



# Interim Progress Report: Frederick, Maryland Cancer Investigation

Monday, October 4, 2010  
Frederick, Maryland



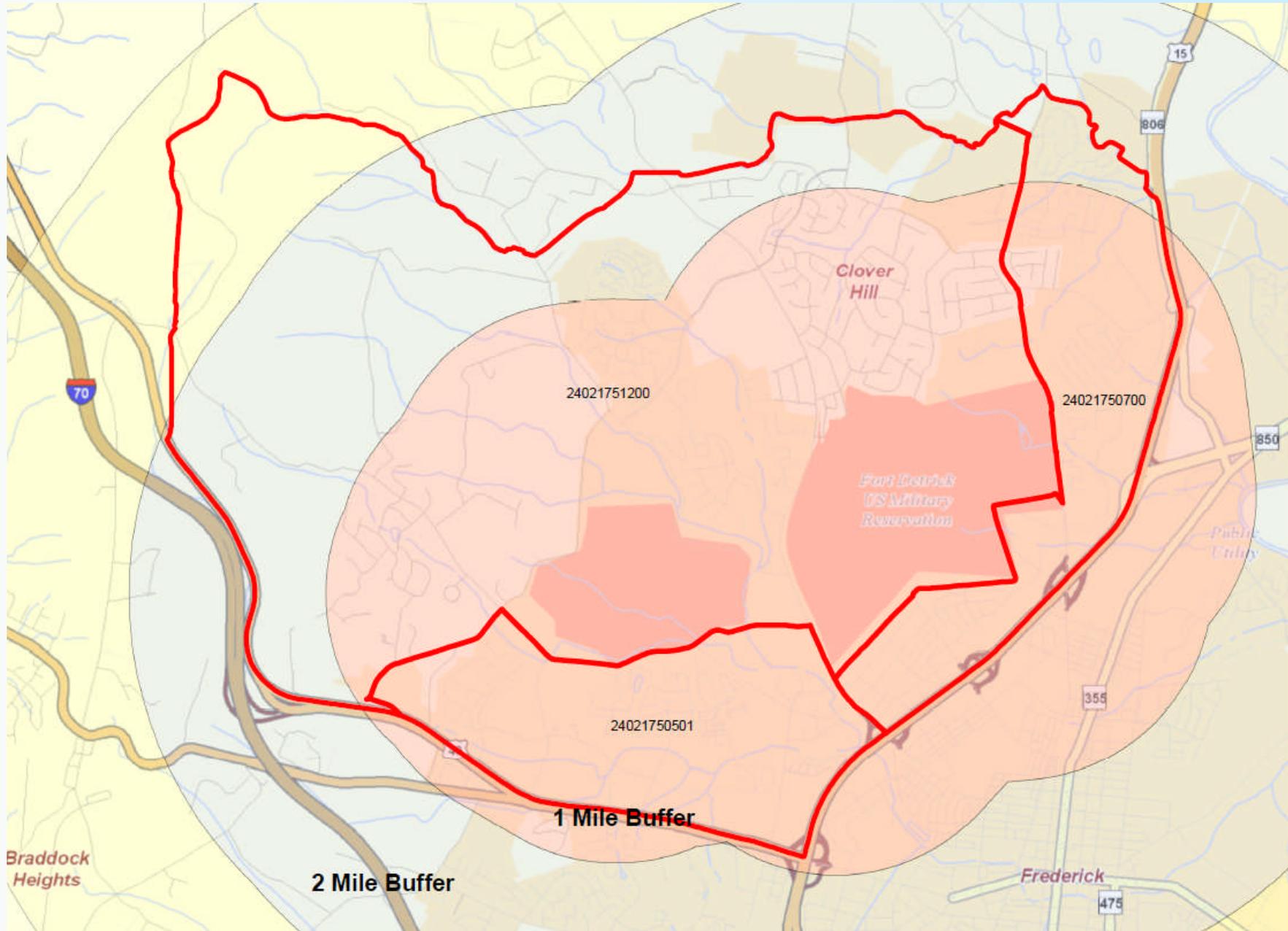
# Purpose

- Describe progress to date on cancer investigation involving Maryland Cancer Registry, Center for Environmental Health Coordination, and Frederick County Health Department



