

References material supporting that when cancer is detected at an early stage the probability to save lives increases greatly

Dario Crosetto to Richard Garwin, November 2, 2008

Here is the quantitative information about the benefit of early cancer detection found in SEER statistics: SURVIVAL RATES, BY RACE, SEX, DIAGNOSIS YEAR, STAGE AND AGE

For Prostate cancer please see Table XXIII-5 on page 6 of 19 of:

http://seer.cancer.gov/csr/1975_2005/results_merged/sect_23_prostate.pdf

(I am also attaching the single page to this document at page 2)

Please notice at mid page, 5-YR RELATIVE SURVIVAL RATES, 1996-2004. For the STAGE on the left column, localized/Regional is 100.% and Distant is 31.7%

The value 91% Localized/Regional on the left column, in the group STAGE DISTRIBUTION versus 4% for the distant is an indication that a good number of early detections are found

For Breast cancer please see Table IV-10 on page 12 of 36 of:

http://seer.cancer.gov/csr/1975_2005/results_merged/sect_04_breast.pdf

(I am also attaching the single page to this document at page 3)

Please notice at mid page, 5-YR RELATIVE SURVIVAL RATES, 1996-2004. For the STAGE on the left column, localized/Regional is 98.1.% and Distant is 27.1%

The value 61% Localized/Regional on the left column, in the group STAGE DISTRIBUTION versus 6% for the distant is an indication that a good number of early detections are found

For Colon and Rectal cancer see Table VI-9 on page 11/34 of:

http://seer.cancer.gov/csr/1975_2005/results_merged/sect_06_colon_rectum.pdf

(I am also attaching the single page to this document at page 4)

Please notice at mid page, 5-YR RELATIVE SURVIVAL RATES, 1996-2004. For the STAGE on the left column, localized/Regional is 89.7% and Distant is 10.8%

The value 40% Localized/Regional on the left column, in the group STAGE DISTRIBUTION versus 19% for the distant is an indication that fewer early detections are found and there are more cases of late detection.

For Lung and Bronchus cancer see Table XV-9 on page 11 of 38 of:

http://seer.cancer.gov/csr/1975_2005/results_merged/sect_15_lung_bronchus.pdf

(I am also attaching the single page to this document at page 5)

Please notice at mid page, 5-YR RELATIVE SURVIVAL RATES, 1996-2004. For the STAGE on the left column, localized/Regional is 49.5% and Distant is 2.8%

The value 16% Localized/Regional on the left column, in the group STAGE DISTRIBUTION versus 51% for the distant is an indication that fewer early detections are found and there are more cases of late detection.

From the above data can be seen the beneficial role of early detection (although data should be collected differently in order to show the precise positive impact of early detection versus late detection). See www.crosettofoundation.com/uploads.231.pdf

Table XXIII-5
PROSTATE CANCER (Invasive)

SURVIVAL RATES, BY RACE, DIAGNOSIS YEAR, STAGE AND AGE

	All Races, Males			White Males			Black Males		
	All	<65	65+	All	<65	65+	All	<65	65+
<u>5-YR RELATIVE SURVIVAL RATES</u>									
YEAR OF DIAGNOSIS:									
1960-1963 ^a	-	-	-	50	-	-	35	-	-
1970-1973 ^a	-	-	-	63	-	-	55	-	-
1975-1977 ^b	68.9	73.4	67.3	69.8	75.2	67.8	61.3	61.9	61.0
1978-1980 ^b	72.0	75.7	70.6	73.2	77.2	71.8	62.8	65.3	61.5
1981-1983 ^b	73.8	76.4	72.8	74.9	78.0	73.9	63.7	65.4	62.9
1984-1986 ^b	76.1	77.5	75.6	77.3	79.1	76.7	66.3	67.3	65.8
1987-1989 ^b	83.9	83.4	84.0	85.4	84.8	85.6	72.2	72.9	72.0
1990-1992 ^b	94.2	93.4	94.4	95.3	94.4	95.6	85.5	87.0	84.9
1993-1995 ^b	95.4	95.8	95.2	96.2	96.5	96.0	91.5	92.9	90.5
1996-2004 ^b	98.9 ^e	99.2 ^e	99.1 ^e	99.4 ^e	99.5 ^e	99.6 ^e	95.9 ^e	98.0 ^e	94.3 ^e
<u>5-YR PERIOD SURVIVAL RATES^{cd}</u>									
YEAR OF DIAGNOSIS:									
1996-2004	99.9	99.3	99.8	99.9	99.7	99.8	96.3	97.9	94.5
<u>STAGE DISTRIBUTION (%) 1996-2004^c</u>									
All Stages									
Number of cases	324,062	118,154	205,908	258,296	92,400	165,896	40,796	18,954	21,842
Percent	100%	100%	100%	100%	100%	100%	100%	100%	100%
Localized/Regional	91	95	89	92	95	90	89	93	86
Distant	4	3	5	4	3	5	6	5	8
Unstaged	4	2	5	4	2	5	5	3	7
<u>5-YR RELATIVE SURVIVAL RATES, 1996-2004^c</u>									
AGE AT DIAGNOSIS:									
<45	94.5	-	-	94.0	-	-	95.5	-	-
45-54	97.5	-	-	97.8	-	-	96.5	-	-
55-64	99.5	-	-	99.7	-	-	98.2	-	-
65-74	100.0	-	-	100.0	-	-	96.7	-	-
75+	96.0	-	-	96.6	-	-	85.7	-	-
Under 65	99.0	-	-	99.3	-	-	97.6	-	-
65 and over	99.3	-	-	99.7	-	-	93.6	-	-
STAGE:									
All Stages	98.9	99.0	99.3	99.5	99.3	99.7	95.4	97.6	93.6
Localized/Regional	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Distant	31.7	32.0	31.7	30.9	32.0	30.6	29.4	28.3	30.1
Unstaged	79.4	88.7	76.8	79.1	89.6	76.2	72.2	83.2	67.3

