

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as potential conflicts of interest.

Abbreviations:

GC	Gastric Cancer
ES	El Salvador
NCCP	National Cancer Control Plan
ASIR	Age Standardized Incidence Rates
PBCR	Population Based Cancer Registry

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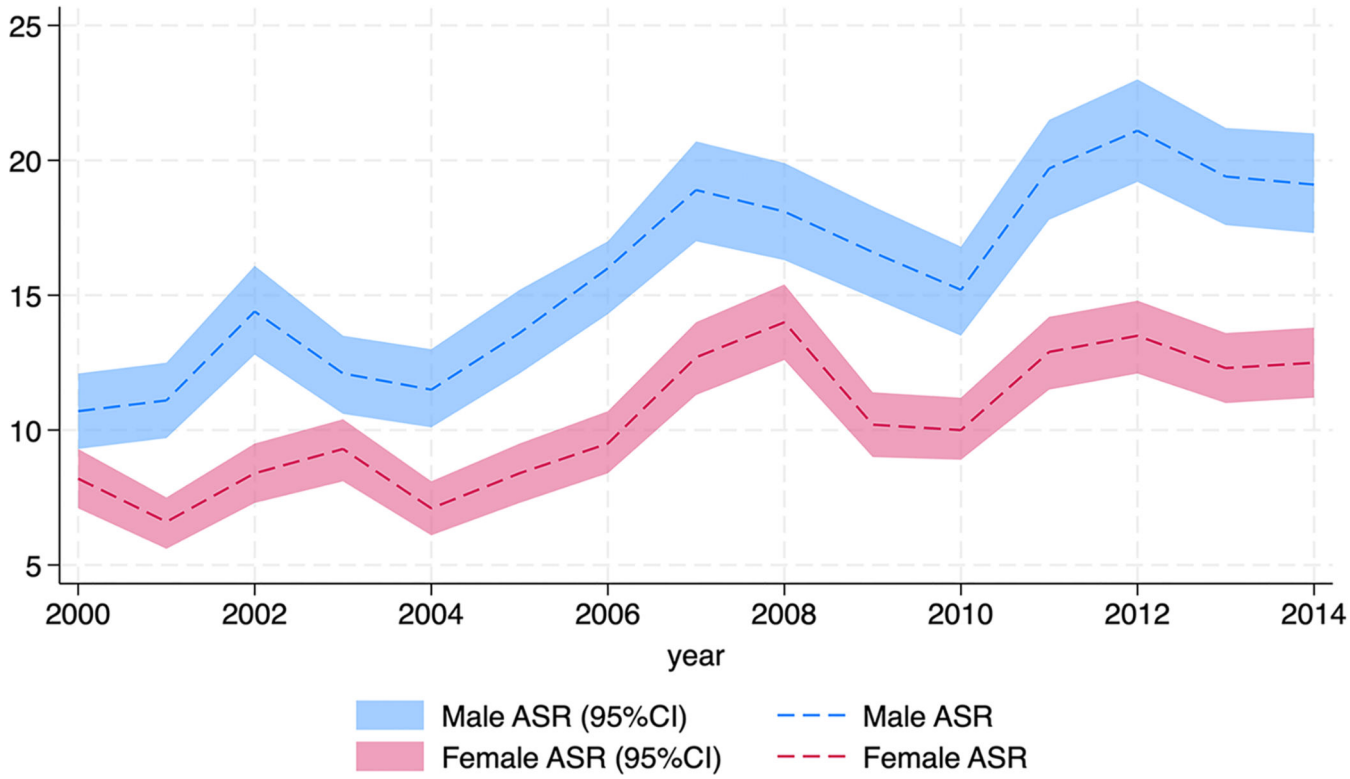

Figure 1. Gastric cancer age-standardized incidence rates (ASIR) in El Salvador 2000–2014.
This figure presents a line graph comparing the Age-Standardized Rates (ASR) for males and females over a 14-year period. The dashed lines represent the central ASR estimates for males (blue) and females (red), with the shaded areas indicating the 95% confidence intervals (CI) for each gender.

