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International laboratory for population and health

BURDEN OF CANCER IN RUSSIA: DATA AND TRENDS OVER 2000-S

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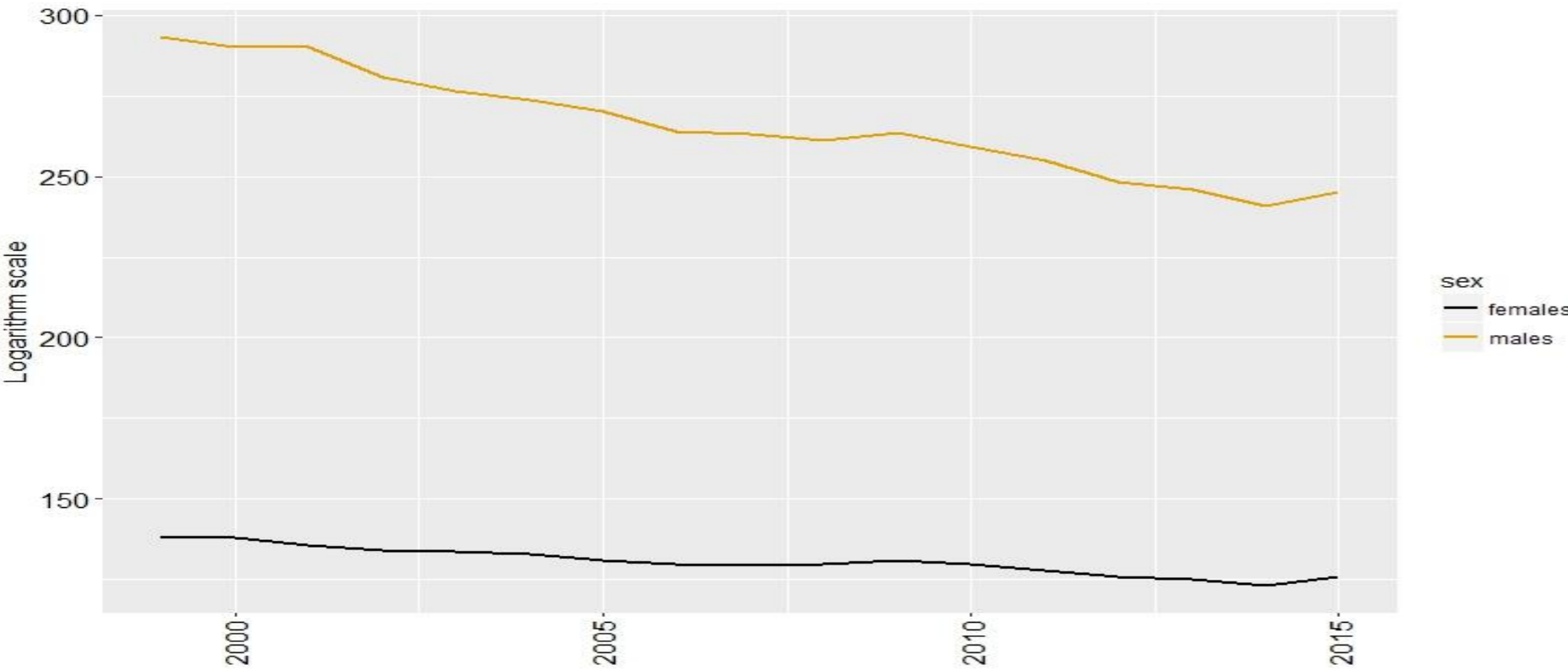
Why cancer?

Motivation:

- \$3784 – Average financial burden per cancer patient in Russia.
- Second leading cause of mortality in the world with 8.7 million death worldwide (2015).
- 296 476 cancer caused deaths in Russia (2015) out of total 1 908 541 death. 15,5%
- 589 341 incident cases of malignant neoplasms –in Russia, in 2015.
- Relatively poor quality of cancer statistics in Russia.

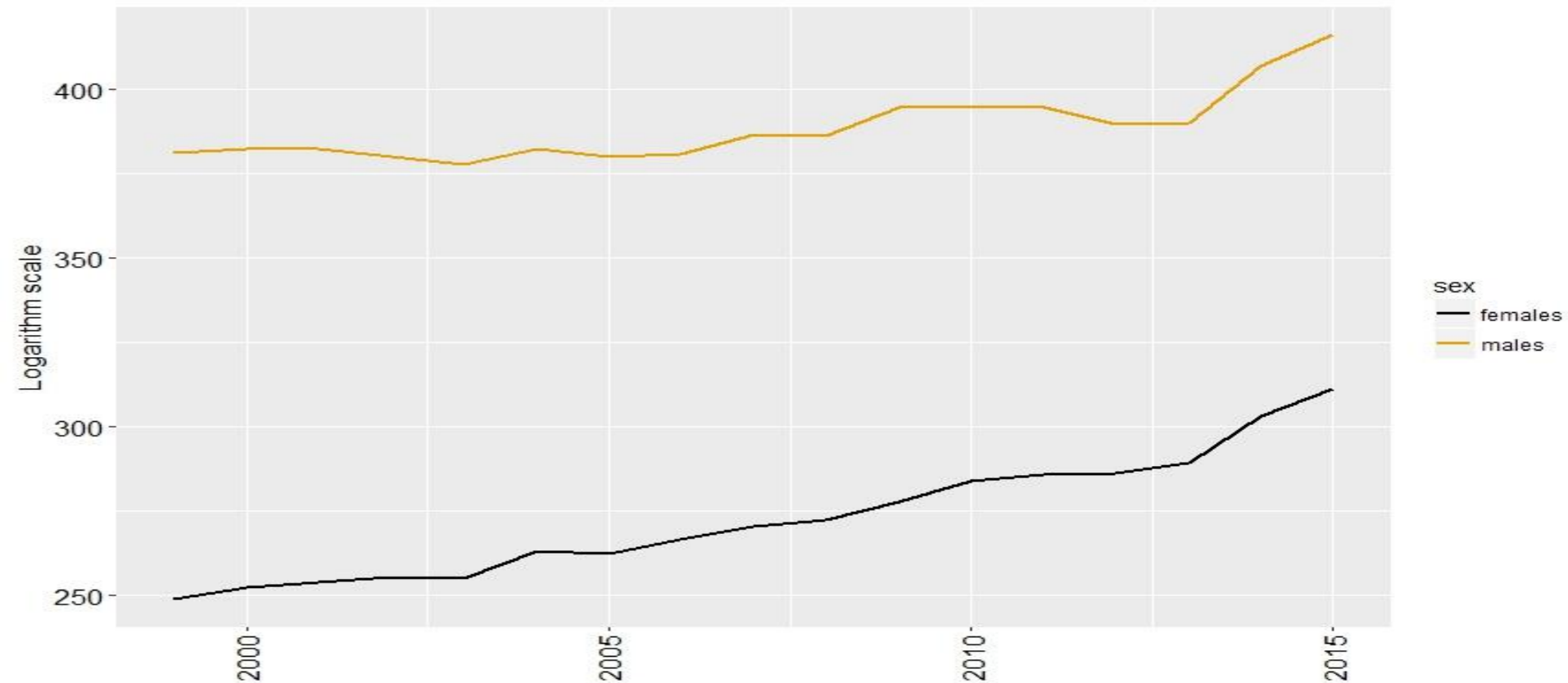


Age standardized death and incidence rates, ESPD, AII MN



←
Age standardized death rate, ESPD

Age standardized incidence rate, ESPD





Research objectives:

- To estimate the total losses from both cancer morbidity and mortality, expressed in DALY - (Disability Adjusted Life Years) and its two integral components reflecting the burden of premature mortality (YLL - Years of Life Lost) and morbidity (YLD – Years Lived with Disability).
- To calculate the unpublished indicators: lethality, prevalence, average expected life expectancy of cancer patients, average duration of disease, average expected LE increase should the elimination cancer occur in the population.
- To reassess the published indicators, such as average age at incurring cancer and average age at death from cancer.
- To describe and analyze the publicly available data on cancer mortality and morbidity in Russia.
- To give an assessment to the quality of the current state of the oncological statistics in Russia using international criteria.



General Framework and structure:

Disaggregation:

Years of observation: 1999-2015.

Age: 2 aggregated age intervals (age-standardized).

Localizations:

- All Malignant Neoplasms C00-C97
- Malignant neoplasms of lip, oral cavity and esophagus C00-C15
- Malignant neoplasm of trachea, Malignant neoplasm of bronchus and lungs C33- C34
- Malignant neoplasms of stomach C16
- Malignant neoplasms of intestines and rectum C17- C21
- Malignant neoplasms of breast C50
- Malignant neoplasms of female genital organs C51- C58
- Malignant neoplasms of prostate C61
- All other malignant neoplasms



METHODS

Methodology Applied:

For DALY calculation, we are using the formulas for so called simplified DALY*

- $DALY_i^j = YLL_i^j + YLD_i^j$ – where i – I an age interval, and j is localization.
- $YLL_i^j = D_i^j * e_i^{stad}$ - where D_i^j number of death attributable to a certain localization j in the age interval i , and e_i^{stad} – standard expected life expectancy at the age interval i .
- $YLD_i^j = P_i^j * DW^j$ - where P_i^j – prevalence of the neoplasms of the certain localization j in the age interval i , and DW^j – disability weight.

Methodology:

* Murray, C. J., Ezzati, M., Flaxman, A. D., Lim, S., Lozano, R., Michaud, C., ... & Wikler, D. (2012). GBD 2010: design, definitions, and metrics. *The Lancet*, 380(9859), 2063-2066.

* WHO, G. (2013). *WHO methods and data sources for global burden of disease estimates 2000-2011*. Geneva: Department of Health Statistics and Information Systems.

Reference life table for standard LE (e_i^{stad}):

* *Global Burden of Disease Study 2015. Global Burden of Disease Study 2015 (GBD 2015) Reference Life Table*. Seattle, United States: Institute for Health Metrics and Evaluation (IHME), 2016.

Disability weights (DW^j):

* *Global Burden of Disease Study 2015. Global Burden of Disease Study 2015 (GBD 2015) Disability Weights*. Seattle, United States: Institute for Health Metrics and Evaluation (IHME), 2016.



Methodology Applied:

Population model of cancer based on mortality and morbidity data using a multidecrement life table:

Prevalence Calculation:

Pi_x - the share of the life table population ill with cancer.

$Pi_x = \frac{L_x^c}{L_x^{all}}$ - where L_x^c corresponds to number of years lived in the age interval by the population ill with cancer and L_x^{all} number of years lived in the age interval by the total population.

By multiplying the Pi_x by the population living in the corresponding age interval we are obtaining the number of prevalent cases in the population living in the age x:

$$C_{pr} = Pi_x * Pop_x$$

Methodology Applied:

Population model of cancer based on mortality and morbidity data using a multidecrement life table:

This model is described in details by J. Duchenne in 2002 in the chapter "The measurement of mortality by cause and morbidity".*

Indicators calculated with Duchenne model:

- expected average duration of the disease,
- the average age incurring cancer and average age at death from cancer,
- the expected increase in life expectancy should the elimination of cancer occur in the population,
- the expected life expectancy of those ill with cancer,
- age and localization specific assessment of lethality and prevalence of cancer.

* *Duchêne, J. (2002). The measurement of mortality by cause and of morbidity. In The Life Table (pp. 209-244). Springer Netherlands.*

* *Курс «Население и здоровье» Российской экономической школы. Available at*

http://www.demogr.nes.ru/index.php/ru/popul_health visited 26.11.2017



Methodology Applied:

Data quality:

IARC distinguish 4 dimensions of data quality:

- Comparability
- Validity
- Timeliness
- Completeness

Sources:

Bray, F., & Parkin, D. M. (2009). Evaluation of data quality in the cancer registry: principles and methods. Part I: comparability, validity and timeliness. European journal of cancer, 45(5), 747-755.

Parkin, D. M., & Bray, F. (2009). Evaluation of data quality in the cancer registry: principles and methods Part II. Completeness. European journal of cancer, 45(5), 756-764.

Bray, F., Znaor, A., Cueva, P., Korir, A., Swaminathan, R., Ullrich, A., ... & Parkin, D. M. (2014). Planning and developing population-based cancer registration in low-and middle-income settings. IARC (International Agency for Research on Cancer).

Methodology Applied:

Data quality:

- **Comparability** - the standardization of coding and classification practices. The rules adopted for coding and reporting of the primary-multiple neoplasms. The coding practices adopted on the national level are to be compared with the international practices. The existing discrepancies are being seen as the maluses of the comparability (qualitative measure).
- **Validity** – Consistency checks that are being inbuilt in the cancer registry software. The accuracy of the data is also considered. The accuracy is calculated as a percentage of the morphologically verified cases, and the number of case for which some information is missing or for which the information came from medical certificates of death only (quantitative measure).
- **Timeliness** –the deadlines for reporting the data. Should the deadlines be too stringent, the data completeness will suffer (qualitative measure).
- **Completeness** - this dimension consists of two main indicators: **Mortality to incidence ratio** and **stability of incidence overtime**. **Stability of incidence overtime**, allows for a quick check for the maluses in the case finding. In case there were no noteworthy changes in the population structure, there should be no significant fluctuations in cancer incidence overtime.



Methodology Applied: Comparability:

Accounting validity index:

Based on the $M:I$ ratio, the AVI (Accounting Validity Index) was developed):

$AVI = \frac{D - D_s}{I - I_s}$, - Where D corresponds to the number of deaths, D_s corresponds to the number of death due to the C44 code (Malignant skin tumors, ICD - 10), I correspond to the number of incident cases, and I_s corresponds to the number of incident cases of C44 (Malignant skin tumors).

With well-established records of the patients and medical care provided, the number of incident cases should exceed the number of deaths by at least 25%, meaning that the AVI should not exceed 0.8 (80%).*

* Кривонос, О. В., Чиссов, В. В., Старинский, В. В., Александрова, Л. М., Петрова, Г. В., & Грецова, О. П. (2010). Организация работы и задачи первичного онкологического кабинета в системе онкологической помощи населению Российской Федерации. Методическая рекомендация, ФГУ «МНИОИ им. ПА Герцена Минздравсоцразвития России, 45.



