

Age-Period-Cohort Robust Bayesian Models for Projecting Cancer Incidence and Mortality in Puerto Rico

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Cancer Registry of Puerto Rico CCCUPR and Center for Biostatistics
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Abstract

Race is not available in Puerto Rican data so the Worksheet for Completeness of Case Ascertainment can not estimate completeness. Cancer data is subject to unavoidable delays. Projections of cancer incidence and mortality provide a valuable indication of the current and future burden. They better inform planning and decision making, and assist in the efficient allocation of resources to meet the future needs for the prevention, detection, and treatment of cancer. **Objective:** To estimate the present and predict the future (2014) of incidence and mortality for top cancer in Puerto Rico (*PR*), by gender, age group and primary cancer site to design public policy; and to give an indication of the degree of cancer registry completeness. **Methods:** Incidence and mortality data from Puerto Rico Central Cancer Registry, were obtained for the years 1985 to 2004. A robust Age-period-cohort (*APC*) model with autoregressive errors were fitted using Bayesian methods.

Abstract

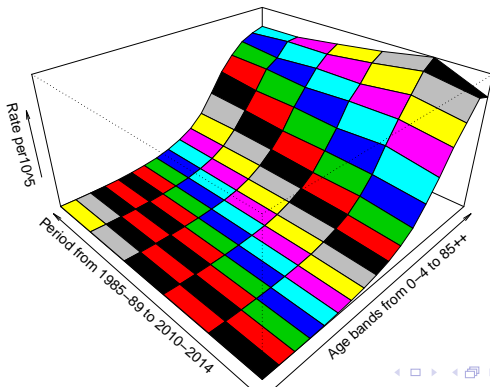
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Introduction

APC: Age-Period-Cohort model: three different factors, three different **time** frames:

- 1 **Age**: age band at diagnosis or death.
- 2 **Period**: calendar year at diagnosis or death. Factor that affects all in a given period: like Technological Advances.
- 3 **Cohort**: year of birth. The Generation Effect: like Smoking or Diet Habits etc.

Historic rates and predictions for all cancer cases



Aggregated Data Provided by Cancer Registry CCCUPR

We have 20 single years of Incidence and Mortality data. Verificar.
There are two long term five years prediction points 2009 to 2014
(10 years of prediction).

| | | |
|-------|---|--|
| Years | Incidence 1985 – 2004 | Mortality 1980-2004 |
| Types | All cases ★ including Lung, Colon, Breast and Breast Malignant etc. | All cases ★ including Lung, Colon, Breast. |

★ Cancer cases excluding basal and squamous cell skin cancers and in situ carcinomas except urinary bladder.

Incidence and mortality data are from May, 2011.

- The following figures presents incidence cancer historical values 1985 – 1989, 1990 – 1994, 1995 – 1999 and 2000 – 2004 and posterior median estimators for 2005 – 2009 and 2010 – 2014 with 60% probability intervals around the median. For this, population estimators of Puerto Rico from 1985 to 2014 were taken from Junta de Planificación. Each one of the graphs presents the historical data and the estimated quinquennial periods starting in 2005 and 2010 respectively.
- For mortality, there is 5 historical population quinquennial periods 1980 – 1985, 1985 – 1989, 1990 – 1994, 1995 – 1999 and 2000 – 2004 provided by the Cancer Registry of Puerto Rico and posterior median predictors for 2005 – 2009 and 2010 – 2014. Population quinquennial estimators for 2005 – 2009 and 2010 – 2014 were obtained in Junta de Planificación of Puerto Rico.

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- For mortality, there is 5 historical population quinquennial periods 1980 – 1985, 1985 – 1989, 1990 – 1994, 1995 – 1999 and 2000 – 2004 provided by the Cancer Registry of Puerto Rico and posterior median predictors for 2005 – 2009 and 2010 – 2014. Population quinquennial estimators for 2005 – 2009 and 2010 – 2014 were obtained in Junta de Planificación of Puerto Rico.

Hierarchical APC model implementation I

The model can be stated as Poisson likelihood :

$$y_{a,t} \sim \text{Pois}(\mu_{a,t})$$

$$\log \mu_{a,t} = \lambda_0 + \varphi_a + \theta_t + \alpha_c$$

where $y_{a,t}$ is the occurrence in each age band (a) and period (t). Here we use autoregressive priors on the parameters, as an example we present those for θ . RW2: **Linear Time Trend**: **The one used in our calculations.**

$$\theta_t | \theta_{t-1}, \theta_{t-2} \sim N(2\theta_{t-1} - \theta_{t-2}, \tau)$$

Note that τ is precision, reciprocal of Variance and that RW2 has a local time linear trend ie. $\theta_t - \theta_{t-1} = \theta_{t-1} - \theta_{t-2} + \epsilon$ In order to

Hierarchical APC model implementation II

be more **robust** we improve this model using the following novel assumption:

$$\tau = \frac{\sigma_0^2}{\sigma^2} \sim \beta_2(p, q, \sigma_0)$$

where $\beta_2(p, q, \sigma_0)$ is the scale Beta probability distribution of the second kind.

Model checking via cross validation of a model.

Since the APC model is used here as a predictor tool a fair cross validation is needed in order to have some sense in the models predicted ability.

Cross-validation method for evaluating a model

- (1) remove part of the data,
- (2) fit the model with remaining data set excluding the removed part,
- (3) use the fitted model to predict the removed part,
- (4) summarizing the prediction error by comparing to the actual left-out data.

Leave the last one out. **Not using the data twice.**

We removed the data of the period 2000 – 2004 from the data and fitted the model to compare how close the estimator is to the historical value. The calculation using the full APC model using the **All cancer type** data set is presented here.

We got an estimated **age standardized expectation rate per 100,000 persons** of 269.15 with probability intervals given in the following table.

| Historic | 2.5% | 25% | 50% | 75% | 97.5% |
|-----------------|--------|---------------|---------------|---------------|--------|
| 272.4615 | 159.77 | 238.10 | 269.15 | 303.60 | 452.93 |

The age standardized expectation rate is calculated using 2000 Puerto Rico population rates per 100,000 persons. The median value is really close to the historical value. Doing the same process with all the specific age values provide us with a fair prediction assessment on each of the bands age as presented in the next table.

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Cross validation for period 2000–2004 across age bands for all cases type both.

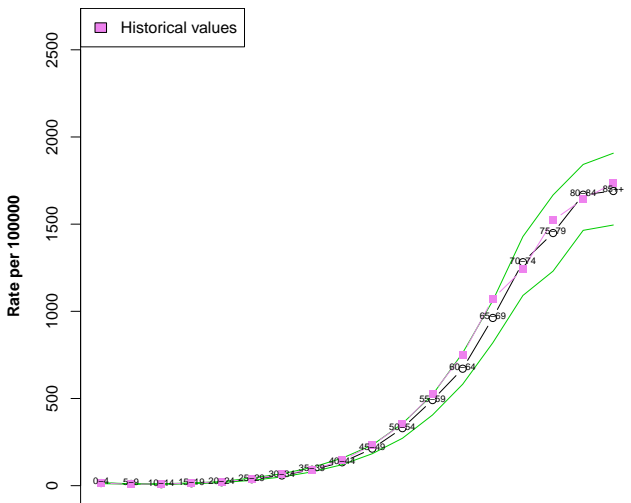


Table: Incidence All Sites

| | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}$ | $\% \delta_{04-14}$ |
|--------------|---------|---------|---------|---------|---------|---------|---------------------|---------------------|
| 0-4 | 15.64 | 14.65 | 16.03 | 14.57 | 13.90 | 13.02 | -4.60 | -10.64 |
| 5-9 | 10.25 | 10.52 | 9.09 | 8.31 | 9.06 | 8.49 | 8.99 | 2.19 |
| 10-14 | 9.20 | 8.39 | 11.32 | 10.28 | 9.06 | 8.63 | -11.89 | -16.06 |
| 15-19 | 12.64 | 14.66 | 16.04 | 13.66 | 13.29 | 12.68 | -2.68 | -7.15 |
| 20-24 | 19.87 | 19.10 | 22.56 | 23.66 | 21.92 | 20.33 | -7.37 | -14.09 |
| 25-29 | 31.49 | 38.39 | 40.77 | 36.24 | 39.05 | 37.82 | 7.73 | 4.35 |
| 30-34 | 47.87 | 57.46 | 62.22 | 65.23 | 62.91 | 63.22 | -3.54 | -3.07 |
| 35-39 | 81.22 | 88.79 | 89.61 | 90.84 | 96.62 | 96.76 | 6.36 | 6.52 |
| 40-44 | 131.63 | 139.86 | 141.65 | 145.22 | 152.25 | 156.45 | 4.84 | 7.73 |
| 45-49 | 185.07 | 208.31 | 227.00 | 232.64 | 230.60 | 239.90 | -0.88 | 3.12 |
| 50-54 | 285.26 | 307.94 | 334.41 | 354.95 | 352.90 | 355.35 | -0.58 | 0.11 |
| 55-59 | 428.39 | 477.60 | 475.73 | 526.40 | 543.90 | 544.70 | 3.32 | 3.48 |
| 60-64 | 665.89 | 702.04 | 720.03 | 752.48 | 794.55 | 827.30 | 5.59 | 9.94 |
| 65-69 | 865.44 | 1044.26 | 1019.40 | 1075.44 | 1055.00 | 1122.00 | -1.90 | 4.33 |
| 70-74 | 1239.38 | 1421.68 | 1327.68 | 1240.59 | 1345.00 | 1357.00 | 8.42 | 9.38 |
| 75-79 | 1455.27 | 1636.06 | 1516.73 | 1524.35 | 1466.00 | 1527.00 | -3.83 | 0.17 |
| 80-84 | 1713.96 | 1916.52 | 1779.80 | 1640.55 | 1670.00 | 1610.50 | 1.80 | -1.83 |
| 85++ | 1761.63 | 1990.85 | 1855.16 | 1732.14 | 1678.00 | 1676.00 | -3.13 | -3.24 |
| λ_t | 246.18 | 276.21 | 271.18 | 272.69 | 276.20 | 280.50 | 1.29 | 2.86 |

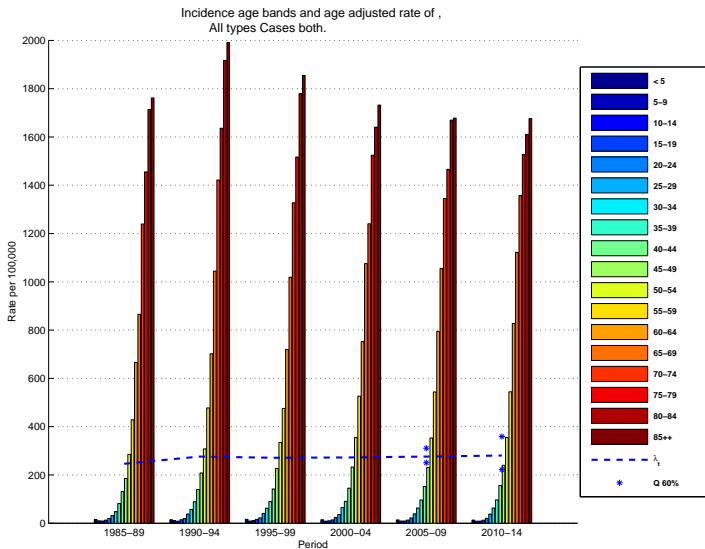


Table: Incidence All Female

| | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}$ | $\% \delta_{04-14}$ |
|-------------|---------|---------|---------|---------|---------|---------|---------------------|---------------------|
| 0-4 | 15.13 | 14.66 | 14.06 | 12.59 | 12.30 | 11.81 | -2.30 | -6.19 |
| 5-9 | 9.94 | 9.50 | 7.04 | 8.73 | 8.49 | 8.09 | -2.75 | -7.31 |
| 10-14 | 9.49 | 7.13 | 9.47 | 10.58 | 8.78 | 8.40 | -16.96 | -20.59 |
| 15-19 | 12.15 | 13.55 | 17.07 | 12.35 | 13.45 | 13.04 | 8.91 | 5.59 |
| 20-24 | 21.20 | 20.08 | 24.65 | 26.11 | 24.20 | 23.50 | -7.31 | -9.99 |
| 25-29 | 35.68 | 39.09 | 43.56 | 41.81 | 45.37 | 44.92 | 8.51 | 7.44 |
| 30-34 | 57.00 | 65.96 | 75.29 | 86.83 | 84.46 | 85.95 | -2.73 | -1.01 |
| 35-39 | 100.91 | 106.94 | 119.41 | 122.65 | 136.00 | 142.40 | 10.89 | 16.11 |
| 40-44 | 164.08 | 174.12 | 173.64 | 188.64 | 205.90 | 223.15 | 9.15 | 18.29 |
| 45-49 | 215.46 | 230.66 | 260.29 | 263.62 | 278.60 | 302.60 | 5.68 | 14.79 |
| 50-54 | 295.12 | 310.05 | 342.01 | 352.79 | 363.90 | 391.20 | 3.15 | 10.89 |
| 55-59 | 385.08 | 393.94 | 420.76 | 460.47 | 474.65 | 488.50 | 3.08 | 6.09 |
| 60-64 | 558.45 | 529.93 | 561.09 | 559.75 | 615.60 | 648.05 | 9.98 | 15.77 |
| 65-69 | 642.42 | 681.61 | 717.49 | 739.15 | 732.30 | 789.15 | -0.93 | 6.76 |
| 70-74 | 906.85 | 883.94 | 859.21 | 833.86 | 886.40 | 909.70 | 6.30 | 9.10 |
| 75-79 | 1050.45 | 1007.12 | 1001.66 | 1045.61 | 1000.00 | 1027.00 | -4.36 | -1.78 |
| 80-84 | 1203.23 | 1159.27 | 1185.56 | 1152.34 | 1136.00 | 1123.00 | -1.42 | -2.55 |
| 85++ | 1196.79 | 1307.40 | 1343.49 | 1210.82 | 1206.00 | 1207.00 | -0.40 | -0.32 |
| λ_t | 206.18 | 209.52 | 219.57 | 222.94 | 229.90 | 239.35 | 3.12 | 7.36 |