# Background

- Initial review: 3 census tracts around Ft. Detrick
- Data: All cancers in the Maryland Cancer Registry for 2000-2007
- Population comparisons for 2000:
  - Investigation tracts: 26,464
  - Frederick City: 52,767
  - Frederick County: 196,577





# Is The Number of Cancers More (Or Less) Than Expected?

- One way to answer this question – the Standardized Incidence Ratio (SIR)
- To figure out how many cancers expected, use a comparison population (Frederick County, Maryland)
- Compare the actual number of cases observed in the 3 tracts with how many you would expect



# How Did We Determine The Expected Number Of Cancers?

- For all cancers and each type of cancer:
  1. Look at the known *age-specific* rate of cancer in the comparison population (Maryland, Frederick County)
  2. Multiply the RATE by the NUMBER of people in that age group in the 3 census tracts
  3. Add up the number in each age group to get the total number of cases expected



# EXAMPLE

- Suppose we have 200 people, 100 under age 30, 100 age 30 and over
- If the *age-specific* rate for people under 30 is 10 cases per hundred per year, we would EXPECT 10 cases in that group
- If the *age-specific* rate for people 30 and over is 15 cases per hundred per year, we would EXPECT 15 cases in that group
- The TOTAL EXPECTED cases would be 25



# Confidence Intervals

- Because these are ESTIMATES, we always allow for some uncertainty
- A *Confidence Interval* allows for some uncertainty, but is our best guess
- For SIRs, if the 95% Confidence Interval includes 1.0, it means that the number observed is within our best guess estimate for the number expected



# All Cancers

Observed Number of Cases in CT 750501, 750700, 751200	1,059
^ Expected Number of Cases based on Frederick County rates 2000-2007	1,072
SIR** compared to Frederick County	0.99
95% CI	0.93-1.05
Census Tracts 750501, 750700, 751200 Statistically different from Frederick County	No
Expected Number of Cases based on Maryland 2000-2007	957
SIR** compared to Maryland	1.11
95% CI	1.04-1.17
Census Tracts 750501, 750700, 751200 Statistically different from Maryland	Yes

SEER Stat with data as of 12/01/2009 were used to calculate expected number of cases using Frederick County and Maryland rates.

CT\* Census Tract

SIR\*\* Standard Incidence Ratio= Observed/Expected Cases

^ expected number of cases=( 2000-2007 Frederick or Maryland State cancer rates by age) X ( estimated population by age of CT 750501,750700,751200)



# Cancer Type: Lung and Bronchus

Observed Number of Cases in CT 750501, 750700, 751200	149
^ Expected Number of Cases based on Frederick County rates 2000-2007	141
SIR** compared to Frederick County	1.06
95% CI	0.89-1.24
Census Tracts 750501, 750700, 751200 Statistically different from Frederick County	No
Expected Number of Cases based on Maryland 2000-2007	133
SIR** compared to Maryland	1.12
95% CI	0.94-1.31
Census Tracts 750501, 750700, 751200 Statistically different from Maryland	No

SEER Stat with data as of 12/01/2009 were used to calculate expected number of cases using Frederick County and Maryland rates.

CT\* Census Tract

SIR\*\* Standard Incidence Ratio= Observed/Expected Cases

^ expected number of cases=( 2000-2007 Frederick or Maryland State cancer rates by age) X ( estimated population by age of CT 750501,750700,751200)



# Cancer Type: Female Breast Cancer

Observed Number of Cases in CT 750501, 750700, 751200	159
^ Expected Number of Cases based on Frederick County rates 2000-2007	161
SIR** compared to Frederick County	0.99
95% CI	0.84-1.15
Census Tracts 750501, 750700, 751200 Statistically different from Frederick County	No
Expected Number of Cases based on Maryland 2000-2007	148
SIR** compared to Maryland	1.07
95% CI	0.91-1.25
Census Tracts 750501, 750700, 751200 Statistically different from Maryland	No

SEER Stat with data as of 12/01/2009 were used to calculate expected number of cases using Frederick County and Maryland rates.