DATA

Data used for calculations:

- "Report on the malignant neoplasm incidence" (Table No. 7)*
- "Report on patients with malignant neoplasms." (Table No. 35).
- Table № C51 of Rosstat
- Statistical yearbooks "Malignant neoplasms in Russia" (2007 - 2015) published by the Moscow State Research Institute named after P.A. Gerzen (since 2007).
- Review of statistical information "Malignant neoplasms in Russia 1993-2013" published by the Moscow State Research Institute named after P.A. Gerzen (since 2007).

From 2016 these two tables are being combined*

* The Duchenne model uses the data on the age-specific death rate - M_x , the age-specific death rate from the disease under study (in our case cancer) - M_x^C disaggregated by the diagnostic categories, and the age - specific incidence rate attributable to the certain diagnostic category under study - I_x^C . Data should be presented by 5-year age intervals starting from 15 and up to 85+ years.

- *The order of the Rostat № 672 from 30.12.2015.*
- *Decree of the State Statistics Committee of Russia from 29.06.1999, No. 49*



RESULTS



Data quality, validity, timeliness and comparability

Individual level forms:

- "Medical outpatient card"(025/U).
- "Medical card of a stationary patient" (003/U).
- "Notification on a patient diagnosed with malignant neoplasm for the first time in his life» (090/U).

tight deadlines may potentially cause a decrease in the quality of information

- "Protocol in case of revealing a neglected form of malignant neoplasm in a patient" (027-2/U).

it is difficult to judge the real causes for the late diagnosis, either the latent flow or untimely treatment will be

listed as the reasons most likely. Doubles the information from 0-30-6/GRR.

- "Talon of additions to the control card of dispensary observation of a patient with malignant neoplasm" (030-6/TD).
- "Control card for dispensary observation of a patient with malignant neoplasm" (030-6/U).
- "Registration card of a patient with malignant neoplasm" (030-6/GGR).
- "Medical certificate of death" (106/U-08)
- "Protocol of pathoanatomical study" (013/U) rarely goes to oncological institutions



Data quality, validity, timeliness and comparability

Comparability:

- Table № 7 and Table № 35 – Different coding practices for concurrent tumors
- Table № 7 – does not comply with IARC recommendations
- Table № 35 – has no disaggregation by sex and age groups, does not contain an information on the cases of primary-multiple neoplasms and posthumously considered cases
- Table No. C51 Rosstat - has a limited number of localizations of malignant tumors

More problems:

Tables, compiled in different years, differ in the completeness of the information provided.

Tables on morbidity was changed in 2011, causes of death directories were expanded 2 times in 1999 and 2011. In 2011, the localization directory for the table containing the information on the contingent of registered patients was expanded. The changes introduced did not lead to the coincidence of the localizations of all reporting tables.



Data quality, validity, timeliness and comparability

Validity:

% of diagnoses that were morphologically verified										
1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
70,9	72,2	73,5	74,2	75,1	75,8	76,6	77,5	78,2	79,1	80,0
2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
80,7	81,8	82,9	83,2	84,5	85,3	85,8	86,7	87,7	88,8	90,4

Timeliness:

More stringent deadlines for compilation of table № 35 compared to table № C51), distorts the quality of data

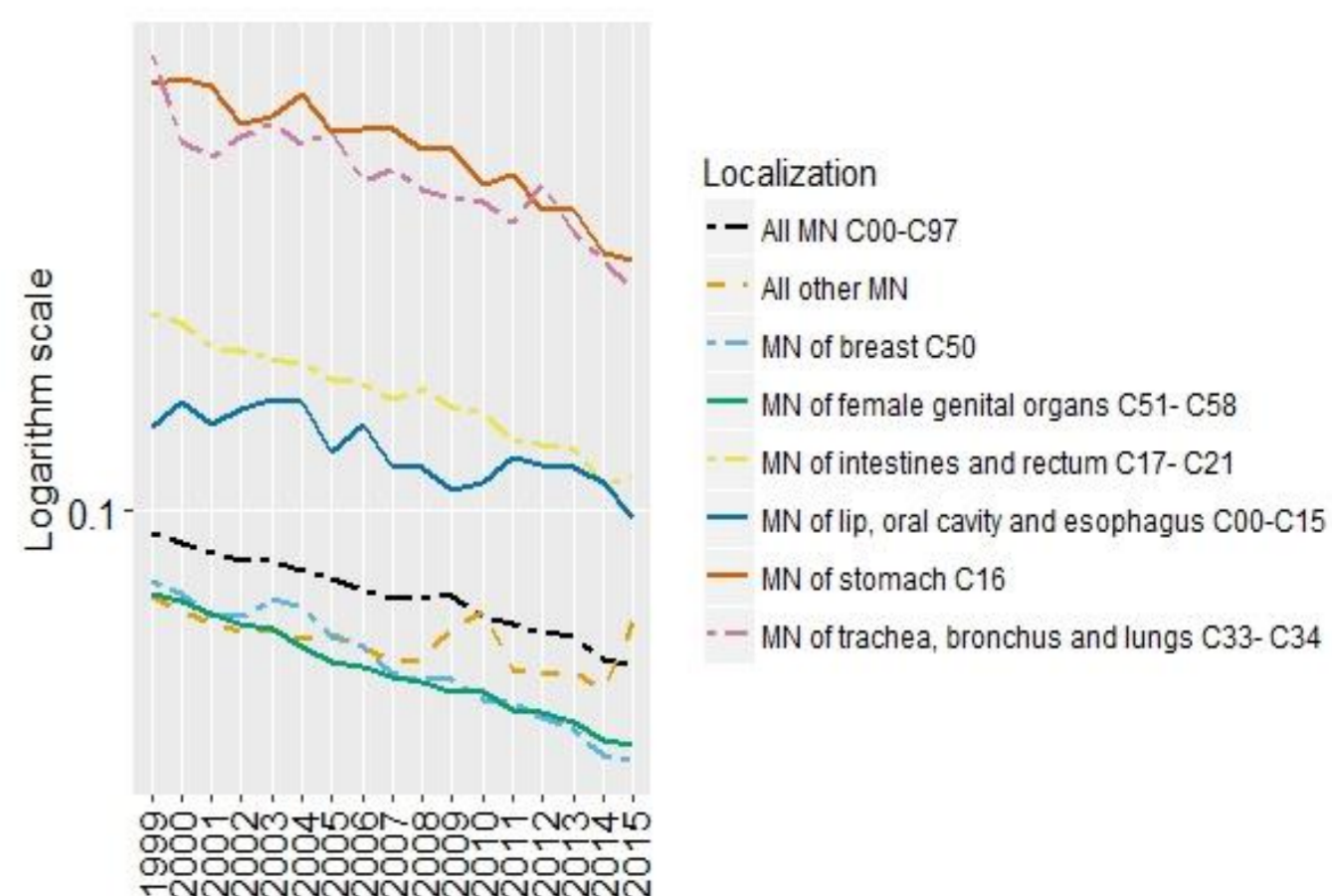
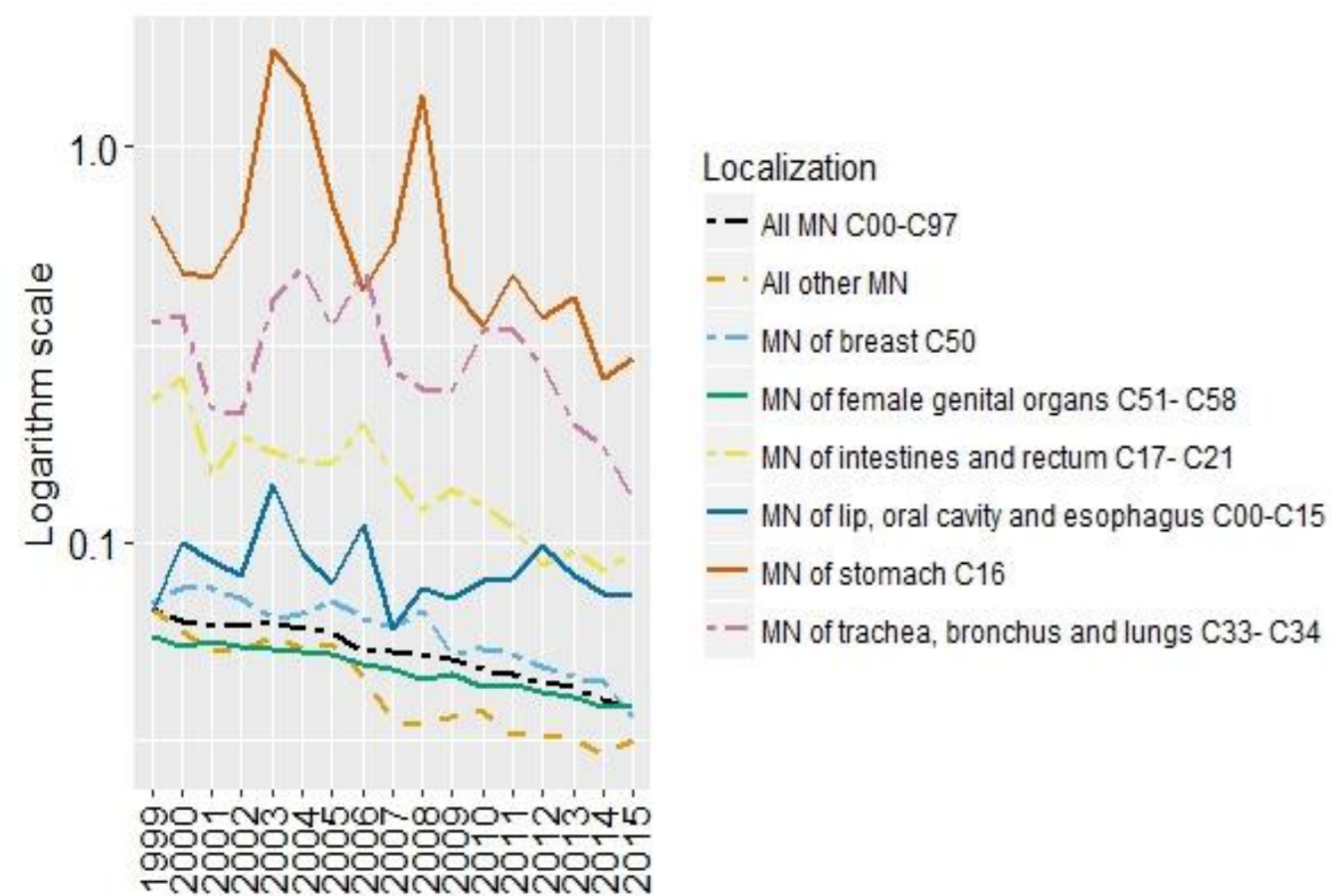
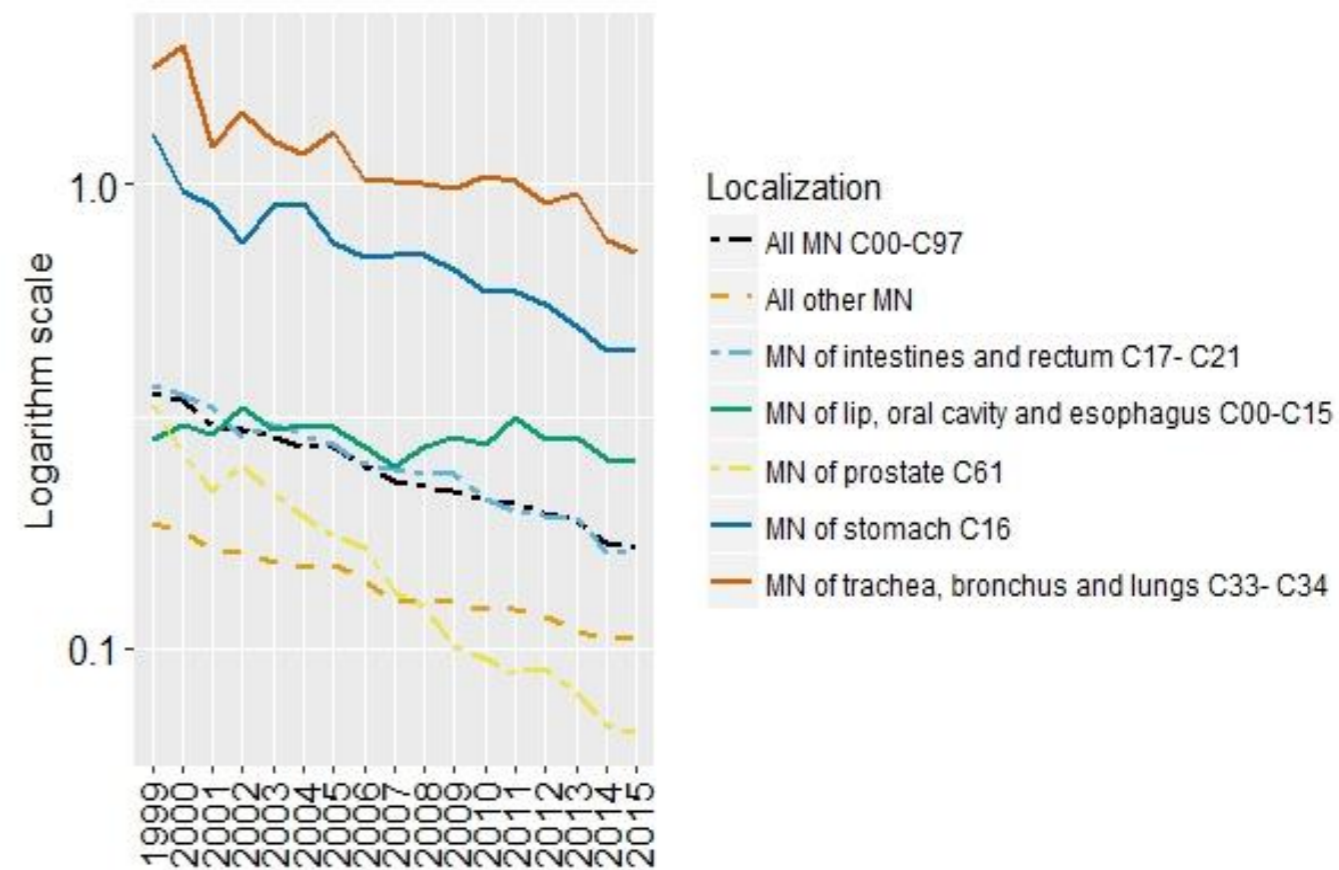
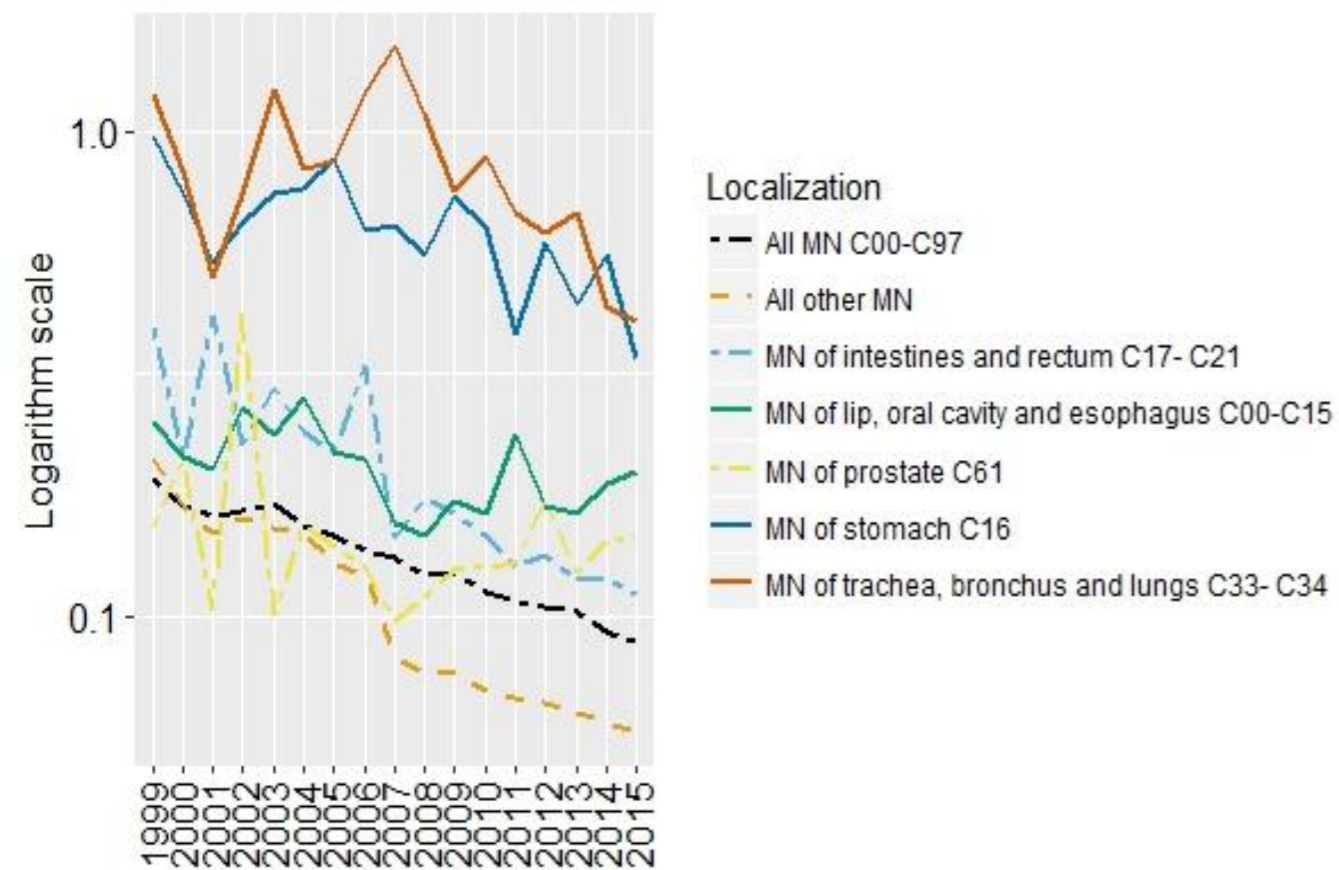
Since the adoption of the order number 152-F3 from 27/07/2006 "On the personal data", the reconciliation of the cases of death was significantly hampered.