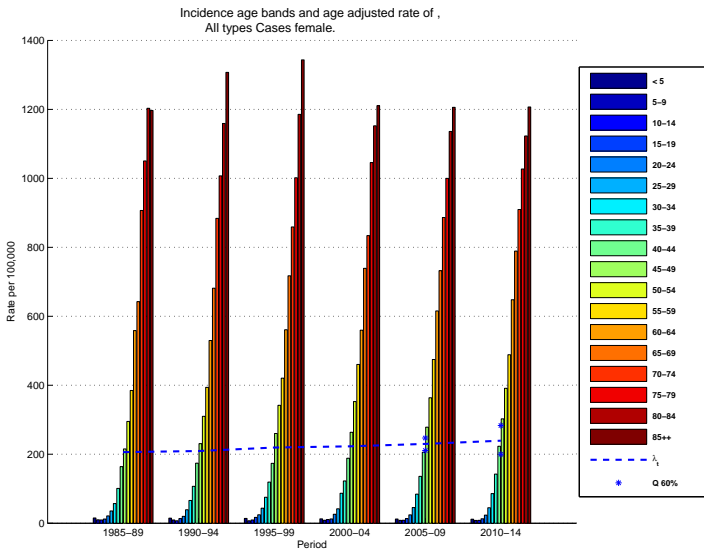


Table: Incidence All Male

| | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}$ | $\% \delta_{04-14}$ |
|-------------|---------|---------|---------|---------|---------|---------|---------------------|---------------------|
| 0-4 | 16.13 | 14.64 | 17.92 | 16.46 | 15.43 | 14.90 | -6.28 | -9.49 |
| 5-9 | 10.55 | 11.50 | 11.05 | 7.92 | 10.15 | 9.89 | 28.16 | 24.84 |
| 10-14 | 8.93 | 9.60 | 13.10 | 10.00 | 9.73 | 9.67 | -2.70 | -3.30 |
| 15-19 | 13.12 | 15.73 | 15.04 | 14.92 | 13.54 | 12.88 | -9.26 | -13.68 |
| 20-24 | 18.47 | 18.08 | 20.42 | 21.20 | 19.56 | 18.18 | -7.73 | -14.24 |
| 25-29 | 26.86 | 37.63 | 37.82 | 30.45 | 31.89 | 30.99 | 4.74 | 1.78 |
| 30-34 | 37.52 | 47.92 | 47.89 | 42.12 | 42.02 | 41.26 | -0.23 | -2.03 |
| 35-39 | 58.82 | 68.12 | 55.88 | 55.42 | 56.76 | 54.62 | 2.41 | -1.45 |
| 40-44 | 94.68 | 100.55 | 104.75 | 95.35 | 95.71 | 92.89 | 0.38 | -2.58 |
| 45-49 | 150.96 | 183.02 | 188.63 | 196.57 | 179.10 | 175.00 | -8.89 | -10.97 |
| 50-54 | 274.13 | 305.54 | 325.62 | 357.48 | 346.10 | 321.45 | -3.18 | -10.08 |
| 55-59 | 477.38 | 573.84 | 539.59 | 603.82 | 628.60 | 618.90 | 4.10 | 2.50 |
| 60-64 | 787.79 | 901.38 | 904.48 | 978.15 | 1008.50 | 1041.00 | 3.10 | 6.43 |
| 65-69 | 1116.92 | 1466.55 | 1378.38 | 1477.78 | 1468.00 | 1544.50 | -0.66 | 4.51 |
| 70-74 | 1613.79 | 2051.94 | 1899.74 | 1749.75 | 1927.00 | 1947.00 | 10.13 | 11.27 |
| 75-79 | 1915.40 | 2383.07 | 2168.78 | 2159.67 | 2100.00 | 2214.00 | -2.76 | 2.52 |
| 80-84 | 2335.74 | 2870.74 | 2564.85 | 2317.05 | 2438.00 | 2342.50 | 5.22 | 1.10 |
| 85++ | 2549.96 | 2959.84 | 2608.61 | 2534.57 | 2452.00 | 2437.00 | -3.26 | -3.85 |
| λ_t | 293.91 | 357.49 | 336.81 | 338.08 | 343.00 | 346.05 | 1.46 | 2.36 |

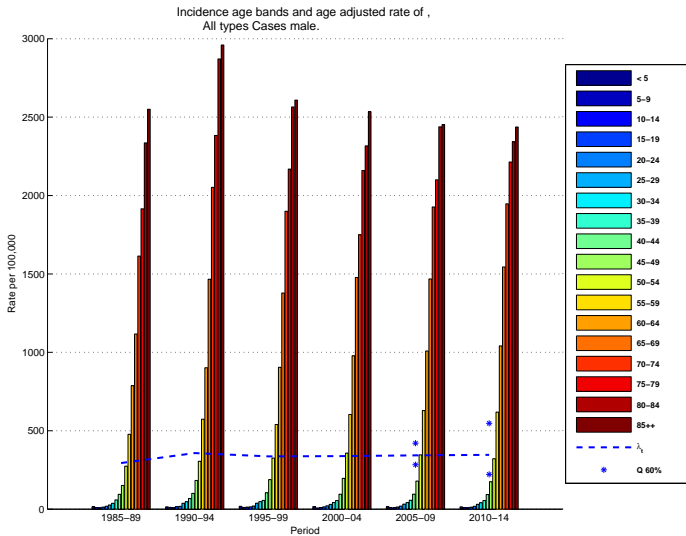


Table: Incidence Colon cancer

| | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}$ | $\% \delta_{04-14}$ |
|--------------|--------|--------|--------|--------|--------|--------|---------------------|---------------------|
| 0-4 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 5-9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 10-14 | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 | 0.00 | * | * |
| 15-19 | 0.12 | 0.25 | 0.13 | 0.39 | 0.13 | 0.07 | -66.10 | -82.32 |
| 20-24 | 0.71 | 0.28 | 0.54 | 0.74 | 0.40 | 0.34 | -45.12 | -53.92 |
| 25-29 | 2.00 | 1.48 | 1.33 | 1.51 | 1.10 | 0.91 | -27.11 | -39.82 |
| 30-34 | 3.81 | 3.67 | 3.69 | 3.34 | 2.63 | 2.22 | -21.13 | -33.58 |
| 35-39 | 6.25 | 5.69 | 7.10 | 6.12 | 5.74 | 5.08 | -6.28 | -17.00 |
| 40-44 | 11.77 | 12.72 | 13.97 | 13.03 | 12.69 | 11.36 | -2.63 | -12.84 |
| 45-49 | 18.00 | 20.00 | 21.59 | 27.20 | 25.97 | 24.37 | -4.52 | -10.40 |
| 50-54 | 32.76 | 35.62 | 40.44 | 47.73 | 50.66 | 50.88 | 6.13 | 6.59 |
| 55-59 | 54.59 | 56.24 | 61.69 | 72.63 | 82.36 | 90.15 | 13.40 | 24.13 |
| 60-64 | 85.19 | 86.86 | 96.67 | 102.95 | 120.00 | 136.50 | 16.56 | 32.59 |
| 65-69 | 104.10 | 124.00 | 128.66 | 150.02 | 157.35 | 180.30 | 4.89 | 20.19 |
| 70-74 | 147.38 | 160.46 | 175.28 | 179.00 | 206.50 | 224.10 | 15.36 | 25.20 |
| 75-79 | 177.71 | 188.36 | 207.17 | 231.32 | 245.50 | 273.70 | 6.13 | 18.32 |
| 80-84 | 185.13 | 212.38 | 244.13 | 253.66 | 285.00 | 301.80 | 12.35 | 18.98 |
| 85++ | 199.11 | 224.83 | 239.11 | 260.73 | 296.20 | 334.15 | 13.60 | 28.16 |
| λ_t | 27.82 | 30.23 | 33.10 | 36.38 | 39.70 | 43.09 | 9.15 | 18.45 |

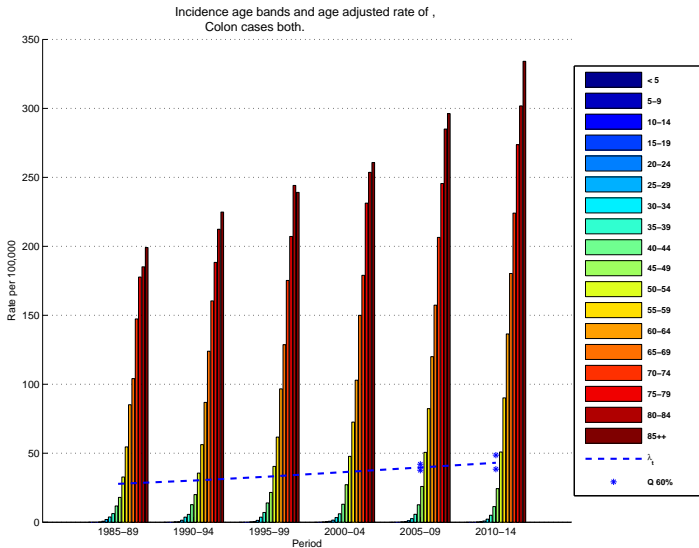


Table: Incidence Colon Female cancer

| | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}^{\delta}$ | $\% \delta_{04-14}^{\delta}$ |
|--------------|--------|--------|--------|--------|--------|--------|------------------------------|------------------------------|
| 0-4 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 5-9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 10-14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 15-19 | 0.12 | 0.38 | 0.13 | 0.27 | 0.14 | 0.14 | -48.87 | -46.65 |
| 20-24 | 0.69 | 0.41 | 0.53 | 0.80 | 0.41 | 0.27 | -48.96 | -65.60 |
| 25-29 | 1.90 | 1.42 | 1.15 | 1.55 | 1.10 | 0.84 | -29.40 | -45.96 |
| 30-34 | 4.27 | 4.44 | 3.97 | 4.55 | 2.84 | 2.40 | -37.67 | -47.33 |
| 35-39 | 7.05 | 6.51 | 7.78 | 5.74 | 6.37 | 5.48 | 11.00 | -4.56 |
| 40-44 | 9.78 | 12.15 | 14.73 | 14.66 | 13.05 | 11.89 | -10.96 | -18.87 |
| 45-49 | 16.70 | 18.09 | 18.72 | 25.05 | 25.52 | 23.71 | 1.88 | -5.34 |
| 50-54 | 31.77 | 32.59 | 36.79 | 42.72 | 47.24 | 48.73 | 10.57 | 14.06 |
| 55-59 | 47.36 | 42.25 | 50.88 | 62.58 | 69.02 | 79.14 | 10.29 | 26.46 |
| 60-64 | 72.22 | 68.08 | 75.43 | 77.13 | 94.28 | 109.70 | 22.23 | 42.22 |
| 65-69 | 78.85 | 92.07 | 102.29 | 123.23 | 122.80 | 143.70 | -0.35 | 16.61 |
| 70-74 | 129.95 | 137.25 | 134.47 | 140.09 | 165.60 | 180.00 | 18.21 | 28.49 |
| 75-79 | 159.61 | 171.40 | 179.71 | 188.88 | 205.85 | 232.15 | 8.98 | 22.91 |
| 80-84 | 162.96 | 195.41 | 222.25 | 225.48 | 239.50 | 260.15 | 6.22 | 15.37 |
| 85++ | 205.07 | 203.20 | 212.46 | 231.60 | 261.00 | 281.90 | 12.69 | 21.72 |
| λ_t | 24.72 | 25.88 | 28.06 | 30.79 | 33.46 | 36.83 | 8.66 | 19.59 |

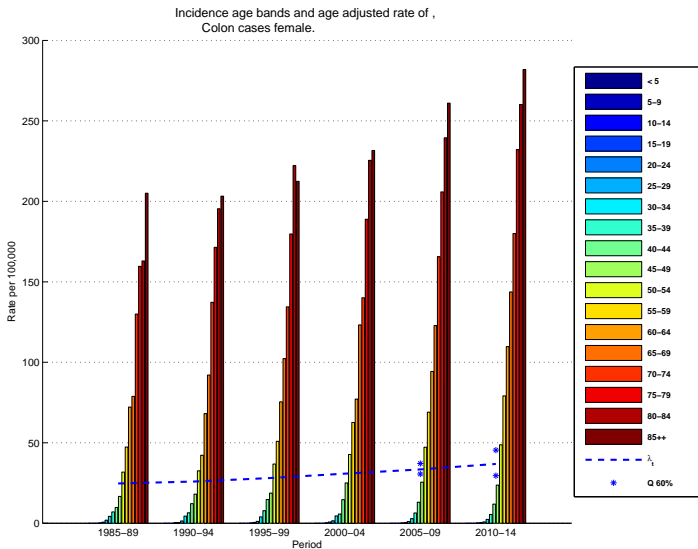


Table: Incidence Colon Male cancer

| | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}$ | $\% \delta_{04-14}$ |
|--------------|--------|--------|--------|--------|--------|--------|---------------------|---------------------|
| 0-4 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 5-9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 10-14 | 0.00 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 | * | * |
| 15-19 | 0.12 | 0.12 | 0.12 | 0.51 | 0.13 | 0.14 | -74.70 | -73.65 |
| 20-24 | 0.73 | 0.14 | 0.54 | 0.67 | 0.53 | 0.40 | -20.66 | -40.23 |
| 25-29 | 2.10 | 1.54 | 1.52 | 1.47 | 1.11 | 1.12 | -24.60 | -23.72 |
| 30-34 | 3.28 | 2.82 | 3.39 | 2.04 | 2.57 | 2.47 | 25.75 | 20.90 |
| 35-39 | 5.35 | 4.76 | 6.32 | 6.55 | 5.71 | 5.43 | -12.82 | -17.07 |
| 40-44 | 14.03 | 13.38 | 13.09 | 11.17 | 12.78 | 12.11 | 14.43 | 8.43 |
| 45-49 | 19.46 | 22.16 | 24.89 | 29.70 | 26.82 | 26.38 | -9.70 | -11.18 |
| 50-54 | 33.88 | 39.08 | 44.66 | 53.60 | 53.29 | 53.04 | -0.59 | -1.05 |
| 55-59 | 62.76 | 72.34 | 74.25 | 84.43 | 96.01 | 100.50 | 13.72 | 19.04 |
| 60-64 | 99.91 | 108.62 | 121.33 | 133.18 | 148.50 | 167.40 | 11.51 | 25.70 |
| 65-69 | 132.57 | 161.18 | 160.01 | 182.06 | 200.90 | 227.50 | 10.35 | 24.96 |
| 70-74 | 167.00 | 187.67 | 225.11 | 227.71 | 256.20 | 283.75 | 12.51 | 24.61 |
| 75-79 | 198.29 | 208.51 | 241.94 | 287.63 | 299.70 | 334.00 | 4.20 | 16.12 |
| 80-84 | 212.11 | 233.77 | 273.03 | 292.72 | 345.75 | 369.75 | 18.12 | 26.32 |
| 85++ | 190.80 | 255.49 | 278.34 | 305.56 | 352.10 | 410.40 | 15.23 | 34.31 |
| λ_t | 31.34 | 35.39 | 39.25 | 43.40 | 47.65 | 52.12 | 9.79 | 20.08 |