^a Rates are based on End Results data from a series of hospital registries and one population-based registry.
^b Rates are from the SEER 9 areas (San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta).
Rates are based on follow-up of patients into 2005.
^c Rates are from the SEER 17 areas (San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta, San Jose-Monterey, Los Angeles, Alaska Native Registry, Rural Georgia, California excluding SF/SJM/LA, Kentucky, Louisiana and New Jersey). California excluding SF/SJM/LA, Kentucky, Louisiana, and New Jersey contribute cases for diagnosis years 2000-2004. The remaining 13 SEER Areas contribute cases for the entire period 1996-2004. Rates are based on follow-up of patients into 2005.
^d Period survival provides a more up-to-date estimate of survival by piecing together the most recent conditional survival estimates from several cohorts. It is computed here using three calendar year blocks (2002-2004: 0-1 year survival), (2001-2003: 1-2 year survival), (2000-2002: 2-3 year survival), (1999-2001: 3-4 year survival), (1998-2000: 4-5 years survival).
^e The difference in rates between 1975-1977 and 1996-2004 is statistically significant (p<.05).
^f The standard error of the survival rate is between 5 and 10 percentage points.
^g The standard error of the survival rate is greater than 10 percentage points.
- Statistic could not be calculated due to fewer than 16 cases during the time period.

Table IV-10
FEMALE BREAST CANCER (Invasive)

