

The Current and Future Burden of Metabolic Dysfunction-related Cancers in Arab Countries from 2022 to 2050

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Abstract

Background and objective: The burden of cancers related to metabolic dysfunction in Arab countries is not well defined. This study aims to provide an overview of the latest estimates for ten types of cancers associated with metabolic dysfunction in the region, along with future projections, to inform cancer control policies.

Methods: We extracted data on the estimated number of new cancer cases and deaths for the following metabolic dysfunction-related cancers: colorectal, liver, gallbladder, pancreas, breast, uterine corpus, ovarian, kidney, thyroid, and multiple myeloma from the GLOBOCAN database for the year 2022. The age-standardized incidence and mortality rates for 2022 are presented, alongside projections for 2050.

Results: In 2022, 22 Arab countries reported a total of 497,929 new cancer cases, with 218,746 (43.9%) of these cases attributed to metabolic dysfunction. Breast cancer was the most commonly diagnosed, accounting for 43.7% of cases, followed by liver cancer (16.8%) and colorectal cancer (10.4%). Projections indicate significant increases in incidence rates by 2050 for all studied cancers in the Arab region, with Kuwait, the United Arab Emirates, and Qatar expected to experience the highest rises.

Conclusion: Cancers related to metabolic dysfunction currently account for nearly half of the cancer burden in Arab countries. The projected substantial increase in estimated cancer incidence and mortality over the next few decades highlights the need for comprehensive, multi-stakeholder policies implemented at the regional level, tailored to the specific cancer profiles of each country.

Keywords: Metabolic Dysfunction; Cancer; Arab Countries.

Introduction

Cancer is a significant global challenge, responsible for nearly one in six deaths and a high proportion of premature deaths from noncommunicable diseases, particularly among those aged 30 to 69.¹ The global incidence of cancer is increasing, driven by population growth, aging, and unhealthy lifestyle choices. In 2020, there were 19.3 million new cancer cases and almost 10 million deaths, making cancer the second most common cause of death globally.² The trends in cancer incidence and mortality vary across regions, shaped by socioeconomic factors and the availability of healthcare.

The growing concern over the rising rates of metabolic dysfunction and obesity has implications for the incidence of diseases related to metabolic disorders.³ There is a well-established link between overweight and obesity, as well as metabolic dysfunction independent of body mass index (BMI) and various types of cancer.⁴⁻⁶ For instance, Metabolic dysfunction-associated fatty liver disease (MAFLD), a prominent manifestation of metabolic dysfunction, is strongly associated with liver cancer and also increases the risk for extrahepatic malignancies such as colorectal and breast cancers.⁵

The Arab region, home to 22 countries and approximately 500 million people is experiencing alarming rises in obesity and declines in metabolic health, with 10 of the 15 countries with the highest obesity rates globally located here. Over 50% of women in Kuwait, Qatar, and Libya are classified as overweight

or obese.⁷ The region has the highest disability-adjusted life years (DALYs) related to metabolic risk factors.⁸ Despite the growing metabolic-related cancer burden, there is a lack of comprehensive understanding of its epidemiology, hindering the development of effective health policies and strategies.

This study aims to describe and estimate the current disease burden of 10 metabolic dysfunction-related cancers—colorectal, liver, gallbladder, pancreas, breast, corpus uterine, ovarian, kidney, thyroid, and multiple myeloma—both collectively and individually, taking into account intraregional variability. Furthermore, it includes predictions for the future incidence and mortality burden in Arab countries by 2050, based on the latest GLOBOCAN estimates provided by the International Agency for Research on Cancer (IARC).

Methods

Data on the burden of ten metabolic dysfunction-related cancers, specifically colorectal, liver, gallbladder, pancreas, breast, corpus uterine, ovarian, kidney, thyroid, and multiple myeloma, both collectively and individually in Arab countries, were obtained from the publicly available GLOBOCAN 2022 database (<https://gco.iarc.who.int>). This database, released by the International Agency for Research on Cancer (IARC), provides detailed worldwide cancer statistics, offering insights into cancer incidence and death rates across 185 countries and regions. Details regarding the data sources and methods used to generate these cancer estimates have been described elsewhere.⁹ In summary, GLOBOCAN compiles national cancer estimates from the best available data and utilizes neighbouring data when local data is missing. The GLOBOCAN project is featured on the open-access platform CANCER TODAY, a user-friendly data visualization tool, which can be accessed at <https://gco.iarc.fr/today>. Information on the estimated projections of cancer incidence and mortality is available through another platform of the same database, CANCER TOMORROW.

The GLOBOCAN data used in this study did not have specific inclusion or exclusion criteria. Because the data is publicly available, ethical approval or patient consent was not required for this research.

We analyzed data on the ten most prevalent cancer types associated with metabolic dysfunction, utilizing estimated incidence and mortality statistics for 2022 on a global basis and specifically within the 22 Arab countries. We examined differences in these trends across various countries in the Arab region. Additionally, we estimated the projected changes in incidence and mortality rates for these metabolic dysfunction-related cancers, both globally and among Arab countries, jointly and individually, for the year 2050.

Results

In 2022, Arab countries reported 497,929 new cancer cases, accounting for 2.5% of the 19,976,499 global cases (**Figure 1, Sup Table 1**). Among these, 218,746 cases were related to metabolic dysfunction, accounting for 43.9% of total cancer cases. Compared to global incidence rates, Arab countries had a lower overall age-standardized incidence rate (ASIR) for metabolic dysfunction-related cancers (131.5 vs. 253.3, respectively).

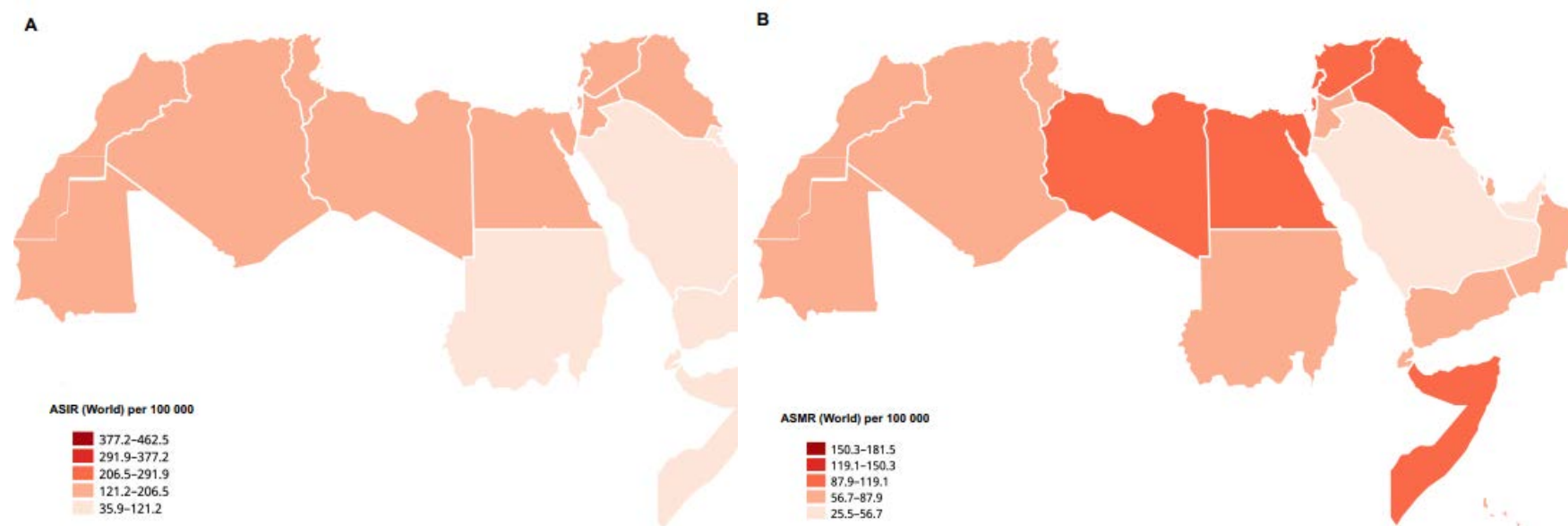


Figure 1: Rates of cancer in 22 Arab countries, 2022. **(A)** Age-standardized incidence rate (ASIR) **(B)** Age-standardized mortality rate (ASMR).

Breast cancer was the most frequently diagnosed metabolic dysfunction-related cancer, with 95,609 cases, making up 43.7% of the overall burden. This was followed by liver and intrahepatic bile duct cancers, with 36,783 cases (16.8%), and colorectal cancer, with 22,752 cases (10.4%). Together, these three cancers accounted for 70.9% of the burden from metabolic dysfunction-related cancers. Thyroid cancer ranked fourth, with 17,435 cases (8.0%), and was followed by pancreatic cancer, which had 10,356 cases (4.7%) (**Table 1**). Notably, the ASIRs for breast cancer (48.7 vs 46.8) and liver cancer (10.3 vs 8.6) were higher than the global averages.

Table 1: Distribution of metabolic-dysfunction related cancer cases and Incidence Rate in 2022 in global and 22 Arab Countries sorted by alphabetical order.

Country	Label	Males				Females				Both sexes			
		Number	95% UI low	95% UI high	ASIR	Number	95% UI low	95% UI high	ASIR	Number	95% UI low	95% UI high	ASIR
Algeria	Breast					14601	14101	15118	61.9	14601	14101	15118	61.9

	Colon	2374	2163	2605	10.6	2141	1952	2348	9.3	4515	3961	5146	9.9
	Thyroid	430	357	518	1.9	2089	1915	2278	9.0	2519	2052	3092	5.4
	Ovary					1147	1021	1288	5.0	1147	1021	1288	5
	Gallbladder	347	266	454	1.6	846	739	968	3.7	1193	884	1610	2.7
	Corpus uteri					593	504	698	2.7	593	504	698	2.7
	Pancreas	693	598	803	3.1	475	397	568	2.1	1168	927	1472	2.6
	Liver and intrahepatic bile ducts	423	343	521	1.9	332	251	439	1.4	755	533	1070	1.7
	Multiple myeloma	405	334	491	1.8	365	293	454	1.6	770	575	1030	1.7
	Kidney	419	332	528	1.9	310	228	421	1.4	729	496	1071	1.6
Bahrain	Breast					324	69	1519	58.5	324	69	1519	58.5
	Colon	65	9	480	11.0	37	3	513	7.6	102	7	1415	9.4
	Corpus uteri					45	3	624	8.2	45	3	624	8.2
	Ovary					29	6	143	5.1	29	6	143	5.1
	Pancreas	14	4	47	2.6	14	3	65	3.0	28	4	199	2.8
	Liver and intrahepatic bile ducts	21	3	173	3.0	12	2	68	2.4	33	2	458	2.7
	Thyroid	10	1	139	1.3	30	2	416	5.2	40	3	555	2.7
	Kidney	24	2	333	2.8	8	1	111	1.5	32	2	444	2.3
	Multiple myeloma	5	0	69	0.75	10	1	139	1.9	15	1	208	1.2
	Gallbladder	2	0	28	0.21	5	0	69	0.92	7	1	97	0.48
Comoros	Breast					65	58	73	21.5	65	58	73	21.5
	Liver and intrahepatic bile ducts	20	14	29	6.0	12	6	24	3.9	32	14	71	5

	Ovary					8	5	14	2.5	8	5	14	2.5
	Colon	4	1	12	1.8	5	3	10	2.0	9	2	33	1.9
	Corpus uteri					3	2	4	1.2	3	2	4	1.2
	Pancreas	2	1	3	0.77	2	1	4	0.74	4	2	10	0.76
	Thyroid	0	0	0	0.00	3	2	4	1.1	3	2	4	0.54
	Kidney	2	1	3	0.36	3	2	4	0.56	5	3	8	0.46
	Gallbladder	0	0	0	0.00	0	0	0	0.00	0	0	0	0
	Multiple myeloma	0	0	0	0.00	0	0	0	0.00	0	0	0	0
Djibouti	Breast					180	142	228	38.1	180	142	228	38.1
	Ovary					29	24	35	6.5	29	24	35	6.5
	Colon	17	12	24	3.8	14	9	21	3.1	31	18	53	3.5
	Liver and intrahepatic bile ducts	22	10	49	5.0	8	7	10	1.9	30	13	68	3.5
	Thyroid	5	3	7	1.3	21	15	30	4.7	26	16	43	3
	Corpus uteri					10	7	14	2.5	10	7	14	2.5
	Kidney	9	7	12	2.1	7	5	9	1.7	16	10	24	1.9
	Pancreas	6	3	11	1.5	5	3	9	1.2	11	5	26	1.4
	Gallbladder	0	0	0	0.00	4	3	6	1.1	4	3	6	0.54
	Multiple myeloma	1	1	1	0.31	1	1	1	0.30	2	1	3	0.3
Egypt	Breast					26845	25873	27854	55.4	26845	25873	27854	55.4
	Liver and intrahepatic bile ducts	17759	17170	18368	43.0	10187	9748	10646	22.0	27946	26438	29540	32
	Ovary					3070	2834	3326	6.4	3070	2834	3326	6.4
	Corpus uteri					2048	1801	2329	4.5	2048	1801	2329	4.5

	Colon	1865	1633	2130	4.2	1849	1666	2052	3.9	3714	3137	4397	4
	Pancreas	2042	1829	2280	4.9	1307	1155	1479	2.8	3349	2837	3953	3.8
	Thyroid	799	656	972	1.9	1813	1635	2011	3.7	2612	2092	3261	2.8
	Kidney	1308	1158	1478	3.0	951	822	1100	2.0	2259	1868	2731	2.4
	Multiple myeloma	588	478	723	1.4	316	231	432	0.70	904	622	1314	1
	Gallbladder	373	295	472	0.94	414	348	493	0.90	787	587	1056	0.9
Iraq	Breast					8626	8254	9015	56.9	8626	8254	9015	56.9
	Ovary					1002	887	1132	6.7	1002	887	1132	6.7
	Colon	873	769	991	7.2	576	491	675	4.2	1449	1182	1776	5.6
	Corpus uteri					688	591	800	5.2	688	591	800	5.2
	Thyroid	377	311	457	2.5	1241	1109	1389	7.0	1618	1294	2024	4.7
	Liver and intrahepatic bile ducts	412	341	497	3.9	395	325	480	3.0	807	616	1057	3.4
	Pancreas	504	425	597	4.6	262	206	334	2.1	766	570	1029	3.2
	Kidney	481	404	573	3.7	377	310	459	2.5	858	660	1116	3.1
	Multiple myeloma	291	232	365	2.6	190	144	251	1.5	481	336	688	2
	Gallbladder	76	48	120	0.72	102	70	149	0.82	178	98	323	0.78
Jordan	Breast					2598	2398	2814	60.0	2598	2398	2814	60
	Colon	467	394	553	12.8	446	371	535	11.3	913	711	1172	12
	Corpus uteri					271	216	341	7.3	271	216	341	7.3
	Ovary					240	188	306	5.7	240	188	306	5.7
	Thyroid	86	57	130	1.9	442	367	532	9.4	528	336	829	5.6
	Pancreas	177	133	236	4.8	112	73	172	3.0	289	173	483	3.8
	Kidney	164	121	223	4.2	92	61	138	2.3	256	154	425	3.2

	Liver and intrahepatic bile ducts	110	76	159	3.0	87	58	131	2.3	197	114	341	2.6
	Multiple myeloma	95	65	139	2.6	80	52	123	2.1	175	98	311	2.4
	Gallbladder	20	9	47	0.60	46	26	81	1.2	66	24	183	0.93
Kuwait	Breast					892	789	1009	49.8	892	789	1009	49.80
	Corpus uteri					123	91	166	8.5	123	91	166	8.50
	Colon	172	131	225	7.5	122	88	168	8.3	294	193	448	7.80
	Ovary					83	56	122	5.5	83	56	122	5.50
	Thyroid	58	36	93	1.9	193	149	251	9.9	251	146	431	4.80
	Liver and intrahepatic bile ducts	105	73	150	5.0	33	17	64	3.0	138	65	292	4.30
	Pancreas	73	48	111	3.4	37	21	65	3.1	110	54	224	3.30
	Kidney	69	45	106	3.1	24	11	50	1.7	93	40	218	2.50
	Multiple myeloma	42	24	73	2.1	23	10	51	1.5	65	24	173	1.80
	Gallbladder	13	4	48	0.63	15	3	66	1.2	28	4	202	0.83
Lebanon	Breast					2161	2000	2335	57.9	2161	2000	2335	57.9
	Colon	460	385	550	11.8	265	209	336	6.7	725	538	976	9.2
	Corpus uteri					295	242	360	8.0	295	242	360	8
	Ovary					247	192	317	6.7	247	192	317	6.7
	Thyroid	143	103	198	3.7	283	223	359	7.5	426	285	637	5.6
	Pancreas	183	139	240	4.7	123	91	167	3.2	306	203	460	3.9
	Kidney	192	147	252	5.0	86	56	132	2.4	278	168	460	3.7
	Multiple myeloma	128	92	178	3.3	91	61	136	2.4	219	130	370	2.8