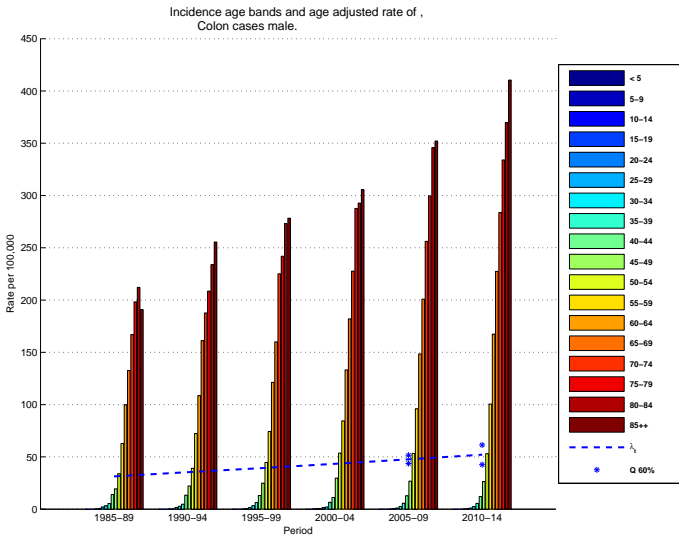


Table: Incidence Lung cancer

| | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}$ | $\% \delta_{04-14}$ |
|--------------|--------|--------|--------|--------|--------|--------|---------------------|---------------------|
| 0-4 | 0.06 | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | * | * |
| 5-9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 10-14 | 0.00 | 0.12 | 0.06 | 0.00 | 0.00 | 0.00 | * | * |
| 15-19 | 0.12 | 0.00 | 0.06 | 0.07 | 0.07 | 0.07 | 1.73 | 6.06 |
| 20-24 | 0.21 | 0.21 | 0.40 | 0.13 | 0.13 | 0.07 | 0.61 | -49.32 |
| 25-29 | 0.46 | 0.44 | 0.44 | 0.65 | 0.28 | 0.21 | -57.49 | -67.60 |
| 30-34 | 1.05 | 0.55 | 0.92 | 0.99 | 0.59 | 0.50 | -40.68 | -49.24 |
| 35-39 | 2.59 | 1.90 | 1.01 | 1.44 | 1.34 | 1.12 | -6.96 | -21.93 |
| 40-44 | 4.73 | 5.37 | 4.52 | 4.27 | 3.23 | 2.78 | -24.27 | -34.82 |
| 45-49 | 8.61 | 11.09 | 9.76 | 9.40 | 7.21 | 6.14 | -23.29 | -34.65 |
| 50-54 | 17.50 | 18.50 | 17.06 | 17.55 | 14.42 | 12.01 | -17.81 | -31.55 |
| 55-59 | 37.34 | 32.04 | 29.98 | 25.86 | 25.37 | 22.21 | -1.88 | -14.10 |
| 60-64 | 55.39 | 54.73 | 45.60 | 39.60 | 36.81 | 34.68 | -7.06 | -12.43 |
| 65-69 | 73.69 | 85.40 | 74.97 | 60.09 | 52.99 | 49.13 | -11.82 | -18.24 |
| 70-74 | 103.49 | 111.75 | 109.10 | 95.80 | 77.59 | 67.54 | -19.01 | -29.50 |
| 75-79 | 111.89 | 112.79 | 123.34 | 116.59 | 101.30 | 81.92 | -13.12 | -29.74 |
| 80-84 | 128.29 | 121.36 | 130.12 | 113.05 | 114.30 | 99.57 | 1.11 | -11.92 |
| 85++ | 119.47 | 102.86 | 119.55 | 108.77 | 107.20 | 103.50 | -1.44 | -4.84 |
| λ_t | 17.63 | 17.86 | 17.26 | 15.39 | 13.73 | 12.17 | -10.82 | -20.92 |

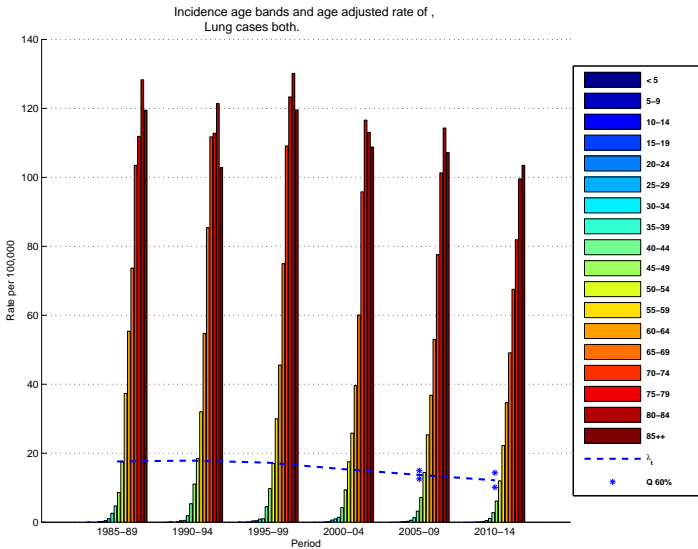


Table: Incidence Lung Female cancer

| | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}^*$ | $\% \delta_{04-14}^*$ |
|-------------|-------|-------|-------|-------|-------|-------|-----------------------|-----------------------|
| 0-4 | 0.13 | 0.00 | 0.14 | 0.00 | 0.00 | 0.00 | * | * |
| 5-9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 10-14 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | * | * |
| 15-19 | 0.25 | 0.00 | 0.00 | 0.13 | 0.14 | 0.14 | 2.27 | 6.71 |
| 20-24 | 0.00 | 0.14 | 0.53 | 0.00 | 0.14 | 0.14 | * | * |
| 25-29 | 0.44 | 0.14 | 0.43 | 0.71 | 0.27 | 0.28 | -61.19 | -60.37 |
| 30-34 | 0.76 | 0.44 | 0.59 | 0.88 | 0.57 | 0.71 | -35.59 | -19.94 |
| 35-39 | 1.01 | 1.55 | 0.88 | 1.00 | 1.21 | 1.30 | 20.80 | 29.17 |
| 40-44 | 1.99 | 3.08 | 2.45 | 3.92 | 2.70 | 2.59 | -31.09 | -33.84 |
| 45-49 | 4.65 | 3.92 | 5.06 | 4.95 | 5.08 | 5.13 | 2.59 | 3.76 |
| 50-54 | 9.18 | 10.72 | 9.64 | 11.16 | 9.93 | 9.92 | -11.02 | -11.10 |
| 55-59 | 15.69 | 16.90 | 16.46 | 16.32 | 16.00 | 16.28 | -1.94 | -0.23 |
| 60-64 | 25.02 | 24.86 | 25.14 | 21.79 | 24.01 | 24.50 | 10.19 | 12.44 |
| 65-69 | 39.78 | 46.35 | 43.51 | 39.27 | 38.87 | 38.49 | -1.02 | -1.99 |
| 70-74 | 61.21 | 61.68 | 60.37 | 57.44 | 55.02 | 53.59 | -4.22 | -6.70 |
| 75-79 | 68.05 | 67.52 | 70.70 | 67.60 | 65.41 | 62.51 | -3.25 | -7.53 |
| 80-84 | 69.69 | 58.54 | 81.40 | 70.61 | 71.01 | 68.68 | 0.56 | -2.74 |
| 85++ | 68.36 | 69.01 | 78.89 | 80.81 | 77.92 | 76.35 | -3.57 | -5.51 |
| λ_t | 9.42 | 9.65 | 10.02 | 9.62 | 9.43 | 9.35 | -1.97 | -2.90 |

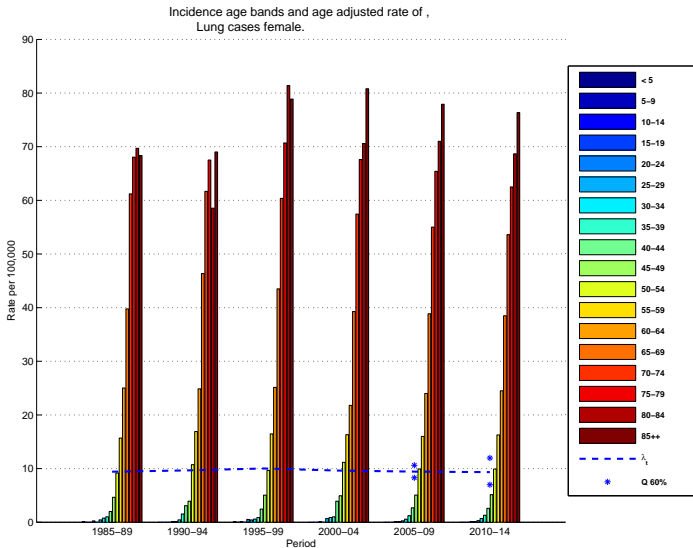


Table: Incidence Lung Male cancer

| | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}^{\delta}$ | $\% \delta_{04-14}^{\delta}$ |
|-------------|--------|--------|--------|--------|--------|--------|------------------------------|------------------------------|
| 0-4 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 5-9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 10-14 | 0.00 | 0.24 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 15-19 | 0.00 | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 | * | * |
| 20-24 | 0.44 | 0.28 | 0.27 | 0.27 | 0.13 | 0.00 | -50.40 | * |
| 25-29 | 0.49 | 0.77 | 0.46 | 0.59 | 0.14 | 0.14 | -76.44 | -76.17 |
| 30-34 | 1.38 | 0.66 | 1.29 | 1.10 | 0.60 | 0.44 | -45.05 | -60.38 |
| 35-39 | 4.39 | 2.29 | 1.16 | 1.92 | 1.30 | 1.09 | -31.91 | -43.34 |
| 40-44 | 7.84 | 7.99 | 6.90 | 4.67 | 3.65 | 2.82 | -21.76 | -39.58 |
| 45-49 | 13.06 | 19.21 | 15.17 | 14.58 | 8.99 | 6.76 | -38.31 | -53.61 |
| 50-54 | 26.88 | 27.35 | 25.64 | 25.03 | 19.18 | 13.77 | -23.36 | -44.98 |
| 55-59 | 61.81 | 49.46 | 45.69 | 37.05 | 35.62 | 28.88 | -3.87 | -22.06 |
| 60-64 | 89.85 | 89.32 | 69.33 | 60.46 | 52.82 | 47.81 | -12.64 | -20.93 |
| 65-69 | 111.93 | 130.87 | 112.38 | 85.00 | 73.25 | 65.61 | -13.82 | -22.81 |
| 70-74 | 151.09 | 170.44 | 168.61 | 143.81 | 108.90 | 91.55 | -24.28 | -36.34 |
| 75-79 | 161.73 | 166.56 | 189.97 | 181.60 | 149.40 | 114.40 | -17.73 | -37.01 |
| 80-84 | 199.64 | 200.53 | 194.49 | 171.85 | 176.60 | 149.10 | 2.77 | -13.24 |
| 85++ | 190.80 | 150.85 | 179.43 | 151.80 | 157.00 | 151.00 | 3.43 | -0.53 |
| λ_t | 27.16 | 27.60 | 26.16 | 22.67 | 19.47 | 16.49 | -14.10 | -27.25 |

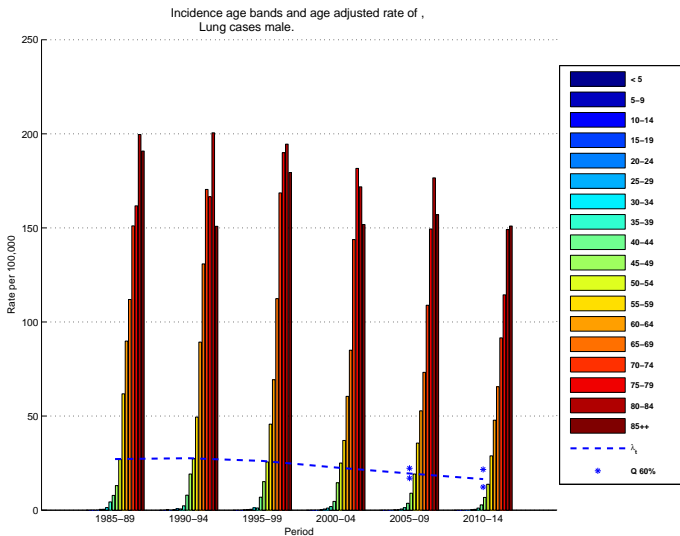


Table: Incidence Liver cancer

| | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | % δ_{04-09} | % δ_{04-14} |
|-------------|-------|-------|-------|-------|-------|-------|--------------------|--------------------|
| 0-4 | 0.13 | 0.33 | 0.07 | 0.35 | 0.14 | 0.15 | -59.05 | -58.15 |
| 5-9 | 0.00 | 0.13 | 0.00 | 0.00 | 0.07 | 0.07 | * | * |
| 10-14 | 0.00 | 0.06 | 0.19 | 0.07 | 0.07 | 0.07 | 5.61 | 6.28 |
| 15-19 | 0.00 | 0.00 | 0.00 | 0.07 | 0.07 | 0.07 | 1.73 | 6.06 |
| 20-24 | 0.21 | 0.21 | 0.00 | 0.07 | 0.07 | 0.07 | 0.61 | 1.37 |
| 25-29 | 0.00 | 0.37 | 0.37 | 0.00 | 0.14 | 0.14 | * | * |
| 30-34 | 0.49 | 0.00 | 0.31 | 0.30 | 0.29 | 0.29 | -3.60 | -5.70 |
| 35-39 | 0.09 | 0.33 | 0.55 | 0.53 | 0.55 | 0.52 | 3.99 | -1.14 |
| 40-44 | 1.35 | 1.47 | 1.48 | 1.40 | 1.66 | 1.67 | 18.52 | 19.45 |
| 45-49 | 2.35 | 3.17 | 4.16 | 5.66 | 4.57 | 4.63 | -19.13 | -18.21 |
| 50-54 | 4.87 | 5.25 | 6.52 | 8.34 | 8.63 | 8.79 | 3.49 | 5.41 |
| 55-59 | 5.80 | 10.24 | 12.52 | 12.10 | 13.74 | 15.14 | 13.51 | 25.08 |
| 60-64 | 12.29 | 12.13 | 14.98 | 16.92 | 18.59 | 20.86 | 9.85 | 23.24 |
| 65-69 | 14.74 | 19.64 | 24.10 | 27.16 | 27.41 | 29.65 | 0.92 | 9.15 |
| 70-74 | 27.18 | 25.13 | 31.00 | 28.03 | 33.78 | 36.34 | 20.51 | 29.65 |
| 75-79 | 28.30 | 33.27 | 42.05 | 40.66 | 40.80 | 44.71 | 0.36 | 9.97 |
| 80-84 | 29.82 | 49.19 | 54.79 | 48.94 | 51.71 | 53.00 | 5.66 | 8.29 |
| 85++ | 28.35 | 42.16 | 61.40 | 57.85 | 57.79 | 58.57 | -0.11 | 1.24 |
| λ_t | 4.07 | 5.07 | 6.28 | 6.40 | 6.76 | 7.21 | 5.75 | 12.65 |