SURVIVAL RATES, BY RACE, DIAGNOSIS YEAR, STAGE AND AGE

	All Races, Females			White Females			Black Females		
	All	<50	50+	All	<50	50+	All	<50	50+
<u>5-YR RELATIVE SURVIVAL RATES</u>									
YEAR OF DIAGNOSIS:									
1960-1963 ^a	-	-	-	63	-	-	46	-	-
1970-1973 ^a	-	-	-	68	-	-	51	-	-
1975-1977 ^b	75.1	76.7	74.6	75.9	77.9	75.2	62.3	62.6	62.2
1978-1980 ^b	74.9	75.6	74.7	75.6	76.2	75.4	63.9	67.1	62.0
1981-1983 ^b	76.7	77.5	76.5	77.7	78.7	77.4	64.1	65.3	63.4
1984-1986 ^b	79.3	77.9	79.8	80.4	79.7	80.7	65.2	64.0	65.9
1987-1989 ^b	84.2	81.5	85.2	85.3	82.9	86.2	71.3	69.6	72.2
1990-1992 ^b	85.5	83.4	86.3	86.7	85.1	87.3	71.8	70.3	72.8
1993-1995 ^b	86.6	84.3	87.5	88.0	86.3	88.6	72.8	70.0	74.5
1996-2004 ^b	89.3 ^e	87.6 ^e	90.0 ^e	90.5 ^e	89.3 ^e	91.0 ^e	77.8 ^e	75.8 ^e	79.1 ^e
<u>5-YR PERIOD SURVIVAL RATES^{cd}</u>									
YEAR OF DIAGNOSIS:									
1996-2004	89.3	87.4	89.9	90.4	88.9	91.0	77.7	76.6	78.5
<u>STAGE DISTRIBUTION (%) 1996-2004^c</u>									
All Stages									
Number of cases	295,133	73,948	221,185	245,831	57,329	188,502	26,263	8,732	17,531
Percent	100%	100%	100%	100%	100%	100%	100%	100%	100%
Localized	61	54	63	62	54	64	51	46	53
Regional	31	39	28	31	39	28	37	43	33
Distant	6	5	6	6	5	6	10	9	10
Unstaged	2	2	2	2	1	2	3	2	3
<u>5-YR RELATIVE SURVIVAL RATES, 1996-2004^c</u>									
AGE AT DIAGNOSIS:									
<45	85.2	-	-	86.9	-	-	73.3	-	-
45-54	89.0	-	-	90.4	-	-	77.7	-	-
55-64	89.8	-	-	90.9	-	-	78.2	-	-
65-74	90.4	-	-	91.2	-	-	79.8	-	-
75+	88.5	-	-	89.2	-	-	77.5	-	-
Under 65	88.4	-	-	89.8	-	-	76.5	-	-
65 and over	89.6	-	-	90.4	-	-	78.9	-	-
STAGE:									
All Stages	88.7	86.9	89.4	89.9	88.4	90.4	77.1	75.2	78.2
Localized	98.1	95.5	98.9	98.6	96.1	99.4	93.1	90.4	94.5
Regional	83.8	83.1	84.2	85.2	84.9	85.4	72.3	71.5	72.9
Distant	27.1	33.9	24.8	28.8	38.0	26.0	17.1	18.5	16.4
Unstaged	56.9	70.7	52.6	57.7	73.9	53.2	45.8	51.2	43.2
<i>IN SITU</i> ^h	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.3	100.0

^a Rates are based on End Results data from a series of hospital registries and one population-based registry.

^b Rates are from the SEER 9 areas (San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta). Rates are based on follow-up of patients into 2005.

^c Rates are from the SEER 17 areas (San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta, San Jose-Monterey, Los Angeles, Alaska Native Registry, Rural Georgia, California excluding SF/SJM/LA, Kentucky, Louisiana and New Jersey). California excluding SF/SJM/LA, Kentucky, Louisiana, and New Jersey contribute cases for diagnosis years 2000-2004. The remaining 13 SEER Areas contribute cases for the entire period 1996-2004. Rates are based on follow-up of patients into 2005.

^d Period survival provides a more up-to-date estimate of survival by piecing together the most recent conditional survival estimates from several cohorts. It is computed here using three calendar year blocks (2002-2004: 0-1 year survival), (2001-2003: 1-2 year survival), (2000-2002: 2-3 year survival), (1999-2001: 3-4 year survival), (1998-2000: 4-5 years survival).

^e The difference in rates between 1975-1977 and 1996-2004 is statistically significant ($p < .05$).

^f The standard error of the survival rate is between 5 and 10 percentage points.

^g The standard error of the survival rate is greater than 10 percentage points.

^h *In situ* cases are not included in the All Stages group.

- Statistic could not be calculated due to fewer than 16 cases during the time period.

Table VI-9
COLON AND RECTUM CANCER (Invasive)

