

Digestive and Liver Disease Statistics in Iran

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ABSTRACT

BACKGROUND

Gastrointestinal and liver diseases (GILD) are among the most common causes of morbidity in Iran and constitute a substantial proportion of mortality which imposes enormous economic consequences. Our purpose is to collect information and report current statistics on physician visits, hospitalizations, and deaths due to common GILD in Iran.

METHODS

Data on the leading causes of death were obtained from the Iranian Ministry of Health, Office of Health Statistics. A total of 213,322 deaths were reported from March 2003 to February 2004 (excluding mortality from the Bam earthquake) which equaled 4.4 deaths per 1000 population. Of these, 36,575 were due to accidents. Causes of death were reported on the basis of the 10th revision of the International Classification of Diseases (ICD-10; 1992). The leading causes of hospitalization were obtained from the database of the GILD ward in Shariati Hospital, one of the largest and best known gastroenterology referral hospitals in Iran. Similarly, leading causes of out-patient referrals were identified from a large multi-physician outpatient clinic in Tehran.

RESULTS

The five leading gastrointestinal causes of death in order of frequency were: gastric cancer, hepatobiliary cancer, liver cirrhosis, esophageal cancer, and colorectal cancer. The five leading causes of hospitalization in the GILD ward of Shariati Hospital were: liver cirrhosis, hepatitis, peptic ulcer disease, cholecystitis and cholangitis, and colorectal cancer. The most common outpatient diagnosis was gastroesophageal reflux disease followed by irritable bowel syndrome (IBS), duodenal ulcer (DU), non-ulcer dyspepsia, and chronic hepatitis B (HBV).

CONCLUSION

Gastrointestinal and liver malignancy along with chronic liver disease constitute the main GILD reasons for hospitalization and deaths in Iran. Gastroesophageal reflux disease, IBS, and chronic HBV are the most common GILD outpatient diagnoses.

KEYWORDS

Digestive; Liver; Diseases; Statistics; Iran

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INTRODUCTION

Gastrointestinal and liver diseases (GILD) are among the most common causes of morbidity in Iran resulting in a substantial proportion of mortality with enormous economic consequences for this country. Gastrointestinal cancer constitutes about 40% of all malignancies in Iran.¹ In addition; there is evidence that the incidence of a number of digestive and liver diseases is increasing.²⁻¹²

In order to decrease the burden of such diseases we should first know the number of patients affected. The impact of these diseases on the health, budget and resources of the society should be determined. Population based statistics are not available in Iran and no information on common types of digestive diseases has been published.

We aimed to collect and report current statistics on physician visits, hospitalizations, and deaths due to common gastrointestinal and liver diseases.

Such information is an invaluable reference for authors, grant applicants, funding agencies, and policy makers. Understanding and quantifying the burden of different diseases is also essential for planning a realistic curriculum for medical education. This data can also guide future research. Data from various sources have been compiled in order to provide a convenient resource for researchers and health planners.

The statistics should be updated periodically to identify trends in incidence, prevalence, and mortality of different diseases which have important implications for health policy planning.

The full range of GILD is too large to be covered adequately within the scope of this paper. Therefore we have examined only a selection of GILD for which reliable and recent data is available. We report the frequency and severity of GILD effects on the population of Tehran, the capital of Iran, houses about 20% of the urban population of Iran.

MATERIALS AND METHODS

The principal causes of mortality were extracted from the Comprehensive Statistics on Overall Mortality issued by the Ministry of Health for

the Iranian year 1382 (March 2003 to February 2004).¹³ These statistics were extracted from three major sources: the National Registry, records of rural health centers, and the Mortality Registration Program operated by the Ministry of Health. Rural health centers manage health-related activities and are responsible for recording all deaths in their respective areas in addition to performing an annual population census.

In the original report, causes of death have been reported based on the 10th revision of the International Classification of Diseases (ICD-10). ICD-10 codes were published by the World Health Organization in 1992 and have been used for coding and classifying causes of death since 1999.

To calculate the frequency of gastrointestinal causes of death, all terms related to GI disorders were highlighted and pertinent proportions were recalculated. The leading causes of hospitalization from 2000 to 2004 were obtained from the database of Shariati Hospital.

This hospital is a large university hospital in Tehran which is one of the major referral centers for GILD and home to the Digestive Disease Research Center (DDRC) which has carried out this research. The routine procedures of the GILD ward at Shariati Hospital include the preparation of a two-page chart summary for all patients upon discharge or death. This summary is reviewed and signed by the respective attending physician.

A copy of this summary is kept at DDRC and is entered into a database. The database uses an internal coding system for diagnostic labels and we have mapped this internal coding structure to ICD-10.