	Liver and intrahepatic bile ducts	102	68	152	2.6	81	55	119	2.1	183	105	319	2.3
	Gallbladder	30	15	58	0.78	33	18	62	0.79	63	25	157	0.78
Libya	Breast					1169	1017	1344	31.0	1169	1017	1344	31
	Colon	281	216	365	10.6	351	274	449	10.4	632	441	905	10.4
	Ovary					184	117	290	5.3	184	117	290	5.3
	Liver and intrahepatic bile ducts	170	111	261	6.5	96	60	155	3.2	266	140	505	4.7
	Pancreas	125	83	187	4.6	103	65	163	3.3	228	124	421	3.8
	Kidney	127	85	191	4.7	72	36	143	2.3	199	90	441	3.4
	Thyroid	42	19	95	1.2	173	124	242	4.9	215	89	518	3.2
	Gallbladder	27	11	65	1.1	109	71	168	3.3	136	51	360	2.2
	Corpus uteri					55	37	82	2.0	55	37	82	2
	Multiple myeloma	44	17	115	1.8	40	20	82	1.3	84	25	279	1.5
Mauritania	Breast					600	389	926	34.5	600	389	926	34.5
	Liver and intrahepatic bile ducts	174	120	252	11.4	117	61	223	7.3	291	138	612	9.3
	Ovary					81	25	261	4.8	81	25	261	4.8
	Colon	48	3	706	3.6	45	3	662	3.0	93	6	1368	3.2
	Corpus uteri					39	8	196	2.7	39	8	196	2.7
	Pancreas	30	2	441	2.4	18	1	265	1.2	48	3	706	1.8
	Kidney	28	2	412	1.6	19	2	146	0.94	47	3	691	1.2
	Thyroid	16	1	235	1.1	19	1	280	1.1	35	2	515	1.1
	Multiple myeloma	16	1	235	1.2	13	1	191	0.89	29	2	427	1

	Gallbladder	2	0	29	0.16	12	1	177	0.71	14	1	206	0.44
Morocco	Breast					12756	12296	13234	58.4	12756	12296	13234	58.4
	Thyroid	403	323	504	2.0	2458	2241	2696	11.5	2861	2248	3642	6.8
	Colon	1422	1272	1590	6.9	1460	1291	1651	6.5	2882	2442	3402	6.7
	Ovary					1367	1229	1521	6.3	1367	1229	1521	6.3
	Corpus uteri					918	784	1074	4.2	918	784	1074	4.2
	Pancreas	729	636	836	3.5	500	427	586	2.2	1229	997	1515	2.8
	Liver and intrahepatic bile ducts	593	494	711	2.9	519	437	616	2.3	1112	866	1427	2.6
	Kidney	408	337	495	2.1	344	261	453	1.7	752	537	1052	1.9
	Multiple myeloma	337	260	436	1.6	212	161	279	0.93	549	377	800	1.3
	Gallbladder	137	83	227	0.67	393	304	508	1.7	530	301	934	1.2
Oman	Breast					549	465	648	34.0	549	465	648	34
	Colon	196	151	255	7.8	60	39	93	4.5	256	154	425	6.4
	Liver and intrahepatic bile ducts	116	83	163	5.7	32	17	61	2.8	148	72	305	4.6
	Thyroid	56	35	91	1.4	156	116	211	8.7	212	120	374	3.8
	Corpus uteri					44	26	76	3.5	44	26	76	3.5
	Ovary					50	30	85	3.5	50	30	85	3.5
	Pancreas	72	47	109	4.0	15	6	38	1.3	87	31	241	2.8
	Kidney	67	44	102	2.8	28	14	55	2.0	95	43	212	2.4
	Multiple myeloma	46	27	78	2.1	15	6	38	1.3	61	21	178	1.9
	Gallbladder	26	8	89	1.2	9	3	30	0.84	35	6	195	1.1
Palestine	Breast					828	780	879	46.3	828	780	879	46.3

	Colon	187	159	219	13.3	175	148	207	11.2	362	287	457	12.2
	Corpus uteri					107	86	132	6.9	107	86	132	6.9
	Liver and intrahepatic bile ducts	91	44	186	6.4	61	31	120	3.8	152	57	407	5.1
	Thyroid	47	28	80	2.3	171	144	203	7.5	218	125	380	4.9
	Pancreas	80	59	108	5.9	51	32	81	3.5	131	76	227	4.6
	Ovary					74	62	88	4.2	74	62	88	4.2
	Multiple myeloma	51	32	82	3.7	45	25	80	3.0	96	45	203	3.4
	Kidney	72	52	99	4.4	43	28	67	2.4	115	67	198	3.3
	Gallbladder	20	3	149	1.6	24	12	48	1.7	44	5	367	1.6
Qatar	Breast					248	191	321	39.0	248	191	321	39
	Colon	72	45	114	4.3	47	28	80	10.0	119	59	240	5.8
	Ovary					30	15	60	5.8	30	15	60	5.8
	Liver and intrahepatic bile ducts	48	28	82	3.9	12	3	43	3.7	60	15	240	4.1
	Corpus uteri					18	7	44	4.1	18	7	44	4.1
	Thyroid	40	14	114	1.6	49	28	86	6.5	89	27	294	2.6
	Pancreas	21	6	69	1.5	14	2	91	3.2	35	4	321	2.1
	Kidney	27	9	83	1.3	11	2	57	2.4	38	5	278	1.6
	Gallbladder	5	1	46	0.59	6	1	55	2.1	11	1	101	1.1
	Multiple myeloma	19	4	95	1.0	4	0	37	0.77	23	3	211	0.97
Saudi Arabia	Breast					3777	3534	4037	25.3	3777	3534	4037	25.3
	Corpus uteri					928	822	1048	8.4	928	822	1048	8.4
	Thyroid	819	715	938	3.5	1799	1640	1973	11.3	2618	2222	3084	6.6

	Colon	1339	1203	1490	6.9	665	571	774	5.4	2004	1664	2414	6.3
	Liver and intrahepatic bile ducts	934	822	1062	6.0	320	257	399	3.0	1254	972	1617	4.7
	Ovary					426	347	524	3.3	426	347	524	3.3
	Kidney	568	483	669	2.8	270	213	343	2.1	838	628	1119	2.5
	Pancreas	412	339	500	2.3	167	123	226	1.5	579	404	829	2
	Multiple myeloma	201	153	264	1.2	94	63	139	0.83	295	183	476	1
	Gallbladder	71	45	112	0.44	128	91	180	1.2	199	112	353	0.72
Somalia	Breast					1811	1580	2076	38.6	1811	1580	2076	38.6
	Ovary					311	280	346	7.0	311	280	346	7
	Colon	210	188	235	5.5	210	189	234	4.9	420	360	490	5.2
	Liver and intrahepatic bile ducts	169	115	249	4.3	132	104	167	3.2	301	191	474	3.7
	Corpus uteri					144	120	172	3.6	144	120	172	3.6
	Thyroid	57	8	399	1.3	210	119	371	4.2	267	35	2029	2.8
	Pancreas	70	56	87	2.0	79	62	101	2.0	149	107	207	2
	Kidney	118	60	234	2.2	106	68	166	1.8	224	99	508	2
	Multiple myeloma	48	24	94	1.3	49	16	147	1.2	97	27	352	1.3
	Gallbladder	21	11	41	0.59	49	36	67	1.2	70	34	146	0.91
Sudan	Breast					6631	6233	7054	39.9	6631	6233	7054	39.9
	Ovary					1003	866	1162	6.4	1003	866	1162	6.4
	Liver and intrahepatic bile ducts	803	678	951	5.8	425	341	530	3.0	1228	930	1622	4.4
	Colon	460	370	572	3.1	368	290	467	2.3	828	600	1143	2.7

	Corpus uteri					359	281	458	2.6	359	281	458	2.6
	Thyroid	192	135	273	1.5	536	441	651	3.7	728	487	1087	2.6
	Kidney	303	233	395	2.0	302	233	391	1.8	605	418	876	1.9
	Pancreas	153	108	218	1.3	135	93	197	0.90	288	172	482	1.1
	Multiple myeloma	183	131	255	1.4	112	72	173	0.80	295	171	510	1.1
	Gallbladder	60	33	110	0.51	203	146	282	1.5	263	132	522	1
Syira	Breast					4114	3347	5057	46.2	4114	3347	5057	46.2
	Corpus uteri					704	275	1804	8.2	704	275	1804	8.2
	Colon	515	390	679	7.7	594	462	764	7.4	1109	763	1612	7.5
	Ovary					462	321	665	5.1	462	321	665	5.1
	Thyroid	272	20	3774	2.9	565	41	7840	5.7	837	60	11614	4.4
	Pancreas	392	322	478	5.8	227	173	297	2.8	619	443	864	4.2
	Kidney	290	141	595	4.0	157	55	444	1.9	447	126	1584	2.9
	Liver and intrahepatic bile ducts	213	165	275	3.1	195	151	251	2.4	408	284	585	2.8
	Multiple myeloma	195	14	2706	2.8	151	11	2095	1.9	346	25	4801	2.4
	Gallbladder	60	34	105	0.90	72	39	132	0.96	132	58	301	0.93
Tunisia	Breast					2820	2636	3017	36.2	2820	2636	3017	36.2
	Colon	502	414	609	6.9	512	421	622	6.2	1014	770	1334	6.6
	Ovary					358	266	483	4.6	358	266	483	4.6
	Liver and intrahepatic bile ducts	342	240	488	4.7	285	180	451	3.4	627	351	1120	4.1
	Corpus uteri					320	249	411	4.0	320	249	411	4
	Pancreas	311	243	398	4.3	202	142	287	2.4	513	334	788	3.3

	Thyroid	75	31	180	1.1	287	235	351	3.8	362	147	889	2.5
	Kidney	182	125	265	2.6	140	92	213	1.9	322	184	565	2.2
	Multiple myeloma	110	51	238	1.5	111	65	190	1.4	221	86	566	1.4
	Gallbladder	68	33	142	0.92	106	51	219	1.2	174	62	489	1.1
United Arab Emirates	Breast					1142	1022	1277	57.1	1142	1022	1277	57.1
	Corpus uteri					152	114	203	10.3	152	114	203	10.3
	Colon	215	168	275	6.8	135	102	179	8.6	350	241	509	7.2
	Ovary					105	73	152	5.4	105	73	152	5.4
	Thyroid	107	74	154	2.4	337	276	412	13.1	444	293	673	5.4
	Liver and intrahepatic bile ducts	57	36	91	2.8	32	17	62	2.6	89	40	200	2.7
	Kidney	79	52	119	2.6	43	24	77	2.9	122	60	250	2.7
	Pancreas	54	33	87	2.4	31	16	60	2.5	85	37	194	2.4
	Multiple myeloma	45	24	83	1.3	24	11	51	1.9	69	26	183	1.5
	Gallbladder	8	2	37	0.26	11	3	40	0.74	19	3	140	0.39
Yemen	Breast					2872	2661	3100	25.4	2872	2661	3100	25.4
	Colon	429	359	513	4.7	502	426	591	6.1	931	731	1186	5.5
	Liver and intrahepatic bile ducts	461	383	554	6.2	265	216	326	2.9	726	551	957	4.4
	Ovary					341	283	410	2.9	341	283	410	2.9
	Thyroid	131	98	175	1.4	395	329	474	3.2	526	374	739	2.3
	Pancreas	167	126	221	2.4	167	127	220	1.8	334	225	495	2
	Kidney	106	75	150	0.82	63	40	99	0.44	169	96	298	0.62
	Corpus uteri					16	7	39	0.15	16	7	39	0.15

	Gallbladder	4	1	24	0.06	14	5	36	0.16	18	2	135	0.11
	Multiple myeloma	16	7	39	0.19	2	0	25	0.03	18	1	223	0.11
Arab Total	Breast					95609	-	-	48.7	95609	-	-	48.7
	Liver and intrahepatic bile ducts	23145	-	-	13.0	13638	-	-	7.6	36783	-	-	10.3
	Colon	12173	-	-	6.7	10579	-	-	5.8	22752	-	-	6.2
	Ovary					10647	-	-	5.6	10647	-	-	5.6
	Corpus uteri					7880	-	-	4.4	7880	-	-	4.4
	Thyroid	4165	-	-	2.0	13270	-	-	6.5	17435	-	-	4.2
	Pancreas	6310	-	-	3.6	4046	-	-	2.3	10356	-	-	2.9
	Kidney	5043	-	-	2.7	3456	-	-	1.8	8499	-	-	2.2
	Multiple myeloma	2866	-	-	1.6	1948	-	-	1.1	4814	-	-	1.4
	Gallbladder	1370	-	-	0.82	2601	-	-	1.5	3971	-	-	1.1
Global total	Breast					2296840	2285641	2308093	46.8	2296840	2285641	2308093	46.8
	Colon	609228	603702	614804	12.4	533058	527675	538496	9.2	1142286	1126812	1157972	10.7
	Thyroid	206485	203812	209193	4.6	614729	609950	619546	13.6	821214	808835	833782	9.1
	Liver and intrahepatic bile ducts	600676	595922	605468	12.7	265460	262152	268810	4.8	866136	853373	879090	8.6
	Corpus uteri					420368	415409	425386	8.4	420368	415409	425386	8.4
	Ovary					324603	320784	328467	6.7	324603	320784	328467	6.7
	Pancreas	269709	266040	273429	5.5	241283	237676	244945	4.0	510992	500694	521501	4.7
	Kidney	277800	273718	281943	5.9	157040	153941	160202	3.0	434840	424177	445771	4.4
	Multiple myeloma	103805	101448	106217	2.1	84147	81966	86386	1.5	187952	181507	194626	1.8
	Gallbladder	43538	42365	44744	0.88	78953	77333	80607	1.4	122491	118361	126765	1.2

At the country level, Algeria reported the highest ASIR for breast cancer at 61.9, while Saudi Arabia and Yemen recorded the lowest at 25.3 and 25.4, respectively. The incidence of liver cancer was disproportionately high in Egypt (ASIR: 32.0) and Mauritania (ASIR: 9.3), whereas Algeria had the lowest liver cancer incidence (ASIR: 1.7).

Gender-specific trends mirrored the overall patterns: liver cancer was the most common metabolic dysfunction-related cancer among males (ASIR: 13.0), followed by colorectal cancer (ASIR: 6.7). Conversely, breast cancer dominated among females (ASIR: 48.7), followed by liver cancer (ASIR: 7.6). There was a significant disparity in thyroid cancer incidence by gender, with the female ASIR (6.5) being three times that of males (2.0) (**Table 1**).

In 2022, there were 297,965 cancer-related deaths in Arab countries (**Figure 2**), comprising 3.1% of the 9,743,832 global cancer deaths (**Sup Table 2**). Of these, 116,696 deaths were attributed to metabolic dysfunction-related cancers, representing 38.8% of total cancer deaths in the region, which is higher than the global average of 32.3%.

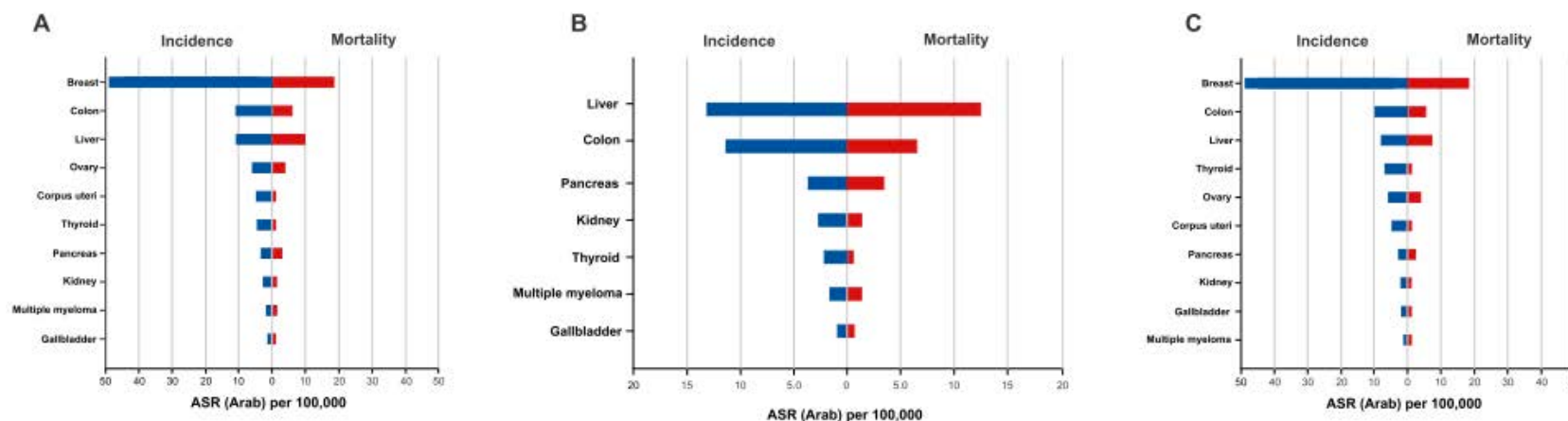


Figure 2: Age-standardized rates for the incidence and mortality of colorectal, liver, gallbladder, pancreatic, breast, corpus uteri, ovarian, kidney, thyroid, and multiple myeloma cancers in 22 Arab countries. (A) Both sexes, (B) Male, (C) Female.