SURVIVAL RATES, BY RACE, SEX, DIAGNOSIS YEAR, STAGE AND AGE

	All Races			Whites			Blacks		
	Total	Males	Females	Total	Males	Females	Total	Males	Females
<u>5-YR RELATIVE SURVIVAL RATES</u>									
YEAR OF DIAGNOSIS:									
1960-1963 ^a	-	-	-	-	-	-	-	-	-
1970-1973 ^a	-	-	-	-	-	-	-	-	-
1975-1977 ^b	50.8	49.8	51.7	50.9	50.1	51.7	46.1	44.4	47.1
1978-1980 ^b	52.5	51.5	53.4	52.9	51.9	53.8	46.2	44.3	47.5
1981-1983 ^b	55.4	55.2	55.7	55.8	55.8	55.9	47.5	43.9	50.3
1984-1986 ^b	58.5	58.4	58.6	59.2	59.2	59.3	49.1	48.2	49.8
1987-1989 ^b	60.6	60.9	60.4	61.1	61.6	60.6	53.4	51.2	55.3
1990-1992 ^b	62.4	62.4	62.4	63.2	63.1	63.2	53.8	55.5	52.3
1993-1995 ^b	60.9	60.4	61.4	61.5	61.0	62.1	52.9	51.7	53.9
1996-2004 ^b	65.3 ^e	65.4 ^e	65.2 ^e	66.3 ^e	66.4 ^e	66.2 ^e	56.0 ^e	56.1 ^e	55.9 ^e
<u>5-YR PERIOD SURVIVAL RATES^{cd}</u>									
YEAR OF DIAGNOSIS:									
1996-2004	65.4	65.6	65.3	66.3	66.5	66.1	57.0	57.1	57.0
<u>STAGE DISTRIBUTION (%) 1996-2004^c</u>									
All Stages									
Number of cases	204,212	103,110	101,102	166,480	84,530	81,950	20,392	9,435	10,957
Percent	100%	100%	100%	100%	100%	100%	100%	100%	100%
Localized	40	40	39	40	41	39	35	36	35
Regional	36	36	37	36	36	37	34	34	35
Distant	19	20	19	19	19	19	24	25	24
Unstaged	5	4	5	5	4	5	6	6	7
<u>5-YR RELATIVE SURVIVAL RATES, 1996-2004^c</u>									
AGE AT DIAGNOSIS:									
<45	66.3	65.8	66.8	68.2	67.2	69.4	57.4	57.9	56.9
45-54	67.7	66.9	68.7	68.8	67.8	70.0	58.9	57.8	60.1
55-64	66.7	66.4	67.3	67.8	67.4	68.4	57.1	56.2	58.2
65-74	66.0	65.5	66.6	66.8	66.2	67.3	57.2	56.5	57.8
75+	59.6	59.9	59.4	60.7	61.2	60.3	46.3	44.3	47.4
Under 65	67.0	66.4	67.6	68.2	67.5	69.1	57.8	57.0	58.6
65 and over	62.8	63.1	62.6	63.6	64.0	63.3	52.3	51.7	52.7
STAGE:									
All Stages	64.4	64.5	64.3	65.3	65.4	65.2	55.1	54.7	55.5
Localized	89.7	89.7	89.8	90.3	90.3	90.2	84.4	83.6	85.1
Regional	68.4	68.4	68.5	69.2	69.3	69.2	61.2	61.6	60.9
Distant	10.8	10.5	11.2	11.1	10.6	11.6	8.3	8.3	8.2
Unstaged	36.6	39.9	33.6	36.0	39.8	32.5	33.7	33.4	33.5

^a Rates are based on End Results data from a series of hospital registries and one population-based registry.

^b Rates are from the SEER 9 areas (San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta).

Rates are based on follow-up of patients into 2005.

^c Rates are from the SEER 17 areas (San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta, San Jose-Monterey, Los Angeles, Alaska Native Registry, Rural Georgia, California excluding SF/SJM/LA, Kentucky, Louisiana and New Jersey). California excluding SF/SJM/LA, Kentucky, Louisiana, and New Jersey contribute cases for diagnosis years 2000-2004. The remaining 13 SEER Areas contribute cases for the entire period 1996-2004. Rates are based on follow-up of patients into 2005.

^d Period survival provides a more up-to-date estimate of survival by piecing together the most recent conditional survival estimates from several cohorts. It is computed here using three calendar year blocks (2002-2004: 0-1 year survival), (2001-2003: 1-2 year survival), (2000-2002: 2-3 year survival), (1999-2001: 3-4 year survival), (1998-2000: 4-5 years survival).

^e The difference in rates between 1975-1977 and 1996-2004 is statistically significant ($p < .05$).

^f The standard error of the survival rate is between 5 and 10 percentage points.

^g The standard error of the survival rate is greater than 10 percentage points.

- Statistic could not be calculated due to fewer than 16 cases during the time period.

Table XV-9
LUNG AND BRONCHUS CANCER (Invasive)