Data on outpatient visits were gathered from a large well known multi-physician referral clinic for GILD in Tehran. This clinic serves patients throughout Iran who present with GILD problems.

Data on the leading symptoms of patients served by the clinic and the final diagnosis was extracted from the clinic's database. Patients who first referred between 2000 and 2004 were included. The final diagnosis was not coded according to ICD-10 in the database. Two gastroenterologists mapped the diagnosis to respective ICD-10 codes.

Cases in which follow-up was incomplete or did not lead to a definite diagnosis were excluded. Diagnosis of gastroesophageal reflux disease (GERD) was based on clinical symptoms and endoscopic findings. Diagnosis of irritable bowel syndrome (IBS) was based on the Rome II criteria. Estimates of cancer incidence and mortality rates¹ were obtained from three separate, recent reports of population based cancer registries in Iran.¹⁴⁻¹⁶

The number of cancer cases in the year 2002 was calculated using this estimated “national” rate, and the estimated population for 2002.¹⁷ The study protocol was reviewed and approved by the Ethics Committee of DDRC.

Iran’s population is ethnically diverse due to historical and geographical reasons, and includes 51% Fars (Persian), 24% Azeri, 8% Gilaki and Mazandarani, 7% Kurd, 3% Arab, 2% Lur, 2% Baloch, 2% Turkmen and 1% other ethnicities. Tehran, the capital of Iran is a ‘megacity’ with a population of over 10 million, including suburban areas. In one study, 224 individuals (114 females, 110 males) from Tehran were enrolled.

The ethnic composition of the studied group was 58.0% Fars, 28.1% Azeri, 7.1% Gilaki and Mazandarani, 4.5% Kurd, 0.9% Arab, 0.9% Lor, and 0.5% Baluch; which resembled the ethnic diversity of the Iranian population.¹⁸

RESULTS

The total population of Iran in 2003 was estimated to be 63,741,000.¹⁷ The death survey for the

same year covered 23 out of 28 provinces with a population of 48,379,552. A total of 213,322 deaths were recorded (excluding Bam earthquake mortality) which amounted to 4.4 deaths per 1000 population. From these, 36,575 were caused by accidents. Among the remaining 176,747; another 21,303 (22%) died from malignant diseases.

Approximately, 14,649 death records (8.29%) were attributable (Table 1) to GILD (9,050 malignant and 5,599 nonmalignant). The leading gastrointestinal causes of death in Iran,¹³ based on an estimate by the Ministry of Health, are shown in Table 2. The final diagnoses for 2,697 patients admitted to the Shariati Hospital GILD ward during the study period are shown in Table 3. Cirrhosis was the main diagnosis in 39% of the cases. The leading gastrointestinal diseases which prompted outpatient clinic visits were estimated from 12,000 outpatient visits by 7,985 patients (Table 4). The most common outpatient diagnosis was GERD followed by IBS, DU, non-ulcer dyspepsia, and chronic HBV.

It is estimated that approximately 50,800 new cancer cases occur annually in Iran¹ (Table 5). Over 53% are male with an age standardized incidence rate (ASR) of 116.8 per 100,000 males and 93.1 per 100,000 females. The most common organ system involved by cancer in both sexes is the gastrointestinal tract where over 38% of all cancers occur.

The five most common cancers in males (by ASR) are: stomach (26.1 per 100,000), esophagus (17.6 per 100,000), colon and rectal (8.3 per 100,000), bladder (8.0 per 100,000)

Table 1: Proportions of benign and malignant disease causing non accidental death in 23 provinces of Iran.

	Non-Malignant	%	Malignant	%	Total	%
Cardiovascular	82106	52.82	0	0	82106	46.45
GI and Liver	5599	3.6	9050	42.48	14649	8.29
Respiratory	11404	7.34	3102	14.56	14506	8.21
Genitourinary	3255	2.09	1664	7.81	4919	2.78
CNS	2931	1.89	1518	7.13	4449	2.52
Blood	771	0.5	2216	10.4	2987	1.69
Endocrine	3479	2.24	0*	0*	3479	1.97
Others	45899	29.53	3753	17.62	49652	28.09
Total	155444	100	21303	100	176747	100

*NA= Not available (As the endocrine malignancies were not separated).

and leukemia (4.8 per 100,000). In females the five most common cancers are: breast (17.1 per 100,000), esophagus (14.4 per 100,000), stomach (11.1 per 100,000), colon and rectal (6.5 per 100,000), and cervix uteri (4.5 per 100,000).

The yearly number of cancer-related deaths is estimated to be over 35,000. The mean mortality to incidence ratio is approximately 70%; ranging from 19% for thyroid cancer to 94% for liver cancer. The

most important causes of cancer mortality amongst males are stomach, esophagus and lung. In females, esophagus, stomach, and breast are most frequent (Table 5).¹

DISCUSSION

The health care system requires national estimates of disease mortality and morbidity to establish priorities on health care programs. Although the

Table 2: Major GI causes of death in Iran (March 2003 to February 2004).

