

# *Demographic Analysis*

*John Lathrop, Ph.D.*

**Subcommittee 4: Communication & Outreach**



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# What is a Demographic Analysis? And Why?

## ➤ A spreadsheet analysis combining:

- NTPR records of how many participated in each test series, and how many qualify as Atomic Vets who were in Hiroshima & Nagasaki, and their birth years (of some of them)
- Actuarial Data on how long people live, who were born in year 1910, 1911, etc.
- Data on the “Healthy Soldier Effect”

## ➤ To calculate:

- How many Atomic Veterans are still living
- How that number will diminish with time, through mortality



BAKER (CROSSROADS)  
Bikini Atoll, 23 kt  
24 July 1946

## ➤ So that we can:

- Plan in a more informed way
- Establish a relationship between pace of outreach and how many we can reach



# What Fraction Are Still With Us in 2011?

	Series	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934
1945	Hiroshima	.002	.010	.018	.025	.033	.041	.049	.057	.065	.073	.081	.110	.140	.170	.200	.229	.259	.289	.318	.348	.378	This grey area rejects YC corresponding to the v less than 16 yrs of at the series.			
1945	Nagasaki	.002	.010	.018	.025	.033	.041	.049	.057	.065	.073	.081	.110	.140	.170	.200	.229	.259	.289	.318	.348	.378				
1945	Trinity	.002	.010	.018	.025	.033	.041	.049	.057	.065	.073	.081	.110	.140	.170	.200	.229	.259	.289	.318	.348	.378				
1945	Post-Trinity	.002	.010	.018	.025	.033	.041	.049	.057	.065	.073	.081	.110	.140	.170	.200	.229	.259	.289	.318	.348	.378				
1946	Crossroads	.002	.010	.018	.026	.033	.041	.049	.057	.065	.073	.081	.111	.141	.170	.200	.230	.259	.289	.319	.349	.378				
1946	Post-Crossroads	.002	.010	.018	.026	.033	.041	.049	.057	.065	.073	.081	.111	.141	.170	.200	.230	.259	.289	.319	.349	.378				
1948	Sandstone	.002	.010	.018	.026	.034	.042	.050	.058	.066	.073	.081	.111	.141	.171	.201	.230	.260	.290	.320	.350	.379	.409	.438		
1948	Post-Sandstone	.002	.010	.018	.026	.034	.042	.050	.058	.066	.073	.081	.111	.141	.171	.201	.230	.260	.290	.320	.350	.379	.409	.438		
1951	Ranger	.002	.010	.018	.026	.034	.042	.050	.058	.066	.074	.082	.112	.142	.172	.202	.232	.262	.292	.322	.351	.381	.411	.440	.469	.498
1951	Post-Ranger	.002	.010	.018	.026	.034	.042	.050	.058	.066	.074	.082	.112	.142	.172	.202	.232	.262	.292	.322	.351	.381	.411	.440	.469	.498
1951	Greenhouse	.002	.010	.018	.026	.034	.042	.050	.058	.066	.074	.082	.112	.142	.172	.202	.232	.262	.292	.322	.351	.381	.411	.440	.469	.498
1951	Post Greenhouse	.002	.010	.018	.026	.034	.042	.050	.058	.066	.074	.082	.112	.142	.172	.202	.232	.262	.292	.322	.351	.381	.411	.440	.469	.498
1951	Buster-Jangle	.002	.010	.018	.026	.034	.042	.050	.058	.066	.074	.082	.112	.142	.172	.202	.232	.262	.292	.322	.351	.381	.411	.440	.469	.498
1951	Post-Buster-Jangle	.002	.010	.018	.026	.034	.042	.050	.058	.066	.074	.082	.112	.142	.172	.202	.232	.262	.292	.322	.351	.381	.411	.440	.469	.498
1952	Tumbler-Snapper	.002	.010	.018	.026	.034	.042	.050	.058	.066	.074	.082	.112	.142	.172	.202	.232	.262	.292	.322	.352	.382	.411	.440	.469	.498
1952	Post-Tumbler-Snapper	.002	.010	.018	.026	.034	.042	.050	.058	.066	.074	.082	.112	.142	.172	.202	.232	.262	.292	.322	.352	.382	.411	.440	.469	.498
1953	Ivy	.002	.010	.018	.026	.034	.042	.050	.058	.066	.074	.082	.112	.142	.173	.203	.233	.263	.293	.323	.353	.383	.412	.441	.470	.499
1953	Post-Ivy	.002	.010	.018	.026	.034	.042	.050	.058	.066	.074	.082	.112	.142	.173	.203	.233	.263	.293	.323	.353	.383	.412	.441	.470	.499
1953	Upshot-Knothole	.002	.010	.018	.026	.034	.042	.050	.058	.066	.074	.082	.112	.142	.173	.203	.233	.263	.293	.323	.353	.383	.412	.441	.470	.499