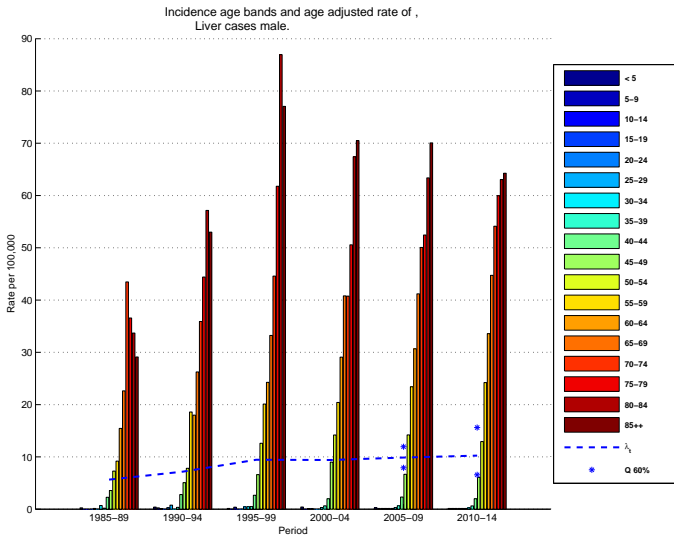


Table: Incidence Thyroid cancer

| | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}^c$ | $\% \delta_{04-14}^c$ |
|-------------|-------|-------|-------|-------|-------|-------|-----------------------|-----------------------|
| 0-4 | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 5-9 | 0.06 | 0.19 | 0.06 | 0.07 | 0.07 | 0.07 | 3.99 | 10.11 |
| 10-14 | 0.18 | 0.42 | 0.19 | 0.59 | 0.35 | 0.28 | -41.33 | -52.76 |
| 15-19 | 0.85 | 1.30 | 1.07 | 0.91 | 0.93 | 0.90 | 1.73 | -1.52 |
| 20-24 | 2.90 | 1.72 | 2.15 | 2.47 | 2.29 | 2.24 | -7.53 | -9.59 |
| 25-29 | 2.77 | 4.51 | 4.36 | 3.75 | 4.48 | 4.41 | 19.57 | 17.78 |
| 30-34 | 4.13 | 4.53 | 4.92 | 7.52 | 7.17 | 7.37 | -4.57 | -1.91 |
| 35-39 | 3.57 | 3.55 | 6.16 | 9.75 | 10.22 | 10.61 | 4.83 | 8.83 |
| 40-44 | 3.28 | 4.85 | 7.07 | 10.55 | 13.48 | 15.49 | 27.77 | 46.82 |
| 45-49 | 1.79 | 4.55 | 6.50 | 9.07 | 14.11 | 19.18 | 55.64 | 111.56 |
| 50-54 | 3.29 | 5.48 | 7.67 | 10.58 | 15.96 | 23.16 | 50.87 | 118.93 |
| 55-59 | 3.57 | 5.58 | 5.17 | 11.33 | 16.21 | 24.04 | 43.07 | 112.18 |
| 60-64 | 4.04 | 5.15 | 7.35 | 9.40 | 16.30 | 24.55 | 73.37 | 161.12 |
| 65-69 | 4.29 | 7.52 | 8.61 | 11.68 | 16.26 | 25.82 | 39.21 | 121.05 |
| 70-74 | 6.48 | 7.49 | 8.15 | 12.42 | 16.03 | 22.43 | 29.08 | 80.62 |
| 75-79 | 4.28 | 7.05 | 8.15 | 7.94 | 13.01 | 17.82 | 63.77 | 124.32 |
| 80-84 | 6.19 | 7.36 | 5.64 | 7.24 | 10.58 | 14.41 | 46.18 | 99.10 |
| 85++ | 6.07 | 5.06 | 5.58 | 6.17 | 8.89 | 11.54 | 44.08 | 87.00 |
| λ_t | 2.51 | 3.40 | 4.11 | 5.75 | 7.58 | 9.94 | 31.98 | 73.05 |

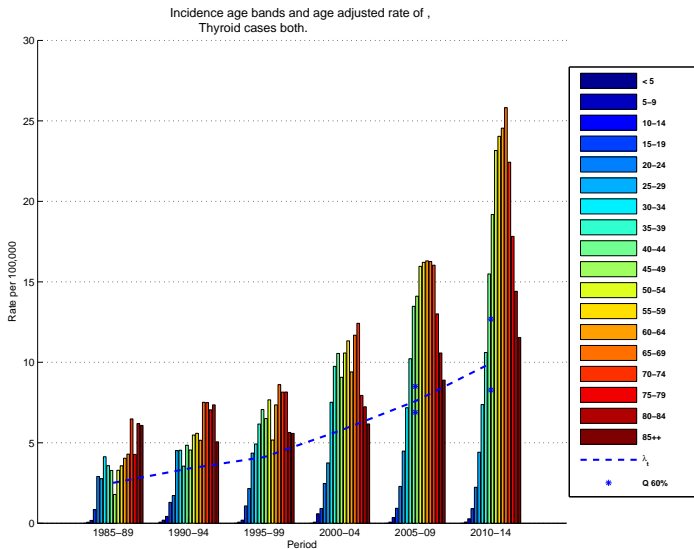


Table: Incidence Thyroid Female cancer

| | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | % δ_{04-09} | % δ_{04-14} |
|-------------|-------|-------|-------|-------|-------|-------|--------------------|--------------------|
| 0-4 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 5-9 | 0.00 | 0.26 | 0.00 | 0.14 | 0.14 | 0.15 | 3.71 | 9.87 |
| 10-14 | 0.36 | 0.61 | 0.26 | 0.94 | 0.57 | 0.57 | -39.53 | -39.24 |
| 15-19 | 1.47 | 2.26 | 2.05 | 1.86 | 1.90 | 1.84 | 2.31 | -0.92 |
| 20-24 | 4.96 | 3.12 | 3.33 | 4.66 | 4.49 | 4.67 | -3.76 | 0.23 |
| 25-29 | 4.53 | 8.10 | 7.33 | 6.50 | 8.22 | 8.54 | 26.57 | 31.39 |
| 30-34 | 6.55 | 7.25 | 8.09 | 12.34 | 12.07 | 13.13 | -2.20 | 6.39 |
| 35-39 | 5.54 | 6.20 | 10.43 | 15.49 | 16.98 | 17.87 | 9.60 | 15.35 |
| 40-44 | 5.07 | 7.77 | 9.66 | 16.25 | 21.45 | 24.48 | 31.98 | 50.59 |
| 45-49 | 3.38 | 6.90 | 10.12 | 13.76 | 21.75 | 30.05 | 58.06 | 118.37 |
| 50-54 | 4.96 | 8.36 | 11.79 | 16.26 | 24.07 | 35.31 | 48.03 | 117.15 |
| 55-59 | 5.33 | 8.45 | 6.84 | 16.14 | 23.60 | 33.94 | 46.24 | 110.31 |
| 60-64 | 5.07 | 7.34 | 10.21 | 13.29 | 22.84 | 34.26 | 71.84 | 157.77 |
| 65-69 | 5.28 | 10.79 | 11.53 | 15.76 | 21.80 | 34.68 | 38.33 | 120.06 |
| 70-74 | 8.00 | 8.99 | 9.40 | 14.04 | 19.54 | 27.52 | 39.16 | 95.99 |
| 75-79 | 6.19 | 7.79 | 10.03 | 11.06 | 16.27 | 22.37 | 47.07 | 102.22 |
| 80-84 | 8.20 | 6.60 | 7.79 | 8.31 | 13.00 | 18.26 | 56.49 | 119.81 |
| 85++ | 9.27 | 7.67 | 9.37 | 7.00 | 11.69 | 15.32 | 67.02 | 118.89 |
| λ_t | 3.80 | 5.17 | 6.11 | 8.65 | 11.47 | 14.99 | 32.61 | 73.37 |

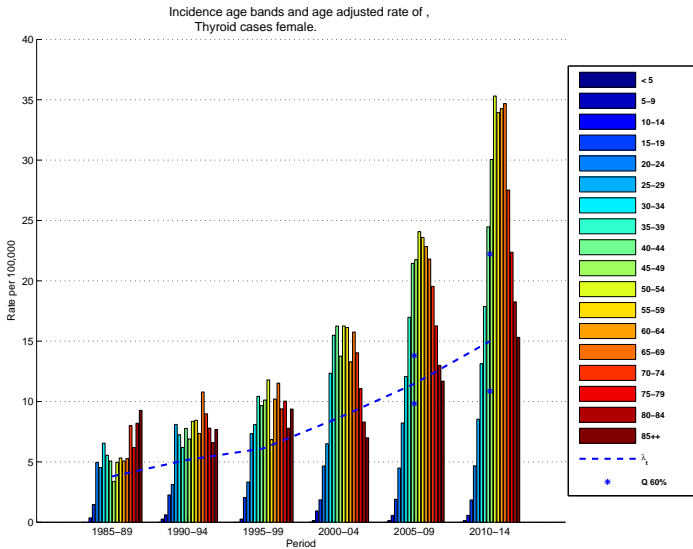


Table: Incidence Thyroid Male cancer

| | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | % δ_{04-09}^c | % δ_{04-14}^c |
|-------------|-------|-------|-------|-------|-------|-------|----------------------|----------------------|
| 0-4 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 5-9 | 0.12 | 0.12 | 0.13 | 0.00 | 0.00 | 0.00 | * | * |
| 10-14 | 0.00 | 0.24 | 0.12 | 0.26 | 0.14 | 0.14 | -47.29 | -46.86 |
| 15-19 | 0.24 | 0.37 | 0.12 | 0.00 | 0.26 | 0.27 | * | * |
| 20-24 | 0.73 | 0.28 | 0.95 | 0.27 | 0.53 | 0.53 | 98.36 | 99.25 |
| 25-29 | 0.81 | 0.62 | 1.22 | 0.88 | 1.11 | 1.12 | 25.66 | 27.13 |
| 30-34 | 1.38 | 1.49 | 1.45 | 2.36 | 2.12 | 2.18 | -10.24 | -7.56 |
| 35-39 | 1.34 | 0.53 | 1.33 | 3.35 | 3.26 | 3.57 | -2.75 | 6.40 |
| 40-44 | 1.24 | 1.49 | 4.07 | 4.00 | 4.65 | 5.47 | 16.18 | 36.83 |
| 45-49 | 0.00 | 1.90 | 2.33 | 3.60 | 5.33 | 6.76 | 48.05 | 87.88 |
| 50-54 | 1.40 | 2.20 | 2.89 | 3.92 | 6.22 | 8.67 | 58.51 | 121.05 |
| 55-59 | 1.58 | 2.29 | 3.23 | 5.68 | 7.36 | 10.64 | 29.40 | 87.17 |
| 60-64 | 2.88 | 2.62 | 4.04 | 4.85 | 8.13 | 12.41 | 67.66 | 156.01 |
| 65-69 | 3.18 | 3.70 | 5.14 | 6.80 | 9.16 | 13.56 | 34.66 | 99.41 |
| 70-74 | 4.77 | 5.75 | 6.62 | 10.39 | 10.34 | 13.82 | -0.45 | 33.06 |
| 75-79 | 2.11 | 6.17 | 5.77 | 3.81 | 8.81 | 11.52 | 131.55 | 202.67 |
| 80-84 | 3.74 | 8.31 | 2.81 | 5.76 | 7.12 | 8.83 | 23.74 | 53.35 |
| 85++ | 1.62 | 1.36 | 0.00 | 4.90 | 4.43 | 6.20 | -9.43 | 26.51 |
| λ_t | 1.06 | 1.41 | 1.83 | 2.46 | 3.28 | 4.39 | 33.00 | 78.42 |