The overall age-standardized mortality rate (ASMR) for cancer in Arab countries was 66.4, lower than the global level of 123.6. The ASMR for metabolic dysfunction-related cancers was 27.6, again lower than the global rate of 44.6. At the country level, the ASMR for liver cancer was disproportionately high in Egypt (ASMR: 30.8), followed by Mauritania (ASMR: 9.1), and the lowest in Algeria (ASMR: 1.5). For colorectal cancer, higher ASMRs were noted in Libya (ASMR: 7.9), followed by Palestine (ASMR: 7.4), with the lowest in Comoros (ASMR: 1.4).

Figure 2 presents the age-standardized rates (ASRs) of cancer incidence and mortality in Arab countries for men, women, and the overall population in 2022. Liver cancer was the leading cause of cancer mortality for both sexes, resulting in 35,393 deaths (30.3%), with an ASMR higher than the global average (9.9 vs 7.4).

Liver cancer was the leading cause of death related to metabolic dysfunction in males, with an ASMR of 12.6. Egypt had the highest rate at 41.5, followed by Mauritania at 11.0, while Algeria reported the lowest rate at 1.5. Breast cancer was the leading cause of cancer death in females, with 35,261 deaths (30.2%), also above the global average (18.4 vs 12.7). Colorectal cancer ranked third, causing 13,245 deaths (11.3%) with an ASMR of 3.7, compared to 4.7 globally (**Table 2**). Somalia reported the highest rate at 25.7, followed by Iraq at 23.5, with Saudi Arabia having the lowest rate at 7.6.

Table 2: Distribution of metabolic-dysfunction related cancer deaths and Mortality Rate in 2022 in global and 22 Arab Countries sorted by alphabetical order.

Country	Label	Males				Females				Both sexes			
		Number	95% UI low	95% UI high	ASMR	Number	95% UI low	95% UI high	ASMR	Number	95% UI low	95% UI high	ASMR
Algeria	Breast					4893	4825	4962	20.8	4893	4825	4962	20.8
	Colon	1418	1327	1516	6.2	1227	1152	1307	5.2	2645	2413	2900	5.7
	Ovary					795	722	876	3.6	795	722	876	3.6
	Pancreas					461	374	568	2.0	1136	867	1488	2.5
	Gallbladder	232	187	288	1.0	553	497	615	2.4	785	618	997	1.7
	Liver and intrahepatic bile ducts	345	281	423	1.5	318	231	438	1.4	663	453	970	1.5
	Multiple myeloma	344	283	418	1.5	311	249	389	1.4	655	486	882	1.5
	Kidney	216	187	249	0.96	155	129	186	0.68	371	294	469	0.82
	Thyroid	78	75	81	0.33	280	276	284	1.2	358	343	374	0.75
Bahrain	Corpus uteri					124	119	129	0.55	124	119	129	0.55
	Breast					96	63	147	19.7	96	63	147	19.7
	Ovary					21	7	61	4.2	21	7	61	4.2
	Colon	27	12	58	4.9	14	3	60	3.0	41	8	213	4
	Pancreas	13	5	37	2.6	14	3	58	3.0	27	5	158	2.7
	Liver and intrahepatic bile ducts	16	4	71	2.5	11	3	48	2.5	27	3	219	2.4
	Corpus uteri					8	2	34	1.6	8	2	34	1.6
	Multiple myeloma	5	0	57	1.1	7	1	80	1.4	12	1	138	1.1

	Kidney	7	1	80	1.2	3	0	34	0.60	10	1	115	0.93
	Thyroid	1	0	11	0.26	4	0	46	1.1	5	0	57	0.61
	Gallbladder	0	0	0	0.00	4	0	46	0.77	4	0	46	0.3
Comoros	Breast					34	32	36	11.8	34	32	36	11.8
	Liver and intrahepatic bile ducts	20	13	30	6.0	12	6	25	3.9	32	14	75	5
	Ovary					6	4	9	2.1	6	4	9	2.1
	Colon	2	1	4	0.82	5	2	10	2.0	7	3	18	1.4
	Pancreas	2	1	3	0.77	2	1	5	0.74	4	2	11	0.76
	Corpus uteri					1	1	1	0.43	1	1	1	0.43
	Thyroid	0	0	0	0.00	2	2	3	0.74	2	2	3	0.38
	Kidney	1	1	1	0.17	2	2	2	0.37	3	2	4	0.27
	Gallbladder	0	0	0	0.00	0	0	0	0.00	0	0	0	0
	Multiple myeloma	0	0	0	0.00	0	0	0	0.00	0	0	0	0
Djibouti	Breast					102	89	117	22.1	102	89	117	22.1
	Ovary					22	19	26	5.2	22	19	26	5.2
	Liver and intrahepatic bile ducts	22	10	51	5.0	8	7	10	1.9	30	13	71	3.5
	Colon	14	11	19	3.4	10	7	14	2.4	24	16	36	2.8
	Thyroid	3	2	4	0.86	9	8	11	2.2	12	9	16	1.5
	Pancreas	6	3	11	1.5	5	3	10	1.2	11	5	27	1.4
	Kidney	6	5	8	1.5	4	3	5	0.98	10	8	13	1.2
	Gallbladder	0	0	0	0.00	4	3	6	1.1	4	3	6	0.54
	Corpus uteri					2	2	2	0.49	2	2	2	0.49
Egypt	Multiple myeloma	1	1	1	0.31	1	1	2	0.30	2	1	3	0.3
	Liver and intrahepatic bile ducts	17179	16600	17778	41.5	9792	9366	10238	21.1	26971	25497	28530	30.8
	Breast					9596	9464	9730	19.9	9596	9464	9730	19.9
	Ovary					1944	1843	2051	4.2	1944	1843	2051	4.2
	Pancreas	1936	1734	2161	4.7	1250	1104	1416	2.7	3186	2698	3762	3.7

	Colon	993	922	1070	2.2	998	941	1059	2.1	1991	1811	2189	2.2
	Kidney	547	518	577	1.3	443	413	476	0.92	990	906	1082	1.1
	Corpus uteri					425	413	437	0.91	425	413	437	0.91
	Multiple myeloma	503	418	606	1.3	268	203	354	0.60	771	552	1078	0.9
	Gallbladder	268	224	320	0.68	310	270	356	0.67	578	461	724	0.66
	Thyroid	150	144	156	0.44	333	326	340	0.70	483	462	505	0.59
Iraq	Breast					3372	3302	3443	23.5	3372	3302	3443	23.5
	Ovary					693	626	767	5.1	693	626	767	5.1
	Colon	549	498	605	4.6	352	313	396	2.6	901	774	1049	3.5
	Liver and intrahepatic bile ducts	402	322	502	3.9	375	300	469	2.9	777	567	1065	3.4
	Pancreas	496	405	607	4.6	256	192	341	2.0	752	530	1068	3.2
	Kidney	254	227	284	2.2	194	172	219	1.4	448	380	529	1.8
	Multiple myeloma	242	193	304	2.3	162	122	216	1.3	404	280	582	1.8
	Corpus uteri					196	186	207	1.6	196	186	207	1.6
	Thyroid	71	68	74	0.66	160	157	163	1.2	231	220	242	0.93
	Gallbladder	66	41	107	0.62	89	60	133	0.71	155	83	291	0.67
Jordan	Breast					802	778	827	19.3	802	778	827	19.3
	Colon	240	216	267	6.8	232	207	261	5.9	472	403	553	6.3
	Ovary					159	130	194	4.1	159	130	194	4.1
	Pancreas	171	122	240	4.6	111	66	186	2.9	282	152	523	3.8
	Liver and intrahepatic bile ducts	107	69	166	2.9	85	52	138	2.3	192	100	370	2.6
	Corpus uteri					83	76	90	2.3	83	76	90	2.3
	Multiple myeloma	72	51	102	2.1	64	42	98	1.8	136	78	236	1.9
	Kidney	79	66	95	2.1	43	34	54	1.1	122	91	163	1.6
	Thyroid	14	13	15	0.44	56	54	58	1.5	70	64	76	0.99
	Gallbladder	16	7	37	0.50	31	20	49	0.86	47	18	122	0.69
Kuwait	Breast					255	244	267	17.0	255	244	267	17
	Ovary					55	39	77	4.3	55	39	77	4.3

	Colon	77	66	90	4.0	55	46	66	4.3	132	103	169	4.1
	Liver and intrahepatic bile ducts	99	64	153	4.7	32	14	73	3.0	131	52	332	4.1
	Pancreas	69	41	116	3.4	36	18	74	3.1	105	43	254	3.2
	Corpus uteri					28	26	31	2.5	28	26	31	2.5
	Multiple myeloma	30	18	50	2.1	14	7	26	1.0	44	19	99	1.6
	Kidney	25	20	30	1.6	7	5	9	0.68	32	23	45	1.3
	Thyroid	9	8	10	0.54	18	17	19	1.5	27	24	30	0.89
	Gallbladder	13	2	70	0.63	15	2	102	1.2	28	2	358	0.83
Lebanon	Breast					781	755	808	20.4	781	755	808	20.4
	Colon	266	234	302	6.8	157	132	187	3.8	423	342	524	5.2
	Ovary					171	138	211	4.6	171	138	211	4.6
	Pancreas	181	130	252	4.6	121	84	175	3.1	302	184	495	3.9
	Liver and intrahepatic bile ducts	102	63	166	2.6	78	49	123	2.0	180	92	351	2.3
	Multiple myeloma	106	76	148	2.7	75	50	113	1.9	181	107	307	2.3
	Corpus uteri					86	80	92	2.2	86	80	92	2.2
	Kidney	98	83	116	2.5	45	34	59	1.2	143	104	197	1.8
	Thyroid	23	22	25	0.58	37	36	38	0.92	60	56	65	0.74
	Gallbladder	23	12	43	0.59	24	14	42	0.57	47	20	109	0.58
Libya	Breast					460	435	487	13.3	460	435	487	13.3
	Colon	200	165	242	8.6	239	201	284	7.5	439	339	568	7.9
	Liver and intrahepatic bile ducts	158	105	238	6.2	91	57	145	3.1	249	134	462	4.5
	Ovary					126	92	173	3.9	126	92	173	3.9
	Pancreas	108	75	155	4.1	95	61	147	3.0	203	115	357	3.5
	Gallbladder	23	11	49	0.93	88	61	126	2.7	111	48	258	1.8
	Kidney	70	56	88	2.8	24	19	30	0.80	94	68	131	1.7
	Multiple myeloma	37	16	85	1.6	33	18	61	1.1	70	25	196	1.3

	Thyroid	9	8	11	0.39	31	29	33	1.1	40	33	48	0.77
	Corpus uteri					13	12	14	0.50	13	12	14	0.5
Mauritania	Breast					315	251	396	18.5	315	251	396	18.5
	Liver and intrahepatic bile ducts	167	117	238	11.0	114	61	214	7.2	281	137	578	9.1
	Ovary					58	25	134	3.8	58	25	134	3.8
	Colon	35	5	264	2.6	31	2	456	2.1	66	4	971	2.3
	Pancreas	30	2	441	2.4	18	1	265	1.2	48	3	706	1.8
	Corpus uteri					14	8	25	1.0	14	8	25	1
	Multiple myeloma	16	1	235	1.2	11	1	162	0.79	27	2	397	0.98
	Kidney	18	2	146	1.1	13	3	53	0.69	31	3	384	0.87
	Gallbladder	2	0	29	0.16	12	1	177	0.71	14	1	206	0.44
	Thyroid	6	0	86	0.44	6	1	25	0.42	12	1	177	0.44
Morocco	Breast					4044	3988	4100	18.1	4044	3988	4100	18.1
	Ovary					919	844	1001	4.2	919	844	1001	4.2
	Colon	817	757	882	4.0	824	759	895	3.6	1641	1467	1836	3.8
	Pancreas	702	601	821	3.4	479	400	574	2.1	1181	930	1499	2.7
	Liver and intrahepatic bile ducts	564	459	693	2.8	483	400	584	2.1	1047	792	1384	2.4
	Multiple myeloma	292	224	381	1.5	190	142	255	0.82	482	325	716	1.1
	Kidney	218	193	246	1.1	194	161	233	0.90	412	330	514	1
	Corpus uteri					211	202	220	0.93	211	202	220	0.93
	Gallbladder	98	64	151	0.48	275	222	340	1.2	373	231	603	0.85
	Thyroid	67	64	70	0.34	289	285	293	1.3	356	340	373	0.81
Oman	Breast					199	184	215	13.1	199	184	215	13.1
	Liver and intrahepatic bile ducts	114	74	175	5.4	31	14	69	2.8	145	59	359	4.4
	Colon	117	95	143	4.9	36	26	50	2.7	153	103	226	3.9
	Pancreas	68	41	113	4.0	15	5	50	1.3	83	23	306	2.7
	Ovary					34	21	54	2.7	34	21	54	2.7

	Kidney	44	31	63	2.2	19	10	35	1.5	63	31	126	1.8
	Multiple myeloma	36	21	62	1.9	11	5	27	0.94	47	17	132	1.6
	Gallbladder	23	6	93	1.1	8	2	32	0.73	31	4	221	0.96
	Thyroid	8	7	9	0.49	18	17	19	1.4	26	24	29	0.87
	Corpus uteri					9	8	10	0.82	9	8	10	0.82
Palestine	Breast					333	325	341	19.7	333	325	341	19.7
	Colon	111	101	122	8.2	104	94	115	6.8	215	187	247	7.4
	Liver and intrahepatic bile ducts	86	44	169	6.2	53	29	95	3.6	139	57	341	4.8
	Pancreas	78	58	105	5.9	48	31	74	3.3	126	75	213	4.5
	Ovary					53	47	60	3.4	53	47	60	3.4
	Multiple myeloma	42	28	62	3.1	39	24	64	2.6	81	43	153	2.9
	Corpus uteri					29	27	31	2.0	29	27	31	2
	Kidney	36	31	42	2.5	18	15	22	1.2	54	42	69	1.8
	Gallbladder	16	3	80	1.3	18	11	30	1.3	34	6	183	1.3
	Thyroid	9	8	10	0.61	23	22	24	1.3	32	29	35	0.96
Qatar	Breast					62	57	67	11.4	62	57	67	11.4
	Ovary					19	11	33	4.5	19	11	33	4.5
	Liver and intrahepatic bile ducts	43	24	77	3.7	11	3	46	3.5	54	12	251	3.9
	Colon	32	25	41	2.1	23	17	31	5.1	55	37	82	3
	Pancreas	19	5	70	1.5	12	2	84	3.1	31	3	322	2
	Corpus uteri					4	3	5	1.2	4	3	5	1.2
	Gallbladder	5	0	74	0.59	5	0	74	2.0	10	1	147	1.1
	Multiple myeloma	13	3	49	0.87	3	0	44	0.70	16	1	235	0.83
	Kidney	11	6	19	0.53	5	2	12	1.3	16	6	46	0.77
	Thyroid	4	4	5	0.46	4	4	4	1.1	8	7	9	0.55
	Breast					1046	1023	1069	7.6	1046	1023	1069	7.6

