

An Occupational Health Investigation of Cancers Among Fire Fighters in Anne Arundel County, Maryland

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Cancer Clusters

Definition:

“...greater than expected number of cancer cases that occurs within a group of people in a geographic area over a period of time.”

Identification:

Suspected when statistics show or people report that several family members, friends, neighbors, or coworkers, have been diagnosed with the same or related cancer(s).



Why clusters occur

- Common causes
 - Example: Asbestos, Vinyl Chloride
- Chance
 - Some clusters would be expected just by chance grouping.



Why concern for clusters of cancer in fire fighters?

Cancers can be caused by exposure to chemicals and toxic agents.

- **Fire fighters, by the nature of their occupation, are exposed to chemical compounds generated by fires, which can include toxins and carcinogens.**
 - Benzene
 - Carbon monoxide
 - PAHs
 - Particles
 - Plastics and combustion products



How researchers investigate clusters

- **Gather information**

- How many cases and what types of cancer?
- What is common about the cases?
- What are the common exposures?

- **Compare observed rates to expected rates from the same area**

- **Carry out more detailed studies:**

- Cohort studies or Case-control studies



How researchers find causes of cancer

- To find what might have caused the cancers, researchers will first ask fire fighters, particularly those with cancer, for more details about their past exposures.
- A follow-up study could be done if necessary
- Two main types of follow-up studies:
 - Cohort studies
 - Example: Follow a group of fire fighters for 10 years to see who develops brain cancer.
 - Case-control studies
 - Example: Ask fire fighters with brain cancer and controls without brain cancer about exposures.



Scope of Current Investigation

- **Review published scientific studies**
 - Search databases that contain peer-reviewed articles
 - Search Criteria
 - Cancer risk in fire fighters
 - Cancer risk associated with polychlorinated biphenyls (PCBs)
 - Brain cancer and occupation
 - Summarize findings in evidence tables and graphs.



Current Investigation

Studies have shown fire fighters have higher mortality rates than the general population for certain conditions.

Example table of studies reporting risk estimates for cancers of the brain and nervous system

Study	Population	Obs. # cases	Risk estimate	95% CI	Comments
Baris et al. 2001	7789 Philly FF employed b/w 1925-1986	Brain mortality= 8	SMR= 61	31-122	Relative to US white males
Grimes et al. 1991	205 male FF from Honolulu	Brain and other CNS= 3	Risk Ratio= 3.78	1.22-11.71	Relative to other males from Hawaii
	Caucasian FF	Brain and other CNS= 2	Risk Ratio= 4.15	1.04-16.51	Relative to other males from Hawaii
	Hawaiian FF	Brain and other CNS= 1	Risk Ratio= 3.60	0.49-26.46	Relative to other males from Hawaii