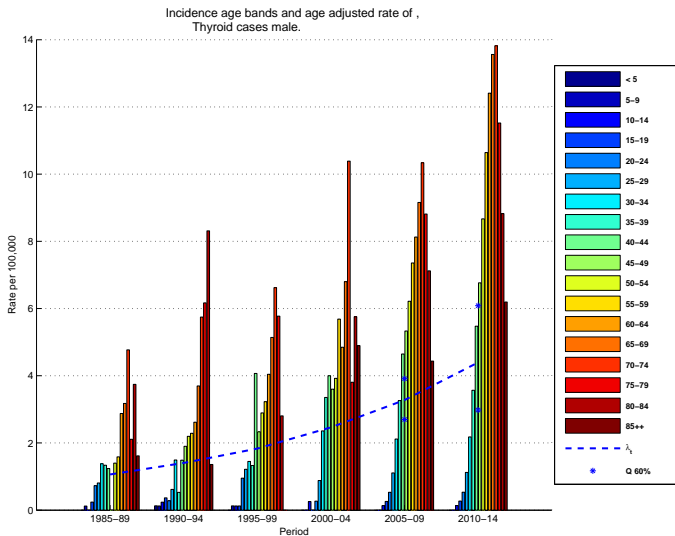


Table: Incidence Prostate cancer

| | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}$ | $\% \delta_{04-14}$ |
|-------------|--------|---------|---------|--------|--------|---------|---------------------|---------------------|
| 0-4 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 5-9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 10-14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 15-19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 20-24 | 0.00 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 | * | * |
| 25-29 | 0.00 | 0.46 | 0.15 | 0.00 | 0.00 | 0.00 | * | * |
| 30-34 | 0.00 | 0.33 | 0.16 | 0.16 | 0.00 | 0.00 | * | * |
| 35-39 | 0.19 | 0.71 | 0.67 | 0.32 | 0.16 | 0.00 | -48.94 | * |
| 40-44 | 1.44 | 3.72 | 4.25 | 8.33 | 3.32 | 0.83 | -60.17 | -90.05 |
| 45-49 | 4.04 | 14.35 | 21.97 | 36.00 | 41.64 | 21.56 | 15.66 | -40.13 |
| 50-54 | 17.64 | 51.78 | 66.36 | 95.63 | 151.40 | 194.60 | 58.32 | 103.50 |
| 55-59 | 56.11 | 149.25 | 168.36 | 221.91 | 320.00 | 534.05 | 44.20 | 140.66 |
| 60-64 | 139.44 | 311.15 | 337.12 | 418.92 | 536.60 | 820.50 | 28.09 | 95.86 |
| 65-69 | 286.18 | 640.67 | 602.33 | 715.86 | 829.05 | 1123.50 | 15.81 | 56.94 |
| 70-74 | 456.46 | 946.98 | 817.01 | 772.60 | 926.95 | 1152.50 | 19.98 | 49.17 |
| 75-79 | 569.56 | 1107.94 | 903.66 | 919.44 | 837.30 | 1036.00 | -8.93 | 12.68 |
| 80-84 | 753.62 | 1297.70 | 1017.34 | 911.03 | 874.60 | 863.10 | -4.00 | -5.26 |
| 85++ | 852.14 | 1344.02 | 1046.66 | 967.60 | 799.20 | 793.35 | -17.40 | -18.01 |
| λ_t | 66.62 | 133.18 | 119.47 | 129.06 | 146.90 | 190.60 | 13.82 | 47.68 |

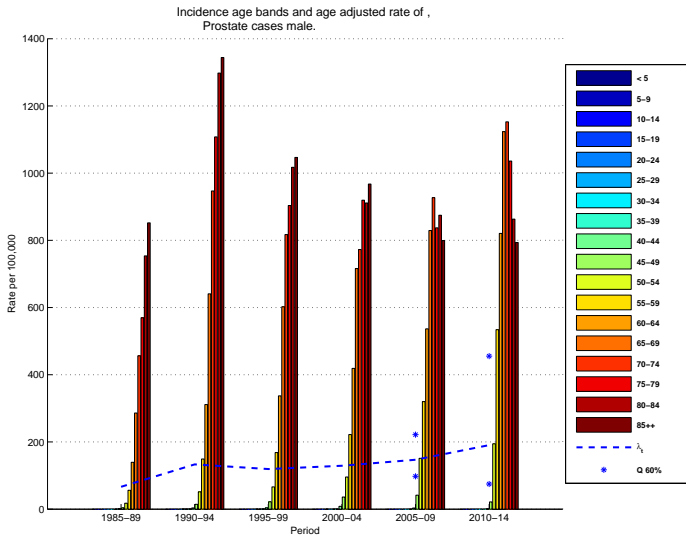


Table: Incidence Uterus Cancer

| | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}^c$ | $\% \delta_{04-14}^c$ |
|-------------|-------|-------|-------|-------|-------|-------|-----------------------|-----------------------|
| 0-4 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 5-9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 10-14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 15-19 | 0.00 | 0.00 | 0.00 | 0.27 | 0.14 | 0.14 | -48.87 | -46.65 |
| 20-24 | 0.28 | 0.41 | 0.53 | 0.40 | 0.82 | 0.96 | 104.17 | 140.75 |
| 25-29 | 1.32 | 1.28 | 2.59 | 3.53 | 3.15 | 3.78 | -10.71 | 7.01 |
| 30-34 | 2.90 | 3.55 | 4.41 | 7.05 | 7.67 | 9.31 | 8.71 | 32.09 |
| 35-39 | 4.03 | 6.97 | 8.81 | 9.04 | 12.36 | 15.56 | 36.72 | 72.18 |
| 40-44 | 8.51 | 9.88 | 11.50 | 12.77 | 16.50 | 21.20 | 29.21 | 66.02 |
| 45-49 | 11.42 | 12.49 | 16.03 | 13.61 | 19.87 | 24.61 | 46.04 | 80.87 |
| 50-54 | 19.61 | 21.66 | 25.00 | 26.46 | 30.69 | 37.35 | 15.97 | 41.14 |
| 55-59 | 31.95 | 33.55 | 39.13 | 44.47 | 48.33 | 55.47 | 8.68 | 24.74 |
| 60-64 | 43.40 | 42.09 | 52.28 | 53.82 | 62.02 | 69.35 | 15.24 | 28.86 |
| 65-69 | 51.39 | 46.03 | 49.85 | 63.04 | 66.44 | 74.39 | 5.40 | 18.01 |
| 70-74 | 48.50 | 52.69 | 46.63 | 57.76 | 63.24 | 69.68 | 9.49 | 20.64 |
| 75-79 | 45.16 | 49.86 | 45.16 | 53.26 | 55.97 | 63.23 | 5.08 | 18.71 |
| 80-84 | 36.90 | 40.40 | 48.84 | 51.62 | 50.01 | 53.90 | -3.13 | 4.41 |
| 85++ | 28.96 | 35.46 | 32.02 | 34.99 | 40.63 | 41.17 | 16.10 | 17.65 |
| λ_t | 11.49 | 12.21 | 13.67 | 15.33 | 17.48 | 20.30 | 14.02 | 32.42 |

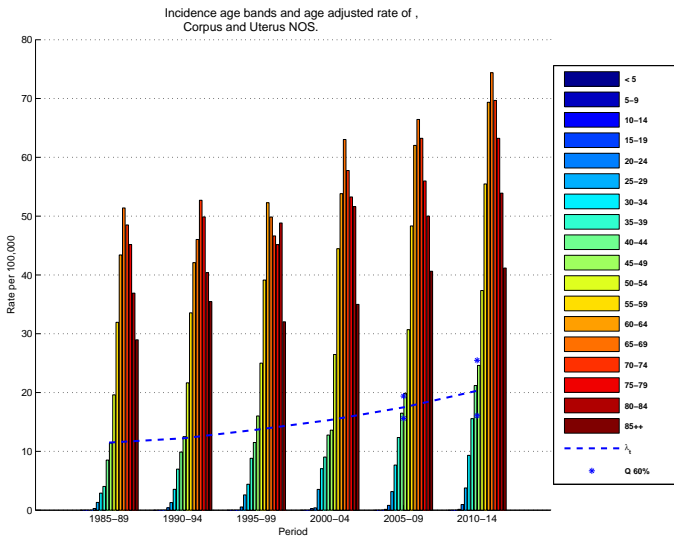


Table: Incidence Breast In Situ cancer

| | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}^c$ | $\% \delta_{04-14}^c$ |
|-------------|-------|-------|-------|-------|-------|--------|-----------------------|-----------------------|
| 0-4 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 5-9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 10-14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 15-19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.14 | * | * |
| 20-24 | 0.14 | 0.00 | 0.13 | 0.40 | 0.27 | 0.55 | -31.93 | 37.58 |
| 25-29 | 0.29 | 0.43 | 0.14 | 0.57 | 0.96 | 1.82 | 69.82 | 221.94 |
| 30-34 | 0.46 | 0.44 | 0.74 | 1.76 | 2.84 | 4.94 | 61.03 | 180.20 |
| 35-39 | 2.01 | 1.39 | 2.20 | 4.30 | 8.34 | 14.41 | 93.80 | 234.86 |
| 40-44 | 3.62 | 3.56 | 7.67 | 13.79 | 22.35 | 38.88 | 62.13 | 182.04 |
| 45-49 | 5.07 | 8.02 | 11.81 | 20.72 | 38.14 | 66.59 | 84.09 | 221.40 |
| 50-54 | 3.23 | 9.01 | 16.25 | 28.54 | 50.39 | 89.44 | 76.59 | 213.43 |
| 55-59 | 5.89 | 10.44 | 16.89 | 30.66 | 58.51 | 106.75 | 90.82 | 248.15 |
| 60-64 | 6.34 | 11.02 | 17.18 | 36.82 | 69.85 | 130.60 | 89.69 | 254.67 |
| 65-69 | 5.63 | 17.78 | 25.36 | 45.47 | 87.62 | 166.55 | 92.70 | 266.28 |
| 70-74 | 8.95 | 13.89 | 18.07 | 35.42 | 74.94 | 145.30 | 111.56 | 310.19 |
| 75-79 | 7.42 | 8.83 | 17.33 | 41.38 | 68.99 | 133.30 | 66.72 | 222.12 |
| 80-84 | 8.20 | 8.25 | 7.79 | 23.14 | 45.01 | 86.50 | 94.50 | 273.78 |
| 85++ | 2.32 | 3.83 | 3.91 | 12.73 | 23.93 | 46.91 | 88.05 | 268.63 |
| λ_t | 2.26 | 3.78 | 5.93 | 11.45 | 21.14 | 39.06 | 84.69 | 241.25 |

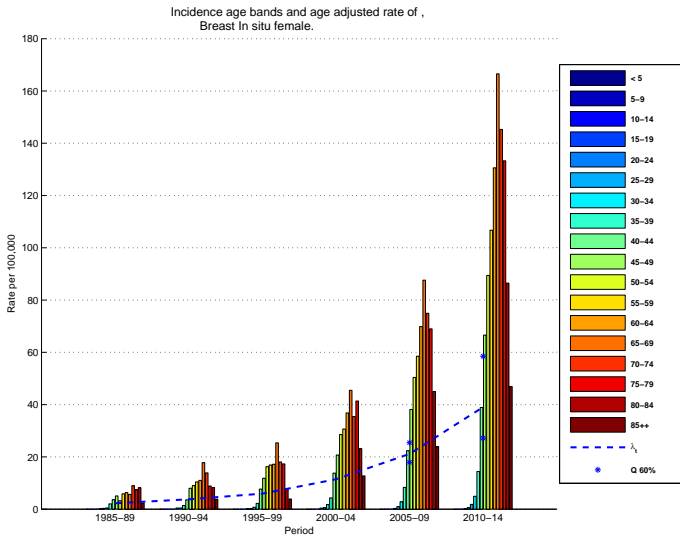


Table: Incidence Breast Malignant cancer

| | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}$ | $\% \delta_{04-14}$ |
|--------------|--------|--------|--------|--------|--------|--------|---------------------|---------------------|
| 0-4 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 5-9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 10-14 | 0.12 | 0.00 | 0.26 | 0.00 | 0.00 | 0.00 | * | * |
| 15-19 | 0.00 | 0.13 | 0.39 | 0.13 | 0.14 | 0.14 | 2.26 | 6.77 |
| 20-24 | 0.83 | 1.63 | 2.13 | 1.07 | 0.82 | 0.69 | -23.45 | -35.55 |
| 25-29 | 6.58 | 5.54 | 5.46 | 6.64 | 4.52 | 3.50 | -31.87 | -47.30 |
| 30-34 | 21.03 | 19.82 | 21.62 | 20.42 | 18.74 | 15.10 | -8.24 | -26.06 |
| 35-39 | 42.48 | 40.45 | 43.18 | 44.32 | 41.70 | 39.05 | -5.92 | -11.90 |
| 40-44 | 78.60 | 80.82 | 72.55 | 79.52 | 79.28 | 76.40 | -0.30 | -3.92 |
| 45-49 | 106.14 | 115.24 | 125.51 | 127.40 | 125.00 | 126.10 | -1.89 | -1.02 |
| 50-54 | 115.91 | 124.58 | 154.49 | 160.05 | 153.40 | 155.50 | -4.16 | -2.85 |
| 55-59 | 130.32 | 154.84 | 168.26 | 189.35 | 200.30 | 193.90 | 5.78 | 2.40 |
| 60-64 | 156.80 | 164.40 | 197.90 | 206.34 | 239.00 | 250.65 | 15.83 | 21.47 |
| 65-69 | 152.07 | 184.45 | 214.67 | 229.68 | 250.50 | 287.20 | 9.07 | 25.05 |
| 70-74 | 182.69 | 198.11 | 232.06 | 238.06 | 280.00 | 302.90 | 17.62 | 27.24 |
| 75-79 | 167.65 | 190.62 | 203.89 | 257.30 | 265.90 | 300.95 | 3.34 | 16.96 |
| 80-84 | 175.26 | 178.92 | 211.63 | 229.64 | 263.50 | 283.20 | 14.75 | 23.33 |
| 85++ | 147.14 | 187.87 | 185.12 | 171.79 | 213.20 | 250.30 | 24.10 | 45.70 |
| λ_t | 55.13 | 60.29 | 67.38 | 71.60 | 75.77 | 78.80 | 5.83 | 10.06 |