	Disease	Number	%	ICD-10
1	Stomach cancer	4587	33%	C16.0–C16.9
2	Neoplasm of liver and hepatic ducts	1762	12.8	C22.0–C22.4, C22.7, C22.9
3	Fibrosis/cirrhosis of liver and hepatic failure not otherwise specified	1308	10	K72.0–K72.1, K72.9, K74.0–K74.1, K74.3–K74.6 K77
4	Esophageal cancer	1160	8.4	C15.0–C15.9
5	Colorectal and anal cancer	1198	8.7	C18.0–C18.9, C19, C20, C21.0–C21.2, C21.8
6	Peptic ulcer disease	619	4.5	K25.0–K31
7	Viral hepatitis	394	2.8	B15, B16, B17, B18, B19
8	Pancreatic cancer	293	2	C25.0–C25.4, C25.8–C25.9
9	Intestinal infections	349	2.5	A04
10	Pancreas, ducts and gallbladder disease	271	1.9	K80-87
11	Appendicitis	55	0.4	K35-8
12	Hydatid cyst	20	0.14	B67
13	Miscellaneous	1824	13	K35, K67, K88, K92.

Table 3: Most common inpatient gastrointestinal diagnoses in Shariati Hospital, 2000-2004.

	Disease	Number	%	ICD-10
1	Fibrosis/cirrhosis of liver and hepatic failure	962	39%	K72.0–K72.1, K72.9, K74.0–K74.1, K74.3, K74.6
2	Hepatitis	606	24	K72.0-K73.9
3	Peptic Ulcer Disease	364	15	K25.0–K25.1, K25.3–K25.7, K25.9, K26.0–K26.7, K26.9, K27.0–K27.7, K27.9, K28.4–K28.9
4	Cholecystitis/Cholangitis	245	10	K81.0–K81.1, K81.8–K81.9
5	Colorectal and anal cancer	134	5.4	C18.0–C18.9, C19, C20, C21.0–C21.2, C21.8
6	Inflammatory Bowel Disease (IBD)	118	5	K52.9
7	Stomach cancer	82	3.3	C16.0–C16.9
8	Pancreatitis	59	2.3	K85
9	Cholangio carcinoma	55	2.2	C22.1

Table 4: Leading physician diagnoses for outpatient clinic visits in Tehran, 2000-2004.

	Diseases	Number	%	Male	ICD-10
1	GERD	2620	32	46	K21
2	Irritable bowel Syndrome	2022	25	39	K58 ,K58.0,K58.9
3	Duodenal ulcer	1130	14	60	K26
4	Dyspepsia	909	11	44	K30
5	Chronic hepatitis B	581	7	73	B18.1
6	Ulcerative Colitis	365	4	47	K51
7	Cirrhosis	331	4	71	0,K74.1,K74.6,K74.5
8	Gastroduodenitis & Duodenitis	275	3	50	K29.9, K29.8
9	Fatty liver	231	3	67	K76.0
10	Crohn's disease	207	2	45	K50
11	Chronic hepatitis C	204	2	68	B18.2
12	Cholelithiasis	167	2	42	K80
13	Constipation	164	2	41	K59.0
14	Hemorrhoid	132	2	34	I84
15	Autoimmune hepatitis	109	1	24	K75.4
16	Gastric cancer	103	1	62	C16.0,C16.9
17	Polyps of colon	68	0.8	58	K63.5
18	Gastric ulcer	66	0.8	68	K25
19	Achalasia of esophagus	59	0.7	51	K22.0
20	Hemangioma	56	0.7	19	D18.
21	Colorectal cancer	53	0.6	51	C18.9,C18.7
22	Celiac	40	0.5	37	K90.0
23	Esophageal cancer	38	0.4	31	C15.9-C15.0
24	Primary biliary cirrhosis	33	0.4	3	K74.3
25	Lactose intolerance	31	0.3	48	E73
26	Primary Sclerosing cholangitis	33	0.4	60	K83.8
27	Pancreatic cancer	23	0.2	69	C25.9,C25.0,C25.1,C25.4
28	Budd Chiari Syndrome	17	0.2	64	I82.0
29	Wilson Disease	16	0.2		
30	Gastric Maltoma Lymphoma	13	0.1	61	C85.7
31	Cholangiocarcinoma	17	0.2	76	C24.0,C24.1,C24.9
32	HCC	12	0.1	72	C22.0
33	GB cancer	6	0.0	80	C23
34	Neuroendocrin Tumors	5	0.06	33	C25.4