Saudi Arabia

	Liver and intrahepatic bile ducts	917	788	1067	5.9	309	239	399	2.9	1226	912	1649	4.6
	Colon	688	644	735	3.8	347	315	382	2.9	1035	922	1162	3.4
	Ovary					271	231	317	2.4	271	231	317	2.4
	Corpus uteri					214	207	221	2.2	214	207	221	2.2
	Pancreas	405	322	509	2.4	162	114	231	1.5	567	372	863	2
	Kidney	236	218	256	1.3	105	94	117	0.89	341	297	391	1.1
	Thyroid	95	93	97	0.66	151	150	152	1.3	246	241	251	0.92
	Multiple myeloma	156	121	201	1.0	73	51	105	0.69	229	147	358	0.86
Somalia	Gallbladder	53	35	80	0.33	99	72	136	0.92	152	90	256	0.56
	Breast					1165	1063	1277	25.7	1165	1063	1277	25.7
	Ovary					238	219	259	5.7	238	219	259	5.7
	Colon	174	158	192	4.6	171	156	187	4.1	345	302	394	4.3
	Liver and intrahepatic bile ducts	166	111	247	4.2	130	102	165	3.1	296	186	472	3.6
	Pancreas	69	55	87	1.9	76	59	97	1.9	145	104	203	1.9
	Corpus uteri					59	55	64	1.5	59	55	64	1.5
	Kidney	82	50	135	1.6	74	53	103	1.3	156	86	283	1.5
	Thyroid	22	10	48	0.59	76	61	94	1.8	98	43	221	1.2
	Multiple myeloma	43	23	81	1.2	44	16	123	1.1	87	26	291	1.2
Sudan	Gallbladder	21	11	42	0.59	45	33	61	1.1	66	31	140	0.86
	Breast					3243	3147	3342	20.7	3243	3147	3342	20.7
	Ovary					659	598	726	4.4	659	598	726	4.4
	Liver and intrahepatic bile ducts	791	670	934	5.8	409	331	506	2.9	1200	917	1571	4.3
	Colon	304	263	351	2.1	242	207	283	1.5	546	442	675	1.8
	Kidney	234	191	287	1.7	214	178	257	1.3	448	341	589	1.5
	Multiple myeloma	173	127	236	1.3	105	70	158	0.75	278	166	464	1
	Pancreas	143	103	199	1.2	117	85	162	0.79	260	164	413	0.98

	Gallbladder	51	31	85	0.44	172	130	227	1.3	223	125	399	0.88
	Corpus uteri					111	103	120	0.83	111	103	120	0.83
	Thyroid	56	51	62	0.49	128	122	134	0.94	184	164	206	0.73
Syria	Breast					1781	1622	1955	20.9	1781	1622	1955	20.9
	Colon	356	291	435	5.2	408	341	489	5.0	764	583	1000	5.1
	Pancreas	357	296	431	5.3	205	159	264	2.6	562	410	771	3.8
	Ovary					294	231	375	3.5	294	231	375	3.5
	Liver and intrahepatic bile ducts	205	158	266	3.0	190	147	246	2.4	395	274	569	2.7
	Multiple myeloma	185	12	2893	2.7	144	9	2252	1.9	329	21	5145	2.3
	Corpus uteri					182	141	235	2.2	182	141	235	2.2
	Kidney	139	97	199	2.0	69	43	111	0.85	208	114	379	1.4
	Thyroid	64	4	1001	0.89	93	58	150	1.2	157	10	2455	1.1
	Gallbladder	50	31	81	0.77	58	35	97	0.80	108	53	219	0.78
Tunisia	Breast					901	881	922	10.9	901	881	922	10.9
	Liver and intrahepatic bile ducts	313	221	442	4.3	265	168	417	3.1	578	327	1023	3.7
	Colon	268	240	299	3.7	279	249	312	3.3	547	467	640	3.5
	Pancreas	303	235	391	4.2	200	138	289	2.3	503	321	788	3.2
	Ovary					236	191	291	2.9	236	191	291	2.9
	Multiple myeloma	85	45	160	1.2	88	56	138	1.0	173	79	377	1.1
	Kidney	87	72	105	1.2	70	56	87	0.86	157	117	210	1
	Corpus uteri					78	73	83	0.88	78	73	83	0.88
	Gallbladder	54	29	100	0.73	83	45	152	0.92	137	58	326	0.83
	Thyroid	18	14	23	0.27	55	53	57	0.53	73	58	92	0.44
United Arab Emirates	Breast					253	245	261	15.9	253	245	261	15.9
	Ovary					61	47	80	4.0	61	47	80	4
	Colon	90	79	102	3.2	57	49	66	3.9	147	121	179	3.3
	Corpus uteri					33	31	36	2.8	33	31	36	2.8

	Liver and intrahepatic bile ducts	54	31	94	2.7	32	14	73	2.6	86	32	232	2.6
	Pancreas	49	28	84	2.3	30	13	67	2.5	79	30	210	2.3
	Thyroid	15	14	16	0.89	30	29	31	3.1	45	42	48	1.6
	Kidney	29	24	35	1.2	15	12	19	1.3	44	32	61	1.2
	Multiple myeloma	25	16	38	0.88	12	7	19	1.2	37	20	70	1
	Gallbladder	6	1	25	0.19	8	2	26	0.62	14	2	89	0.3
Yemen	Breast					1528	1463	1596	14.0	1528	1463	1596	14
	Liver and intrahepatic bile ducts	446	369	540	5.9	248	202	305	2.8	694	524	919	4.2
	Colon	290	255	330	3.2	366	322	416	4.5	656	547	786	3.9
	Ovary					224	197	255	2.3	224	197	255	2.3
	Pancreas	142	110	183	2.2	144	112	186	1.6	286	200	410	1.8
	Thyroid	39	36	43	0.58	100	95	105	1.0	139	125	154	0.8
	Kidney	75	58	97	0.65	41	30	56	0.31	116	77	174	0.48
	Corpus uteri					10	6	18	0.10	10	6	18	0.1
	Multiple myeloma	13	6	28	0.17	2	0	29	0.03	15	1	221	0.09
	Gallbladder	3	1	12	0.05	7	4	12	0.09	10	2	45	0.07
Arab Total	Breast					35261	-	-	18.4	35261	-	-	18.4
	Liver and intrahepatic bile ducts	22316	-	-	12.6	13077	-	-	7.3	35393	-	-	9.9
	Ovary					7058	-	-	3.9	7058	-	-	3.9
	Colon	7068	-	-	4.0	6177	-	-	3.4	13245	-	-	3.7
	Pancreas	6022	-	-	3.5	3857	-	-	2.2	9879	-	-	2.8
	Kidney	2512	-	-	1.4	1757	-	-	0.94	4269	-	-	1.2
	Multiple myeloma	2419	-	-	1.4	1657	-	-	0.95	4076	-	-	1.2
	Corpus uteri					1920	-	-	1.1	1920	-	-	1.1
	Gallbladder	1023	-	-	0.62	1908	-	-	1.1	2931	-	-	0.85
	Thyroid	761	-	-	0.46	1903	-	-	1.0	2664	-	-	0.76

Global total	Breast					666103	660000	672262	12.7	666103	660000	672262	12.7
	Liver and intrahepatic bile ducts	521826	517095	526601	10.9	236899	233569	240276	4.1	758725	746051	771615	7.4
	Colon	283784	279746	287881	5.6	254383	250449	258379	4.0	538167	526889	549687	4.7
	Pancreas	247589	243840	251396	5.0	219820	216161	223541	3.5	467409	456923	478136	4.2
	Ovary					206956	203693	210271	4.0	206956	203693	210271	4
	Corpus uteri					97723	95204	100309	1.7	97723	95204	100309	1.7
	Kidney	100343	97828	102923	2.0	55610	53709	57578	0.95	155953	149376	162819	1.5
	Multiple myeloma	66966	65042	68947	1.3	54422	52631	56274	0.92	121388	116118	126898	1.1
	Gallbladder	31406	30363	32484	0.63	57649	56217	59118	1.0	89055	85385	92882	0.83
	Thyroid	17241	16379	18148	0.35	30266	29057	31525	0.53	47507	44496	50722	0.44

An analysis of projected cancer incidence rates indicates that the Arab region will experience a significant increase in metabolic dysfunction-related cancers across various types by 2050, with specific trends observed in certain countries (**Table 3**).

		Male					Female					Both sexes				
		Annual population		Number		Change in number	Annual population		Number		Change in number	Annual population		Number		Change in number
Country	Label	2022	2050	2022	2050		2022	2050	2022	2050		2022	2050	2022	2050	
Algeria	Colon	22912687	30399027	4082	9722	138.20%	22437454	29602095	3665	8178	123.10%	45350141	60001122	7747	17900	131.10%
	Liver and intrahepatic bile ducts			423	1063	151.30%			332	811	144.30%			755	1874	148.20%
	Gallbladder			347	885	155.00%			846	2031	140.10%			1193	2916	144.40%
	Pancreas			693	1775	156.10%			475	1205	153.70%			1168	2980	155.10%
	Breast								14601	23317	59.70%			14601	23317	59.70%
	Corpus uteri								593	1228	107.10%			593	1228	107.10%
	Ovary								1147	2097	82.80%			1147	2097	82.80%
	Kidney			419	840	100.50%			310	591	90.60%			729	1431	96.30%
	Thyroid			430	773	79.80%			2089	3339	59.80%			219	4112	63.20%

	Multiple myeloma			405	969	139.30%			365	896	145.50%			770	1865	142.20%
	Total			6799	16027	135.73%			24423	43693	78.90%			28922	59720	106.49%
Bahrain	Colon	1157308	1068951	97	320	229.90%	626677	740295	60	177	195.00%	1783985	1809246	157	497	216.60%
	Liver and intrahepatic bile ducts			21	66	214.30%			12	34	183.30%			33	100	203.00%
	Gallbladder			2	3	50.00%			5	9	80.00%			7	12	71.40%
	Pancreas			14	63	350.00%			14	48	242.90%			28	111	296.40%
	Breast								324	702	116.70%			324	702	116.70%
	Corpus uteri								45	93	106.70%			45	93	106.70%
	Ovary								29	65	124.10%			29	65	124.10%
	Kidney			24	47	95.80%			8	15	87.50%			32	63	96.90%
	Thyroid			10	28	180.00%			30	58	93.30%			40	87	117.50%
	Multiple myeloma			5	17	240.00%			10	22	120.00%			15	38	153.30%
	Total			173	544	214.45%			537	1223	127.75%			710	1768	149.01%
Comoros	Colon	457722	625492	7	21	200.00%	449689	620724	10	27	170.00%	907411	1246216	17	48	182.40%
	Liver and intrahepatic bile ducts			20	39	95.00%			12	27	125.00%			32	66	106.30%
	Gallbladder			0	0	0			0	0	0			0	0	0
	Pancreas			2	5	150.00%			2	5	150.00%			4	9	125.00%
	Breast								65	142	118.50%			65	142	118.50%
	Corpus uteri								3	8	166.70%			3	8	166.70%
	Ovary								8	16	100.00%			8	16	100.00%
	Kidney			2	2	0			3	3	0			5	5	0
	Thyroid			0	0	0			3	7	133.30%			3	7	133.30%
	Multiple myeloma			0	0	0			0	0	0			0	0	0
	Total			31	67	116.13%			106	235	121.70%			137	301	119.71%
Djibouti	Colon	532524	739704	33	65	97.00%	483574	762882	25	56	124.00%	1016098	1502586	58	121	108.60%
	Liver and intrahepatic bile ducts			22	45	104.50%			8	21	162.50%			30	66	120.00%
	Gallbladder			0	0	0			4	12	200.00%			4	12	200.00%
	Pancreas			6	15	150.00%			5	12	140.00%			11	27	145.50%

	Breast								180	361	100.60%			180	361	100.60%
	Corpus uteri								10	25	150.00%			10	25	150.00%
	Ovary								29	64	120.70%			29	64	120.70%
	Kidney			9	18	100.00%			7	14	100.00%			16	32	100.00%
	Thyroid			5	11	120.00%			21	46	119.00%			26	58	123.10%
	Multiple myeloma			1	3	200.00%			1	3	200.00%			2	5	150.00%
	Total			76	157	106.58%			290	614	111.72%			366	771	110.66%
Egypt	Colon	53629377	8049543 5	2939	6070	106.50%	52527315	79844464	3001	6187	106.20%	10615669 2	16033989 9	5940	12257	106.30%
	Liver and intrahepatic bile ducts			17759	39990	125.20%			10187	23311	128.80%			27946	63302	126.50%
	Gallbladder			373	914	145.00%			414	936	126.10%			787	1851	135.20%
	Pancreas			2042	4637	127.10%			1307	3031	131.90%			3349	7668	129.00%
	Breast								26845	52514	95.60%			26845	52514	95.60%
	Corpus uteri								2048	4676	128.30%			2048	4676	128.30%
	Ovary								3070	6210	102.30%			3070	6210	102.30%
	Kidney			1308	2651	102.70%			951	1921	102.00%			2259	4572	102.40%
	Thyroid			799	1736	117.30%			1813	3722	105.30%			2612	5458	109.00%
	Multiple myeloma			588	1295	120.20%			316	679	114.90%			904	1974	118.40%
	Total			25808	57293	122.00%			49952	103187	106.57%			75760	160482	111.83%
Iraq	Colon	21347815	3749789 6	1312	3841	192.80%	20817148	37017250	1008	2911	188.80%	42164963	74515146	2320	6752	191.00%
	Liver and intrahepatic bile ducts			412	1333	223.50%			395	1244	214.90%			807	2577	219.30%
	Gallbladder			76	246	223.70%			102	343	236.30%			178	590	231.50%
	Pancreas			504	1610	219.40%			262	831	217.20%			766	2440	218.50%
	Breast								8626	22265	158.10%			8626	22265	158.10%
	Corpus uteri								688	2012	192.40%			688	2012	192.40%
	Ovary								1002	2630	162.50%			1002	2630	162.50%
	Kidney			481	1321	174.60%			377	962	155.20%			858	2283	166.10%
	Thyroid			377	926	145.60%			1241	2734	120.30%			1618	3661	126.30%
	Multiple myeloma			291	913	213.70%			190	606	218.90%			481	1519	215.80%
	Total			3453	10190	195.11%			13891	36538	163.03%			17344	46729	169.42%
	Colon			629	1842	192.80%			645	1696	162.90%			1274	3538	177.70%
Jordan		5220178	7642544				5080684	7363407				10300862	15005951			

	Liver and intrahepatic bile ducts			110	316	187.30%			87	263	202.30%			197	580	194.40%
	Gallbladder			20	68	240.00%			46	145	215.20%			66	213	222.70%
	Pancreas			177	508	187.00%			112	321	186.60%			289	829	186.90%
	Breast								2598	5596	115.40%			2598	5596	115.40%
	Corpus uteri								271	743	174.20%			271	743	174.20%
	Ovary								240	547	127.90%			240	547	127.90%
	Kidney			164	419	155.50%			92	221	140.20%			256	640	150.00%
	Thyroid			86	193	124.40%			442	856	93.70%			528	1049	98.70%
	Multiple myeloma			95	285	200.00%			80	234	192.50%			175	519	196.60%
	Total			1281	3631	183.45%			4613	10622	130.26%			5894	14254	141.84%
Kuwait	Colon	2683264	2944082	261	1289	393.90%	1697066	2211340	175	667	281.10%	4380330	5155422	436	1956	348.60%
	Liver and intrahepatic bile ducts			105	631	501.00%			33	239	624.20%			138	870	530.40%
	Gallbladder			13	96	638.50%			15	86	473.30%			28	182	550.00%
	Pancreas			73	449	515.10%			37	212	473.00%			110	661	500.90%
	Breast								892	2372	165.90%			892	2372	165.90%
	Corpus uteri								123	482	291.90%			123	482	291.90%
	Ovary								83	324	290.40%			83	324	290.40%
	Kidney			69	355	414.50%			24	90	275.00%			93	445	378.50%
	Thyroid			58	140	141.40%			193	327	69.40%			251	467	86.10%
	Multiple myeloma			42	291	592.90%			23	76	230.40%			65	367	464.60%
	Total			621	3251	423.51%			1598	4875	205.07%			2219	8126	266.20%
Lebanon	Colon	3369956	2424999	621	746	20.10%	3314891	2512590	384	550	43.20%	6684847	4937589	1005	1296	29.00%
	Liver and intrahepatic bile ducts			102	125	22.50%			81	125	54.30%			183	250	36.60%
	Gallbladder			30	43	43.30%			33	62	87.90%			63	104	65.10%
	Pancreas			183	216	18.00%			123	191	55.30%			306	407	33.00%
	Breast								2161	2165	0.20%			2161	2165	0.20%
	Corpus uteri								295	372	26.10%			295	372	26.10%
	Ovary								247	263	6.50%			247	263	6.50%
	Kidney			192	195	1.60%			86	107	24.40%			278	301	8.30%