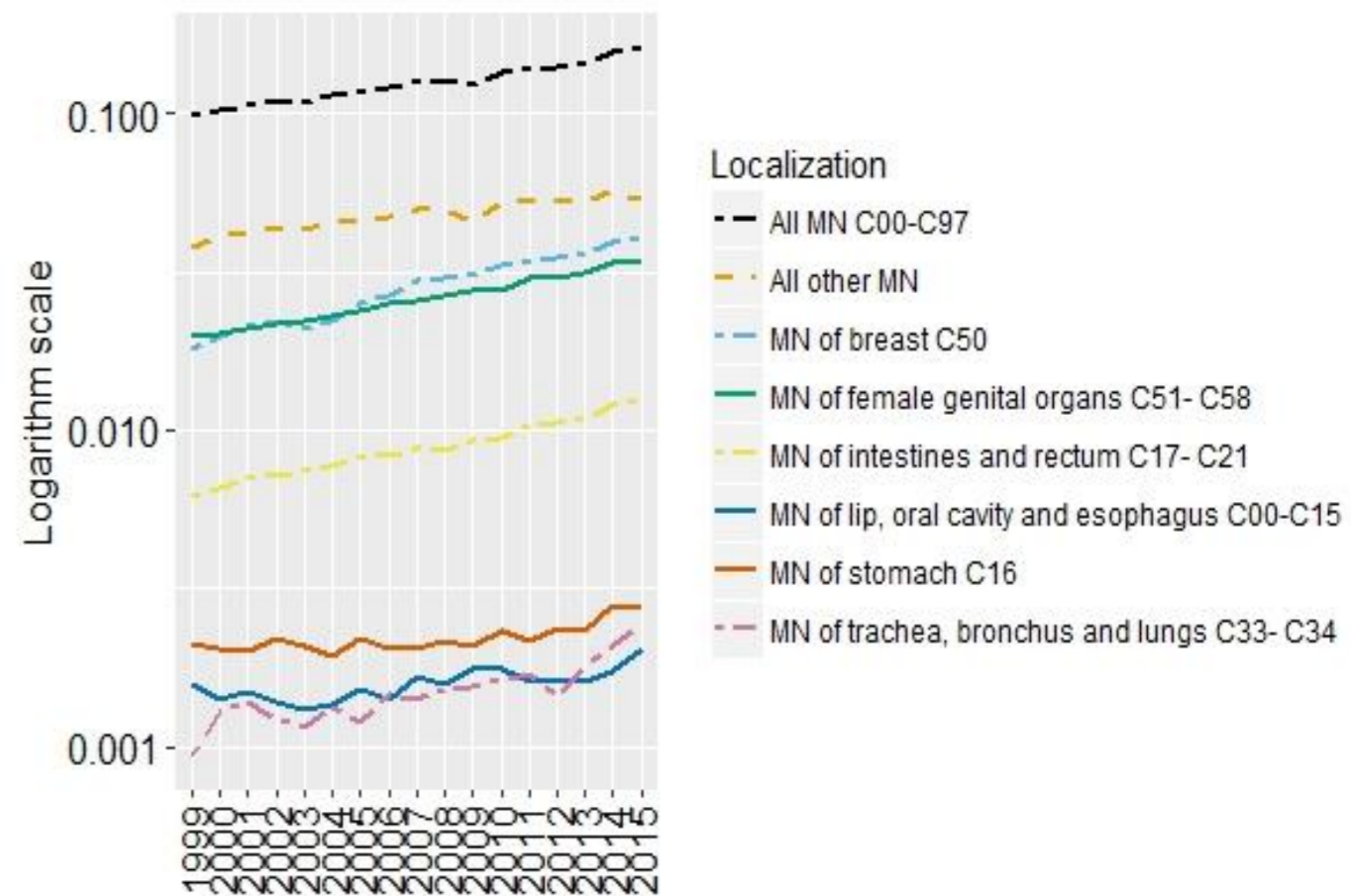
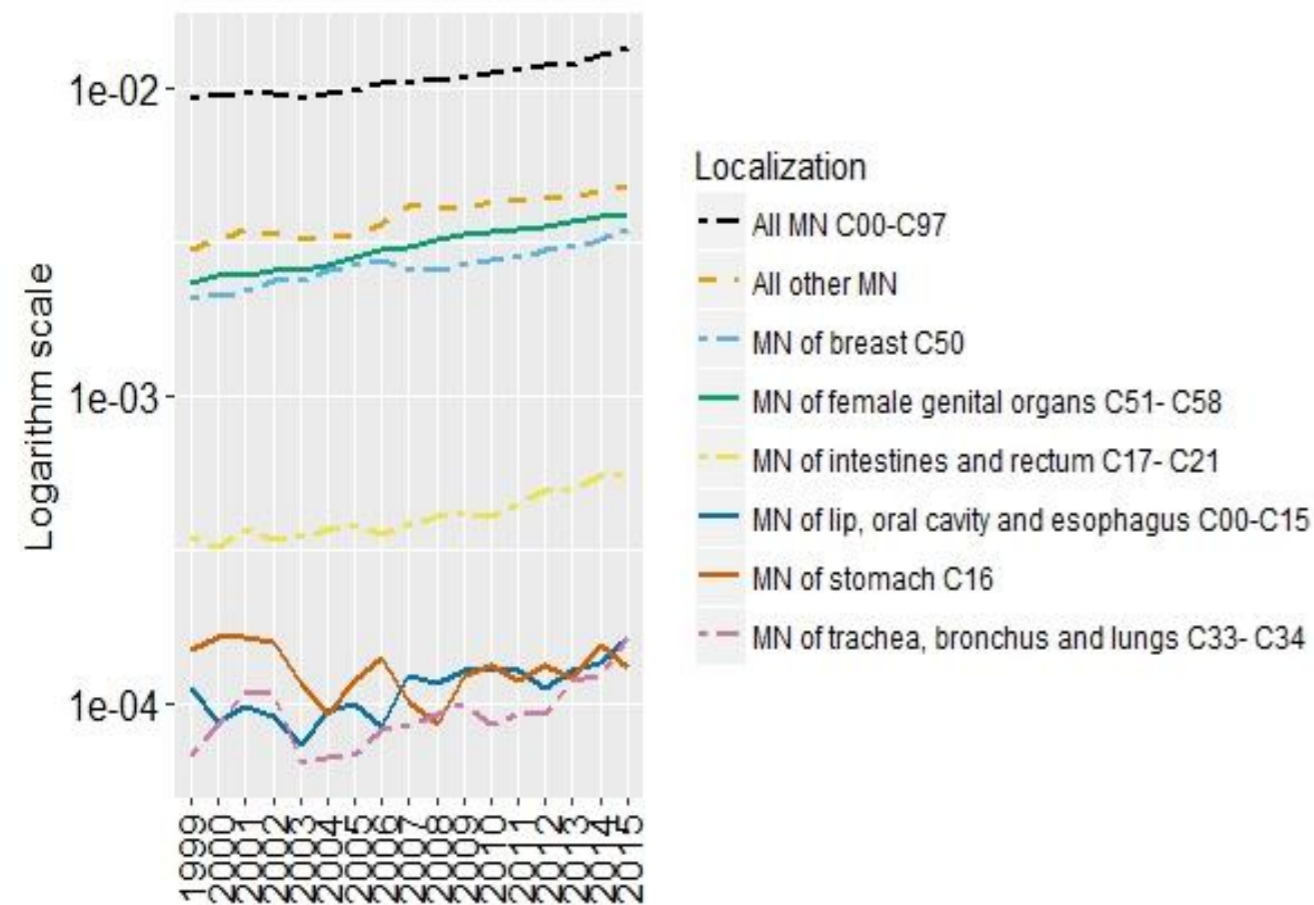
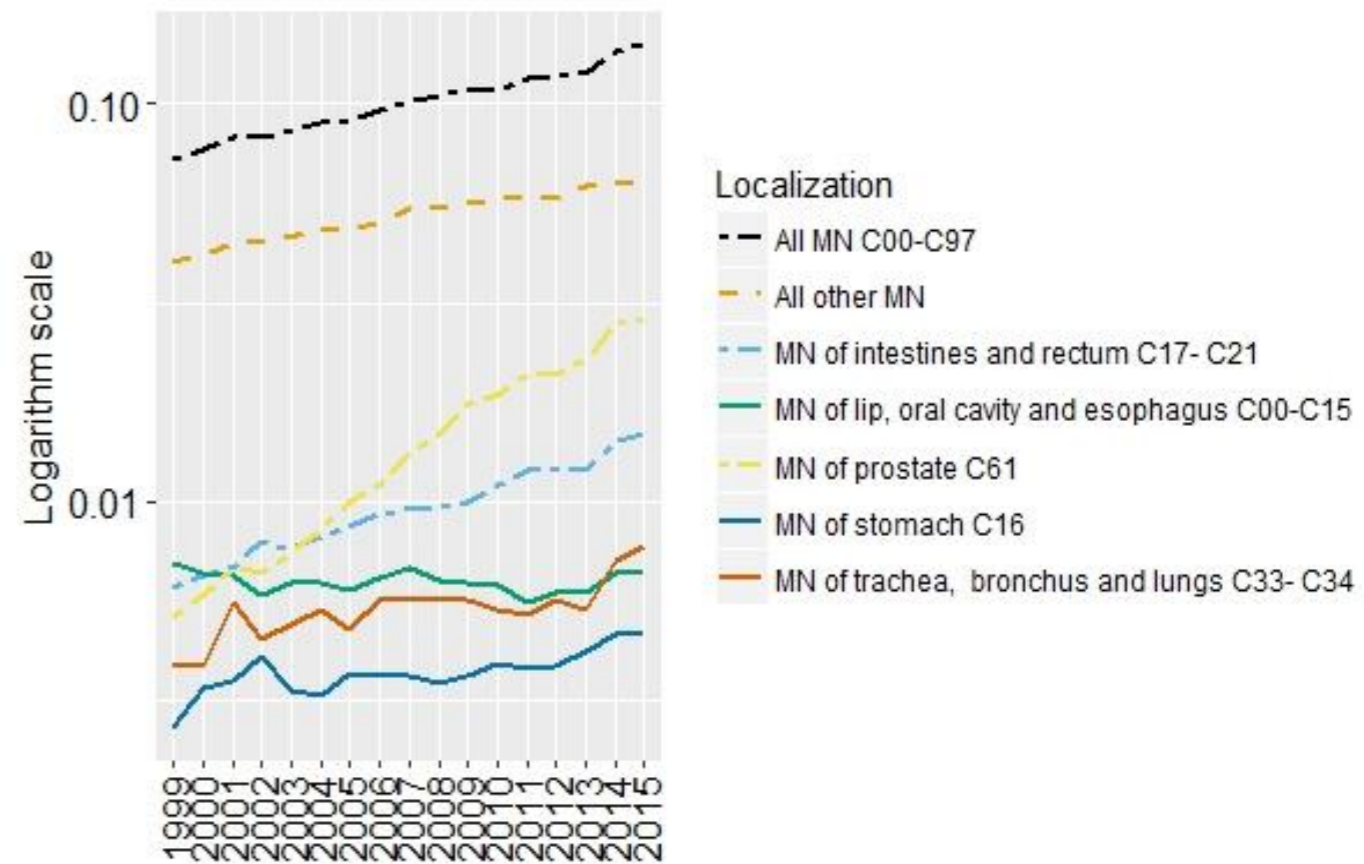
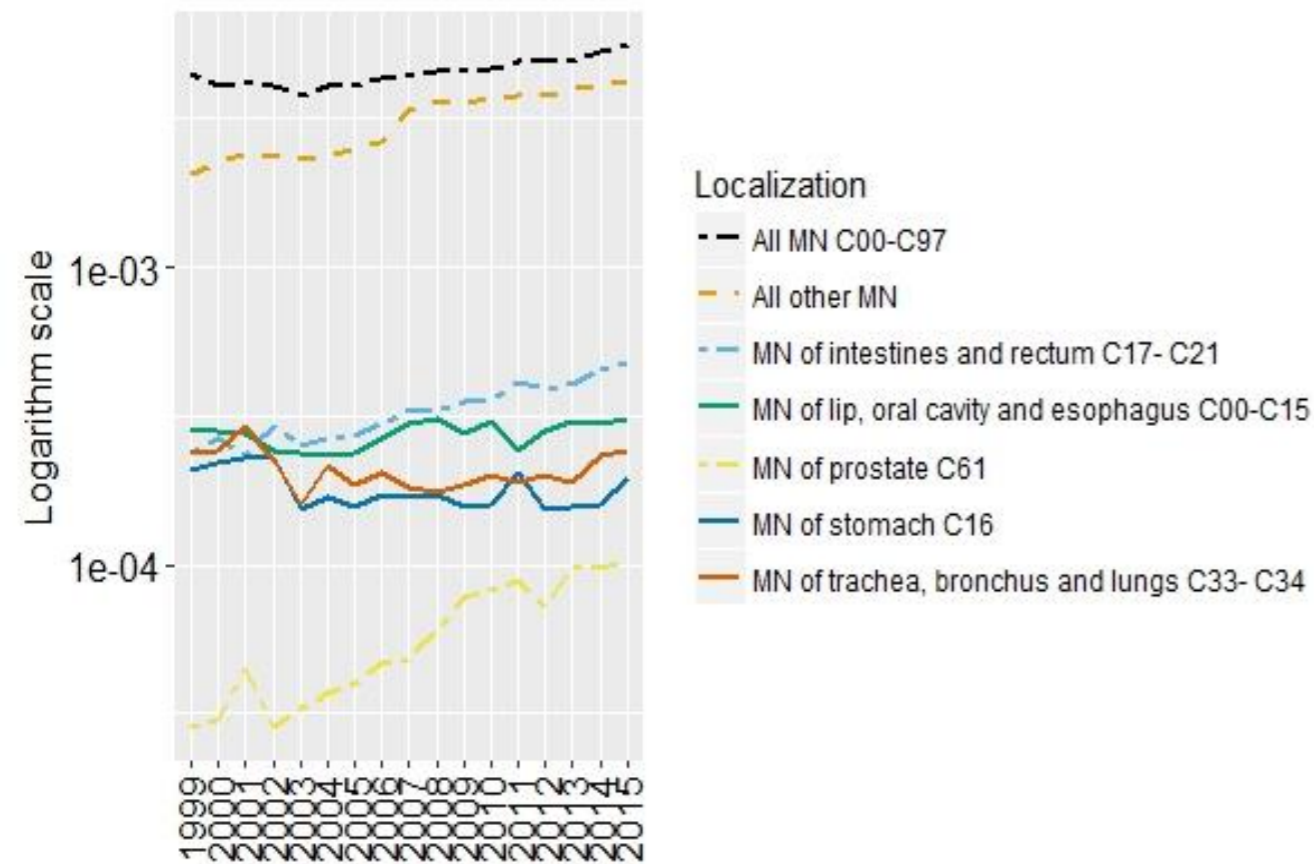
Data quality, Completeness: Accounting validity index, males and females