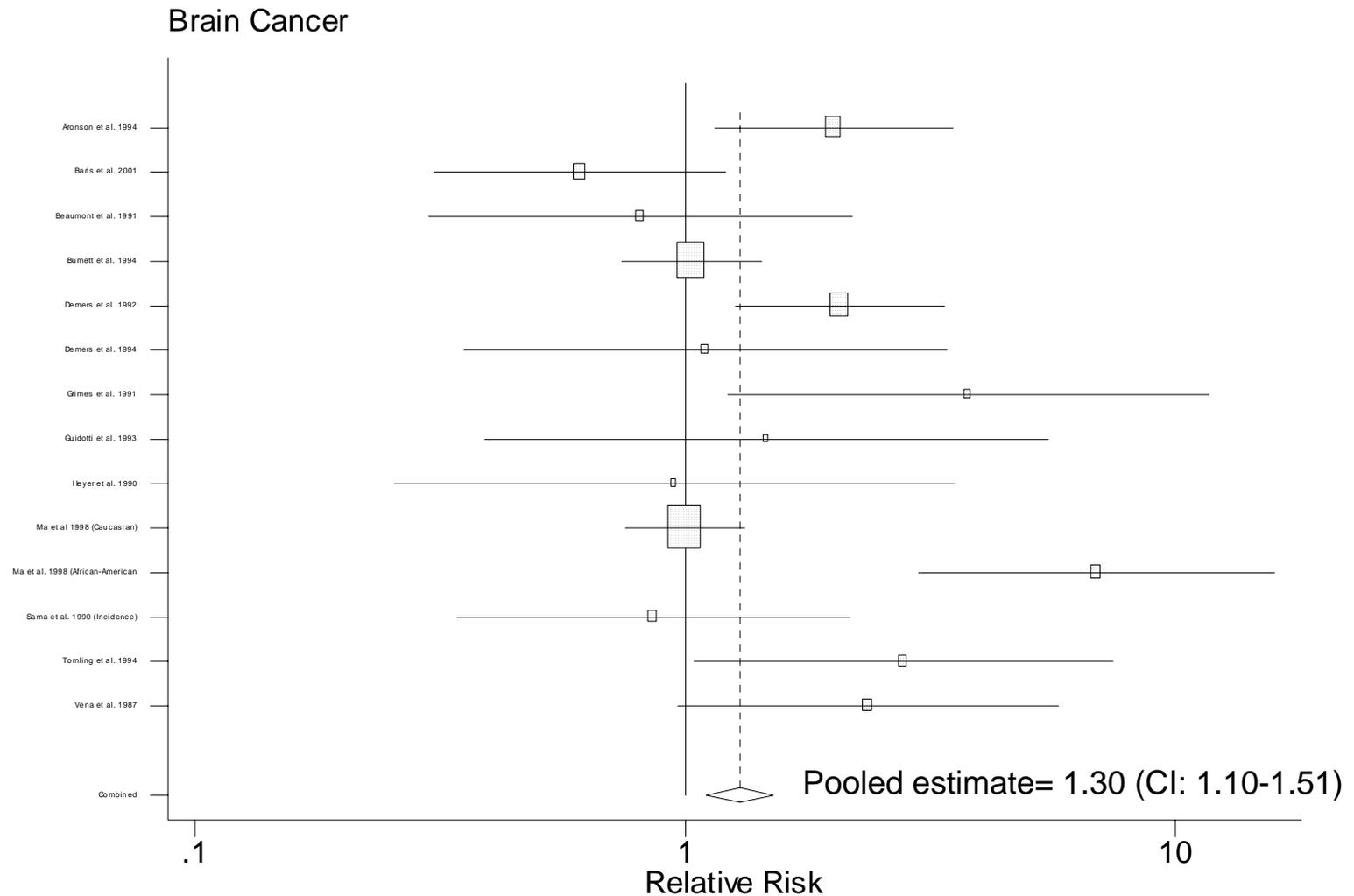


Current Investigation

- By pooling data, we can evaluate the data on increased mortality rates from multiple studies.
- Plots are created to graphically display individual studies and pooled data.