	Thyroid			143	122	-14.70%			283	245	-13.40%			426	367	-13.80%
	Multiple myeloma			128	137	7.00%			91	132	45.10%			219	268	22.40%
	Total			1399	1584	13.22%			3784	4212	11.31%			5183	5793	11.77%
Libya	Colon	3550940	4255377	452	1280	183.20%	3489809	4284611	522	1367	161.90%	7040749	8539988	974	2646	171.70%
	Liver and intrahepatic bile ducts			170	507	198.20%			96	288	200.00%			266	796	199.20%
	Gallbladder			27	72	166.70%			109	284	160.60%			136	356	161.80%
	Pancreas			125	332	165.60%			103	287	178.60%			228	619	171.50%
	Breast								1169	1868	59.80%			1169	1868	59.80%
	Corpus uteri								55	172	212.70%			55	172	212.70%
	Ovary								184	357	94.00%			184	357	94.00%
	Kidney			127	317	149.60%			72	212	194.40%			199	529	165.80%
	Thyroid			42	83	97.60%			173	362	109.20%			215	445	107.00%
	Multiple myeloma			44	124	181.80%			40	100	150.00%			84	223	165.50%
	Total			987	2715	175.08%			2523	5297	109.95%			3510	8011	128.23%
Mauritania	Colon	2463368	4407028	96	226	135.40%	2438611	4507656	87	218	150.60%	4901979	8914684	183	444	142.60%
	Liver and intrahepatic bile ducts			174	398	128.70%			117	288	146.20%			291	686	135.70%
	Gallbladder			2	5	150.00%			12	29	141.70%			14	34	142.90%
	Pancreas			30	73	143.30%			18	46	155.60%			48	119	147.90%
	Breast								600	1418	136.30%			600	1418	136.30%
	Corpus uteri								39	101	159.00%			39	101	159.00%
	Ovary								81	193	138.30%			81	193	138.30%
	Kidney			28	56	100.00%			19	39	105.30%			47	96	104.30%
	Thyroid			16	37	131.30%			19	45	136.80%			35	82	134.30%
	Multiple myeloma			16	38	137.50%			13	33	153.80%			29	71	144.80%
	Total			362	833	130.11%			1005	2410	139.80%			1367	3244	137.31%
Morocco	Colon	18762419	2250811 9	2752	5164	87.60%	19010338	22536879	2554	4613	80.60%	37772757	45044998	5306	9777	84.30%
	Liver and intrahepatic bile ducts			593	1228	107.10%			519	1090	110.00%			1112	2318	108.50%
	Gallbladder			137	266	94.20%			393	769	95.70%			530	1036	95.50%

	Pancreas			729	1356	86.00%			500	967	93.40%			1229	2323	89.00%
	Breast								12756	18561	45.50%			12756	18561	45.50%
	Corpus uteri								918	1625	77.00%			918	1625	77.00%
	Ovary								1367	2178	59.30%			1367	2178	59.30%
	Kidney			408	683	67.40%			344	593	72.40%			752	1276	69.70%
	Thyroid			403	627	55.60%			2458	3320	35.10%			2861	3948	38.00%
	Multiple myeloma			337	664	97.00%			212	419	97.60%			549	1083	97.30%
	Total			5359	9988	86.38%			22021	34135	55.01%			27380	44125	61.16%
Oman	Colon	3503227	3644269	327	730	123.20%	1820773	2684719	104	277	166.30%	5324000	6328988	431	1007	133.60%
	Liver and intrahepatic bile ducts			116	319	175.00%			32	108	237.50%			148	427	188.50%
	Gallbladder			26	72	176.90%			9	31	244.40%			35	103	194.30%
	Pancreas			72	232	222.20%			15	48	220.00%			87	280	221.80%
	Breast								549	1127	105.30%			549	1127	105.30%
	Corpus uteri								44	122	177.30%			44	122	177.30%
	Ovary								50	124	148.00%			50	124	148.00%
	Kidney			67	146	117.90%			28	65	132.10%			95	212	123.20%
	Thyroid			56	73	30.40%			156	284	82.10%			212	357	68.40%
	Multiple myeloma			46	117	154.30%			15	53	253.30%			61	170	178.70%
	Total			710	1689	137.89%			1002	2239	123.45%			1712	3929	129.50%
Palestine	Colon	2710663	4454830	295	897	204.10%	2634882	4406928	258	816	216.30%	5345545	8861758	553	1713	209.80%
	Liver and intrahepatic bile ducts			91	278	205.50%			61	195	219.70%			152	473	211.20%
	Gallbladder			20	69	245.00%			24	92	283.30%			44	160	263.60%
	Pancreas			80	259	223.80%			51	186	264.70%			131	445	239.70%
	Breast								828	2186	164.00%			828	2186	164.00%
	Corpus uteri								107	327	205.60%			107	327	205.60%
	Ovary								74	202	173.00%			74	202	173.00%
	Kidney			72	192	166.70%			43	112	160.50%			115	303	163.50%
	Thyroid			47	104	121.30%			171	353	106.40%			218	457	109.60%
	Multiple myeloma			51	162	217.60%			45	156	246.70%			96	319	232.30%
	Total			656	1961	198.93%			1662	4625	178.28%			2318	6585	184.08%

Qatar	Colon	2227901	2261216	121	258	113.20%	752014	1097247	61	179	193.40%	2979915	3358463	182	438	140.70%
	Liver and intrahepatic bile ducts			48	150	212.50%			12	53	341.70%			60	202	236.70%
	Gallbladder			5	26	420.00%			6	35	483.30%			11	60	445.50%
	Pancreas			21	58	176.20%			14	50	257.10%			35	109	211.40%
	Breast								248	485	95.60%			248	485	95.60%
	Corpus uteri								18	51	183.30%			18	51	183.30%
	Ovary								30	69	130.00%			30	69	130.00%
	Kidney			27	40	48.10%			11	31	181.80%			38	70	84.20%
	Thyroid			40	60	50.00%			49	85	73.50%			89	145	62.90%
	Multiple myeloma			19	36	89.50%			4	10	150.00%			23	46	100.00%
	Total			281	628	123.49%			453	1048	131.35%			734	1675	128.20%
Saudi Arabia	Colon	20702764	2638884 2	2532	7571	199.00%	15142149	21985710	1218	3572	193.30%	35844913	48374552	3750	11144	197.20%
	Liver and intrahepatic bile ducts			934	4191	348.70%			320	1210	278.10%			1254	5401	330.70%
	Gallbladder			71	309	335.20%			128	472	268.80%			199	781	292.50%
	Pancreas			412	1512	267.00%			167	609	264.70%			579	2121	266.30%
	Breast								3777	7850	107.80%			3777	7850	107.80%
	Corpus uteri								928	3152	239.70%			928	3152	239.70%
	Ovary								426	1143	168.30%			426	1143	168.30%
	Kidney			568	1458	156.70%			270	650	140.70%			838	2108	151.60%
	Thyroid			819	1584	93.40%			1799	3179	76.70%			2618	4763	81.90%
	Multiple myeloma			201	790	293.00%			94	328	248.90%			295	1118	279.00%
	Total			5537	17415	214.52%			9127	22165	142.85%			14664	39581	169.92%
Somalia	Colon	8395755	1823908 3	380	967	154.50%	8446050	18223756	375	1011	169.60%	16841805	36462839	755	1977	161.90%
	Liver and intrahepatic bile ducts			169	428	153.30%			132	348	163.60%			301	776	157.80%
	Gallbladder			21	53	152.40%			49	129	163.30%			70	183	161.40%
	Pancreas			70	175	150.00%			79	207	162.00%			149	382	156.40%
	Breast								1811	4948	173.20%			1811	4948	173.20%
	Corpus uteri								144	378	162.50%			144	378	162.50%
	Ovary								311	827	165.90%			311	827	165.90%

	Kidney			118	264	123.70%			106	244	130.20%			224	508	126.80%
	Thyroid			57	146	156.10%			210	550	161.90%			267	696	160.70%
	Multiple myeloma			48	122	154.20%			49	130	165.30%			97	252	159.80%
	Total			863	2155	149.71%			3266	8772	168.59%			4129	10927	164.64%
Sudan	Colon	22981354	4207696 5	840	1946	131.70%	23010664	42417314	864	2036	135.60%	45992018	84494279	1704	3982	133.70%
	Liver and intrahepatic bile ducts			803	1966	144.80%			425	1082	154.60%			1228	3047	148.10%
	Gallbladder			60	146	143.30%			203	536	164.00%			263	682	159.30%
	Pancreas			153	377	146.40%			135	339	151.10%			288	716	148.60%
	Breast								6631	15567	134.80%			6631	15567	134.80%
	Corpus uteri								359	931	159.30%			359	931	159.30%
	Ovary								1003	2402	139.50%			1003	2402	139.50%
	Kidney			303	659	117.50%			302	681	125.50%			605	1339	121.30%
	Thyroid			192	458	138.50%			536	1349	151.70%			728	1807	148.20%
	Multiple myeloma			183	443	142.10%			112	279	149.10%			295	722	144.70%
	Total			2534	5995	136.58%			10570	25202	138.43%			13104	31195	138.06%
Syira	Colon	9679915	1899438 3	705	2209	213.30%	9684892	19312001	921	3373	266.20%	19364807	38306384	1626	5583	243.40%
	Liver and intrahepatic bile ducts			213	680	219.20%			195	697	257.40%			408	1377	237.50%
	Gallbladder			60	200	233.30%			72	257	256.90%			132	457	246.20%
	Pancreas			392	1271	224.20%			227	806	255.10%			619	2076	235.40%
	Breast								4114	11602	182.00%			4114	11602	182.00%
	Corpus uteri								704	2085	196.20%			704	2085	196.20%
	Ovary								462	1218	163.60%			462	1218	163.60%
	Kidney			290	880	203.40%			157	523	233.10%			447	1403	213.90%
	Thyroid			272	636	133.80%			565	1340	137.20%			837	1975	136.00%
	Multiple myeloma			195	627	221.50%			151	511	238.40%			346	1138	228.90%
	Total			2127	6503	205.74%			7568	22412	196.14%			9695	28914	198.24%
Tunisia	Colon	5974995	7002742	939	1753	86.70%	6071661	7313044	900	1697	88.60%	12046656	14315786	1839	3450	87.60%
	Liver and intrahepatic bile ducts			342	657	92.10%			285	615	115.80%			627	1272	102.90%

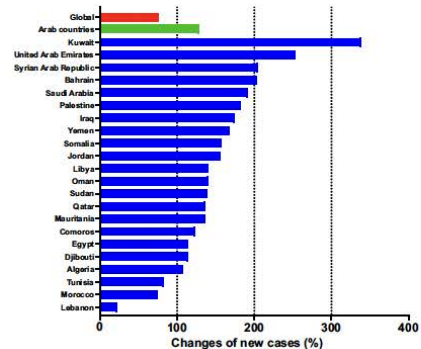
	Gallbladder			68	144	111.80%			106	243	129.20%			174	387	122.40%
	Pancreas			311	583	87.50%			202	451	123.30%			513	1034	101.60%
	Breast								2820	4139	46.80%			2820	4139	46.80%
	Corpus uteri								320	575	79.70%			320	575	79.70%
	Ovary								358	584	63.10%			358	584	63.10%
	Kidney			182	313	72.00%			140	254	81.40%			322	567	76.10%
	Thyroid			75	118	57.30%			287	456	58.90%			362	574	58.60%
	Multiple myeloma			110	198	80.00%			111	214	92.80%			221	412	86.40%
	Total			2027	3766	85.79%			5529	9228	66.90%			7556	12994	71.97%
United Arab Emirates	Colon	6932241	7464391	346	1371	296.20%	3149541	3985091	204	774	279.40%	10081782	11449482	550	2145	290.00%
	Liver and intrahepatic bile ducts			57	362	535.10%			32	173	440.60%			89	535	501.10%
	Gallbladder			8	32	300.00%			11	45	309.10%			19	77	305.30%
	Pancreas			54	307	468.50%			31	165	432.30%			85	471	454.10%
	Breast								1142	3251	184.70%			1142	3251	184.70%
	Corpus uteri								152	632	315.80%			152	632	315.80%
	Ovary								105	304	189.50%			105	304	189.50%
	Kidney			79	314	297.50%			43	177	311.60%			122	491	302.50%
	Thyroid			107	275	157.00%			337	714	111.90%			444	989	122.70%
	Multiple myeloma			45	161	257.80%			24	123	412.50%			69	284	311.60%
	Total			696	2822	305.46%			2081	6358	205.53%			2777	9179	230.54%
Yemen	Colon	15690895	27596095	832	2410	189.70%	15463971	27700247	740	2330	214.90%	31154866	55296342	1572	4740	201.50%
	Liver and intrahepatic bile ducts			461	1508	227.10%			265	783	195.50%			726	2291	215.60%
	Gallbladder			4	13	225.00%			14	43	207.10%			18	57	216.70%
	Pancreas			167	485	190.40%			167	500	199.40%			334	985	194.90%
	Breast								2872	7438	159.00%			2872	7438	159.00%
	Corpus uteri								16	48	200.00%			16	48	200.00%
	Ovary								341	839	146.00%			341	839	146.00%
	Kidney			106	226	113.20%			63	123	95.20%			169	348	105.90%
	Thyroid			131	342	161.10%			395	955	141.80%			526	1297	146.60%
	Multiple myeloma			16	49	206.30%			2	7	250.00%			18	56	211.10%

	Total			1717	5033	193.13%			4875	13066	168.02%			6592	18099	174.56%
ArabTotal	Colon	234887268	353131470	20598	50698	146.13%	218549853	341130250	17781	42712	140.21%	453437121	694261720	38379	93411	143.39%
	Liver and intrahepatic bile ducts			23145	56280	143.16%			13638	33005	142.01%			36783	89286	142.74%
	Gallbladder			1370	3662	167.30%			2601	6589	153.33%			3971	10253	158.20%
	Pancreas			6310	16298	158.29%			4046	10517	159.94%			10356	26812	158.90%
	Breast								95609	189874	98.59%			95609	189874	98.59%
	Corpus uteri								7880	19838	151.75%			7880	19838	151.75%
	Ovary								10647	22656	112.79%			10647	22656	112.79%
	Kidney			5043	11396	125.98%			3456	7628	120.72%			8499	19022	123.81%
	Thyroid			4165	8472	103.41%			13270	24326	83.32%			15135	32801	116.72%
	Multiple myeloma			2866	7441	159.63%			1948	5011	157.24%			4814	12449	158.60%
	Total			63497	154247	142.92%			170876	362156	111.94%			232073	516402	122.52%
Global total	Colon	3972735747	4853577393	1E+06	2E+06	85.20%	3912335034	4855914380	856979	1593471	85.90%	7885070781	9709491773	1926425	3573811	85.52%
	Liver and intrahepatic bile ducts			600676	1E+06	72.60%			265460	487751	83.70%			866136	1524501	76.01%
	Gallbladder			43538	83878	92.70%			78953	144782	83.40%			122491	228660	86.67%
	Pancreas			269709	516570	91.50%			241283	482093	99.80%			510992	998663	95.44%
	Breast								2296840	3553037	54.70%			2296840	3553037	54.69%
	Corpus uteri								420368	676296	60.90%			420368	676296	60.88%
	Ovary								324603	503790	55.20%			324603	503790	55.20%
	Kidney			277800	476581	71.60%			157040	269210	71.40%			434840	745791	71.51%
	Thyroid			206485	284794	37.90%			614729	819021	33.20%			821214	1103816	34.41%
	Multiple myeloma			103805	194362	87.20%			84147	154282	83.30%			187952	348644	85.50%
	Total			3E+06	5E+06	77.85%			5340402	8683733	62.60%			7911861	13257009	67.56%

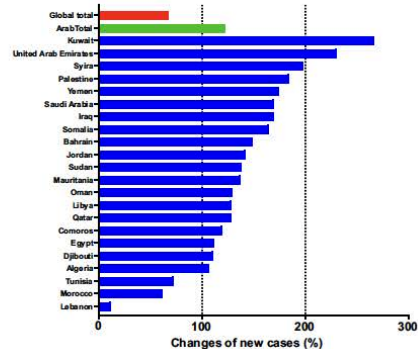
Table 3: Distribution of projected cases and percentage of change by 2050 in global and 22 Arab Countries sorted by alphabetical order. All ten studied metabolic-related cancers are anticipated to see a higher increase in incidence in Arab countries compared to global averages by 2050, with an expected rise of 122.5% compared to 67.5% globally. For instance, globally, pancreatic cancer is expected to show the highest rate of incidence increase at 95.4%, while in Arab countries, it is projected to increase by 158.9%. Even the lowest incidence increase among metabolic-related cancers in Arab countries—breast cancer—will still surpass global levels (Arab: 95.6% vs. Global: 54.7%).

At the country level, the Gulf Cooperation Council (GCC) countries, particularly Kuwait, the United Arab Emirates (UAE), and Qatar, are projected to see some of the highest growth rates in metabolic dysfunction-related cancers. Kuwait shows the highest projected increase at 266.2%, followed by the UAE at 230.5%. In contrast, Lebanon has the lowest projected incidence increase at 11.77% (**Figure 3**).