Males	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
C00-C15	0	0	0,5	0,42857	0,46667	0,41304	0,52427	0,55939	0,57674	0,63842	0,66257	0,71223	0,73171	0,73337	0,78072	0,73653	0,67295	0,73802
C16	0	0	0	1,33333	1,2	0,49153	0,73846	0,6473	0,63134	0,67718	0,76499	0,75639	0,82155	0,78926	0,87056	0,8712	0,95691	1,00417
C33-C34	0,5	0	1	0,14286	0,73333	0,6	0,52212	0,66791	0,75981	0,81326	0,81532	0,82267	0,84918	0,87323	0,93931	0,96159	0,93837	0,94042
C17-C21	0,5	0	0	0,16667	0,35294	0,39394	0,46	0,46328	0,48691	0,45084	0,47712	0,4934	0,51658	0,5471	0,60352	0,7296	0,83317	1,10169
C61	0	0	0	1	1	0,4	1	0,42857	0,475	0,23333	0,18621	0,1918	0,21607	0,21588	0,30734	0,39159	0,56852	0,86947
All	0,19953	0,31637	0,296	0,33871	0,43554	0,35737	0,43269	0,46599	0,53043	0,58993	0,61669	0,6301	0,63764	0,61134	0,67022	0,72268	0,800266	0,94947
C22	0,21739	2	1	2	0,625	1,7	1,28	1,2619	1,16883	1,22543	1,17936	1,20393	1,25573	1,15664	1,26271	1,26677	1,19856	1,4717
C25	0	0	0	1	1,75	0,80952	0,91489	1,02299	0,93069	0,95567	0,96247	1,02894	0,97278	1,00973	1,044	0,99296	0,99528	1,144
C32	0	0	0	0	1	0,2	0,5	0,45283	0,55245	0,53047	0,51078	0,52092	0,60846	0,5975	0,70975	0,81366	0,81879	0,77586
C43	0	0	0	0,27273	0,18919	0,2043	0,30496	0,37423	0,37563	0,44275	0,40722	0,44622	0,48549	0,38255	0,39869	0,46532	0,50259	0,47899
C64	0,03409	0,14815	0,66667	0	0,55556	0,13514	0,05983	0,14068	0,16245	0,26055	0,32544	0,39622	0,4353	0,4309	0,5694	0,66073	0,75532	0,96698
C67	0,16667	0	0	0	0	0,12195	0,06494	0,11667	0,19417	0,24928	0,22894	0,27313	0,33286	0,35789	0,4649	0,54564	0,68348	0,80279
C70-C72	0,40496	0,40833	0,46316	0,45238	0,5625	0,4878	0,71292	0,82759	0,84711	0,85714	0,86652	1,00318	0,9948	1,04215	1,10549	1,15612	1,37879	1,35294
C73	0	0	0	0	0	0,03636	0,02041	0,01786	0,04286	0,09286	0,22388	0,17736	0,26222	0,30144	0,53086	0,56044	1	0,94444
C81-C96	0,16402	0,25974	0,19786	0,27848	0,43686	0,33953	0,42531	0,39963	0,49374	0,48729	0,56883	0,5794	0,63005	0,66667	0,75748	0,83376	0,97149	0,96596
Females	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85+
C00-C15	1	0	0	0	0,125	0,35294	0,33871	0,32308	0,46073	0,51042	0,46943	0,5014	0,54182	0,5655	0,57438	0,6402	0,65412	0,78082
C16	0	0	0	1	0,34783	0,64583	0,78632	0,7449	0,72176	0,70753	0,6696	0,69865	0,68437	0,67395	0,7627	0,84111	0,95166	1,06466
C33-C34	1	1	0	0,5	0,22222	0,20513	0,49315	0,5375	0,50192	0,64337	0,67169	0,68103	0,69385	0,74645	0,80253	0,88669	0,88911	1,04323
C17-C21	0	0	0,66667	0,28571	0,24138	0,42574	0,3972	0,37173	0,39913	0,39123	0,42555	0,44714	0,4761	0,49343	0,57166	0,68832	0,8755	1,13524
C50	0	0	0	0,14286	0	0,10904	0,16231	0,20255	0,20657	0,21141	0,27351	0,32125	0,3272	0,33697	0,39113	0,46779	0,66164	0,89914
C51-C58	0	0	0,09091	0,09259	0,20476	0,16567	0,22354	0,25488	0,28806	0,29381	0,30853	0,31714	0,37023	0,43112	0,53554	0,63534	0,82609	1,02539
All	0,22715	0,28608	0,29942	0,20887	0,24066	0,19663	0,23872	0,26757	0,29391	0,31268	0,36042	0,40048	0,44422	0,48299	0,59032	0,6923	0,8489	1,03456
C22	0,25	1,25	0,33333	0,4	1,2	1,15385	1,07143	0,84375	0,85507	1,19277	1,08458	1,08013	1,22794	1,16633	1,25258	1,32206	1,34043	1,3974
C25	0	0	0,4	1	0,33333	0,52632	0,75	0,68	0,86275	0,86139	0,83964	0,90967	0,895	0,92925	0,94981	1,03332	1,04251	1,1736
C32	0	0	0	0	0	0,33333	0,14286	0,45455	0,47368	0,55172	0,61538	0,52941	0,46739	0,61905	0,84	0,68889	0,6	0,85
C43	0	0	0	0,05556	0,13514	0,13194	0,23404	0,22101	0,30124	0,20538	0,33143	0,27688	0,29907	0,31258	0,38477	0,34864	0,43127	0,65385
C64	0,04167	0,2	0	0,66667	0,07143	0,13043	0,07955	0,14839	0,08271	0,13777	0,14187	0,18019	0,23468	0,25574	0,37939	0,56346	0,75159	1,03966
C67	1	0	0	0	0	0,1	0,21739	0,27273	0,18333	0,24096	0,18653	0,20755	0,22951	0,24514	0,33333	0,43838	0,5718	0,82447
C70-C72	0,45192	0,43617	0,4127	0,48649	0,55357	0,43077	0,53631	0,52778	0,69725	0,772	0,84127	0,94579	0,91855	0,91725	1,05714	1,16351	1,4966	1,33621
C73	0	0	0	0,01163	0	0	0,00562	0,00482	0,012	0,01842	0,02113	0,03497	0,06831	0,08174	0,21212	0,36306	0,71166	1,08163
C81-C96	0,23592	0,14948	0,28369	0,19231	0,30769	0,25052	0,25424	0,3248	0,38767	0,41098	0,42171	0,47303	0,51717	0,55764	0,65453	0,76935	0,94667	1,06276

Age standardized Lethality Males and Females: 25-54 | 55 – 85+



Age standardized Prevalence Males, Females: 15-54 | 55 – 85+





Multidecrement life table results, Males:

average age at incurring cancer Males								average age of death from cancer Males								average duration of disease Males							
Year	C00-C15	C00-C97	C16	C17-C21	C33-C34	C61	Other	Year	C00-C15	C00-C97	C16	C17-C21	C33-C34	C61	other	Year	C00-C15	C00-C97	C16	C17-C21	C33-C34	C61	other
1999	62,38	63,95	64,41	66,38	64,23	71,05	-	1999	62,50	64,44	64,93	67,77	64,55	71,69	-	1999	0,12	0,49	0,52	1,39	0,32	0,64	-
2000	62,33	63,69	64,39	66,06	64,14	70,92	-	2000	62,36	64,28	64,96	67,64	64,32	71,66	-	2000	0,03	0,59	0,57	1,58	0,18	0,73	-
2001	62,16	63,69	64,34	66,16	64,07	70,59	-	2001	62,47	64,37	65,04	67,75	64,45	71,64	-	2001	0,31	0,68	0,70	1,59	0,39	1,04	-
2002	61,99	63,51	64,09	65,88	63,98	70,45	-	2002	62,21	64,20	64,82	67,60	64,33	71,31	-	2002	0,22	0,69	0,73	1,71	0,34	0,86	-
2003	61,97	63,58	64,38	66,00	64,06	70,63	-	2003	62,28	64,24	64,97	67,53	64,39	71,76	-	2003	0,30	0,66	0,59	1,53	0,33	1,13	-
2004	62,32	64,00	64,80	66,41	64,36	70,75	-	2004	62,52	64,64	65,40	67,93	64,72	71,97	-	2004	0,19	0,64	0,59	1,52	0,36	1,21	-
2005	62,44	64,21	64,83	66,65	64,64	70,86	-	2005	62,77	64,87	65,50	68,29	64,92	72,02	-	2005	0,33	0,66	0,66	1,64	0,28	1,16	-
2006	62,86	64,80	65,33	66,86	64,95	71,10	-	2006	63,30	65,58	66,08	69,02	65,45	72,46	-	2006	0,43	0,78	0,75	2,16	0,50	1,36	-
2007	62,97	65,22	65,76	67,31	65,30	71,10	63,54	2007	63,74	66,04	66,58	69,48	65,75	72,97	64,13	2007	0,76	0,82	0,81	2,17	0,45	1,87	0,59
2008	62,87	65,20	65,82	67,31	65,36	70,88	63,42	2008	63,59	66,16	66,64	69,45	65,89	73,22	64,25	2008	0,72	0,96	0,82	2,15	0,54	2,34	0,83
2009	63,29	65,61	66,32	67,63	65,53	70,74	63,91	2009	63,84	66,56	67,12	69,87	66,20	73,34	64,70	2009	0,54	0,95	0,80	2,24	0,67	2,60	0,79
2010	63,13	65,67	66,15	67,52	65,52	71,05	64,03	2010	63,84	66,68	67,15	69,90	66,09	73,74	65,00	2010	0,71	1,00	0,99	2,38	0,57	2,68	0,97
2011	63,65	66,31	66,81	68,08	66,10	71,29	64,69	2011	64,06	67,32	68,02	70,35	66,76	74,25	65,67	2011	0,40	1,01	1,22	2,27	0,66	2,96	0,98
2012	63,74	66,48	67,14	68,24	66,22	71,34	64,86	2012	64,40	67,62	68,21	70,72	66,95	74,54	65,94	2012	0,66	1,14	1,07	2,48	0,72	3,20	1,08
2013	63,62	66,71	67,39	68,45	66,31	71,32	65,23	2013	64,32	67,90	68,59	71,06	67,05	74,82	66,33	2013	0,70	1,19	1,20	2,62	0,74	3,50	1,10
2014	63,66	66,90	67,59	68,49	66,50	71,31	65,30	2014	64,21	68,00	68,59	71,03	67,24	74,89	66,45	2014	0,55	1,10	1,00	2,55	0,73	3,57	1,15
2015	63,63	66,85	67,65	68,31	66,57	71,10	65,29	2015	64,21	67,96	68,70	70,85	67,19	74,84	66,36	2015	0,59	1,11	1,05	2,54	0,62	3,73	1,07