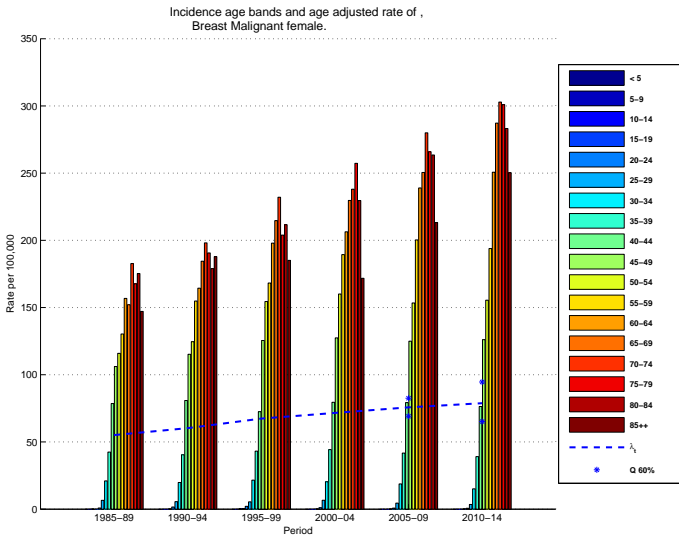


Table: Mortality All Cancer Sites

| | 80-84 | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}$ | $\% \delta_{04-14}$ |
|--------------|---------|---------|---------|---------|---------|---------|---------|---------------------|---------------------|
| 0-4 | 3.80 | 4.04 | 3.40 | 2.22 | 2.33 | 2.03 | 1.70 | -13.15 | -27.08 |
| 5-9 | 4.71 | 3.06 | 2.74 | 1.95 | 2.53 | 1.94 | 1.61 | -23.39 | -36.25 |
| 10-14 | 3.96 | 3.48 | 2.05 | 2.61 | 1.83 | 2.01 | 1.74 | 9.37 | -5.13 |
| 15-19 | 5.08 | 4.43 | 3.53 | 3.54 | 3.92 | 2.66 | 2.29 | -32.18 | -41.67 |
| 20-24 | 5.74 | 6.51 | 4.83 | 4.38 | 5.28 | 3.83 | 3.19 | -27.42 | -39.69 |
| 25-29 | 9.29 | 8.53 | 8.14 | 9.16 | 5.98 | 6.00 | 5.11 | 0.27 | -14.51 |
| 30-34 | 16.61 | 12.80 | 13.84 | 16.61 | 12.60 | 10.76 | 9.45 | -14.63 | -25.03 |
| 35-39 | 28.68 | 25.38 | 25.50 | 26.75 | 20.63 | 20.00 | 17.93 | -3.06 | -13.10 |
| 40-44 | 48.76 | 50.63 | 49.68 | 42.72 | 37.63 | 37.63 | 33.49 | 0.01 | -10.99 |
| 45-49 | 80.04 | 77.05 | 80.10 | 82.29 | 70.45 | 64.62 | 60.10 | -8.27 | -14.69 |
| 50-54 | 137.94 | 139.34 | 134.62 | 121.89 | 117.14 | 107.40 | 99.04 | -8.32 | -15.45 |
| 55-59 | 224.95 | 220.30 | 201.83 | 187.95 | 178.75 | 171.40 | 157.75 | -4.11 | -11.75 |
| 60-64 | 342.40 | 341.62 | 305.62 | 283.33 | 264.30 | 253.20 | 238.50 | -4.20 | -9.76 |
| 65-69 | 463.50 | 447.92 | 451.59 | 397.71 | 386.72 | 347.40 | 328.95 | -10.17 | -14.94 |
| 70-74 | 733.24 | 696.99 | 679.10 | 599.35 | 547.82 | 518.05 | 480.65 | -5.43 | -12.26 |
| 75-79 | 899.91 | 889.55 | 877.82 | 839.41 | 792.07 | 698.15 | 648.55 | -11.86 | -18.12 |
| 80-84 | 1275.97 | 1175.44 | 1270.17 | 1205.33 | 1068.07 | 1023.00 | 928.70 | -4.22 | -13.05 |
| 85++ | 1548.25 | 1495.68 | 1654.77 | 1605.81 | 1526.21 | 1403.50 | 1303.00 | -8.04 | -14.63 |
| λ_t | 141.49 | 136.70 | 136.45 | 127.44 | 118.22 | 109.70 | 100.95 | -7.21 | -14.61 |

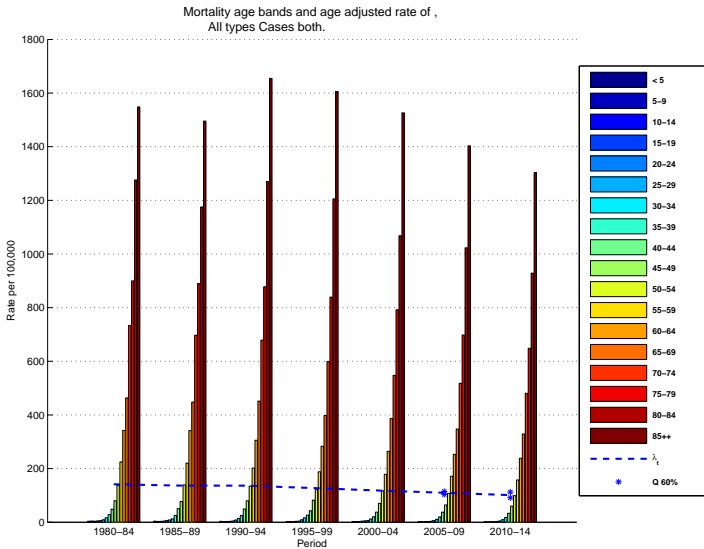


Table: Mortality All Female Cancer Sites

| | 80-84 | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}$ | $\% \delta_{04-14}$ |
|-------------|---------|--------|---------|---------|--------|--------|--------|---------------------|---------------------|
| 0-4 | 3.44 | 4.70 | 2.99 | 2.20 | 2.32 | 1.93 | 1.59 | -16.77 | -31.30 |
| 5-9 | 4.11 | 3.31 | 1.82 | 1.86 | 1.77 | 1.56 | 1.35 | -12.21 | -23.95 |
| 10-14 | 2.53 | 4.20 | 1.97 | 1.56 | 1.87 | 1.70 | 1.28 | -9.31 | -31.66 |
| 15-19 | 4.55 | 3.31 | 3.51 | 2.82 | 3.45 | 2.17 | 1.70 | -37.06 | -50.73 |
| 20-24 | 4.17 | 5.51 | 5.16 | 4.13 | 5.33 | 3.40 | 2.82 | -36.19 | -47.12 |
| 25-29 | 8.08 | 8.48 | 7.53 | 8.48 | 6.22 | 6.03 | 5.32 | -2.96 | -14.43 |
| 30-34 | 17.45 | 14.17 | 16.27 | 19.26 | 14.40 | 12.78 | 11.43 | -11.24 | -20.61 |
| 35-39 | 30.49 | 27.03 | 28.52 | 33.63 | 24.53 | 24.87 | 21.83 | 1.39 | -11.00 |
| 40-44 | 51.42 | 51.98 | 55.07 | 43.72 | 43.68 | 42.90 | 40.41 | -1.78 | -7.48 |
| 45-49 | 80.68 | 67.66 | 76.64 | 80.63 | 69.58 | 67.15 | 63.72 | -3.49 | -8.42 |
| 50-54 | 120.21 | 122.37 | 116.86 | 107.87 | 108.72 | 101.85 | 99.87 | -6.32 | -8.14 |
| 55-59 | 191.12 | 169.28 | 163.79 | 150.09 | 153.85 | 148.60 | 139.05 | -3.41 | -9.62 |
| 60-64 | 250.06 | 245.81 | 220.62 | 223.54 | 200.02 | 197.35 | 194.30 | -1.34 | -2.86 |
| 65-69 | 337.85 | 327.02 | 330.17 | 304.00 | 300.46 | 267.60 | 262.70 | -10.94 | -12.57 |
| 70-74 | 542.94 | 509.46 | 473.43 | 423.28 | 396.35 | 388.20 | 359.15 | -2.06 | -9.39 |
| 75-79 | 659.73 | 622.33 | 621.72 | 559.20 | 562.54 | 496.25 | 477.85 | -11.78 | -15.06 |
| 80-84 | 910.13 | 865.01 | 873.19 | 813.99 | 741.11 | 715.10 | 652.00 | -3.51 | -12.02 |
| 85++ | 1056.48 | 994.04 | 1111.86 | 1092.71 | 987.47 | 916.60 | 865.95 | -7.18 | -12.31 |
| λ_t | 108.51 | 102.80 | 102.30 | 96.34 | 90.81 | 85.15 | 81.22 | -6.23 | -10.55 |

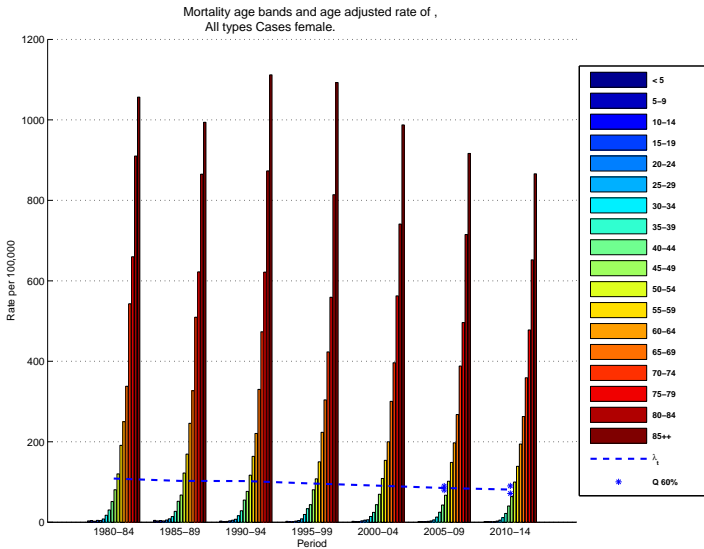


Table: Mortality All Male Cancer Sites cancer

| | 80-84 | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}$ | $\% \delta_{04-14}$ |
|-------------|---------|---------|---------|---------|---------|---------|---------|---------------------|---------------------|
| 0-4 | 4.16 | 3.40 | 3.79 | 2.24 | 2.35 | 2.12 | 1.74 | -9.73 | -26.19 |
| 5-9 | 5.29 | 2.82 | 3.62 | 2.03 | 3.25 | 2.03 | 1.72 | -37.46 | -47.04 |
| 10-14 | 5.34 | 2.78 | 2.13 | 3.62 | 1.80 | 2.30 | 1.77 | 27.98 | -1.37 |
| 15-19 | 5.61 | 5.54 | 3.54 | 4.23 | 4.37 | 2.86 | 2.37 | -34.54 | -45.73 |
| 20-24 | 7.44 | 7.56 | 4.48 | 4.63 | 5.23 | 3.99 | 3.27 | -23.71 | -37.41 |
| 25-29 | 10.65 | 8.58 | 8.79 | 9.87 | 5.74 | 5.55 | 4.77 | -3.32 | -16.88 |
| 30-34 | 15.66 | 11.24 | 11.11 | 13.70 | 10.69 | 8.16 | 7.26 | -23.63 | -32.02 |
| 35-39 | 26.64 | 23.49 | 22.06 | 18.96 | 16.29 | 15.17 | 12.88 | -6.89 | -20.94 |
| 40-44 | 45.76 | 49.09 | 43.49 | 41.58 | 30.67 | 30.22 | 25.47 | -1.49 | -16.97 |
| 45-49 | 79.32 | 87.59 | 84.01 | 84.20 | 71.46 | 59.47 | 51.83 | -16.78 | -27.48 |
| 50-54 | 157.86 | 158.49 | 154.85 | 138.10 | 127.01 | 114.40 | 97.07 | -9.93 | -23.57 |
| 55-59 | 262.28 | 277.99 | 245.60 | 231.93 | 208.01 | 193.20 | 173.60 | -7.12 | -16.54 |
| 60-64 | 443.23 | 450.31 | 404.07 | 352.72 | 339.58 | 310.10 | 285.40 | -8.68 | -15.95 |
| 65-69 | 599.07 | 584.27 | 592.98 | 509.13 | 489.91 | 438.20 | 404.30 | -10.55 | -17.47 |
| 70-74 | 938.88 | 908.18 | 920.15 | 814.35 | 737.46 | 675.65 | 632.65 | -8.38 | -14.21 |
| 75-79 | 1165.95 | 1193.22 | 1181.99 | 1194.06 | 1096.67 | 956.65 | 880.40 | -12.77 | -19.72 |
| 80-84 | 1711.54 | 1553.42 | 1770.44 | 1722.30 | 1521.13 | 1451.50 | 1304.50 | -4.58 | -14.24 |
| 85++ | 2236.70 | 2195.85 | 2424.41 | 2361.32 | 2355.30 | 2162.50 | 2024.50 | -8.19 | -14.05 |
| λ_t | 179.87 | 177.07 | 178.55 | 167.44 | 155.01 | 141.10 | 129.45 | -8.98 | -16.49 |

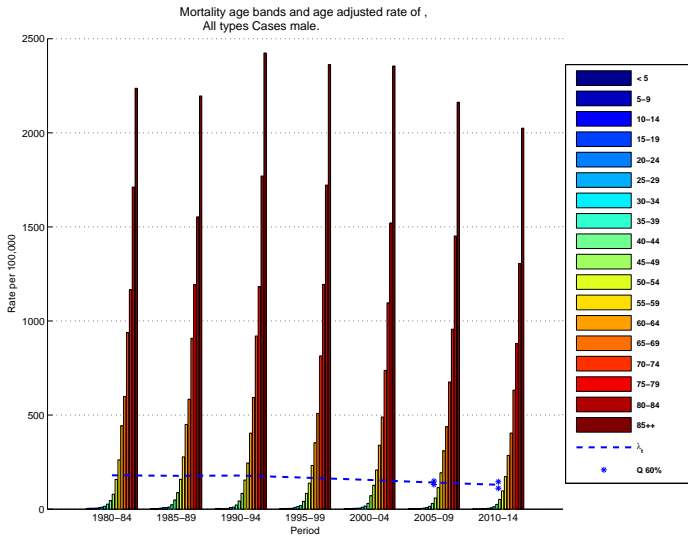


Table: Mortality Colon cancer

| | 80-84 | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}^{\delta}$ | $\% \delta_{04-14}^{\delta}$ |
|--------------|--------|--------|--------|--------|--------|--------|--------|------------------------------|------------------------------|
| 0-4 | 0.06 | 0.00 | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | * | * |
| 5-9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 10-14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 15-19 | 0.12 | 0.00 | 0.12 | 0.13 | 0.00 | 0.00 | 0.00 | * | * |
| 20-24 | 0.29 | 0.28 | 0.07 | 0.00 | 0.20 | 0.07 | 0.07 | -66.46 | -66.21 |
| 25-29 | 0.25 | 0.46 | 0.67 | 0.37 | 0.07 | 0.21 | 0.21 | 187.00 | 191.58 |
| 30-34 | 0.77 | 0.81 | 0.86 | 1.62 | 0.99 | 0.66 | 0.50 | -33.26 | -49.23 |
| 35-39 | 2.66 | 2.14 | 1.98 | 2.50 | 2.49 | 1.73 | 1.35 | -30.67 | -46.07 |
| 40-44 | 3.72 | 5.01 | 4.41 | 4.27 | 3.57 | 4.10 | 3.42 | 14.83 | -4.28 |
| 45-49 | 6.34 | 5.59 | 7.33 | 8.04 | 9.23 | 7.91 | 7.58 | -14.34 | -17.92 |
| 50-54 | 10.43 | 13.68 | 10.73 | 11.02 | 11.95 | 13.68 | 13.66 | 14.43 | 14.26 |
| 55-59 | 21.15 | 18.59 | 16.75 | 18.04 | 23.34 | 22.81 | 23.87 | -2.26 | 2.28 |
| 60-64 | 23.50 | 32.66 | 29.71 | 31.69 | 32.67 | 36.17 | 37.78 | 10.71 | 15.64 |
| 65-69 | 38.90 | 42.16 | 46.80 | 39.91 | 51.08 | 50.26 | 56.09 | -1.61 | 9.80 |
| 70-74 | 52.50 | 64.84 | 59.29 | 64.59 | 65.46 | 73.58 | 76.07 | 12.40 | 16.21 |
| 75-79 | 64.37 | 86.55 | 89.11 | 93.52 | 103.27 | 103.90 | 112.90 | 0.61 | 9.32 |
| 80-84 | 108.28 | 110.29 | 131.02 | 122.87 | 129.93 | 154.65 | 154.90 | 19.02 | 19.22 |
| 85++ | 138.55 | 139.71 | 146.70 | 178.16 | 189.38 | 202.40 | 229.80 | 6.88 | 21.34 |
| λ_t | 11.09 | 12.54 | 12.66 | 13.21 | 14.40 | 15.24 | 16.08 | 5.83 | 11.66 |