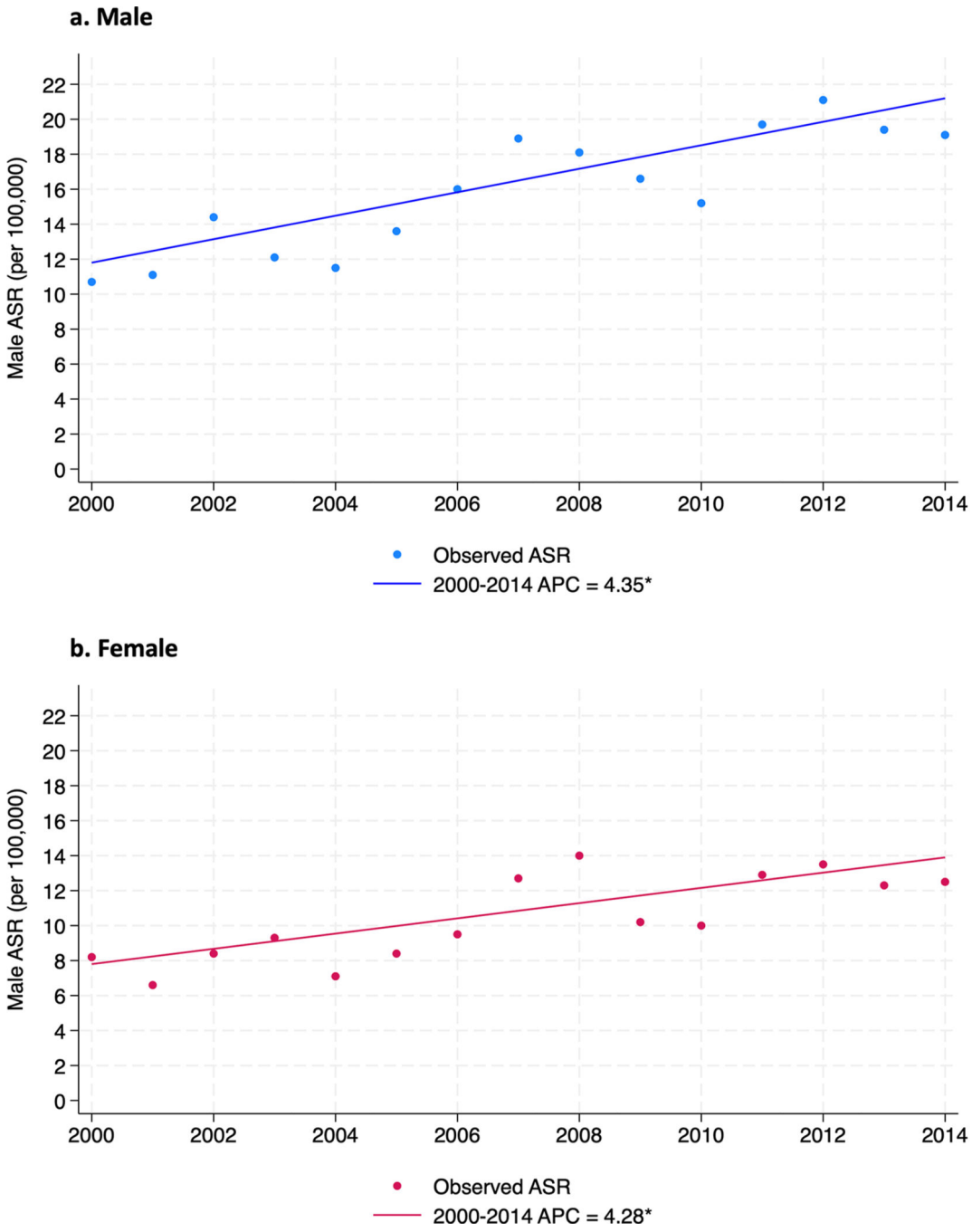

Figure 2. Trend in Age-Standardized Gastric Cancer Incidence Rates per 100,000 people.

2a. Male

2b. Female

This figure is divided into two panels, each displaying the trend in age-standardized incidence rates of gastric cancer from 2000 to 2014, stratified by gender. Figure 2a presents the observed Age-Standardized Rates (ASR) for males, marked by blue dots, with a solid blue line indicating the Annual Percent Change (APC) over the 15-year period. Figure

2b shows the observed ASR for females, marked by pink dots, with a solid pink line representing the APC.

*Indicates that the Annual Percent Change (APC) is significantly different form zero at the alpha = 0.005 level.

Table 1

General Characteristics of El Salvador Gastric Cancer Cases 2000–2014.

Incidence cases: 10,039	**N**	**%**
Gender, n = 10,039		
Male	5484	54.6%
Female	4566	45.4%
Age, n = 10,039		
15–44	941	9.4%
45–54	1185	11.8%
55–64	2017	20.1%
65+	5896	58.7%
Data Availability, n=10,039		
Endoscopy Only	6031	60.1%
Histology Only	2725	27.1%
Endoscopy + Histology	1283	12.8%
Bormann Classification (n =3,072)		
Type I (polyploid)	171	5.6%
Type II (fungating mass)	197	6.4%
Type III (ulcerated mass)	1,526	49.7%
Type IV (infiltrative diffuse)	1,034	33.7%
Linitis Plastica	73	2.4%
Early Cancer	71	2.3%
Lesion Location (n=8561)		
Fundus	83	1.0%
Cardia	350	4.1%
Body	938	11.0%
Antrum	7,166	83.9%
Pyloric Obstruction (n= 7,314)		
Complete	960	13.2%
Partial	733	10.0%
None	5,621	76.8%
Histologic Type (n=4008)		
Intestinal	2220	55.4%
Diffuse	797	19.9%
Mixed	10	0.2%
Indeterminate	261	6.5%
Other Cancer	720	18.0%

Table 2.