Multidecrement life table results, Females:

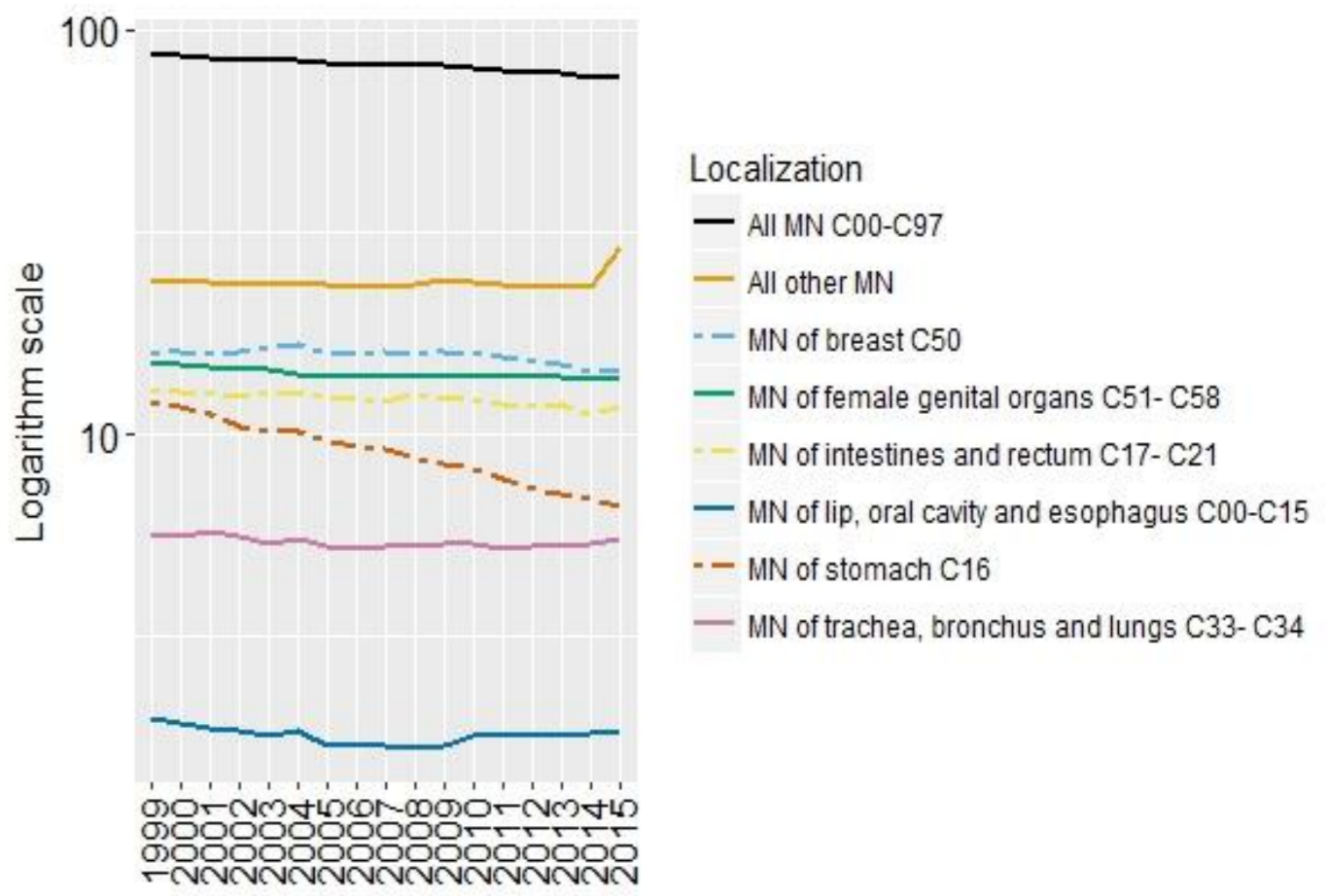
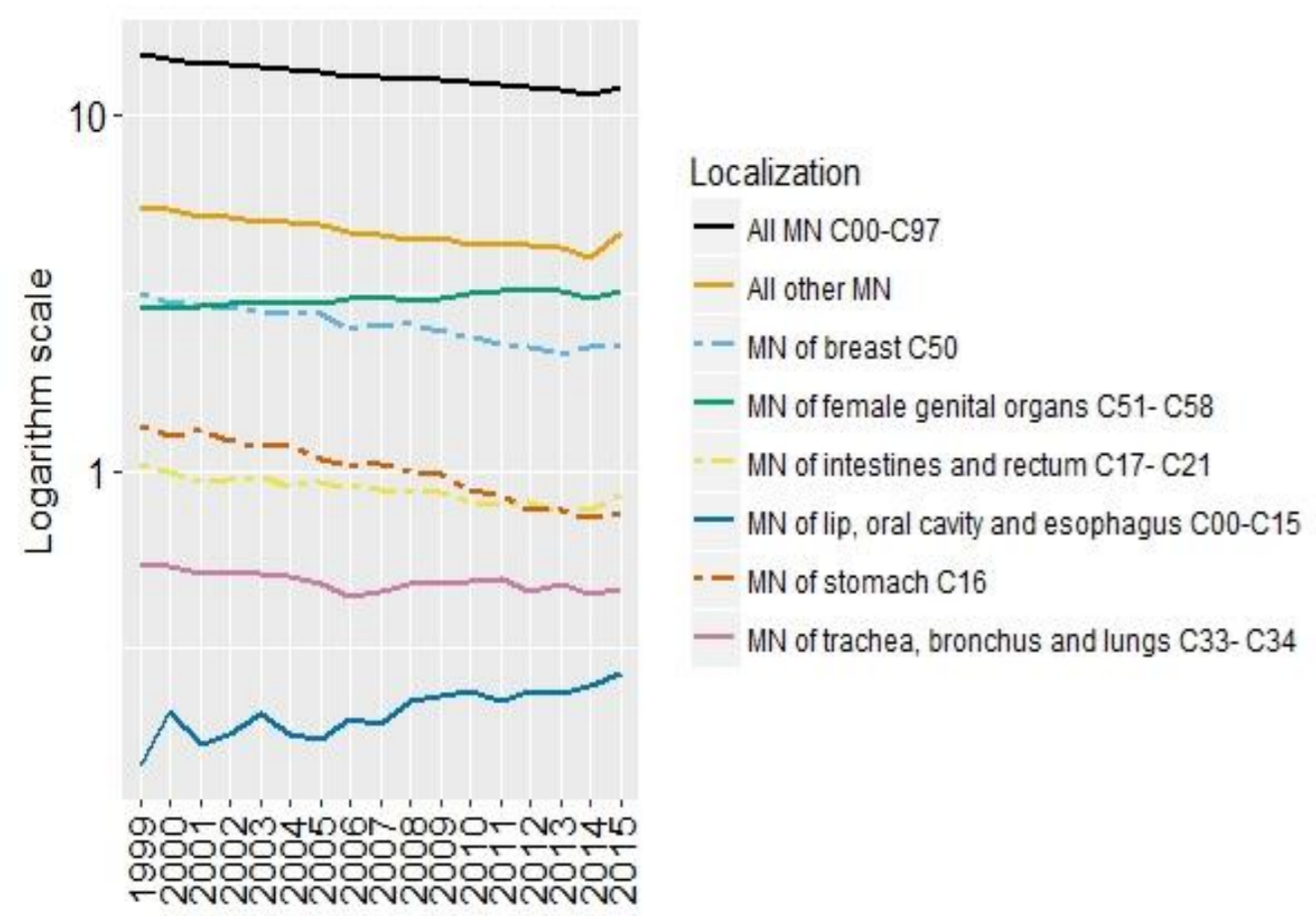
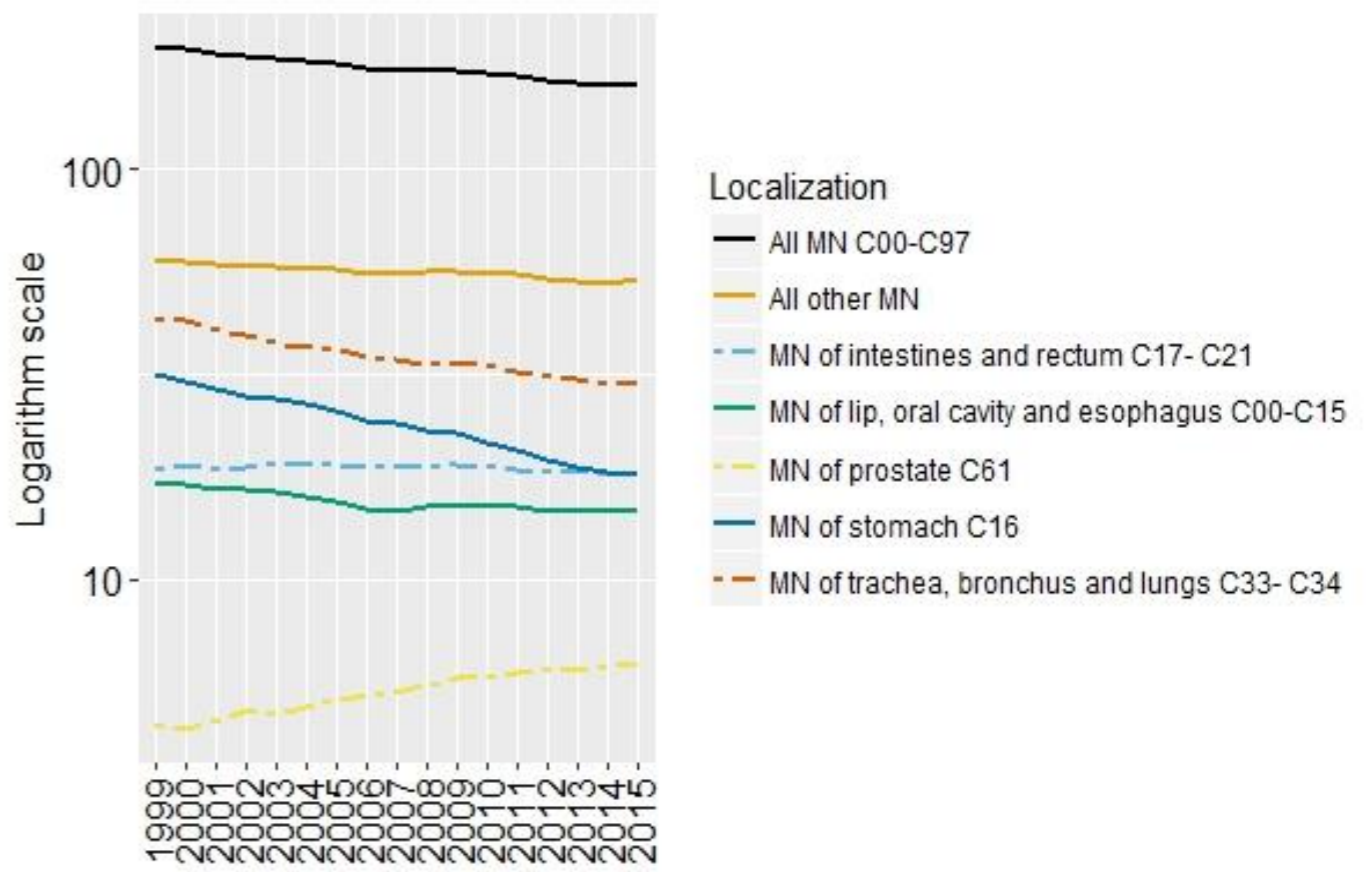
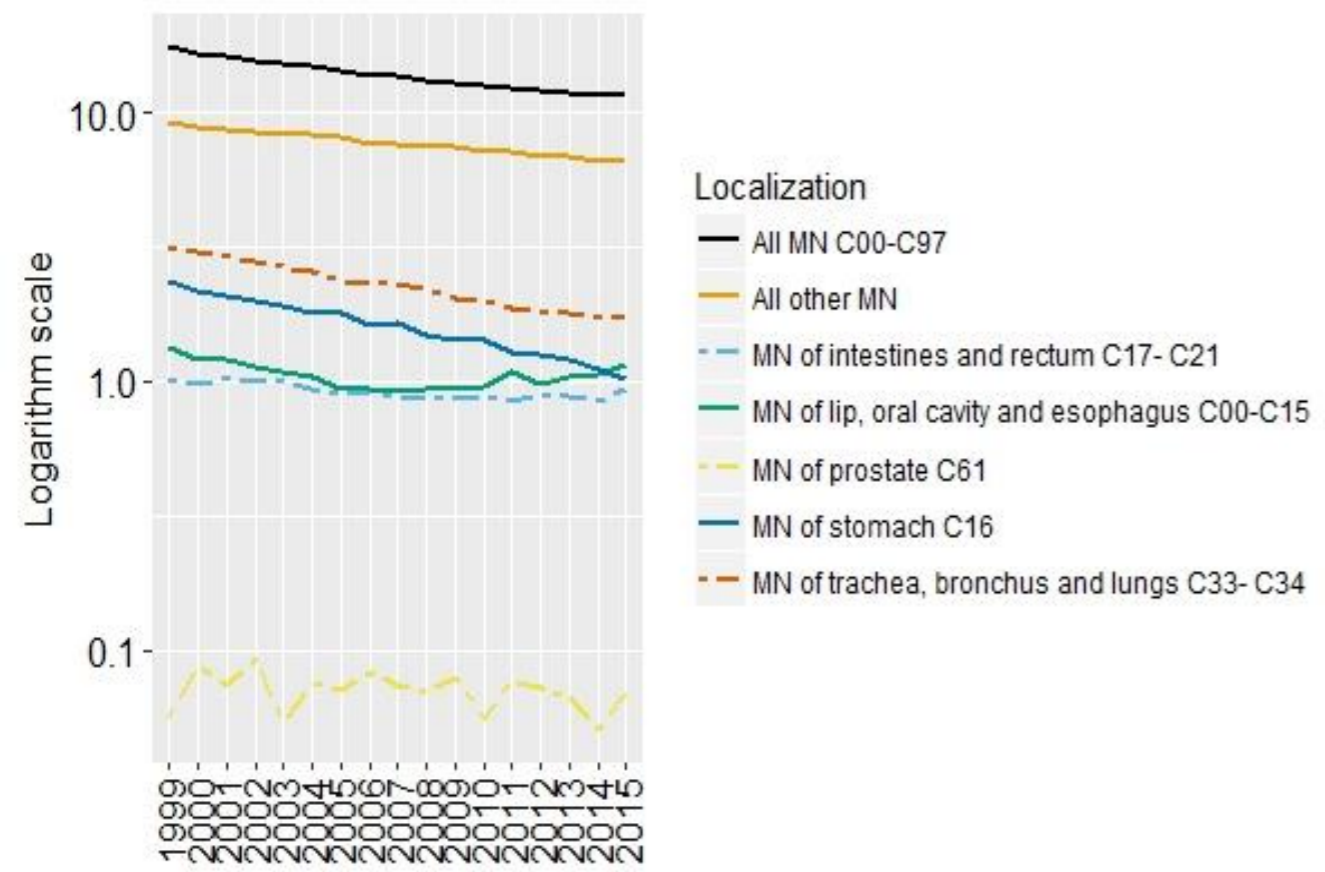
average age at incurring cancer Females									average age of death from cancer Females									average duration of disease Females								
Year	C00-C15	C00-C97	C16	C17-C21	C33-C34	C50	C51-C58	other		C00-C15	C00-C97	C16	C17-C21	C33-C34	C50	C51-C58	other		C00-C15	C00-C97	C16	C17-C21	C33-C34	C50	C51-C58	other
1999	68,91	63,56	67,76	67,36	67,93	58,83	59,10	64,98		71,43	66,65	68,97	69,65	68,59	63,02	64,61	66,20		2,51	3,10	1,22	2,29	0,66	4,19	5,51	1,21
2000	69,04	63,57	67,93	67,50	67,84	58,96	59,10	64,84		71,06	66,87	69,06	69,96	68,95	63,58	64,66	66,43		2,03	3,30	1,13	2,46	1,11	4,62	5,56	1,59
2001	68,94	63,44	67,51	67,31	67,42	59,01	58,93	64,73		71,63	66,85	68,81	70,06	68,67	63,63	64,55	66,51		2,69	3,41	1,30	2,74	1,25	4,61	5,62	1,77
2002	68,84	63,41	67,75	67,42	67,43	58,75	58,76	64,75		70,82	66,73	68,97	70,04	68,57	63,62	64,21	66,41		1,98	3,31	1,22	2,62	1,14	4,87	5,45	1,65
2003	68,84	63,50	67,95	67,59	67,62	59,04	58,63	64,90		70,53	66,72	69,07	70,16	68,42	63,70	64,05	66,43		1,69	3,22	1,12	2,57	0,81	4,67	5,42	1,53
2004	69,01	63,96	68,44	67,97	68,03	59,42	58,79	65,46		71,08	67,09	69,31	70,43	68,71	64,14	64,24	66,95		2,07	3,13	0,86	2,46	0,68	4,71	5,45	1,48
2005	68,63	64,03	68,42	68,11	68,20	59,81	58,60	65,65		71,24	67,26	69,60	70,76	69,07	64,29	64,18	67,06		2,61	3,24	1,18	2,65	0,87	4,48	5,57	1,42
2006	69,14	64,17	68,70	68,23	68,36	60,20	58,68	65,89		70,87	67,77	70,01	71,22	69,64	65,05	64,51	67,66		1,74	3,60	1,31	2,98	1,28	4,85	5,83	1,77
2007	68,54	64,48	69,06	68,59	68,59	61,15	58,76	65,92		71,24	68,11	70,41	71,43	69,69	65,33	64,67	68,25		2,70	3,63	1,35	2,84	1,11	4,18	5,91	2,33
2008	68,15	64,57	69,39	68,73	68,66	61,27	58,69	66,06		71,04	68,31	70,69	71,67	70,00	65,43	64,79	68,44		2,89	3,74	1,30	2,95	1,34	4,16	6,10	2,38
2009	69,53	64,76	69,59	69,06	68,89	61,66	58,77	66,21		71,28	68,77	70,96	72,18	70,33	66,11	65,06	69,03		1,75	4,01	1,37	3,12	1,44	4,45	6,29	2,82
2010	68,42	65,06	69,71	69,17	68,81	61,90	58,75	66,81		70,38	68,85	71,32	72,30	70,24	66,20	64,97	69,18		1,97	3,78	1,61	3,13	1,42	4,29	6,21	2,37
2011	68,96	65,50	70,15	69,54	69,29	62,25	59,76	67,20		71,59	69,54	71,83	73,00	70,81	67,02	65,27	70,06		2,63	4,04	1,68	3,46	1,52	4,77	5,51	2,86
2012	68,57	65,54	70,23	69,57	69,28	62,34	59,77	67,34		70,90	69,67	72,04	73,27	70,90	67,18	65,33	70,19		2,33	4,13	1,81	3,69	1,62	4,84	5,56	2,85
2013	68,44	65,74	70,67	69,70	69,26	62,56	59,90	67,62		71,04	69,98	72,62	73,45	70,96	67,61	65,66	70,46		2,60	4,24	1,95	3,74	1,70	5,05	5,76	2,84
2014	68,54	65,84	70,51	69,91	69,33	62,78	60,07	67,64		70,67	70,05	72,62	73,63	71,21	67,40	65,79	70,58		2,13	4,21	2,11	3,72	1,89	4,62	5,72	2,94
2015	67,90	65,75	70,77	69,84	69,05	62,51	59,99	67,59		70,47	70,00	72,42	73,45	71,09	67,52	65,48	70,75		2,56	4,24	1,66	3,62	2,04	5,01	5,49	3,16