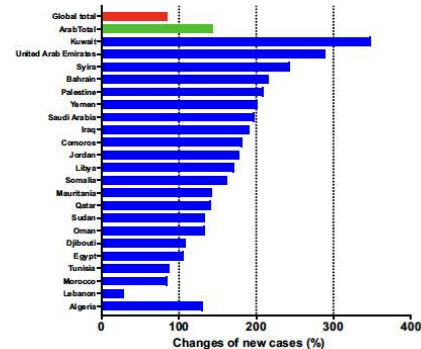
All cancer



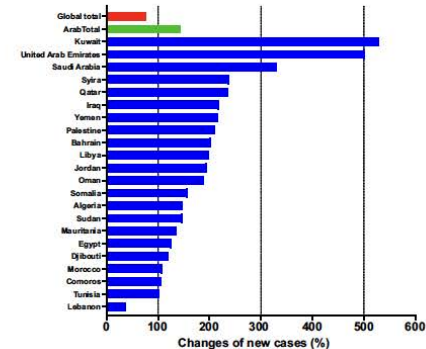
Metabolic-dysfunction related cancers



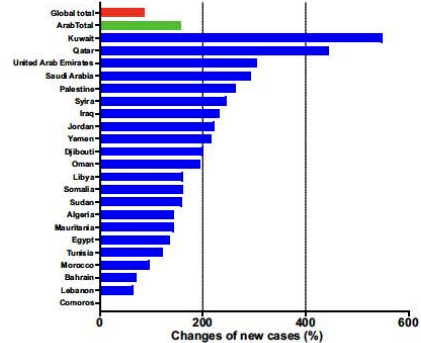
Colon cancer



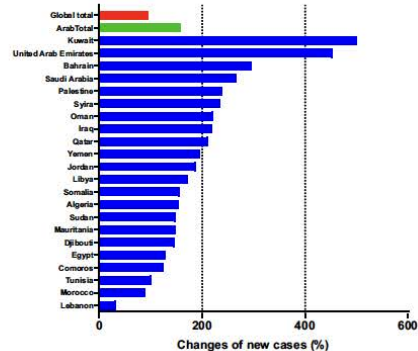
Liver cancer



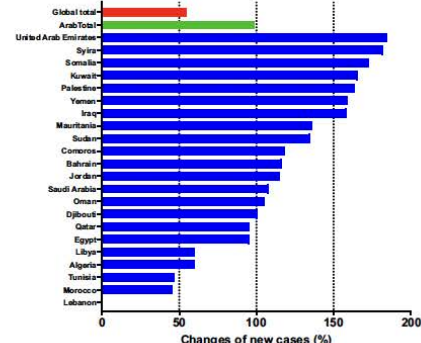
Gallbladder cancer



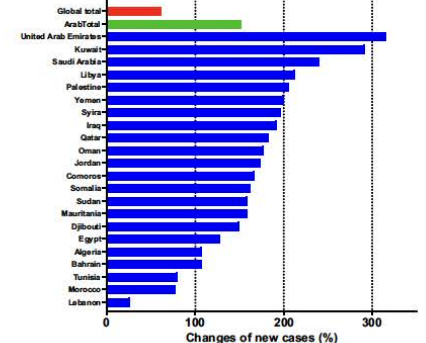
Pancreas cancer



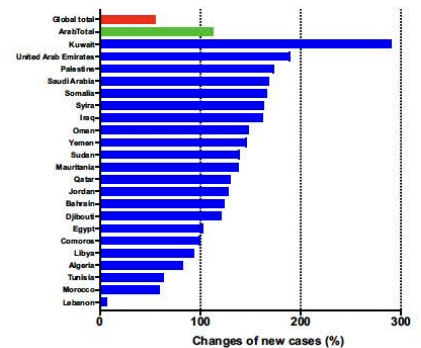
Breast cancer



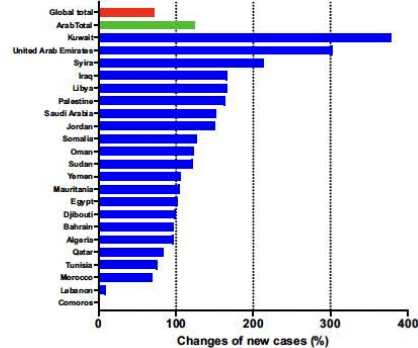
Corpus uteri cancer



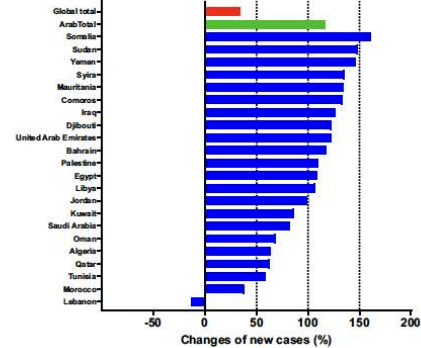
Ovary cancer



Kidney cancer



Thyroid cancer



Multiple myeloma cancer

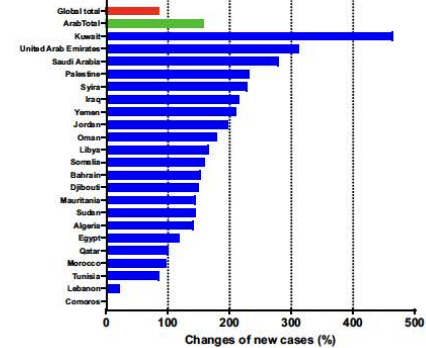


Figure 3: Percentage change in projected incidence of new cases for colorectal, liver, gallbladder, pancreatic, breast, corpus uteri, ovarian, kidney, thyroid, and multiple myeloma cancers across the globe and in 22 Arab countries.

While colorectal cancer is expected to rise by 85.5% globally, several Arab countries are projected to see even more significant increases, including Kuwait (+348.6%), the UAE (+290.0%), and Syria (+243.4%). Similarly, while liver cancer is expected to increase globally by 76%, Kuwait (+530.4%), the UAE (+501.1%), and Qatar (+236.7%) anticipate disproportionately higher growth. Although Egypt's projected increase of 126.5% in liver cancer incidence may not be the highest in percentage terms, its large population size entails that this rate of increase will translate into a substantial rise in the number of cases from 27,946 in 2022 to 63,302 by 2050.

The global projection for thyroid cancer indicates a 34.4% increase; however, Somalia (+160.7%) and Yemen (+146.6%) are expected to experience rates more than four times higher than this average. Conversely, Lebanon is projected to show a 13.8% decrease.

An analysis of projected cancer mortality rates reveals similar trends, with all ten metabolic-related cancers expected to see increased mortality rates in the Arab region that exceed global averages by 2050, with a projected rise of 148.4% compared to 88.4% globally (**Table 4**).

Table 4: Distribution of projected deaths and percentage of change by 2050 in global and 22 Arab Countries sorted by alphabetical order.

		Male					Female					Both sexes				
		Annual population		Number		Change in number	Annual population		Number		Change in number	Annual population		Number		Change in number
Country	Label															
Algeria	Colon	22912687	30399027	2330	6151	164.00%	22437454	29602095	2050	5179	152.60 %	45350141	60001122	4380	11331	158.70%
	Liver and intrahepatic bile ducts			345	895	159.40%			318	799	151.30 %			663	1694	155.50%
	Gallbladder			232	623	168.50%			553	1407	154.40 %			785	2030	158.60%
	Pancreas			675	1750	159.30%			461	1188	157.70 %			1136	2938	158.60%
	Breast								4893	9215	88.30%			4893	9215	88.30%
	Corpus uteri								124	315	154.00 %			124	315	154.00%
	Ovary								795	1673	110.40%			795	1673	110.40%
	Kidney			216	509	135.60%			155	354	128.40 %			371	863	132.60%

	Thyroid			78	210	169.20%			280	718	156.40 %			358	928	159.20%
	Multiple myeloma			344	857	149.10%			311	797	156.30 %			655	1655	152.70%
	Total			4220	10995	160.55%			9940	21645	117.76%			14160	32642	130.52%
Bahrain	Colon	1157308	1068951	39	179	359.00%	626677	740295	26	92	253.80 %	1783985	1809246	65	271	316.90%
	Liver and intrahepatic bile ducts			16	55	243.80%			11	42	281.80 %			27	97	259.30%
	Gallbladder			0	0	0			4	8	100.00 %			4	8	100.00%
	Pancreas			13	62	376.90%			14	48	242.90 %			27	110	307.40%
	Breast								96	289	201.00 %			96	289	201.00%
	Corpus uteri								8	21	162.50 %			8	21	162.50%
	Ovary								21	63	200.00 %			21	63	200.00%
	Kidney			7	27	285.70%			3	7	133.30 %			10	33	230.00%
	Thyroid			1	9	800.00%			4	17	325.00 %			5	26	420.00%
	Multiple myeloma			5	30	500.00%			7	17	142.90 %			12	48	300.00%
	Total			81	362	346.91%			194	604	211.34%			275	966	251.27%
Comoros	Colon	457722	625492	4	12	200.00%	449689	620724	8	22	175.00 %	907411	1246216	12	34	183.30%
	Liver and intrahepatic bile ducts			20	39	95.00%			12	27	125.00 %			32	66	106.30%
	Gallbladder			0	0	0			0	0	0			0	0	0
	Pancreas			2	5	150.00%			2	5	150.00 %			4	9	125.00%
	Breast								34	78	129.40 %			34	78	129.40%
	Corpus uteri								1	3	200.00 %			1	3	200.00%
	Ovary								6	13	116.70%			6	13	116.70%
	Kidney			1	1	0			2	2	0			3	3	0

	Thyroid			0	0	0			2	5	150.00 %			2	5	150.00%
	Multiple myeloma			0	0	0			0	0	0			0	0	0
	Total			27	57	111.11%			67	155	131.34 %			94	211	124.47%
Djibouti	Colon	532524	739704	26	55	111.50%	483574	762882	19	43	126.30 %	1016098	1502586	45	98	117.80%
	Liver and intrahepatic bile ducts			22	45	104.50%			8	21	162.50 %			30	66	120.00%
	Gallbladder			0	0	0			4	12	200.00 %			4	12	200.00%
	Pancreas			6	15	150.00%			5	12	140.00 %			11	27	145.50%
	Breast								102	211	106.90 %			102	211	106.90%
	Corpus uteri								2	6	200.00 %			2	6	200.00%
	Ovary								22	53	140.90 %			22	53	140.90%
	Kidney			6	13	116.70%			4	9	125.00 %			10	23	130.00%
	Thyroid			3	7	133.30%			9	23	155.60 %			12	30	150.00%
	Multiple myeloma			1	3	200.00%			1	3	200.00 %			2	5	150.00%
	Total			64	138	115.63%			176	393	123.30 %			240	531	121.25%
Egypt	Colon	53629377	80495435	1537	3276	113.10%	52527315	79844464	1559	3349	114.80%	106156692	160339899	3096	6625	114.00%
	Liver and intrahepatic bile ducts			17179	38616	124.80%			9792	22420	129.00 %			26971	61036	126.30%
	Gallbladder			268	662	147.00%			310	699	125.50 %			578	1361	135.50%
	Pancreas			1936	4424	128.50%			1250	2916	133.30 %			3186	7339	130.40%
	Breast								9596	20570	114.40%			9596	20570	114.40%
	Corpus uteri								425	1113	161.90 %			425	1113	161.90%
	Ovary								1944	4228	117.50%			1944	4228	117.50%
	Kidney			547	1213	121.80%			443	1036	133.90 %			990	2248	127.10%

	Thyroid			150	395	163.30%			333	911	173.60%			483	1307	170.60%
	Multiple myeloma			503	1151	128.80%			268	600	123.90%			771	1751	127.10%
	Total			22120	49737	124.85%			25920	57842	123.16%			48040	107578	123.93%
Iraq	Colon	21347815	37497896	815	2433	198.50%	20817148	37017250	623	1876	201.10%	42164963	74515146	1438	4308	199.60%
	Liver and intrahepatic bile ducts			402	1322	228.90%			375	1210	222.70%			777	2532	225.90%
	Gallbladder			66	214	224.20%			89	301	238.20%			155	515	232.30%
	Pancreas			496	1591	220.80%			256	821	220.70%			752	2412	220.70%
	Breast								3372	9413	179.20%			3372	9413	179.20%
	Corpus uteri								196	644	228.60%			196	644	228.60%
	Ovary								693	2016	190.90%			693	2016	190.90%
	Kidney			254	760	199.20%			194	549	183.00%			448	1309	192.20%
	Thyroid			71	229	222.50%			160	483	201.90%			231	712	208.20%
	Multiple myeloma			242	793	227.70%			162	541	234.00%			404	1334	230.20%
	Total			2346	7342	212.96%			6120	17854	191.73%			8466	25195	197.60%
Jordan	Colon	5220178	7642544	324	1014	213.00%	5080684	7363407	334	955	185.90%	10300862	15005951	658	1969	199.20%
	Liver and intrahepatic bile ducts			107	316	195.30%			85	263	209.40%			192	580	202.10%
	Gallbladder			16	59	268.80%			31	103	232.30%			47	162	244.70%
	Pancreas			171	494	188.90%			111	322	190.10%			282	815	189.00%
	Breast								802	1926	140.10%			802	1926	140.10%
	Corpus uteri								83	254	206.00%			83	254	206.00%
	Ovary								159	413	159.70%			159	413	159.70%

	Kidney			79	225	184.80%			43	121	181.40%			122	346	183.60%
	Thyroid			14	54	285.70%			56	194	246.40%			70	248	254.30%
	Multiple myeloma			72	241	234.70%			64	203	217.20%			136	444	226.50%
	Total			783	2403	206.90%			1768	4754	168.89%			2551	7157	180.56%
Kuwait	Colon	2683264	2944082	117	800	583.80%	1697066	2211340	78	396	407.70%	4380330	5155422	195	1197	513.80%
	Liver and intrahepatic bile ducts			99	607	513.10%			32	239	646.90%			131	846	545.80%
	Gallbladder			13	96	638.50%			15	86	473.30%			28	182	550.00%
	Pancreas			69	466	575.40%			36	211	486.10%			105	677	544.80%
	Breast								255	1096	329.80%			255	1096	329.80%
	Corpus uteri								28	186	564.30%			28	186	564.30%
	Ovary								55	299	443.60%			55	299	443.60%
	Kidney			25	276	1004.00%			7	63	800.00%			32	339	959.40%
	Thyroid			9	108	1100.00%			18	127	605.60%			27	235	770.40%
	Multiple myeloma			30	385	1183.30%			14	61	335.70%			44	446	913.60%
	Total			362	2738	656.35%			538	2764	413.75%			900	5503	511.44%
Lebanon	Colon	3369956	2424999	354	500	41.20%	3314891	2512590	218	371	70.20%	6684847	4937589	572	872	52.40%
	Liver and intrahepatic bile ducts			102	124	21.60%			78	123	57.70%			180	247	37.20%
	Gallbladder			23	35	52.20%			24	45	87.50%			47	81	72.30%
	Pancreas			181	214	18.20%			121	189	56.20%			302	403	33.40%
	Breast								781	967	23.80%			781	967	23.80%
	Corpus uteri								86	142	65.10%			86	142	65.10%
	Ovary								171	209	22.20%			171	209	22.20%

	Kidney			98	115	17.30%			45	66	46.70%			143	181	26.60%
	Thyroid			23	34	47.80%			37	61	64.90%			60	95	58.30%
	Multiple myeloma			106	122	15.10%			75	121	61.30%			181	243	34.30%
	Total			887	1144	28.97%			1636	2294	40.22%			2523	3440	36.35%
Libya	Colon	3550940	4255377	308	1104	258.40%	3489809	4284611	352	1205	242.30%	7040749	8539988	660	2309	249.80%
	Liver and intrahepatic bile ducts			158	486	207.60%			91	277	204.40%			249	763	206.40%
	Gallbladder			23	60	160.90%			88	234	165.90%			111	294	164.90%
	Pancreas			108	299	176.90%			95	266	180.00%			203	565	178.30%
	Breast								460	955	107.60%			460	955	107.60%
	Corpus uteri								13	49	276.90%			13	49	276.90%
	Ovary								126	301	138.90%			126	301	138.90%
	Kidney			70	221	215.70%			24	88	266.70%			94	310	229.80%
	Thyroid			9	35	288.90%			31	130	319.40%			40	164	310.00%
	Multiple myeloma			37	109	194.60%			33	90	172.70%			70	199	184.30%
	Total			713	2314	224.54%			1313	3595	173.80%			2026	5909	191.66%
Mauritania	Colon	2463368	4407028	71	167	135.20%	2438611	4507656	64	160	150.00%	4901979	8914684	135	327	142.20%
	Liver and intrahepatic bile ducts			167	383	129.30%			114	282	147.40%			281	665	136.70%
	Gallbladder			2	5	150.00%			12	29	141.70%			14	34	142.90%
	Pancreas			30	73	143.30%			18	46	155.60%			48	119	147.90%
	Breast								315	752	138.70%			315	752	138.70%
	Corpus uteri								14	38	171.40%			14	38	171.40%
	Ovary								58	145	150.00%			58	145	150.00%