quality of data and accuracy of estimates based on the dispersed resources are considerably lower than the results of prospective national data gathering projects, the paucity of information in this context makes these data invaluable. A recent report from the Ministry of Health shows that greater than 70% of mortalities are caused by cardiovascular diseases, injuries and cancers, while fewer than 3% of deaths are attributable to infectious or parasitic diseases.¹³ Digestive and liver diseases are associated

with frequent physician visits and hospitalizations and can be fatal. Direct health care costs including hospital, physician, nursing care, pharmaceutical, and other services for GI disorders are considerable. Although often inadequately addressed, indirect costs caused by lost wages are as significant as direct costs. In addition, because of the debilitating and chronic nature of some GI disorders, the direct impact on patients' quality of life should be considered.

Table 5: Prevalence and incidence of gastrointestinal cancers in Iran and the United States, 1996–2000.

Cancer site	United state (1996-2000)		Iran(1996-2000)		Incidence		Mortality	
	Rank among gastrointestinal cancers	Rank among all sites	Rank among gastrointestinal cancers	Rank among all sites	USA	Iran	USA	Iran
Colon and rectum	1	3	2	3	54.2	7.4	21.2	4
Stomach	2	19	1	2	9.1	18.6	4.8	9.4
Pancreas	3	21	5	23	11.1	1.3	10.5	0.8
Esophagus	4	24	3	4	4.5	15.95	4.3	13.2
Liver and intrahepatic ducts	5	25	4	22	5.9	1.4	4.5	1.3

There are several strengths to this study. The mortality data and cancer estimates are population based data and can be used to calculate national statistics.

Diagnosis of in-patient and out-patient cases has been well documented and confirmed by expert gastroenterologists.

The results of this study closely resemble other recent epidemiologic and screening studies from Iran. For example, GERD has been found to be the most common out-patient GI disease in several recent studies.²⁻⁴

Duodenal ulcer and IBS have been also reported to be quite common in Iran.⁵⁻⁷ HBV has already been shown to be the most common etiology of chronic hepatitis and end-stage liver disease in Iran.^{8,9} A recent study indicates that non-alcoholic steatohepatitis is the most common cause of persistently elevated serum ALT in asymptomatic Iranian blood donors in Tehran.¹⁰ A recent increase in Crohn's disease and ulcerative colitis has been reported in Iran.^{11,12} There are, of course, numerous limitations to our study. The in-patient data was from a the GILD ward of one hospital.

Therefore this study may have underestimated diseases such as gallstones, and GI cancers, since many of these cases go directly from our out-patient department to the surgical ward without admission to the GILD ward. Although Tehran's population is multiethnic and Shariati Hospital is a large referral hospital for the entire country, we may still have underestimated diseases which are more prevalent in other geographic areas of the country. Therefore, our in-patient data should be considered as mainly applicable to a tertiary referral center in Tehran rather than the entire country.

We used the database of a multi-physician GILD sub-specialty clinic in Tehran to estimate the main diagnoses for outpatient clinic visits. Again the possibility that we may have underestimated some diseases should be considered.

This would include diseases mostly seen by primary care physicians that are not referred to sub-specialty clinics or diseases prevalent in some regions of the country. Despite these limitations, for the first time, our report provides valuable information on the statistics of GILD in Iran. When comparing our data with similar studies from the US,¹⁹ the most common cause of death due to GILD in the US is due to liver cancer followed by alcoholic liver disease, hepatitis C, and bile duct carcinoma. The leading diagnoses for out-patient GILD clinic visits is GERD followed by gastroenteritis, gastritis, hemorrhoids, and IBS.

The etiologies of in-patient GILD is quite different between the two countries while the main diagnoses for out-patient visits are similar. In Iran, Close to 40% of all cancers are located in the gastrointestinal system,¹ whereas in the US the proportion is less than 20%.^{20,21} The incidence rates of esophageal and stomach cancer in Iran are high, well above the world average, and the incidences of lung and prostate cancer are low amongst Iranian men, which differs from developed countries.

Breast cancer, although the most common cancer of females in Iran, has rates that are low by international standards, especially those observed in Europe and the US. Similarly, the incidence of cervix cancer in Iran is very low, even lower than low risk countries such as China, Kuwait and Spain.^{1,15,21}

In the future, we should plan more comprehensive databases for in-patient data to include hospitals representative of all the regions of Iran.

Information from the newly established family physician network can also be used.

A prerequisite for this is to design an appropriate database for electronic data collection in hospitals and clinics.

We believe that the information included in this report will help focus attention on the more common diseases which bring patients to physicians. Future periodic updates of this data will

reveal trends in the incidence, prevalence, and cost of GILD; an information crucial to monitoring the success of national health programs.

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CONFLICT OF INTEREST

None declared.

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