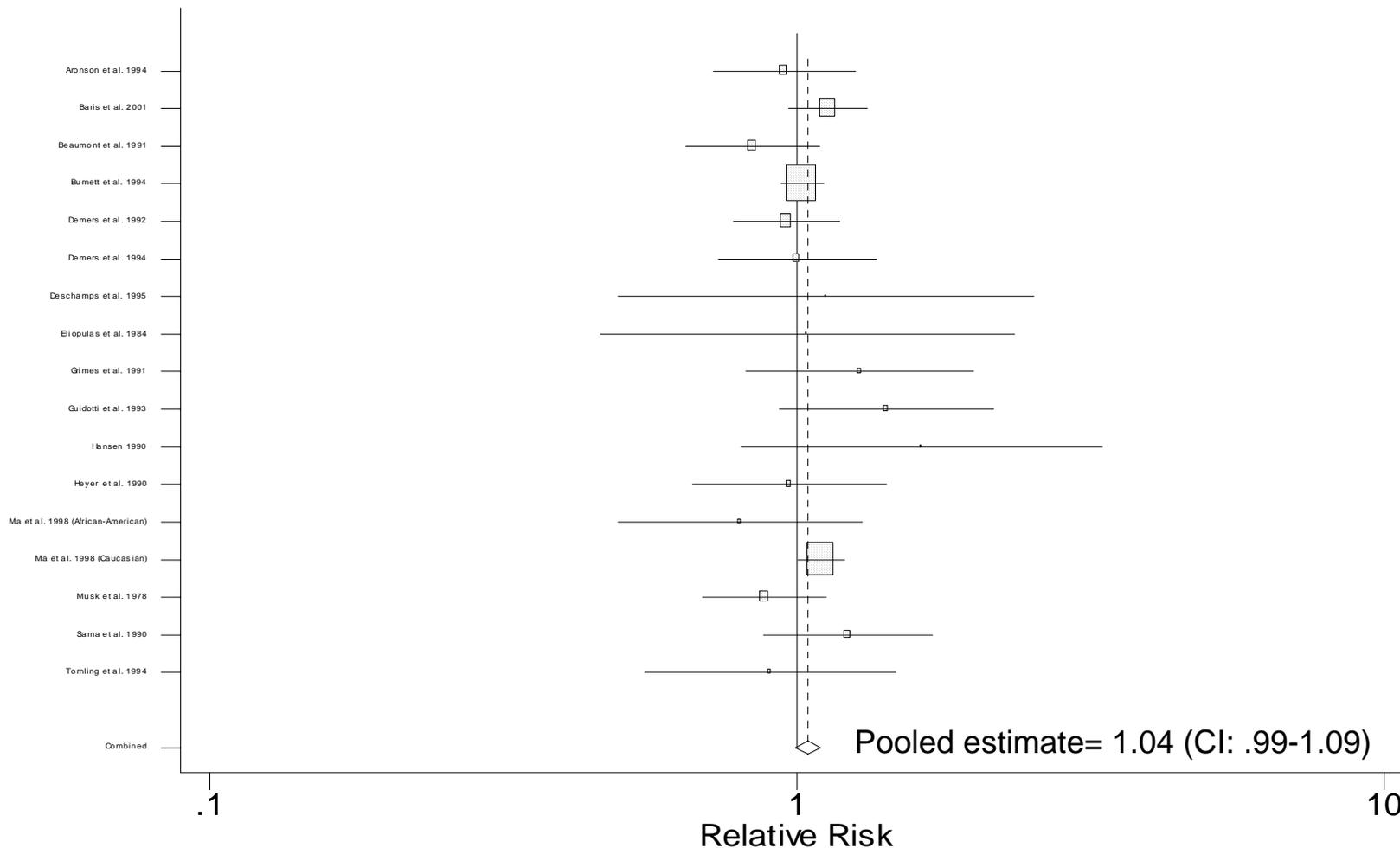


Pooled Data for Brain Cancer



Pooled Data for Lung Cancer

Resp/Lung Cancer



Current Investigation

- **Gather information on cases**

- Speak with fire fighters and families to obtain information on past exposures and the development of cancer.

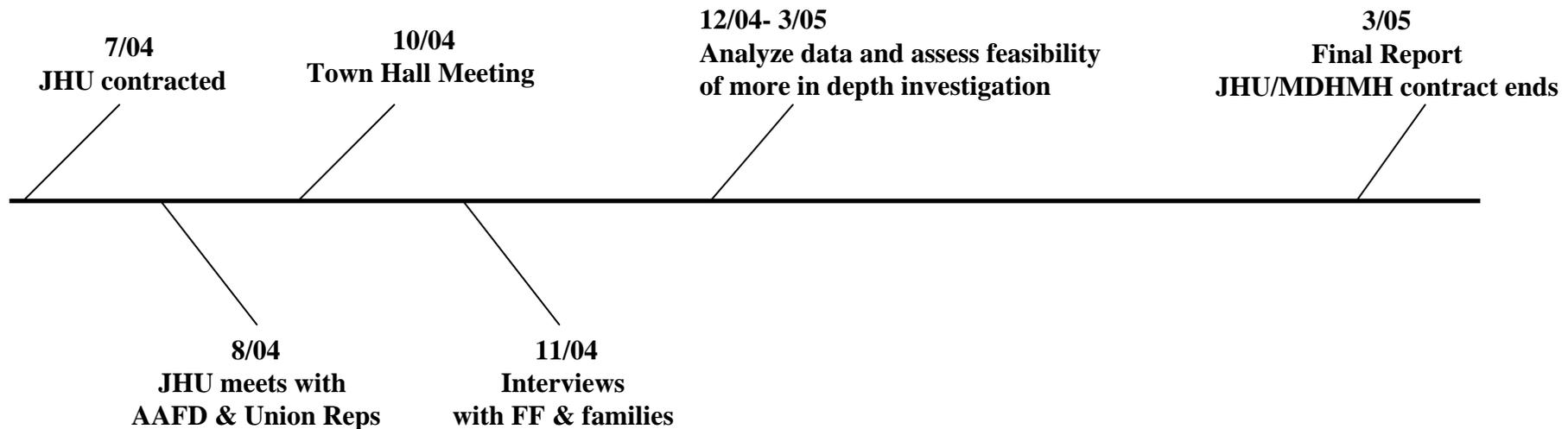
- **Look at specific chemicals that the fire fighters were exposed to**

- Example: PCBs

Feasibility and need for follow-up investigations



Timeline of Cancer Cluster Investigation



Additional Information

- http://cis.nci.nih.gov/fact/3_58.htm
- <http://www.cdc.gov/nceh/clusters/>
- <http://www.cdc.gov/niosh/topics/cancer/>
- <http://www3.cancer.gov/atlasplus/new.html>
- <http://www.cancer.gov/publications>
- <http://www.atsdr.cdc.gov/atsdrhome.html>



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