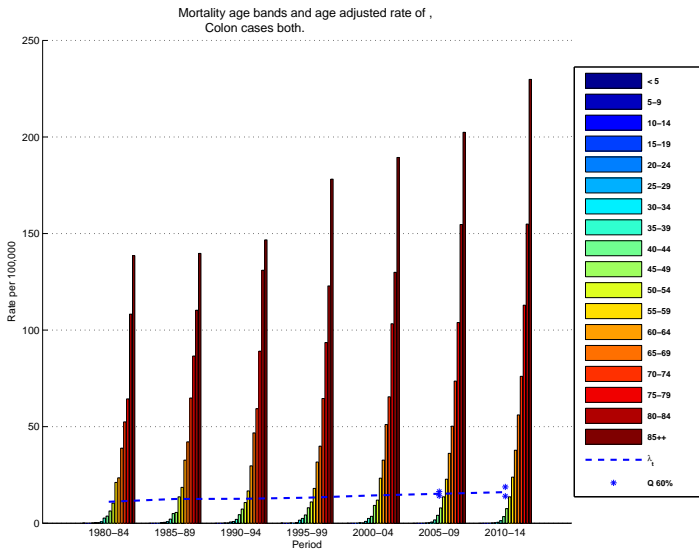


Table: Mortality Colon Female cancer

| | 80-84 | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}^{\sim}$ | $\% \delta_{04-14}^{\sim}$ |
|--------------|--------|--------|--------|--------|--------|--------|--------|----------------------------|----------------------------|
| 0-4 | 0.12 | 0.00 | 0.00 | 0.14 | 0.00 | 0.00 | 0.00 | * | * |
| 5-9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 10-14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 15-19 | 0.12 | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 20-24 | 0.14 | 0.14 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 | * | * |
| 25-29 | 0.00 | 0.44 | 0.43 | 0.00 | 0.00 | 0.14 | 0.14 | * | * |
| 30-34 | 1.12 | 0.91 | 1.18 | 1.76 | 1.03 | 0.57 | 0.42 | -44.79 | -58.83 |
| 35-39 | 2.42 | 2.35 | 1.86 | 2.35 | 2.87 | 1.82 | 1.44 | -36.56 | -49.77 |
| 40-44 | 4.04 | 5.43 | 4.05 | 3.37 | 3.48 | 4.20 | 3.51 | 20.60 | 0.70 |
| 45-49 | 6.36 | 3.59 | 5.22 | 6.41 | 9.59 | 7.54 | 7.55 | -21.34 | -21.25 |
| 50-54 | 8.05 | 15.14 | 7.08 | 9.64 | 11.32 | 12.64 | 12.99 | 11.68 | 14.77 |
| 55-59 | 20.93 | 15.69 | 11.93 | 11.76 | 19.54 | 19.07 | 20.77 | -2.43 | 6.29 |
| 60-64 | 18.29 | 23.76 | 21.75 | 25.14 | 20.48 | 26.34 | 28.96 | 28.60 | 41.40 |
| 65-69 | 35.71 | 36.26 | 35.24 | 29.97 | 43.92 | 34.35 | 41.44 | -21.79 | -5.65 |
| 70-74 | 49.16 | 57.92 | 45.75 | 49.16 | 42.44 | 55.02 | 50.59 | 29.63 | 19.19 |
| 75-79 | 67.35 | 82.90 | 79.47 | 85.75 | 79.90 | 77.45 | 88.89 | -3.06 | 11.26 |
| 80-84 | 103.67 | 112.74 | 121.21 | 116.79 | 106.21 | 121.50 | 115.20 | 14.39 | 8.46 |
| 85++ | 132.58 | 144.82 | 156.24 | 160.90 | 167.97 | 169.20 | 177.60 | 0.73 | 5.73 |
| λ_t | 10.44 | 11.64 | 10.70 | 11.09 | 11.69 | 11.97 | 12.58 | 2.43 | 7.65 |

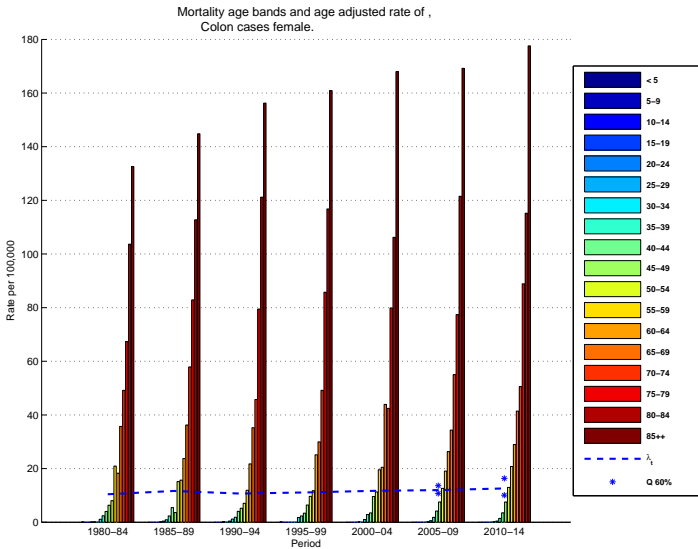


Table: Mortality Colon Male cancer

| | 80-84 | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}$ | $\% \delta_{04-14}$ |
|--------------|--------|--------|--------|--------|--------|--------|--------|---------------------|---------------------|
| 0-4 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 5-9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 10-14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 15-19 | 0.12 | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 | 0.00 | * | * |
| 20-24 | 0.46 | 0.44 | 0.14 | 0.00 | 0.27 | 0.13 | 0.13 | -50.40 | -50.18 |
| 25-29 | 0.52 | 0.49 | 0.93 | 0.76 | 0.15 | 0.28 | 0.28 | 88.53 | 90.63 |
| 30-34 | 0.36 | 0.69 | 0.50 | 1.45 | 0.94 | 0.60 | 0.58 | -35.89 | -38.36 |
| 35-39 | 2.94 | 1.91 | 2.12 | 2.66 | 2.08 | 1.79 | 1.40 | -13.60 | -32.72 |
| 40-44 | 3.35 | 4.54 | 4.83 | 5.31 | 3.67 | 4.15 | 3.65 | 13.16 | -0.50 |
| 45-49 | 6.31 | 7.83 | 9.71 | 9.92 | 8.82 | 8.33 | 7.86 | -5.58 | -10.86 |
| 50-54 | 13.10 | 12.04 | 14.90 | 12.61 | 12.70 | 15.28 | 15.13 | 20.31 | 19.13 |
| 55-59 | 21.40 | 21.87 | 22.30 | 25.33 | 27.79 | 27.68 | 28.24 | -0.40 | 1.61 |
| 60-64 | 29.19 | 42.77 | 38.93 | 39.29 | 46.94 | 47.74 | 48.42 | 1.70 | 3.15 |
| 65-69 | 42.34 | 48.82 | 60.26 | 51.74 | 59.65 | 69.69 | 75.02 | 16.82 | 25.76 |
| 70-74 | 56.11 | 72.63 | 75.16 | 83.42 | 94.28 | 97.56 | 109.70 | 3.48 | 16.36 |
| 75-79 | 61.05 | 90.70 | 100.56 | 103.35 | 134.30 | 137.90 | 146.50 | 2.68 | 9.09 |
| 80-84 | 113.78 | 107.30 | 143.38 | 130.90 | 162.80 | 198.70 | 211.80 | 22.05 | 30.10 |
| 85++ | 146.92 | 132.59 | 133.18 | 203.58 | 222.31 | 253.70 | 302.40 | 14.12 | 36.03 |
| λ_t | 11.83 | 13.54 | 14.92 | 15.79 | 17.89 | 19.41 | 20.85 | 8.51 | 16.56 |

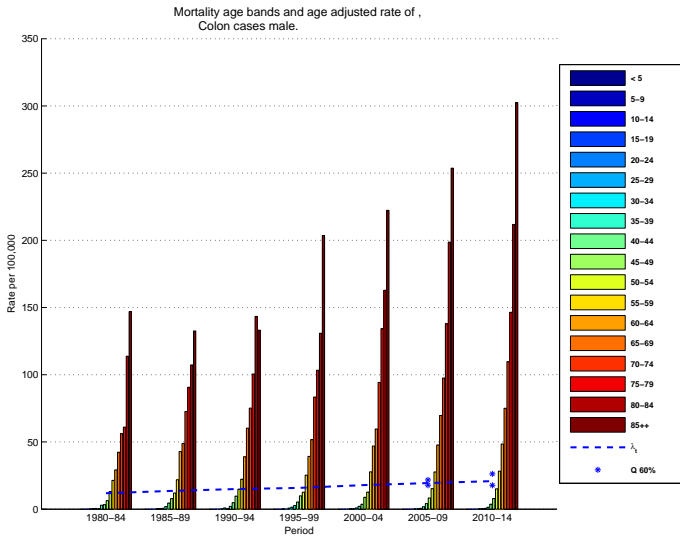


Table: Mortality Leukemia cancer

| | 80-84 | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}$ | $\% \delta_{04-14}$ |
|-------------|-------|-------|-------|-------|-------|-------|-------|---------------------|---------------------|
| 0-4 | 1.27 | 1.73 | 1.07 | 0.54 | 0.21 | 0.36 | 0.30 | 70.61 | 39.46 |
| 5-9 | 2.69 | 1.13 | 1.21 | 0.39 | 0.86 | 0.48 | 0.37 | -44.00 | -57.65 |
| 10-14 | 1.65 | 1.71 | 0.84 | 0.83 | 0.92 | 0.62 | 0.49 | -32.11 | -46.86 |
| 15-19 | 2.21 | 1.64 | 1.79 | 0.82 | 1.57 | 0.73 | 0.55 | -53.38 | -64.65 |
| 20-24 | 1.60 | 1.98 | 1.24 | 1.21 | 1.14 | 0.87 | 0.68 | -23.06 | -40.37 |
| 25-29 | 1.64 | 1.77 | 1.92 | 1.26 | 1.01 | 0.96 | 0.84 | -4.34 | -16.68 |
| 30-34 | 2.56 | 1.05 | 1.80 | 1.08 | 1.37 | 1.17 | 1.00 | -14.32 | -26.69 |
| 35-39 | 2.27 | 2.41 | 1.82 | 1.95 | 1.59 | 1.57 | 1.42 | -0.95 | -10.53 |
| 40-44 | 2.70 | 3.76 | 1.82 | 2.55 | 2.17 | 2.13 | 1.91 | -2.04 | -12.21 |
| 45-49 | 3.75 | 3.69 | 2.48 | 3.07 | 3.58 | 2.87 | 2.71 | -19.81 | -24.17 |
| 50-54 | 5.29 | 5.53 | 4.68 | 4.79 | 4.13 | 3.99 | 3.85 | -3.33 | -6.81 |
| 55-59 | 7.43 | 6.99 | 5.72 | 4.83 | 5.71 | 5.29 | 5.07 | -7.49 | -11.21 |
| 60-64 | 8.08 | 9.93 | 5.61 | 7.49 | 6.58 | 7.42 | 7.12 | 12.70 | 8.16 |
| 65-69 | 13.24 | 11.57 | 10.93 | 12.52 | 13.93 | 11.37 | 11.22 | -18.39 | -19.47 |
| 70-74 | 17.79 | 23.19 | 18.07 | 19.47 | 17.03 | 18.04 | 17.42 | 5.93 | 2.29 |
| 75-79 | 27.36 | 22.71 | 24.53 | 20.64 | 27.80 | 25.46 | 25.31 | -8.43 | -8.97 |
| 80-84 | 34.39 | 38.83 | 45.51 | 37.47 | 34.81 | 37.90 | 37.82 | 8.88 | 8.65 |
| 85++ | 49.94 | 49.95 | 48.90 | 53.96 | 45.90 | 51.30 | 52.95 | 11.77 | 15.36 |
| λ_t | 5.31 | 5.32 | 4.63 | 4.44 | 4.46 | 4.29 | 4.11 | -3.97 | -7.89 |