	Kidney			18	37	105.60%			13	28	115.40%			31	66	112.90%
	Thyroid			6	15	150.00%			6	16	166.70%			12	31	158.30%
	Multiple myeloma			16	38	137.50%			11	29	163.60%			27	67	148.10%
	Total			310	718	131.61%			625	1525	144.00%			935	2244	140.00%
Morocco	Colon	18762419	22508119	1502	3140	109.10%	19010338	22536879	1390	2821	102.90%	37772757	45044998	2892	5961	106.10%
	Liver and intrahepatic bile ducts			564	1187	110.50%			483	1040	115.30%			1047	2226	112.60%
	Gallbladder			98	206	110.20%			275	585	112.70%			373	791	112.10%
	Pancreas			702	1318	87.70%			479	936	95.40%			1181	2254	90.90%
	Breast								4044	6986	72.70%			4044	6986	72.70%
	Corpus uteri								211	427	102.40%			211	427	102.40%
	Ovary								919	1571	70.90%			919	1571	70.90%
	Kidney			218	407	86.70%			194	398	105.20%			412	805	95.40%
	Thyroid			67	172	156.70%			289	595	105.90%			356	768	115.70%
	Multiple myeloma			292	639	118.80%			190	423	122.60%			482	1062	120.30%
	Total			3443	7069	105.32%			8474	15782	86.24%			11917	22851	91.75%
Oman	Colon	3503227	3644269	189	453	139.70%	1820773	2684719	60	168	180.00%	5324000	6328988	249	621	149.40%
	Liver and intrahepatic bile ducts			114	300	163.20%			31	107	245.20%			145	407	180.70%
	Gallbladder			23	64	178.30%			8	26	225.00%			31	90	190.30%
	Pancreas			68	229	236.80%			15	48	220.00%			83	277	233.70%
	Breast								199	454	128.10%			199	454	128.10%
	Corpus uteri								9	32	255.60%			9	32	255.60%
	Ovary								34	98	188.20%			34	98	188.20%

	Kidney			44	125	184.10%			19	54	184.20%			63	179	184.10%
	Thyroid			8	31	287.50%			18	58	222.20%			26	89	242.30%
	Multiple myeloma			36	105	191.70%			11	41	272.70%			47	146	210.60%
	Total			482	1307	171.16%			404	1086	168.81%			886	2393	170.09%
Palestine	Colon	2710663	4454830	172	547	218.00%	2634882	4406928	151	512	239.10%	5345545	8861758	323	1059	227.90%
	Liver and intrahepatic bile ducts			86	267	210.50%			53	188	254.70%			139	455	227.30%
	Gallbladder			16	57	256.30%			18	70	288.90%			34	127	273.50%
	Pancreas			78	258	230.80%			48	177	268.80%			126	435	245.20%
	Breast								333	952	185.90%			333	952	185.90%
	Corpus uteri								29	101	248.30%			29	101	248.30%
	Ovary								53	162	205.70%			53	162	205.70%
	Kidney			36	108	200.00%			18	59	227.80%			54	167	209.30%
	Thyroid			9	26	188.90%			23	64	178.30%			32	90	181.30%
	Multiple myeloma			42	136	223.80%			39	138	253.80%			81	275	239.50%
	Total			439	1399	218.68%			765	2423	216.73%			1204	3823	217.52%
Qatar	Colon	2227901	2261216	50	130	160.00%	752014	1097247	29	100	244.80%	2979915	3358463	79	230	191.10%
	Liver and intrahepatic bile ducts			43	143	232.60%			11	51	363.60%			54	195	261.10%
	Gallbladder			5	26	420.00%			5	34	580.00%			10	59	490.00%
	Pancreas			19	57	200.00%			12	47	291.70%			31	104	235.50%
	Breast								62	145	133.90%			62	145	133.90%
	Corpus uteri								4	16	300.00%			4	16	300.00%

	Ovary								19	60	215.80 %			19	60	215.80%
	Kidney			11	15	36.40%			5	17	240.00 %			16	33	106.30%
	Thyroid			4	20	400.00%			4	14	250.00 %			8	35	337.50%
	Multiple myeloma			13	31	138.50%			3	8	166.70 %			16	39	143.80%
	Total			145	422	191.03%			154	492	219.48 %			299	916	206.35%
Saudi Arabia	Colon	20702764	26388842	1263	4532	258.80%	15142149	21985710	620	2006	223.50 %	35844913	48374552	1883	6538	247.20%
	Liver and intrahepatic bile ducts			917	4133	350.70%			309	1188	284.50 %			1226	5321	334.00%
	Gallbladder			53	230	334.00%			99	366	269.70 %			152	596	292.10%
	Pancreas			405	1577	289.40%			162	620	282.70 %			567	2197	287.50%
	Breast								1046	2673	155.50 %			1046	2673	155.50%
	Corpus uteri								214	952	344.90 %			214	952	344.90%
	Ovary								271	908	235.10 %			271	908	235.10%
	Kidney			236	820	247.50%			105	318	202.90 %			341	1137	233.40%
	Thyroid			95	543	471.60%			151	569	276.80 %			246	1113	352.40%
	Multiple myeloma			156	741	375.00%			73	290	297.30 %			229	1031	350.20%
	Total			3125	12576	302.43%			3050	9890	224.26 %			6175	22466	263.82%
Somalia	Colon	8395755	18239083	318	801	151.90%	8446050	18223756	305	820	168.90 %	16841805	36462839	623	1621	160.20%
	Liver and intrahepatic bile ducts			166	420	153.00%			130	342	163.10 %			296	762	157.40%
	Gallbladder			21	53	152.40%			45	119	164.40 %			66	172	160.60%
	Pancreas			69	173	150.70%			76	200	163.20 %			145	372	156.60%
	Breast								1165	3177	172.70 %			1165	3177	172.70%

	Corpus uteri								59	153	159.30 %			59	153	159.30%
	Ovary								238	628	163.90 %			238	628	163.90%
	Kidney			82	183	123.20%			74	171	131.10 %			156	354	126.90%
	Thyroid			22	53	140.90%			76	192	152.60 %			98	245	150.00%
	Multiple myeloma			43	108	151.20%			44	116	163.60 %			87	223	156.30%
	Total			721	1791	148.40%			2212	5918	167.54 %			2933	7707	162.77%
Sudan	Colon	22981354	42076965	513	1184	130.80%	23010664	42417314	571	1407	146.40 %	45992018	84494279	1084	2591	139.00%
	Liver and intrahepatic bile ducts			791	1943	145.60%			409	1043	155.00 %			1200	2986	148.80%
	Gallbladder			51	124	143.10%			172	455	164.50 %			223	579	159.60%
	Pancreas			143	353	146.90%			117	297	153.80 %			260	649	149.60%
	Breast								3243	7901	143.60 %			3243	7901	143.60%
	Corpus uteri								111	295	165.80 %			111	295	165.80%
	Ovary								659	1626	146.70 %			659	1626	146.70%
	Kidney			234	518	121.40%			214	498	132.70 %			448	1016	126.80%
	Thyroid			56	130	132.10%			128	341	166.40 %			184	472	156.50%
	Multiple myeloma			173	421	143.40%			105	262	149.50 %			278	683	145.70%
	Total			1961	4673	138.30%			5729	14125	146.55 %			7690	18798	144.45%
Syira	Colon	9679915	18994383	481	1485	208.70%	9684892	19312001	611	2238	266.30 %	19364807	38306384	1092	3723	240.90%
	Liver and intrahepatic bile ducts			205	658	221.00%			190	680	257.90 %			395	1338	238.70%
	Gallbladder			50	170	240.00%			58	214	269.00 %			108	384	255.60%
	Pancreas			357	1158	224.40%			205	740	261.00 %			562	1897	237.50%

	Breast								1781	5495	208.50 %			1781	5495	208.50%
	Corpus uteri								182	600	229.70 %			182	600	229.70%
	Ovary								294	864	193.90 %			294	864	193.90%
	Kidney			139	441	217.30%			69	263	281.20 %			208	703	238.00%
	Thyroid			64	198	209.40%			93	327	251.60 %			157	525	234.40%
	Multiple myeloma			185	605	227.00%			144	493	242.40 %			329	1098	233.70%
	Total			1481	4715	218.37%			3627	11914	228.48 %			5108	16627	225.51%
Tunisia	Colon	5974995	7002742	489	1050	114.70%	6071661	7313044	464	1029	121.80 %	12046656	14315786	953	2079	118.20%
	Liver and intrahepatic bile ducts			313	633	102.20%			265	606	128.70 %			578	1240	114.50%
	Gallbladder			54	121	124.10%			83	208	150.60 %			137	330	140.90%
	Pancreas			303	577	90.40%			200	453	126.50 %			503	1030	104.80%
	Breast								901	1735	92.60%			901	1735	92.60%
	Corpus uteri								78	184	135.90 %			78	184	135.90%
	Ovary								236	432	83.10%			236	432	83.10%
	Kidney			87	177	103.40%			70	157	124.30 %			157	334	112.70%
	Thyroid			18	19	5.60%			55	174	216.40 %			73	193	164.40%
	Multiple myeloma			85	178	109.40%			88	199	126.10 %			173	377	117.90%
	Total			1349	2755	104.23%			2440	5177	112.17%			3789	7934	109.40%
United Arab Emirates	Colon	6932241	7464391	149	695	366.40%	3149541	3985091	87	376	332.20 %	10081782	11449482	236	1072	354.20%
	Liver and intrahepatic bile ducts			54	343	535.20%			32	173	440.60 %			86	516	500.00%
	Gallbladder			6	21	250.00%			8	39	387.50 %			14	60	328.60%
	Pancreas			49	300	512.20%			30	164	446.70 %			79	463	486.10%

	Breast								253	968	282.60 %			253	968	282.60%
	Corpus uteri								33	188	469.70 %			33	188	469.70%
	Ovary								61	247	304.90 %			61	247	304.90%
	Kidney			29	146	403.40%			15	87	480.00 %			44	233	429.50%
	Thyroid			15	121	706.70%			30	217	623.30 %			45	338	651.10%
	Multiple myeloma			25	113	352.00%			12	85	608.30 %			37	198	435.10%
	Total			327	1739	431.80%			561	2544	353.48 %			888	4283	382.32%
Yemen	Colon	15690895	27596095	535	1592	197.60%	15463971	27700247	527	1660	215.00 %	31154866	55296342	1062	3252	206.20%
	Liver and intrahepatic bile ducts			446	1437	222.20%			248	741	198.80 %			694	2178	213.80%
	Gallbladder			3	10	233.30%			7	25	257.10 %			10	35	250.00%
	Pancreas			142	436	207.00%			144	439	204.90 %			286	875	205.90%
	Breast								1528	4075	166.70 %			1528	4075	166.70%
	Corpus uteri								10	31	210.00 %			10	31	210.00%
	Ovary								224	646	188.40 %			224	646	188.40%
	Kidney			75	180	140.00%			41	91	122.00 %			116	271	133.60%
	Thyroid			39	122	212.80%			100	298	198.00 %			139	420	202.20%
	Multiple myeloma			13	43	230.80%			2	7	250.00 %			15	50	233.30%
	Total			1253	3820	204.87%			2831	8013	183.04 %			4084	11833	189.74%
ArabTotal	Colon	234887268	353131470	11586	31300	170.15%	218549853	341130250	10146	26785	164.00 %	453437121	694261720	21732	58088	167.29%
	Liver and intrahepatic bile ducts			22316	54352	143.56%			13077	31862	143.65 %			35393	86216	143.60%
	Gallbladder			1023	2836	177.22%			1908	5065	165.46 %			2931	7902	169.60%

	Pancreas			6022	15829	162.85%			3857	10145	163.03%			9879	25967	162.85%
	Breast								35261	80033	126.97%			35261	80033	126.97%
	Corpus uteri								1920	5750	199.48%			1920	5750	199.48%
	Ovary								7058	16655	135.97%			7058	16655	135.97%
	Kidney			2512	6517	159.43%			1757	4436	152.48%			4269	10953	156.57%
	Thyroid			761	2531	232.59%			1903	5534	190.80%			2664	8069	202.89%
	Multiple myeloma			2419	6849	183.13%			1657	4524	173.02%			4076	11374	179.05%
	Total			46639	120214	157.75%			78544	190789	142.91%			125183	311007	148.44%
Global total	Colon	397273574 7	485357739 3	499775	1009371	102.00%	391233503 4	485591438 0	404244	826029	104.30%	788507078 1	970949177 3	904019	1835400	103.00%
	Liver and intrahepatic bile ducts			521826	923551	77.00%			236899	447916	89.10%			758725	1371467	80.80%
	Gallbladder			31406	61722	96.50%			57649	107617	86.70%			89055	169339	90.20%
	Pancreas			247589	485966	96.30%			219820	450072	104.70%			467409	936038	100.30%
	Breast								666103	1138155	70.90%			666103	1138155	70.90%
	Corpus uteri								97723	183093	87.40%			97723	183093	87.40%
	Ovary								206956	351164	69.70%			206956	351164	69.70%
	Kidney			100343	195131	94.50%			55610	109731	97.30%			155953	304861	95.50%
	Thyroid			17241	33360	93.50%			30266	57356	89.50%			47507	90715	91.00%
	Multiple myeloma			66966	133209	98.90%			54422	106368	95.50%			121388	239577	97.40%
	Total			1485146	2842310	91.38%			2029692	3777501	86.11%			3514838	6619809	88.34%

Globally, colorectal cancer exhibits the highest projected increase in mortality at 103.0%, followed by pancreatic cancer, while ovarian cancer shows the lowest increase at 69.7%. However, in Arab countries, thyroid cancer has the highest projected increase in mortality at 202.9% (global average: 91%), closely followed by corpus uterine cancer at 199.48% (global: 87.4%). Notably, even the lowest increase in mortality for breast cancer in Arab countries remains above the global level (Arab: 126.9% vs. Global: 70.9%) (**Table 4**).

Among the Arab countries, Kuwait shows the highest projected increase in mortality at 511.4%, followed by the UAE at 382.3%. Lebanon exhibits the lowest projected increase at 36.3% (**Figure 4**).