SURVIVAL RATES, BY RACE, SEX, DIAGNOSIS YEAR, STAGE AND AGE

	All Races			Whites			Blacks		
	Total	Males	Females	Total	Males	Females	Total	Males	Females
5-YR RELATIVE SURVIVAL RATES									
YEAR OF DIAGNOSIS:									
1960-1963 ^a	-	-	-	8	7	11	5	5	6
1970-1973 ^a	-	-	-	10	9	14	7	6	10
1975-1977 ^b	12.7	11.5	15.8	12.8	11.5	15.9	11.4	10.6	14.0
1978-1980 ^b	13.3	11.8	16.7	13.4	12.0	16.6	12.0	10.0	17.9
1981-1983 ^b	13.7	12.1	16.9	13.9	12.3	17.1	11.7	10.5	15.1
1984-1986 ^b	13.3	11.6	16.4	13.5	11.7	16.7	11.4	10.6	13.0
1987-1989 ^b	13.5	12.4	15.4	13.8	12.5	15.8	11.2	11.1	11.4
1990-1992 ^b	14.1	12.6	16.3	14.5	13.0	16.6	10.8	9.6	12.8
1993-1995 ^b	14.8	12.9	17.4	15.1	13.1	17.7	13.0	11.5	15.8
1996-2004 ^b	15.7 ^e	13.5 ^e	18.2 ^e	15.9 ^e	13.7 ^e	18.4 ^e	12.7 ^e	11.0	15.1
5-YR PERIOD SURVIVAL RATES^{cd}									
YEAR OF DIAGNOSIS:									
1996-2004	15.5	13.3	17.9	15.8	13.6	18.2	12.1	10.4	14.4
STAGE DISTRIBUTION (%) 1996-2004^c									
All Stages									
Number of cases	244,474	134,234	110,240	203,259	109,417	93,842	25,770	15,347	10,423
Percent	100%	100%	100%	100%	100%	100%	100%	100%	100%
Localized	16	15	18	16	15	18	14	12	15
Regional	25	26	24	25	26	25	25	26	25
Distant	51	53	50	51	52	49	55	56	54
Unstaged	8	7	8	8	7	8	6	6	7
5-YR RELATIVE SURVIVAL RATES, 1996-2004^c									
AGE AT DIAGNOSIS:									
<45	23.4	20.8	26.1	25.6	23.6	27.6	15.5	12.0	19.5
45-54	18.1	14.7	22.4	18.8	15.0	23.4	13.8	11.5	17.5
55-64	17.3	14.8	20.7	17.9	15.3	21.1	13.3	11.3	16.8
65-74	15.2	13.1	17.7	15.4	13.2	17.9	11.3	10.0	13.0
75+	10.7	9.4	11.9	10.8	9.5	12.1	8.3	7.0	9.4
Under 65	18.0	15.2	21.7	18.7	15.8	22.3	13.7	11.4	17.4
65 and over	13.3	11.6	15.1	13.5	11.8	15.3	10.2	9.1	11.7
STAGE:									
All Stages	15.2	13.1	17.6	15.5	13.4	17.9	12.1	10.4	14.5
Localized	49.5	44.7	54.0	50.1	45.5	54.3	41.2	37.0	46.1
Regional	20.6	18.8	22.7	20.7	19.0	22.7	17.5	15.5	20.4
Distant	2.8	2.4	3.3	2.7	2.3	3.2	2.7	2.4	3.2
Unstaged	8.3	7.7	8.9	7.8	7.3	8.4	9.3	8.6	10.1

^a Rates are based on End Results data from a series of hospital registries and one population-based registry.

^b Rates are from the SEER 9 areas (San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta).

Rates are based on follow-up of patients into 2005.

^c Rates are from the SEER 17 areas (San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta, San Jose-Monterey, Los Angeles, Alaska Native Registry, Rural Georgia, California excluding SF/SJM/LA, Kentucky, Louisiana and New Jersey). California excluding SF/SJM/LA, Kentucky, Louisiana, and New Jersey contribute cases for diagnosis years 2000-2004. The remaining 13 SEER Areas contribute cases for the entire period 1996-2004. Rates are based on follow-up of patients into 2005.

^d Period survival provides a more up-to-date estimate of survival by piecing together the most recent conditional survival estimates from several cohorts. It is computed here using three calendar year blocks (2002-2004: 0-1 year survival), (2001-2003: 1-2 year survival), (2000-2002: 2-3 year survival), (1999-2001: 3-4 year survival), (1998-2000: 4-5 years survival).

^e The difference in rates between 1975-1977 and 1996-2004 is statistically significant ($p < .05$).

^f The standard error of the survival rate is between 5 and 10 percentage points.

^g The standard error of the survival rate is greater than 10 percentage points.

- Statistic could not be calculated due to fewer than 16 cases during the time period.

SEER (summary of the data from the previous SEER tables)	LOCAL (Early detection)	LOCAL (5-YR Survival following early detection)	DISTANT (Diagnose at an advance Stage)	DISTANT (5-YR Survival following a diagnose at an advance stage)
PROSTATE	91%	100%	4%	31%
BREAST	61%	98.1%	6%	27.1%
COLON	40%	89.7%	19%	10.8%
LUNG	16%	49.5%	51%	2.8%