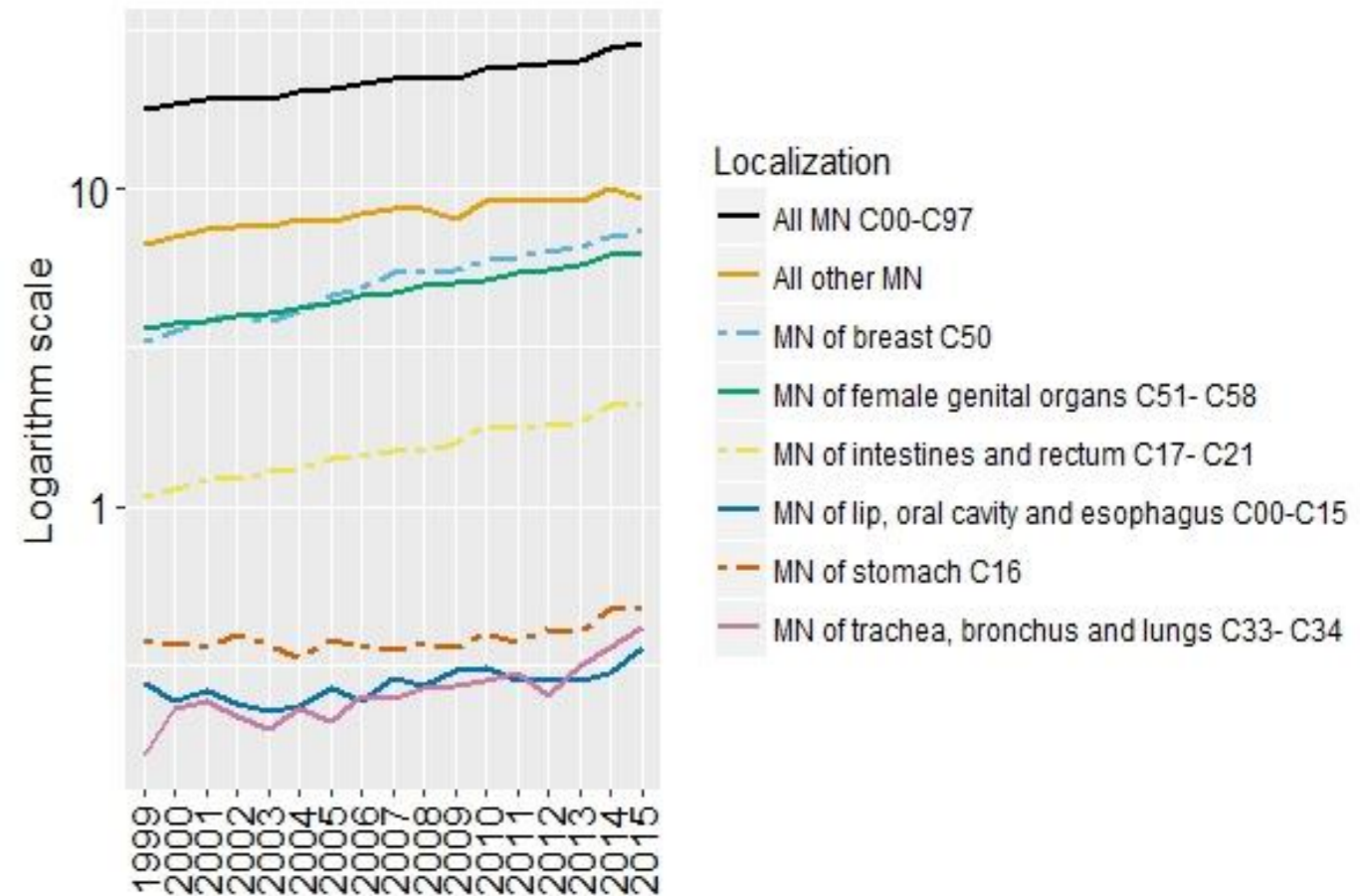
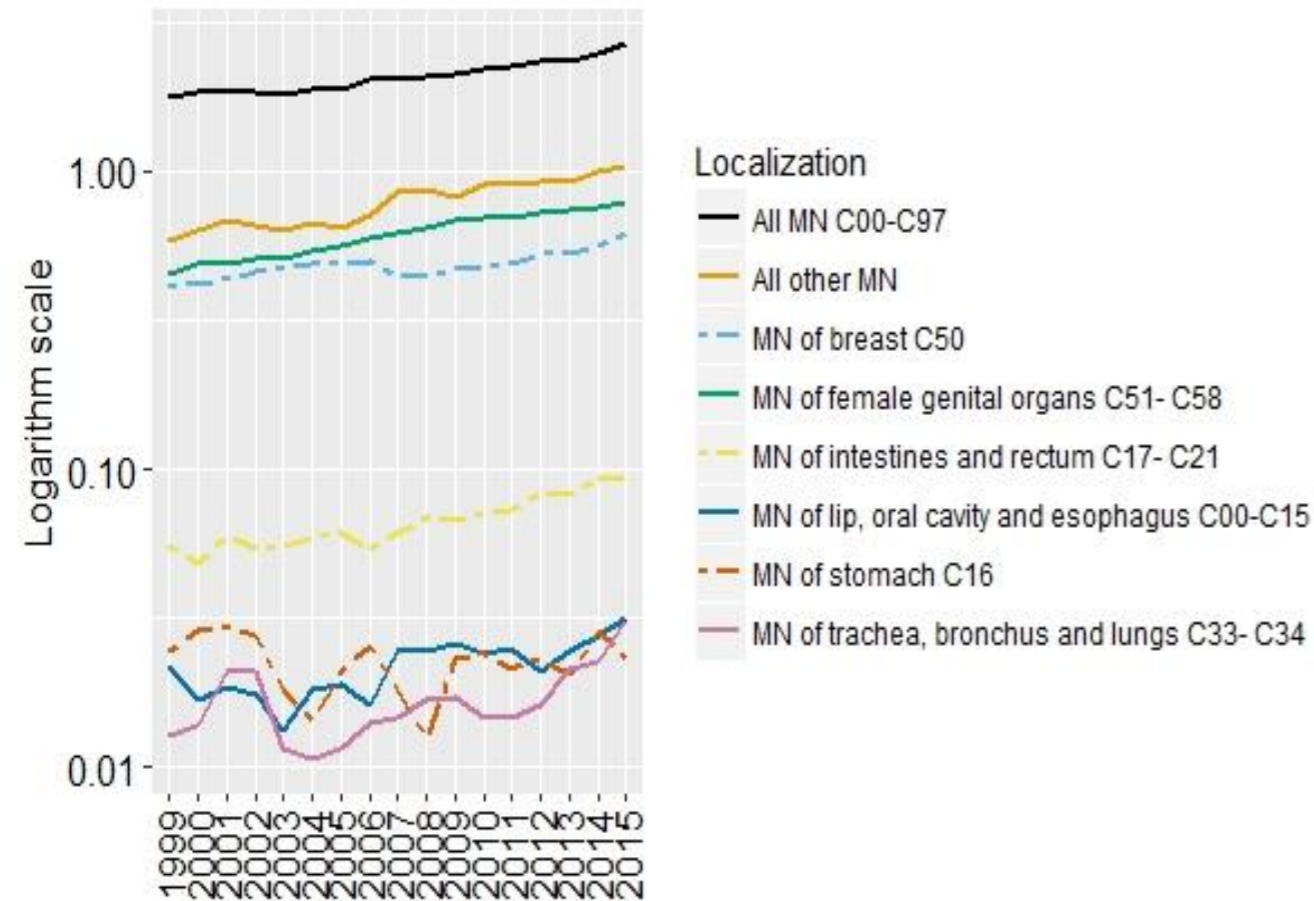
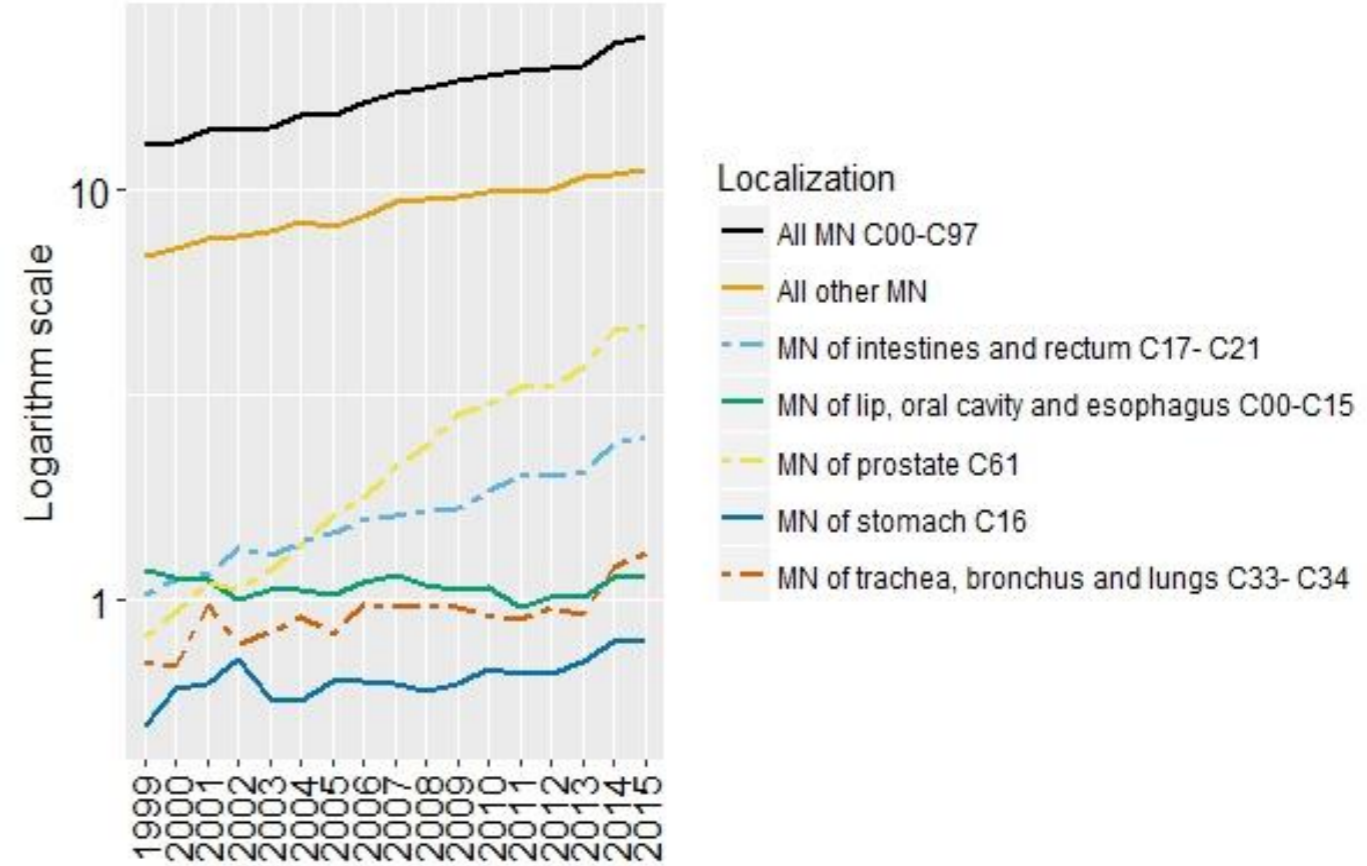
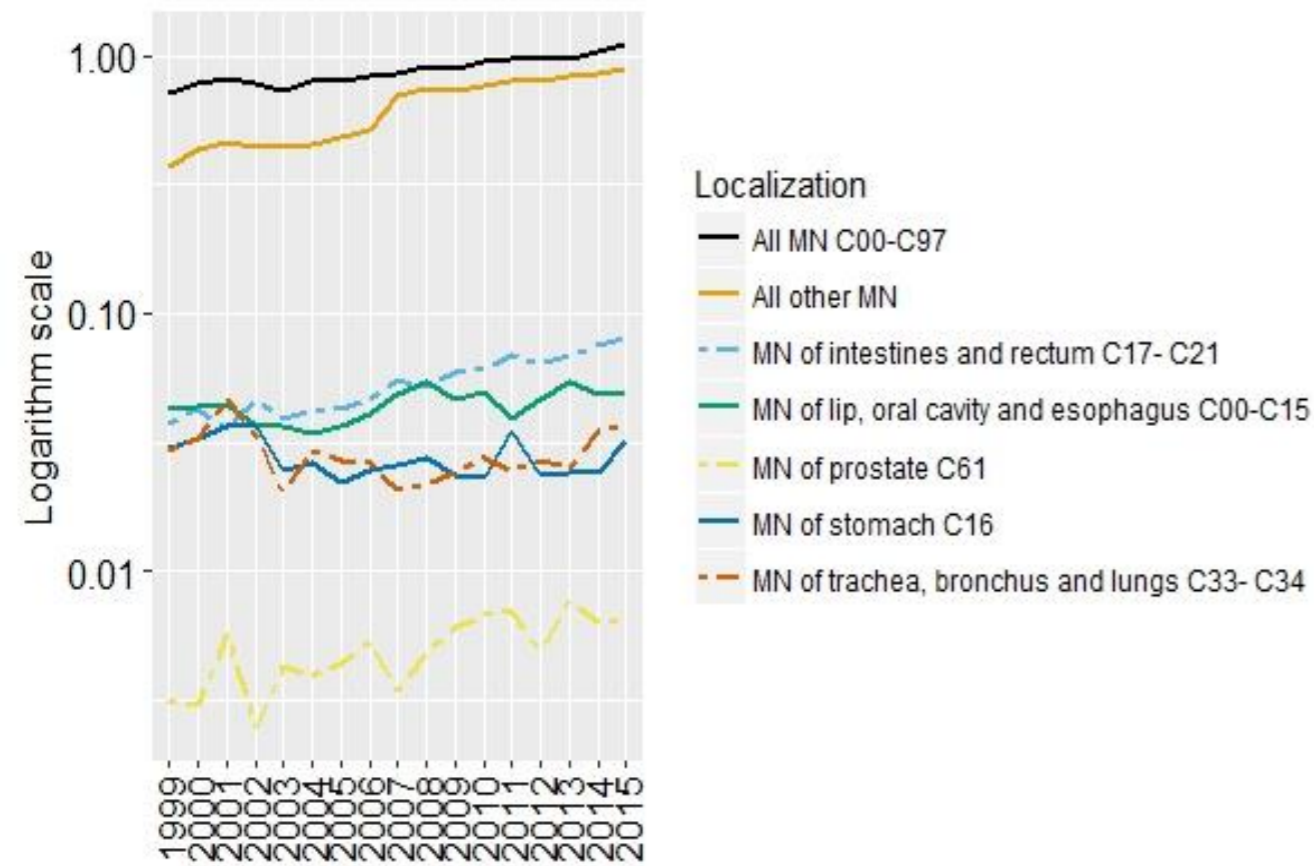
Multidecrement life table results, males and females