Crude and age-standardized incidence rates (ASIR) of Gastric Cancer in El Salvador 2000–2014.

	Crude Incidence Rate per 100,000		Age Standardized Incidence Rate per 100,000			
Year	**Males**	**Females**	**Males**	**95% CI**	**Females**	**95% CI**
2000	8.0	7.2	10.7	9.3–12.1	8.2	7.1–9.3
2001	8.6	5.9	11.1	9.7–12.5	6.6	5.6–7.5
2002	11.0	7.6	14.4	12.8–16.0	8.4	7.3–9.5
2003	9.4	8.3	12.1	10.6–13.5	9.3	8.1–10.4
2004	8.8	6.4	11.5	10.1–13.0	7.1	6.1–8.1
2005	10.4	7.5	13.6	12.1–15.2	8.4	7.3–9.5
2006	12.4	8.7	16.0	14.3–17.0	9.5	8.4–10.7
2007	14.6	11.4	18.9	17.0–20.7	12.7	11.3–14.0
2008	14.0	12.3	18.1	16.3–19.9	14.0	12.6–15.4
2009	12.8	9.1	16.6	14.9–18.3	10.2	9.0–11.4
2010	11.9	8.8	15.2	13.5–16.8	10.0	8.9–11.2
2011	15.6	11.3	19.7	17.8–21.5	12.9	11.5–14.2
2012	16.3	12.1	21.1	19.2–23.0	13.5	12.1–14.8
2013	15.4	11.0	19.4	17.6–21.2	12.3	11.0–13.6
2014	15.0	11.0	19.1	17.3–21.0	12.5	11.2–13.8
Average	12.3	9.2	15.8	14.2–17.5	10.4	9.2–11.6

Notes:

- ASIR: Age standardized incidence rates are expressed per 100,000 person-years.
- Age standardization performed using world standard population proportions for the listed age strata.

Table 3.

Incident gastric cancer cases by center type per year in El Salvador 2000–2014.

Year	Number of Facilities	Public Hospitals	ISSS / Government	Private Centers	Total cases
	N	N (%)	N (%)	N (%)	N (%)
2000	8	313 (68.49)	35 (7.66)	109 (23.85)	457 (100)
2001	8	320(72.89)	38 (8.66)	81 (18.45)	439 (100)
2002	8	405 (71.30)	60(10.56)	103(18.13)	568(100)
2003	9	333 (62.36)	60(11.24)	131(26.240)	534(100)
2004	9	256 (55.41)	89(19.26)	117(25.32)	462(100)
2005	9	371 (68.20)	6(1.10)	167(30.70)	544(100)
2006	10	357 (55.01)	106 (16.33)	186 (28.66)	649 (100)
2007	14	326 (40.65)	80(9.98)	396(49.38)	802(100)
2008	14	424 (51.71)	83(10.12)	313(38.17)	820(100)
2009	15	384 (56.30)	36(5.28)	262(38.42)	682 (100)
2010	16	365 (55.56)	78(11.87)	214(32.57)	657 (100)
2011	16	392 (45.63)	195(22.70)	272(31.66)	859 (100)
2012	16	414 (46.21)	208(23.21)	274(30.58)	869(100)
2013	16	352 (42.05)	228(27.24)	257(30.70)	837(100)
2014	16	384 (46.10)	231(27.73)	218(26.17)	833(100)
Total Cases	**16**	**5396 (53.7)**	**1533 (15.3)**	**3110 (31.0)**	**10039 (100)**

Table 4.

HER2 and EBER prevalence in Gastric Cancer cases in El Salvador 2014–2016

HER2 Status	**N**	**%**
0 (Negative)	182	66.2
1+ (Negative)	47	17.1
2+ (Equivoque)	18	6.5
3+ (Positive)	28	10.2
Total	275	100
EBER Status	**N**	**%**
Negative	79	81.4
Positive	9	9.3
Not Satisfactory	9	9.3
Total	97	100

Notes

HER2: Human epidermal Growth factor Receptor 2, EBER: EBV-encoded RNA