CT\* Census Tract

SIR\*\* Standard Incidence Ratio= Observed/Expected Cases

^ expected number of cases=( 2000-2007 Frederick or Maryland State cancer rates by age) X ( estimated population by age of CT 750501,750700,751200)



# Cancer Type: Colorectal Cancer

Observed Number of Cases in CT 750501, 750700, 751200	102
^ Expected Number of Cases based on Frederick County rates 2000-2007	114
SIR** compared to Frederick County	0.89
95% CI	0.73-1.08
Census Tracts 750501, 750700, 751200 Statistically different from Frederick County	No
Expected Number of Cases based on Maryland 2000-2007	99
SIR** compared to Maryland	1.03
95% CI	0.83-1.24
Census Tracts 750501, 750700, 751200 Statistically different from Maryland	No

SEER Stat with data as of 12/01/2009 were used to calculate expected number of cases using Frederick County and Maryland rates.

CT\* Census Tract

SIR\*\* Standard Incidence Ratio= Observed/Expected Cases

^ expected number of cases=( 2000-2007 Frederick or Maryland State cancer rates by age) X ( estimated population by age of CT 750501,750700,751200)



# Cancer Type: Prostate Cancer

Observed Number of Cases in CT 750501, 750700, 751200	141
^ Expected Number of Cases based on Frederick County rates 2000-2007	146
SIR** compared to Frederick County	0.96
95% CI	0.81-1.14
Census Tracts 750501, 750700, 751200 Statistically different from Frederick County	No
Expected Number of Cases based on Maryland 2000-2007	136
SIR** compared to Maryland	1.04
95% CI	0.87-1.22
Census Tracts 750501, 750700, 751200 Statistically different from Maryland	No

SEER Stat with data as of 12/01/2009 were used to calculate expected number of cases using Frederick County and Maryland rates.

CT\* Census Tract

SIR\*\* Standard Incidence Ratio= Observed/Expected Cases

^ expected number of cases=( 2000-2007 Frederick or Maryland State cancer rates by age) X ( estimated population by age of CT 750501,750700,751200)



# Brain and Central Nervous System Cancer

Observed Number of Cases in CT 750501, 750700, 751200	11
^ Expected Number of Cases based on Frederick County rates 2000-2007	17
SIR** compared to Frederick County	0.66
95% CI	0.32-1.15
Census Tracts 750501, 750700, 751200 Statistically different from Frederick County	No
Expected Number of Cases based on Maryland 2000-2007	14
SIR** compared to Maryland	0.80
95% CI	0.39-1.41
Census Tracts 750501, 750700, 751200 Statistically different from Maryland	No

SEER Stat with data as of 12/01/2009 were used to calculate expected number of cases using Frederick County and Maryland rates.

CT\* Census Tract

SIR\*\* Standard Incidence Ratio= Observed/Expected Cases

^ expected number of cases=( 2000-2007 Frederick or Maryland State cancer rates by age) X ( estimated population by age of CT 750501,750700,751200)



# Kidney and Bladder Cancer

Observed Number of Cases in CT 750501, 750700, 751200	79
^ Expected Number of Cases based on Frederick County rates 2000-2007	76
SIR** compared to Frederick County	1.04
95% CI	0.82-1.29
Census Tracts 750501, 750700, 751200 Statistically different from Frederick County	No
Expected Number of Cases based on Maryland 2000-2007	65
SIR** compared to Maryland	1.21
95% CI	0.95-1.50
Census Tracts 750501, 750700, 751200 Statistically different from Maryland	No

SEER Stat with data as of 12/01/2009 were used to calculate expected number of cases using Frederick County and Maryland rates.