increase in LE age 20 due to elimination of cancer Females									Expectation of life those ill with cancer Females								
Year	C00-C15	C00-C97	C16	C17-C21	C33-C34	C50	C51-C58	other	Year	C00-C15	C00-C97	C16	C17-C21	C33-C34	C50	C51-C58	other
1999	0,04	1,99	0,25	0,25	0,11	0,36	0,34	0,56	1999	5,88	8,88	1,95	4,51	1,95	10,35	10,92	9,28
2000	0,04	1,94	0,24	0,24	0,11	0,35	0,34	0,54	2000	5,47	9,06	2,01	4,63	2,50	10,66	11,13	9,63
2001	0,04	1,91	0,23	0,24	0,11	0,34	0,33	0,53	2001	5,81	9,31	2,05	4,99	2,74	11,04	11,33	9,94
2002	0,04	1,83	0,21	0,23	0,10	0,34	0,33	0,51	2002	5,52	9,35	2,27	4,99	2,54	11,21	11,48	9,90
2003	0,04	1,83	0,20	0,23	0,10	0,34	0,32	0,51	2003	5,31	9,31	2,12	5,06	2,39	10,88	11,60	9,84
2004	0,04	1,89	0,21	0,24	0,11	0,35	0,33	0,53	2004	5,62	9,59	2,01	5,22	2,59	11,22	12,09	10,05
2005	0,04	1,87	0,20	0,24	0,10	0,35	0,33	0,53	2005	6,37	9,73	2,38	5,43	2,47	11,77	12,45	9,96
2006	0,04	1,93	0,20	0,25	0,11	0,35	0,35	0,55	2006	5,97	10,14	2,34	5,56	2,99	12,18	12,82	10,37
2007	0,04	2,00	0,21	0,26	0,11	0,37	0,36	0,56	2007	6,95	10,31	2,30	5,75	2,89	12,34	13,11	10,82
2008	0,04	2,03	0,20	0,27	0,12	0,37	0,36	0,58	2008	6,93	10,40	2,40	5,67	3,06	12,40	13,48	10,79
2009	0,04	2,10	0,20	0,28	0,12	0,38	0,37	0,61	2009	6,76	10,42	2,51	5,92	3,09	12,55	13,75	10,52
2010	0,04	2,08	0,20	0,27	0,12	0,38	0,38	0,60	2010	7,02	10,68	2,81	6,01	3,22	12,84	13,76	10,80
2011	0,05	2,18	0,20	0,29	0,13	0,39	0,39	0,63	2011	6,79	11,01	2,82	6,58	3,40	13,20	14,04	11,02
2012	0,05	2,19	0,19	0,30	0,13	0,38	0,40	0,64	2012	6,95	11,23	3,20	6,68	3,05	13,63	14,20	11,10
2013	0,05	2,22	0,19	0,30	0,13	0,38	0,41	0,65	2013	7,19	11,40	3,24	6,83	3,64	13,90	14,49	11,11
2014	0,05	2,20	0,19	0,29	0,13	0,38	0,40	0,65	2014	7,31	11,84	3,81	7,37	3,99	14,30	14,88	11,48
2015	0,05	2,23	0,18	0,30	0,14	0,38	0,41	0,81	2015	8,02	11,90	3,78	7,26	4,48	14,47	14,87	10,44
increase in LE age 20 due to elimination of cancer Males									Expectation of life those ill with cancer Males								
Year	C00-C15	C00-C97	C16	C17-C21	C33-C34	C61	other	Year	C00-C15	C00-C97	C16	C17-C21	C33-C34	C61	other		
1999	0,15	1,96	0,28	0,15	0,55	0,05	0,63	1999	3,75	3,41	1,09	2,91	0,78	3,66	4,85		
2000	0,14	1,81	0,25	0,14	0,50	0,05	0,59	2000	3,63	3,57	1,33	3,11	0,76	3,85	5,03		
2001	0,13	1,72	0,24	0,14	0,47	0,05	0,57	2001	3,68	3,82	1,44	3,17	1,11	4,28	5,28		
2002	0,13	1,62	0,22	0,13	0,44	0,05	0,54	2002	3,34	3,79	1,63	3,47	0,92	3,95	5,24		
2003	0,12	1,56	0,21	0,13	0,41	0,05	0,53	2003	3,52	3,84	1,34	3,31	0,97	4,27	5,34		
2004	0,12	1,61	0,21	0,14	0,42	0,06	0,54	2004	3,59	4,07	1,36	3,47	1,09	4,56	5,53		
2005	0,12	1,58	0,20	0,14	0,41	0,06	0,53	2005	3,65	4,13	1,53	3,60	1,00	4,80	5,58		
2006	0,13	1,74	0,22	0,16	0,45	0,07	0,58	2006	4,02	4,45	1,63	3,92	1,22	5,10	5,89		
2007	0,14	1,86	0,23	0,17	0,48	0,08	0,62	2007	4,36	4,68	1,65	4,00	1,22	5,59	6,50		
2008	0,14	1,87	0,22	0,17	0,48	0,08	0,63	2008	4,15	4,81	1,65	4,03	1,26	5,86	6,61		
2009	0,15	2,00	0,23	0,19	0,50	0,09	0,67	2009	4,01	4,93	1,71	4,11	1,30	6,30	6,62		
2010	0,15	1,99	0,22	0,19	0,50	0,09	0,67	2010	4,12	5,10	1,94	4,45	1,25	6,32	6,82		
2011	0,17	2,16	0,24	0,21	0,53	0,11	0,73	2011	3,80	5,31	2,05	4,74	1,28	6,78	6,93		
2012	0,17	2,19	0,23	0,22	0,54	0,12	0,74	2012	4,16	5,51	2,07	4,82	1,43	6,86	7,13		
2013	0,18	2,27	0,24	0,23	0,55	0,13	0,76	2013	4,24	5,69	2,29	4,90	1,40	7,22	7,45		
2014	0,18	2,24	0,23	0,22	0,54	0,13	0,75	2014	4,55	6,16	2,54	5,46	1,83	7,72	7,58		
2015	0,19	2,30	0,23	0,23	0,55	0,13	0,78	2015	4,51	6,23	2,63	5,52	1,91	7,74	7,60		