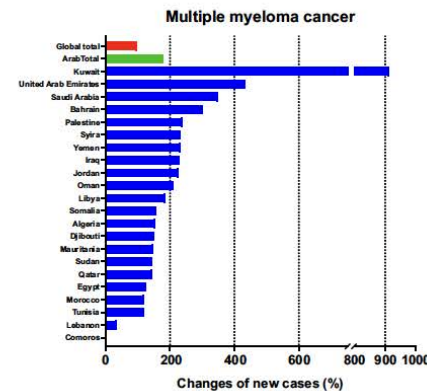
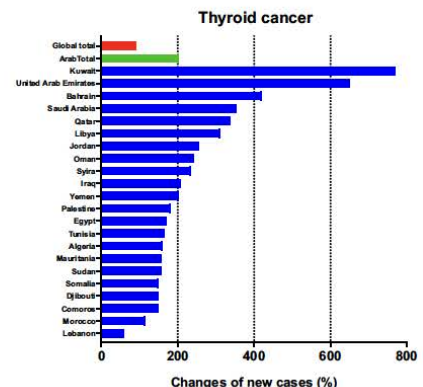
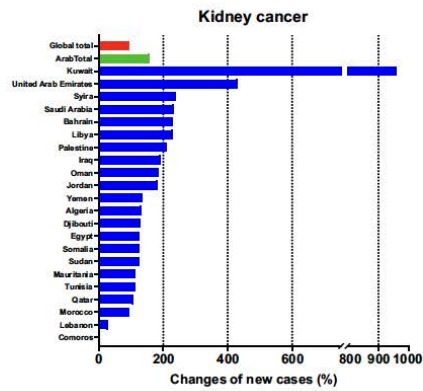
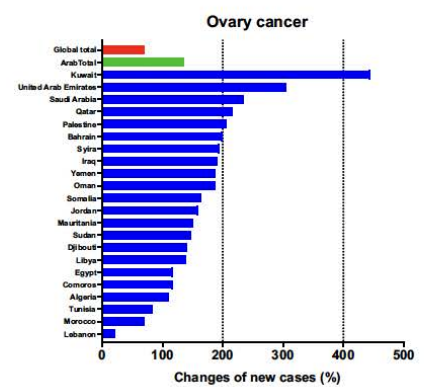
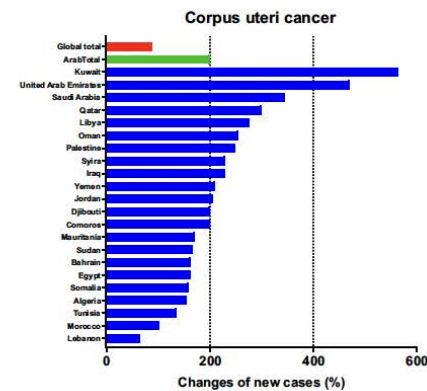
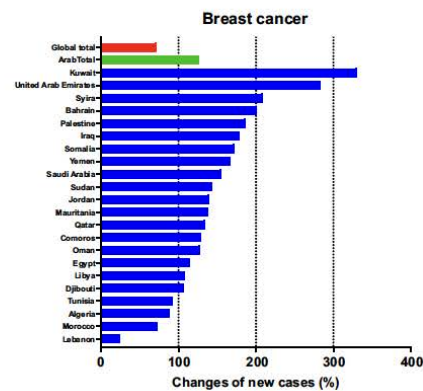
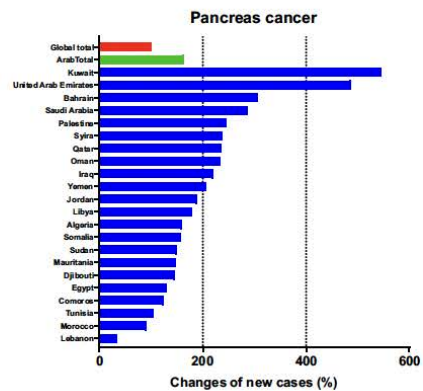
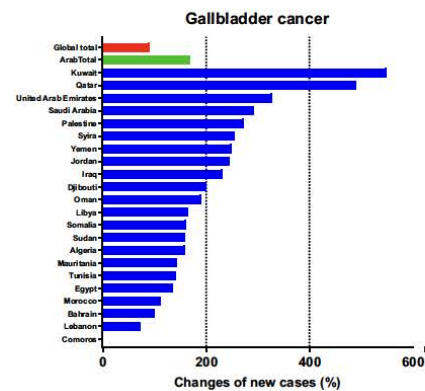
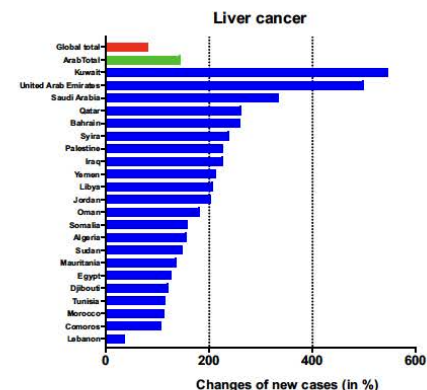
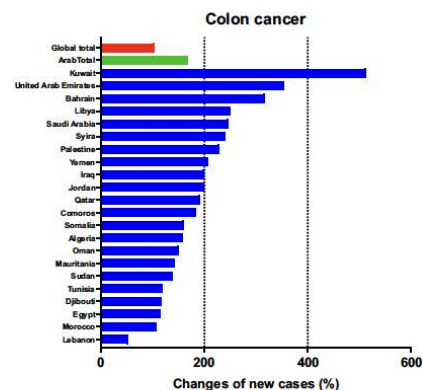
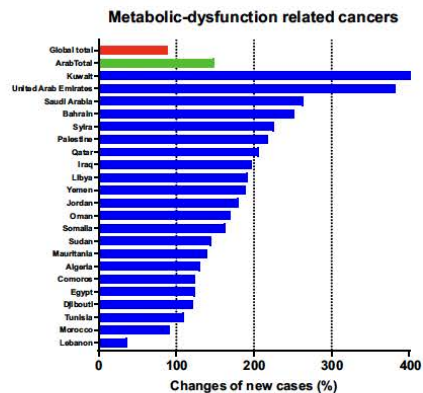
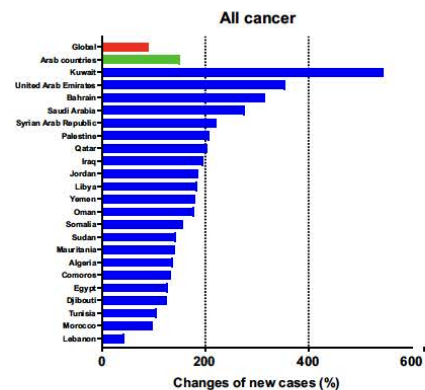


Figure 4: Percentage change in projected mortality of new cases for colorectal, liver, gallbladder, pancreatic, breast, corpus uteri, ovarian, kidney, thyroid, and multiple myeloma cancers across the globe and in 22 Arab countries.

For individual cancer types, thyroid cancer mortality is projected to increase in Kuwait (+770.4%), the UAE (+651.1%), and Bahrain (+420.0%), significantly exceeding the projected global average increase (+91%). For colorectal cancer mortality, several Arab countries, particularly Kuwait (+513.8%), the UAE (+354.2%), and Bahrain (+316.9%), are expected to see disproportionately higher increases than the global average (+103%). Similarly, in liver cancer mortality, Kuwait (+545.8%) and the UAE (+500.0%) are expected to show exceptionally high increases, consistent with incidence trends and surpassing the global average (+80.8%). Additionally, disproportionately high projected increases in pancreatic cancer mortality are also expected in Kuwait (+544.8%), the UAE (+486.1%), and Bahrain (+307.4%).

Discussion

Our results indicate that cancers linked to metabolic dysfunction account for nearly half of the cancer burden in Arab countries. Breast cancer is the most prevalent type of cancer associated with metabolic dysfunction in the region, representing 43.7% of the overall burden and nearly 30.2% of the fatalities attributed to these cancers. This is followed by liver and colorectal cancers.

When comparing these figures to global statistics, we observe that the age-standardized incidence rates (ASIRs) and age-standardized mortality rates (ASMRs) for overall cancer burden in Arab countries are generally lower than global averages. However, certain metabolic dysfunction-related cancers, such as breast and liver cancer, exhibit higher rates than the global average. In contrast, if the current age-standardized rates remain unchanged, it is projected that by 2050, the region will likely experience a significant increase in the burden of metabolic dysfunction-related cancers, surpassing the global rates.

The Arab region is experiencing rapid economic and developmental changes that are impacting lifestyles, particularly in dietary habits and physical activity, due to urbanization and the adoption of more sedentary behaviors.¹⁰ This shift is contributing to a substantial rise in obesity and declining in metabolic health in the region. For instance, Currently, ten of the world's top fifteen countries for obesity are located in this region, with over 50% of women in Kuwait, Qatar, and Libya categorized as overweight or obese.⁷ Additionally, 38.5% of the population exhibits insufficient physical activity, surpassing the global average of 31.3%.¹¹ While, there are currently 537 million individuals living with type 2 diabetes (T2DM) globally, 73 million of them are in the Middle East and North Africa region alone; this figure is projected to increase to 135.7 million by 2045.¹² The aforementioned risk factors likely contribute to the discerned rising incidence of metabolic dysfunction-related cancers in the region.

Furthermore, the region is on the brink of an unprecedented demographic transition. Due to improvements in healthcare systems, the number of older adults is expected to increase.¹³ This aging population will significantly increase the burden of metabolic dysfunction-related and other cancers in the Arab region over the coming decades. Countries will face a growing demand for diagnostic services and treatment facilities, which may overwhelm existing healthcare systems, particularly those with limited resources.^{14,15}

Our projections indicate a concerning upward trend in the number of new metabolic dysfunction-related cancer cases and deaths in the Arab region. By 2050, new cases are expected to rise by 122.5% (global: 67.5%) and deaths by 148.4% (global: 88.4%) if age-standardized rates (ASRs) remain constant. The highest increases are anticipated in Kuwait, followed by the United Arab Emirates and Qatar for most cancer types.

Addressing this projected rise in metabolic dysfunction-related cancer cases requires a multifaceted approach, including strengthening healthcare systems, scaling preventive measures, and fostering collaboration among stakeholders. Expanding access to early detection and care is critical.^{1,16} A strong focus on prevention is pivotal, as a significant proportion of this burden could be avoided by controlling modifiable metabolic risk factors, since improving metabolic health is linked to lower cancer risk.¹⁷ Comprehensive regional efforts should focus on metabolic health and public policies aimed at controlling obesity and promoting healthier lifestyles.

Prioritizing the prevention of adolescent obesity is crucial, with pharmacotherapy and surgical options available for those at the highest risk in adulthood.^{18,19} This can include reducing children's exposure to unhealthy food advertising, clear nutrition labeling, and increasing physical activity from early childhood. Such interventions can lower the risk of metabolic dysfunction-related cancers.^{20,21} Engaging in physical activity boosts metabolic health and lessens the risks associated with metabolic dysfunction. This improvement is linked to better insulin sensitivity, reduced chronic inflammation, and alterations in gut microbiota, all of which are factors associated with metabolic dysfunction and cancer development.^{22,23}

Public awareness of the "connection" between metabolic health and cancer risk remains low,^{24,25} so health promotion efforts should include this information. Building community support and engagement is vital for the successful adoption of these policies. Clear targets and investment in effective interventions are essential for improving health outcomes.

Nonetheless, our study has some limitations, as the findings are constrained by the quality of data available from each country in the region. These findings cannot supersede or be substitutes for robust, real-life, population-based registries that are crucial reserves for cancer incidence and its related mortality. Therefore, researchers and policymakers should exercise caution when interpreting these estimates. Further effort is required to enhance the cancer registries across the region.

Conclusion

Our assessment of the metabolic dysfunction-related cancer burden in the Arab region provides insight into the current pattern and anticipated cancer burden in the 22 countries of the Arab region. Comparatively high projected mortality rates, alongside the increasing burden, indicate the need for multi-stakeholder collaborative efforts to develop targeted interventions and improve outcomes. Focusing on prevention

and scaling up cancer surveillance will be instrumental in planning, evaluating, and monitoring progress in metabolic dysfunction-related cancer control in the Arab region.

Disclosure

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SUPPLEMENTARY

Supplemental Table 1: Distribution of cancer cases and incidence rate in 2022 and the projected cases and percentage of change by 2050 in 22 Arab countries sorted by alphabetical order.

Country	Females	Males	Both sexes
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	2022 cases	ASIR	2050 cases	Change (%)	2022 cases	ASIR	2050 cases	Change (%)	2022 cases	ASIR	2050 cases	Change (%)
Algeria	35,326	152.2	65,612	85.7	29,387	130.6	68,422	132.8	64,713	141.2	134,034	107.1
Bahrain	729	137.4	1,747	139.6	654	105.5	2,455	275.4	1,383	113.8	4,202	203.8
Comoros	382	122.0	804	110.5	237	92.9	582	145.6	619	106.8	1,386	123.9
Djibouti	494	111.3	1,089	120.5	311	71.6	634	103.9	805	90.7	1,724	114.2
Egypt	76,967	161.1	160,439	108.5	73,611	175.1	162,875	121.3	150,578	166.1	323,313	114.7
Iraq	21,558	144.1	56,764	163.3	15,824	132.0	46,038	190.9	37,382	136.6	102,802	175.0
Jordan	6,634	157.6	15,465	133.1	5,694	149.9	16,038	181.7	12,328	152.6	31,503	155.5
Kuwait	2,227	139.1	7,306	228.1	2,120	97.8	11,744	454.0	4,347	111.4	19,049	338.2
Lebanon	6,441	170.2	7,873	22.2	6,593	170.8	8,002	21.4	13,034	168.8	15,875	21.8
Libya	4,101	120.1	8,722	112.7	4,070	150.8	10,937	168.7	8,171	132.3	19,658	140.6
Mauritania	2,008	120.0	4,810	139.5	1,266	91.4	2,935	131.8	3,274	105.3	7,745	136.6
Morocco	32,872	150.3	52,665	60.2	30,737	150.8	58,348	89.8	63,609	149.8	111,013	74.5
Oman	1,572	107.0	3,656	132.6	2,473	111.5	6,072	145.5	4,045	105.3	9,728	140.5
Palestine	2,524	142.6	6,945	175.2	2,506	165.5	7,229	188.5	5,030	152.3	14,174	181.8
Qatar	640	119.7	1,564	144.4	1,093	70.7	2,538	132.2	1,733	82.4	4,101	136.6
Saudi Arabia	13,368	100.4	33,839	153.1	14,745	81.0	48,116	226.3	28,113	87.1	81,954	191.5
Somalia	6,683	145.9	17,701	164.9	3,998	95.4	9,744	143.7	10,681	121.0	27,445	157.0
Sudan	17,260	109.7	41,507	140.5	11,326	80.6	26,709	135.8	28,586	95.6	68,216	138.6
Syrian Arab Republic	11,747	136.9	35,394	201.3	10,179	142.7	31,323	207.7	21,926	138.6	66,717	204.3
Tunisia	9,110	115.3	15,920	74.8	11,441	159.4	21,564	88.5	20,551	135.4	37,484	82.4
United Arab Emirates	2,919	157.8	9,222	215.9	2,607	86.4	10,283	294.4	5,526	105.1	19,504	253.0
Yemen	9,312	89.2	25,058	169.1	7,213	77.8	19,135	165.3	16,525	83.1	44,193	167.4

Supplemental Table 2: Distribution of cancer deaths and mortality rate in 2022 and the projected cases and percentage of change by 2050 in 22 Arab countries sorted by alphabetical order.

Country or territory	Females				Males				Both			
	2022 Deaths	ASMR	2050 Deaths	Change (%)	2022 Deaths	ASMR	2050 Deaths	Change (%)	2022 Deaths	ASMR	2050 Deaths	Change (%)
Algeria	16,969	73.1	37,300	119.8	18,809	82.7	47,346	151.7	35,778	77.7	84,646	136.6
Bahrain	295	62.8	977	231.2	312	59.1	1,547	395.8	607	58.6	2,524	315.8
Comoros	251	85.2	564	124.7	167	65.9	415	148.5	418	75.3	978	134.0
Djibouti	335	78.1	780	132.8	237	56.3	505	113.1	572	66.7	1,285	124.7
Egypt	43,583	92.2	98,214	125.4	51,692	127.4	118,797	129.8	95,275	107.7	217,010	127.8
Iraq	11,133	79.5	31,941	186.9	10,403	91.9	31,756	205.3	21,536	84.4	63,697	195.8
Jordan	3,005	75.5	8,038	167.5	3,453	94.5	10,488	203.7	6,458	84.3	18,526	186.9
Kuwait	870	65.9	4,536	421.4	1,098	58.0	8,147	642.0	1,968	60.2	12,682	544.4
Lebanon	3,357	85.8	4,975	48.2	3,950	101.1	5,457	38.2	7,307	92.3	10,432	42.8
Libya	2,396	74.4	6,367	165.7	2,920	113.6	8,783	200.8	5,316	91.1	15,151	185.0
Mauritania	1,326	82.6	3,247	144.9	908	67.4	2,128	134.4	2,234	74.8	5,375	140.6
Morocco	15,792	70.5	29,507	86.9	21,155	105.0	43,776	106.9	36,947	85.9	73,283	98.4
Oman	751	57.4	2,087	177.9	1,510	75.2	4,207	178.6	2,261	66.3	6,294	178.4
Palestine	1,335	81.5	4,120	208.6	1,676	117.5	5,138	206.6	3,011	98	9,257	207.4
Qatar	255	61.8	867	240.0	527	40.2	1,514	187.3	782	46.2	2,381	204.5
Saudi Arabia	5,349	45.0	17,294	223.3	8,050	48.4	33,027	310.3	13,399	46.2	50,321	275.6
Somalia	4,934	112.6	13,024	164.0	3,104	78.1	7,546	143.1	8,038	95.5	20,570	155.9
Sudan	10,503	69.7	25,988	147.4	8,001	58.7	18,938	136.7	18,504	64.4	44,926	142.8
Syrian Arab Republic	6,631	80.5	21,698	227.2	7,217	103.7	22,843	216.5	13,848	91.0	44,541	221.6
Tunisia	4,819	57.5	10,175	111.1	7,761	106.6	15,803	103.6	12,580	80.2	25,978	106.5
United Arab Emirates	1,000	70.3	4,445	344.5	1,283	48.7	5,916	361.1	2,283	54.4	10,361	353.8
Yemen	6,339	64.5	17,904	182.4	5,515	63.8	15,355	178.4	11,854	63.7	33,259	180.6