CT\* Census Tract

SIR\*\* Standard Incidence Ratio= Observed/Expected Cases

^ expected number of cases=( 2000-2007 Frederick or Maryland State cancer rates by age) X ( estimated population by age of CT 750501,750700,751200)

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October 4, 2010

15



# Leukemia and Lymphoma

Observed Number of Cases in CT 750501, 750700, 751200	79
^ Expected Number of Cases based on Frederick County rates 2000-2007	71
SIR** compared to Frederick County	1.11
95% CI	0.88-1.38
Census Tracts 750501, 750700, 751200 Statistically different from Frederick County	No
Expected Number of Cases based on Maryland 2000-2007	63
SIR** compared to Maryland	1.26
95% CI	1.00-1.57
Census Tracts 750501, 750700, 751200 Statistically different from Maryland	No

SEER Stat with data as of 12/01/2009 were used to calculate expected number of cases using Frederick County and Maryland rates.

CT\* Census Tract

SIR\*\* Standard Incidence Ratio= Observed/Expected Cases

^ expected number of cases=( 2000-2007 Frederick or Maryland State cancer rates by age) X ( estimated population by age of CT 750501,750700,751200)



# Thyroid Cancer

Observed Number of Cases in CT 750501, 750700, 751200	29
^ Expected Number of Cases based on Frederick County rates 2000-2007	32
SIR** compared to Frederick County	0.90
95% CI	0.60-1.29
Census Tracts 750501, 750700, 751200 Statistically different from Frederick County	No
Expected Number of Cases based on Maryland 2000-2007	24
SIR** compared to Maryland	1.18
95% CI	0.78-1.69
Census Tracts 750501, 750700, 751200 Statistically different from Maryland	No

SEER Stat with data as of 12/01/2009 were used to calculate expected number of cases using Frederick County and Maryland rates.

CT\* Census Tract

SIR\*\* Standard Incidence Ratio= Observed/Expected Cases

^ expected number of cases=( 2000-2007 Frederick or Maryland State cancer rates by age) X ( estimated population by age of CT 750501,750700,751200)

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October 4, 2010

17



# Preliminary Findings

- Compared with Frederick County as a whole, the number of cancers observed in the 3 census tracts from 2000-2007 (all causes and each type investigated) is not statistically different than expected
- Compared with Maryland as a whole, the total number of cancers is slightly higher than expected (but not for the individual types of cancers)



# Geographic Distribution

- We also have started to look at mapped cancers by individual type of cancer
- No apparent geographic clustering of individual types of cancers so far



# Summary of All Cancers

**Number of Frederick County Census Tracts\* 750501,750700,751200  
Cases Observed and Expected with Cancer specific Sites SIRs 2000-2007**

	Cancer Type					Cancer Type			
	All sites	Lung & Bronchus	Female Breast	Colorectal Cancer	Prostate	Brain & CNS	Kidney & Bladder	Leukemia & Lymphoma	Thyroid
Observed Number of Cases in CT 750501, 750700, 751200	1059	149	159	102	141	11	79	79	29
^ Expected Number of Cases based on Frederick County rates 2000-2007	1072	141	161	114	146	17	76	71	32
SIR** compared to Frederick County	0.99	1.06	0.99	0.89	0.96	0.66	1.04	1.11	0.90
95% CI	0.93-1.05	0.89-1.24	0.84-1.15	0.73-1.08	0.81-1.14	0.32-1.15	0.82-1.29	0.88-1.38	0.60-1.29
CT 750501, 750700, 751200 Statistically different from Frederick County	No	No	No	No	No	No	No	No	No
Expected Number of Cases based on Maryland rates 2000-2007	957	133	148	99	136	14	65	63	24
SIR** compared to Maryland	1.11	1.12	1.07	1.03	1.04	0.80	1.21	1.26	1.18
95% CI	1.04-1.17	0.94-1.31	0.91-1.25	0.83-1.24	0.87-1.22	0.39-1.41	0.95-1.50	1.00-1.57	0.78-1.69
CT 750501, 750700, 751200 Statistically different from Maryland	Yes	No	No	No	No	No	No	No	No

SEER Stat with data as of 12/01/2009 were used to calculate expected number of cases using Frederick County and Maryland rates.

CT\* Census Tract

SIR\*\* Standard Incidence Ratio= Observed/Expected Cases

^ expected number of cases=( 2000-2007 Frederick or Maryland State cancer rates by age) X ( estimated population by age of CT 750501 ,750700,751200)