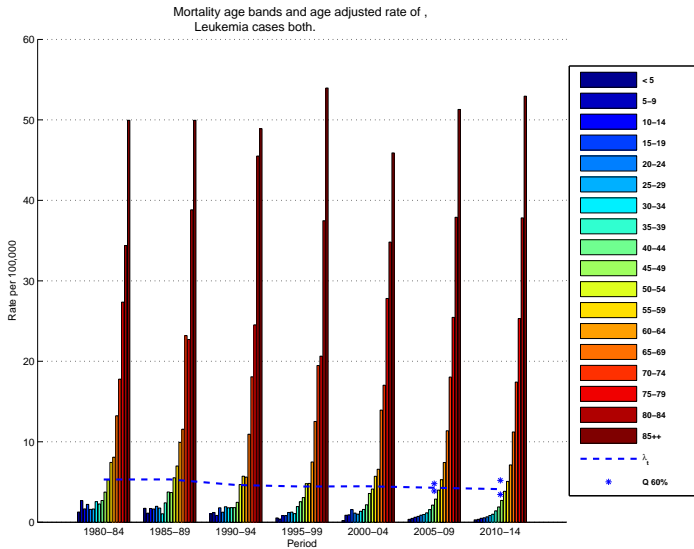


Table: Mortality Prostate cancer

| | 80-84 | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | $\% \delta_{04-09}^{\hat{\delta}}$ | $\% \delta_{04-14}^{\hat{\delta}}$ |
|--------------|--------|--------|--------|--------|--------|--------|--------|------------------------------------|------------------------------------|
| 0-4 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 5-9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 10-14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 15-19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 20-24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 25-29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 30-34 | 0.18 | 0.00 | 0.00 | 0.16 | 0.31 | 0.00 | 0.00 | * | * |
| 35-39 | 0.00 | 0.00 | 0.18 | 0.17 | 0.00 | 0.00 | 0.00 | * | * |
| 40-44 | 0.00 | 0.62 | 0.19 | 0.71 | 0.17 | 0.17 | 0.17 | -0.41 | -0.47 |
| 45-49 | 0.55 | 1.19 | 2.11 | 1.56 | 1.26 | 0.67 | 0.51 | -47.12 | -59.74 |
| 50-54 | 5.93 | 4.20 | 4.15 | 4.13 | 2.99 | 2.31 | 1.70 | -22.73 | -43.11 |
| 55-59 | 14.61 | 14.90 | 13.44 | 13.91 | 8.00 | 7.16 | 5.50 | -10.48 | -31.23 |
| 60-64 | 29.19 | 35.22 | 35.99 | 34.09 | 24.75 | 19.30 | 14.65 | -22.01 | -40.80 |
| 65-69 | 52.50 | 70.65 | 70.98 | 66.47 | 50.07 | 41.46 | 32.37 | -17.20 | -35.35 |
| 70-74 | 131.31 | 139.96 | 157.03 | 136.83 | 110.66 | 96.59 | 77.73 | -12.71 | -29.76 |
| 75-79 | 227.25 | 241.18 | 276.37 | 270.22 | 242.50 | 199.60 | 164.20 | -17.69 | -32.29 |
| 80-84 | 437.50 | 404.26 | 501.83 | 512.39 | 437.43 | 400.90 | 334.10 | -8.35 | -23.62 |
| 85++ | 728.81 | 682.36 | 956.72 | 991.45 | 982.27 | 841.80 | 738.75 | -14.30 | -24.79 |
| λ_t | 28.12 | 28.48 | 34.54 | 34.21 | 30.32 | 26.13 | 21.86 | -13.84 | -27.91 |

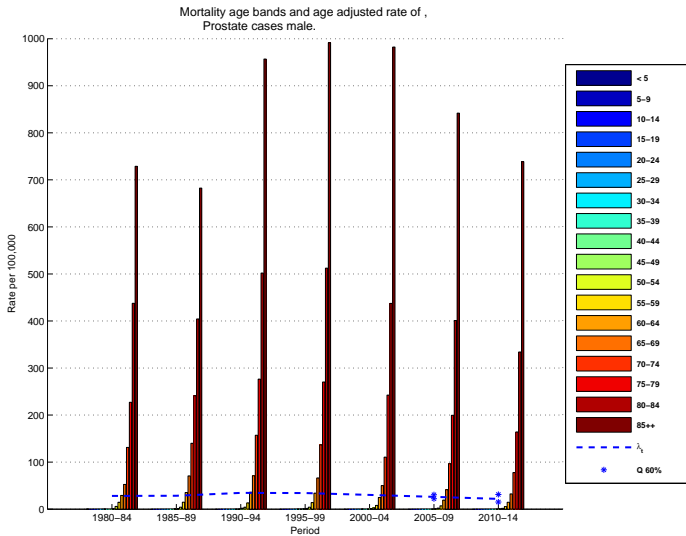
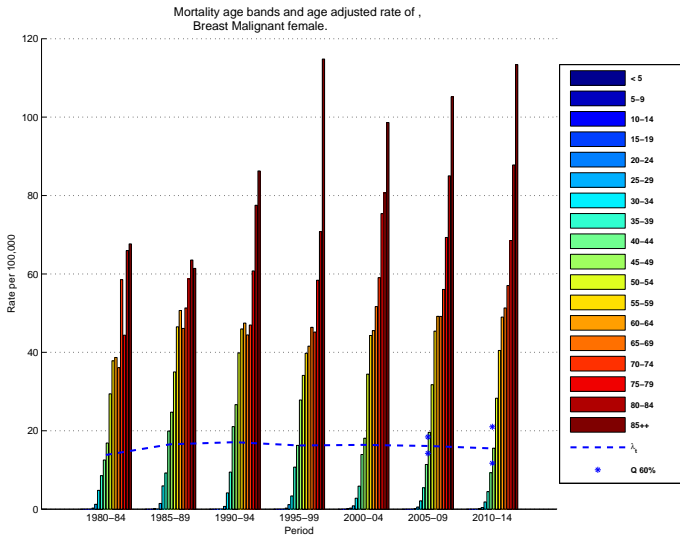


Table: Mortality Breast Malignant cancer

| | 80-84 | 85-89 | 90-94 | 95-99 | 00-04 | 05-09 | 10-14 | % δ_{04-09}^c | % δ_{04-14}^c |
|-------------|-------|-------|-------|--------|-------|--------|--------|----------------------|----------------------|
| 0-4 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 5-9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 10-14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | * | * |
| 15-19 | 0.00 | 0.12 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 | * | * |
| 20-24 | 0.28 | 0.00 | 0.00 | 0.27 | 0.27 | 0.14 | 0.14 | -48.95 | -48.43 |
| 25-29 | 1.24 | 1.46 | 0.71 | 1.15 | 0.85 | 0.55 | 0.42 | -35.30 | -50.47 |
| 30-34 | 4.80 | 5.94 | 4.14 | 3.38 | 2.79 | 2.13 | 1.84 | -23.73 | -34.26 |
| 35-39 | 8.55 | 9.24 | 9.45 | 10.72 | 5.88 | 5.46 | 4.47 | -7.18 | -24.05 |
| 40-44 | 12.54 | 19.92 | 21.06 | 16.26 | 13.93 | 11.40 | 9.30 | -18.16 | -33.23 |
| 45-49 | 16.87 | 24.74 | 26.66 | 27.83 | 18.09 | 19.58 | 15.55 | 8.24 | -14.04 |
| 50-54 | 29.43 | 35.00 | 39.88 | 34.11 | 34.43 | 31.74 | 28.30 | -7.82 | -17.81 |
| 55-59 | 37.85 | 46.52 | 45.98 | 39.77 | 44.29 | 45.42 | 40.48 | 2.55 | -8.60 |
| 60-64 | 38.69 | 50.68 | 47.46 | 41.57 | 45.54 | 49.18 | 48.99 | 8.00 | 7.58 |
| 65-69 | 36.10 | 46.11 | 44.45 | 46.39 | 51.67 | 49.16 | 51.33 | -4.86 | -0.66 |
| 70-74 | 58.55 | 51.32 | 46.98 | 45.18 | 59.04 | 56.05 | 57.03 | -5.06 | -3.40 |
| 75-79 | 44.39 | 58.77 | 60.77 | 58.38 | 75.39 | 69.31 | 68.53 | -8.06 | -9.10 |
| 80-84 | 65.97 | 63.54 | 77.51 | 70.78 | 80.70 | 85.01 | 87.80 | 5.34 | 8.80 |
| 85++ | 67.67 | 61.40 | 86.26 | 114.82 | 98.62 | 105.20 | 113.40 | 6.67 | 14.99 |
| λ_t | 13.83 | 16.55 | 17.08 | 16.25 | 16.40 | 16.12 | 15.49 | -1.71 | -5.55 |



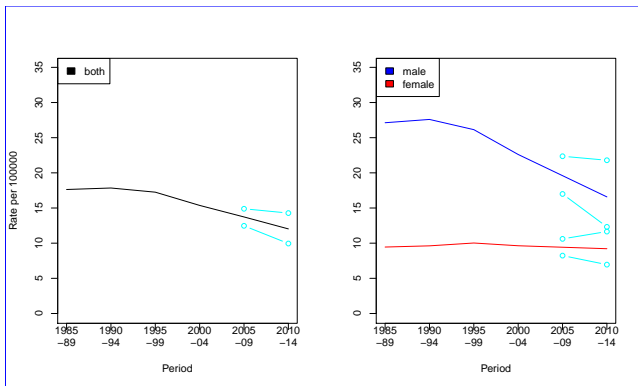
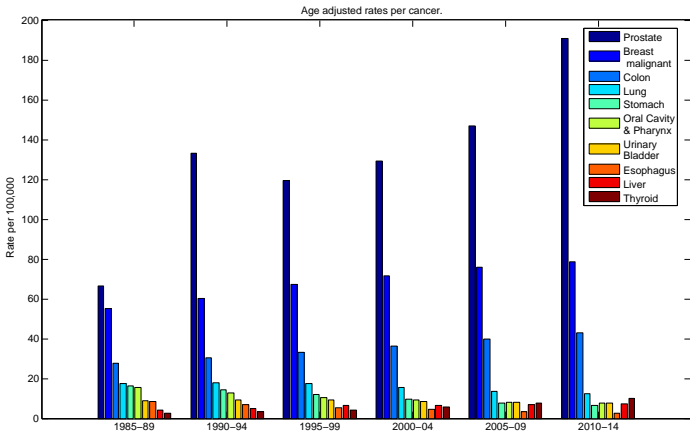
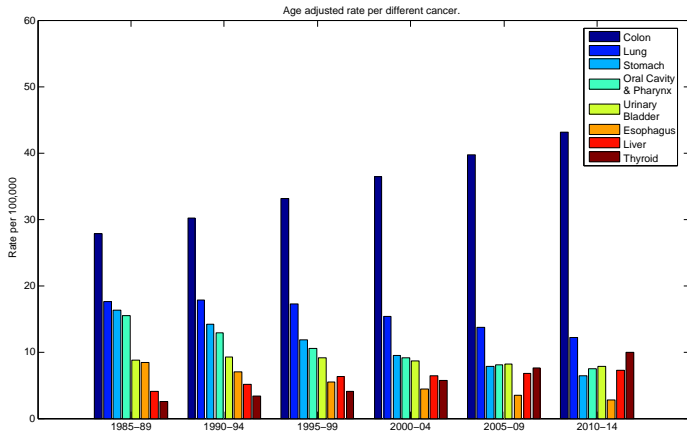


Figure: Incidence age adjusted rate for Lung cancer cases by gender.





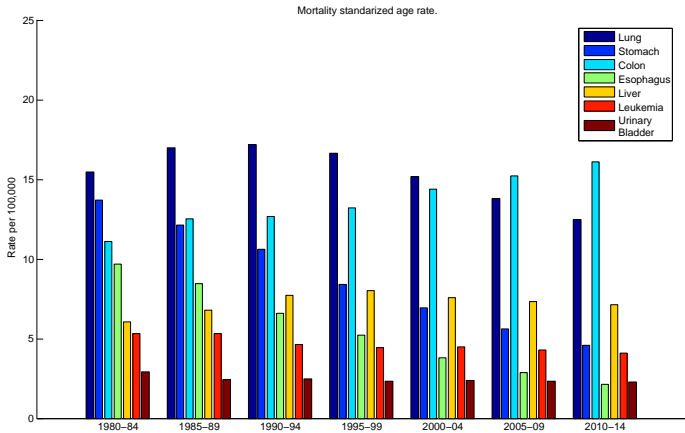


Table: Completeness for all Incidence cancer sites.

| | 2005 | DCO 2005 | Estimated | Q25 | Q75 | Completeness |
|--------------|--------------|------------|--------------|--------------|--------------|--------------|
| 00-04 yr | 40 | 5 | 35 | 30 | 40 | 129% |
| 05-09 yr | 26 | 0 | 25 | 21 | 29 | 104% |
| 10-14 yr | 22 | 0 | 26 | 22 | 30 | 85% |
| 15-19 yr | 32 | 1 | 38 | 33 | 43 | 87% |
| 20-24 yr | 62 | 1 | 61 | 54 | 68 | 103% |
| 25-29 yr | 90 | 0 | 105 | 96 | 115 | 86% |
| 30-34 yr | 138 | 1 | 159 | 146 | 171 | 87% |
| 35-39 yr | 231 | 3 | 237 | 221 | 254 | 99% |
| 40-44 yr | 373 | 7 | 375 | 352 | 397 | 101% |
| 45-49 yr | 567 | 12 | 538 | 507 | 571 | 108% |
| 50-54 yr | 779 | 24 | 772 | 732 | 815 | 104% |
| 55-59 yr | 1176 | 42 | 1175 | 1112 | 1242 | 104% |
| 60-64 yr | 1364 | 51 | 1348 | 1280 | 1428 | 105% |
| 65-69 yr | 1512 | 77 | 1512 | 1432 | 1595 | 105% |
| 70-74 yr | 1413 | 106 | 1518 | 1439 | 1596 | 100% |
| 75-79 yr | 1183 | 134 | 1253 | 1184 | 1319 | 105% |
| 80-84 yr | 730 | 148 | 1036 | 985 | 1094 | 85% |
| 85+ yr | 535 | 240 | 905 | 857 | 956 | 86% |
| Total | 10273 | 852 | 11118 | 10503 | 11763 | 100% |

Observations and Conclusions. I

- Predictions of overall cancer rates increased for incidence, but mortality rates are slightly decreasing in PR, except for Colorectal cancer.
- Age specific trends of overall cancer incidence rates predicts an increase in aged between 40 – 74, and reveal a deceleration or decline at old ages (75+).
- Incidences in Colon, Liver, Thyroid and Uterus are on the increase, and also in Prostate and Breast Malignant. Speed of Thyroid increase is sticking.
- Colon cancer mortality is virtually the only one on the increase in Puerto Rico, for both genres.
- Colon is the cancer type with highest rate increment in PR.
- Cancer in the lung incidence is lowering significantly for males but stagnant in women in PR.

Conclusion-Completeness

- The APC model enables us to accurately predict the cancer incidence and mortality in Puerto Rico. Given that PR is a Hispanic population with different cancer rates behavior as compared to US race ethnicity groups, the estimate of completeness based in APC model lead us to use as a tool of estimate overall completeness of cancer cases in PR, by comparing current data with predictions, taking into account age ranges and genres.
- Completeness 2005: As an example, for the year 2005 the data already obtained and cleared as "bona fide" amounts to the figure of 100.06%, so completeness is reasonably guaranteed.