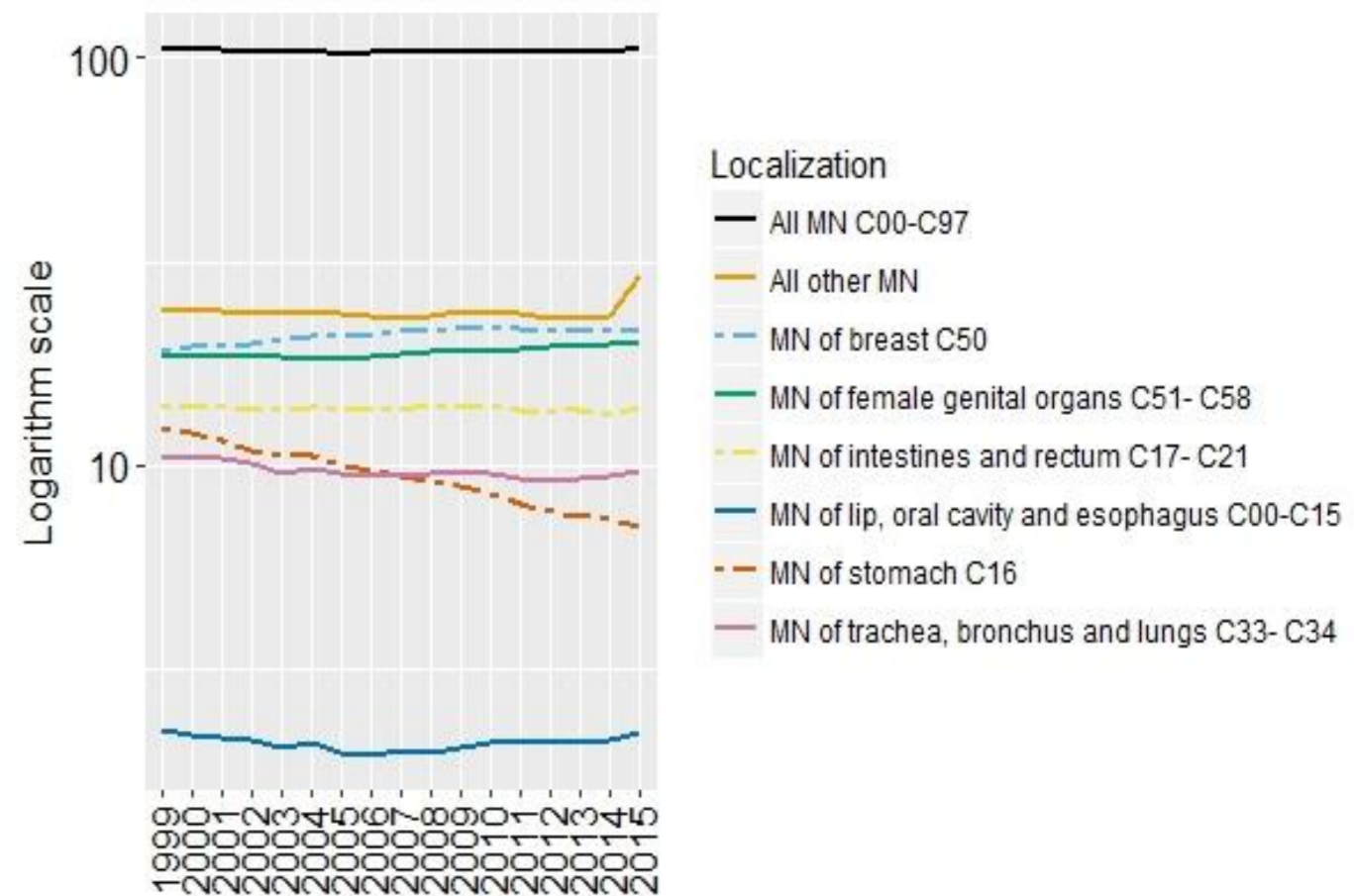
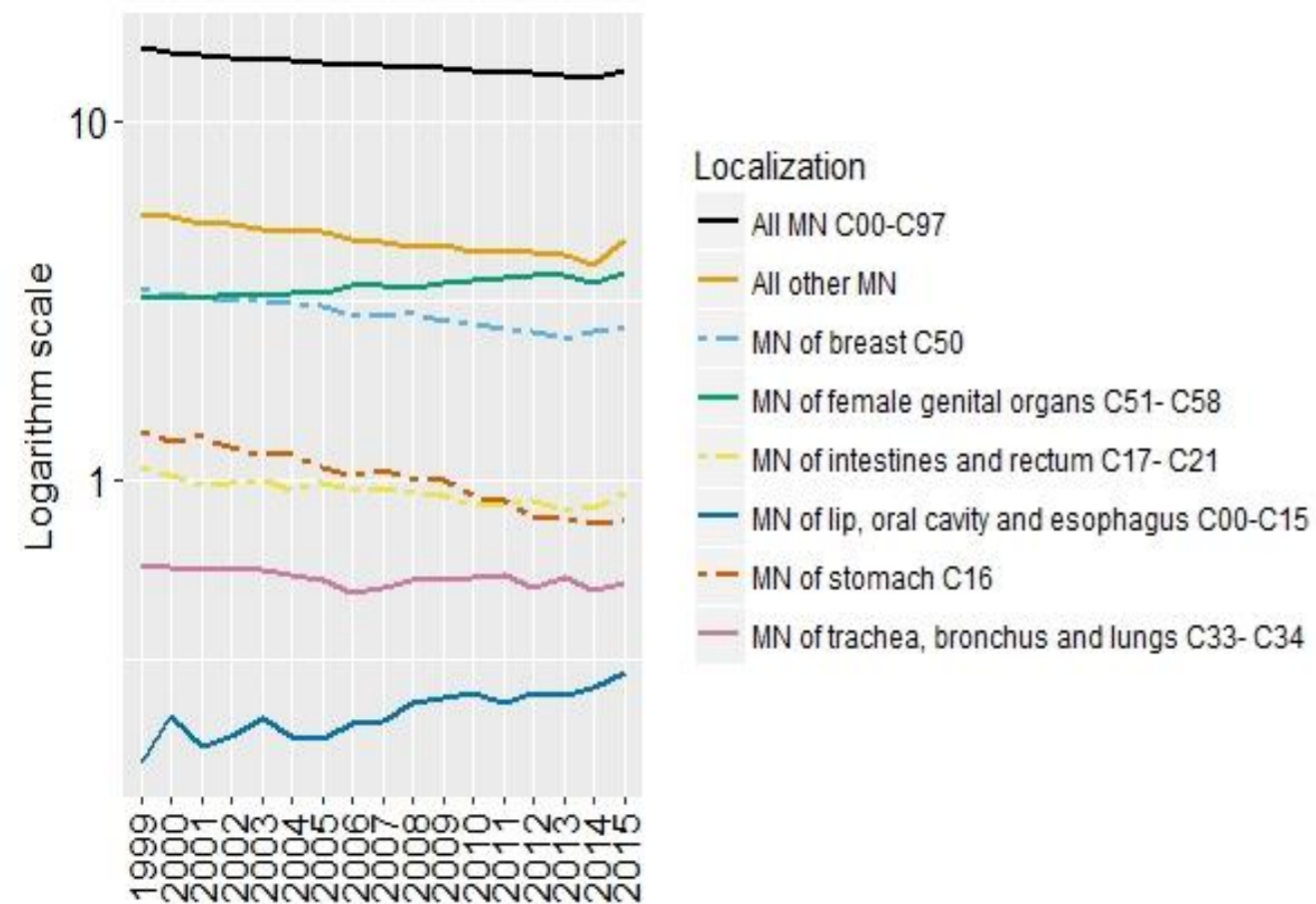
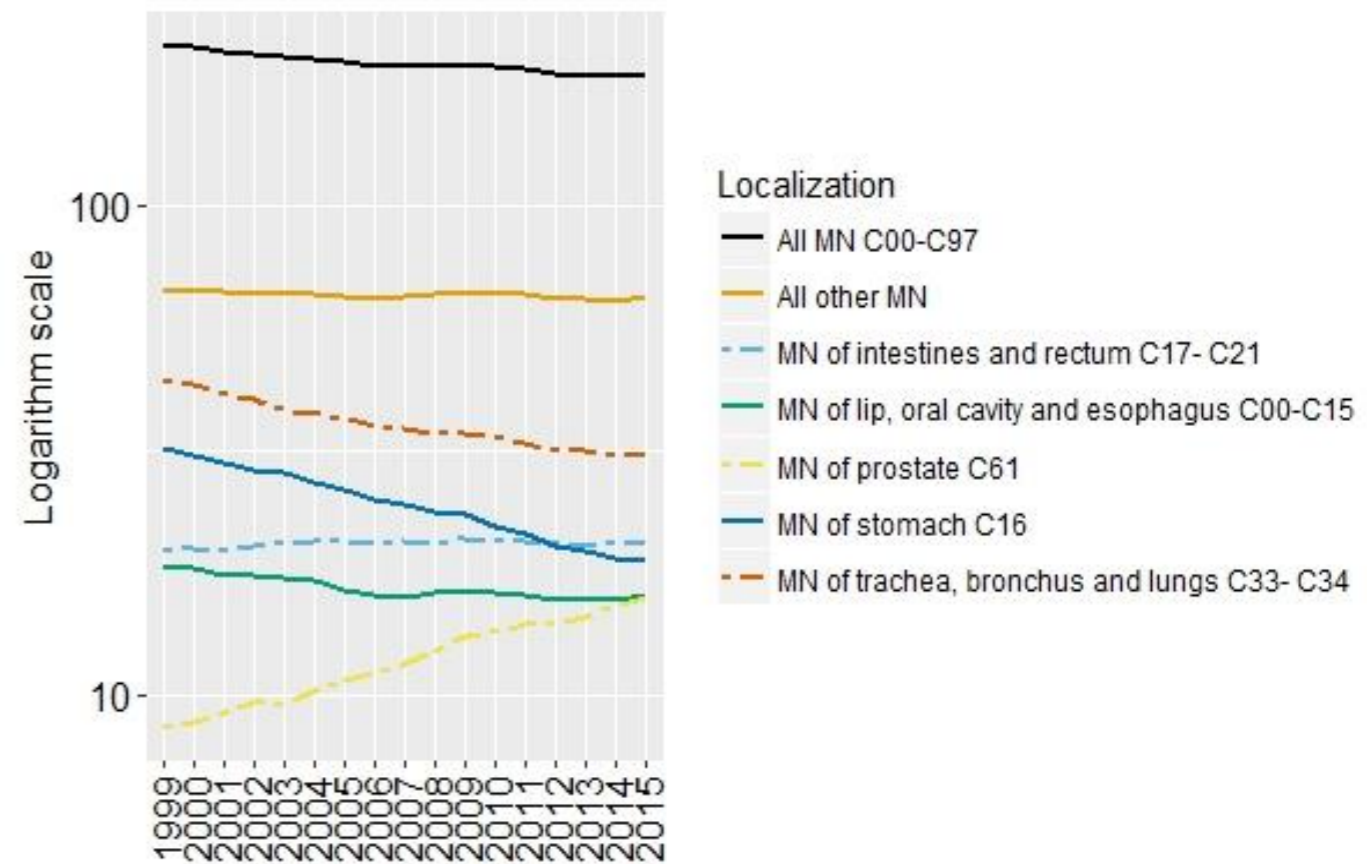
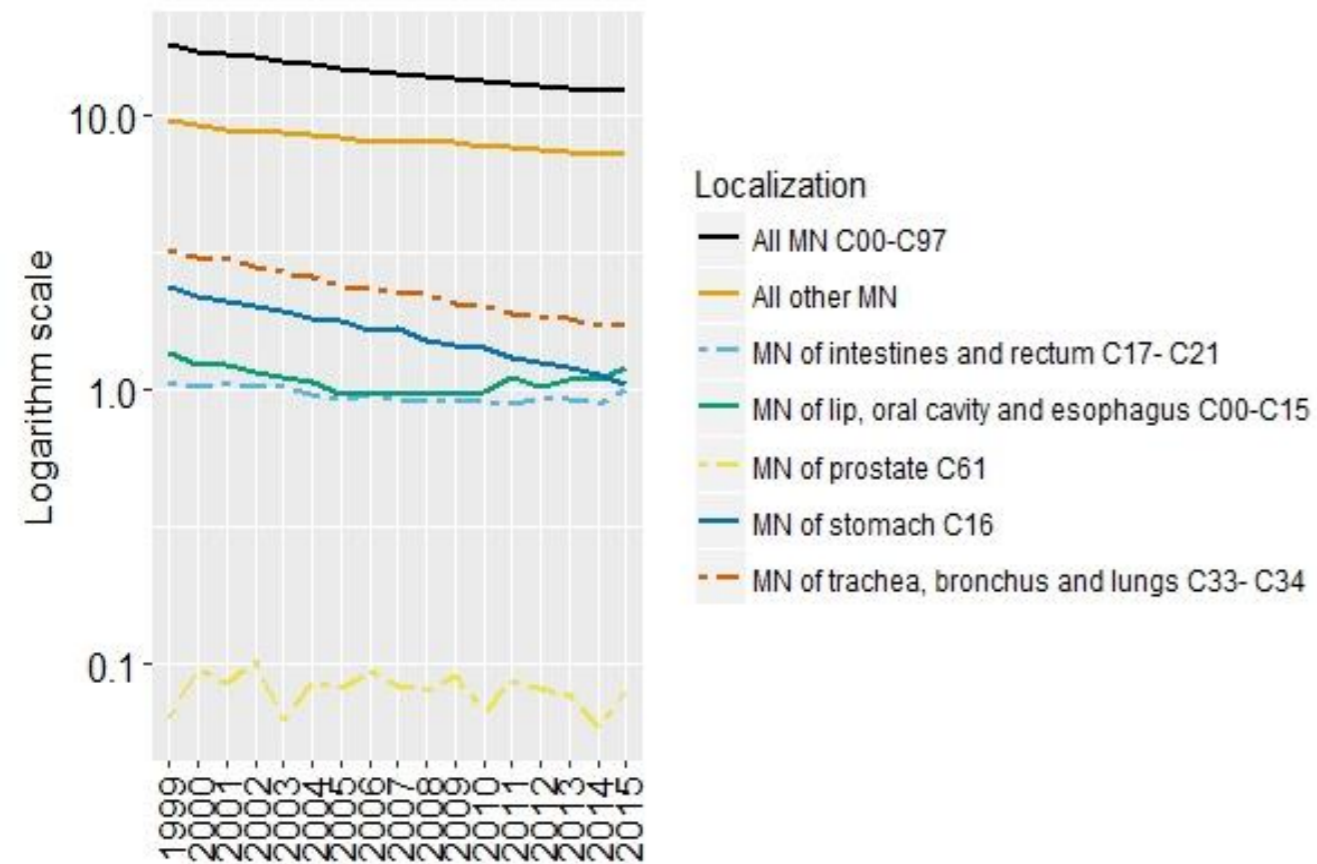
Age standardized YLL, Males, Females: 0-49 | 50 – 85+



Age standardized YLD, Males, Females: 15-49 | 50 – 85+



Age standardized DALY, Males, Females: 15-49 | 50 – 85+





Limitations of the study:

- Due to the absence of microdata disability weights were distributed somewhat inappropriately. It was assumed that all the cases of registered cancer should be assigned the disability weight of primary therapy 0.288.
- Limitations to the calculation of duration of disease indicator due to the absence of data.
- Limited number of diagnostic categories.



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