1953	Post-Upshot-Knothole	.002	.010	.018	.026	.034	.042	.050	.058	.066	.074	.082	.112	.142	.173	.203	.233	.263	.293	.323	.353	.383	.412	.441	.470	.499
1954	Castle	.002	.010	.018	.026	.034	.042	.050	.058	.066	.074	.083	.113	.143	.173	.203	.233	.263	.293	.324	.354	.384	.413	.442	.471	.500
1954	Post-Castle	.002	.010	.018	.026	.034	.042	.050	.058	.066	.074	.083	.113	.143	.173	.203	.233	.263	.293	.324	.354	.384	.413	.442	.471	.500
1955	Teapot	.002	.010	.018	.026	.034	.042	.050	.058	.067	.075	.083	.113	.143	.173	.203	.234	.264	.294	.324	.354	.385	.414	.443	.471	.500
1955	Post-Teapot	.002	.010	.018	.026	.034	.042	.050	.058	.067	.075	.083	.113	.143	.173	.203	.234	.264	.294	.324	.354	.385	.414	.443	.471	.500
1955	Wigwam	.002	.010	.018	.026	.034	.042	.050	.058	.067	.075	.083	.113	.143	.173	.203	.234	.264	.294	.324	.354	.385	.414	.443	.471	.500
1955	Post-Wigwam	.002	.010	.018	.026	.034	.042	.050	.058	.067	.075	.083	.113	.143	.173	.203	.234	.264	.294	.324	.354	.385	.414	.443	.471	.500
1956	Redwing	.002	.010	.018	.026	.034	.042	.050	.059	.067	.075	.083	.113	.143	.174	.204	.234	.264	.295	.325	.355	.385	.414	.443	.472	.501
1956	Post-Redwing	.002	.010	.018	.026	.034	.042	.050	.059	.067	.075	.083	.113	.143	.174	.204	.234	.264	.295	.325	.355	.385	.414	.443	.472	.501
1957	Plumbbob	.002	.010	.018	.026	.034	.042	.051	.059	.067	.075	.083	.114	.144	.174	.204	.235	.265	.295	.325	.356	.386	.415	.444	.473	.502
1957	Post-Plumbbob	.002	.010	.018	.026	.034	.042	.051	.059	.067	.075	.083	.114	.144	.174	.204	.235	.265	.295	.325	.356	.386	.415	.444	.473	.502
1958	Hardtack I	.002	.010	.018	.026	.034	.043	.051	.059	.067	.075	.083	.114	.144	.174	.205	.235	.265	.296	.326	.356	.387	.416	.445	.474	.503
1958	Post-Hardtack I	.002	.010	.018	.026	.034	.043	.051	.059	.067	.075	.083	.114	.144	.174	.205	.235	.265	.296	.326	.356	.387	.416	.445	.474	.503
1958	Argus	.002	.010	.018	.026	.034	.043	.051	.059	.067	.075	.083	.114	.144	.174	.205	.235	.265	.296	.326	.356	.387	.416	.445	.474	.503
1958	Hardtack II	.002	.010	.018	.026	.034	.043	.051	.059	.067	.075	.083	.114	.144	.174	.205	.235	.265	.296	.326	.356	.387	.416	.445	.474	.503
1958	Post-Hardtack II	.002	.010	.018	.026	.034	.043	.051	.059	.067	.075	.083	.114	.144	.174	.205	.235	.265	.296	.326	.356	.387	.416	.445	.474	.503
1962	Dominic I	.002	.010	.018	.027	.035	.043	.052	.060	.068	.076	.085	.115	.146	.176	.207	.237	.268	.298	.328	.359	.389	.419	.448	.477	.506
1962	Post-Dominic I	.002	.010	.018	.027	.035	.043	.052	.060	.068	.076	.085	.115	.146	.176	.207	.237	.268	.298	.328	.359	.389	.419	.448	.477	.506
1962	Dominic II	.002	.010	.018	.027	.035	.043	.052	.060	.068	.076	.085	.115	.146	.176	.207	.237	.268	.298	.328	.359	.389	.419	.448	.477	.506
1962	Post Dominic II	.002	.010	.018	.027	.035	.043	.052	.060	.068	.076	.085	.115	.146	.176	.207	.237	.268	.298	.328	.359	.389	.419	.448	.477	.506
1962	Plowshare	.002	.010	.018	.027	.035	.043	.052	.060	.068	.076	.085	.115	.146	.176	.207	.237	.268	.298	.328	.359	.389	.419	.448	.477	.506





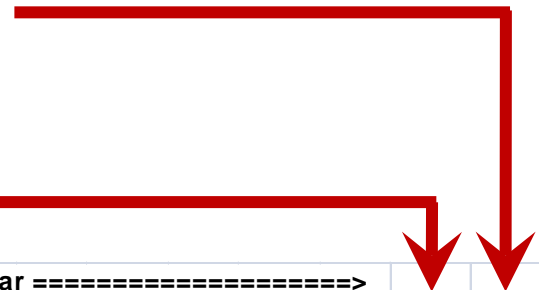
# What Is a Standardized Mortality Rate?

- **Example: 5-Series Study, Institute of Medicine, 2000: Greenhouse**
  - Greenhouse was in 1951. This study counted 9,528 participants.
  - Five-Series study found that 3,274 had died by 1996
  - For U.S. Males as a whole, we would expect 4,197 to have died by then
  - So the Standardized Mortality Rate =  $3,274 / 4,197 = .78$
  - That is, due to the “Healthy Soldier Effect”,  
22% fewer soldiers died than average U.S. males.



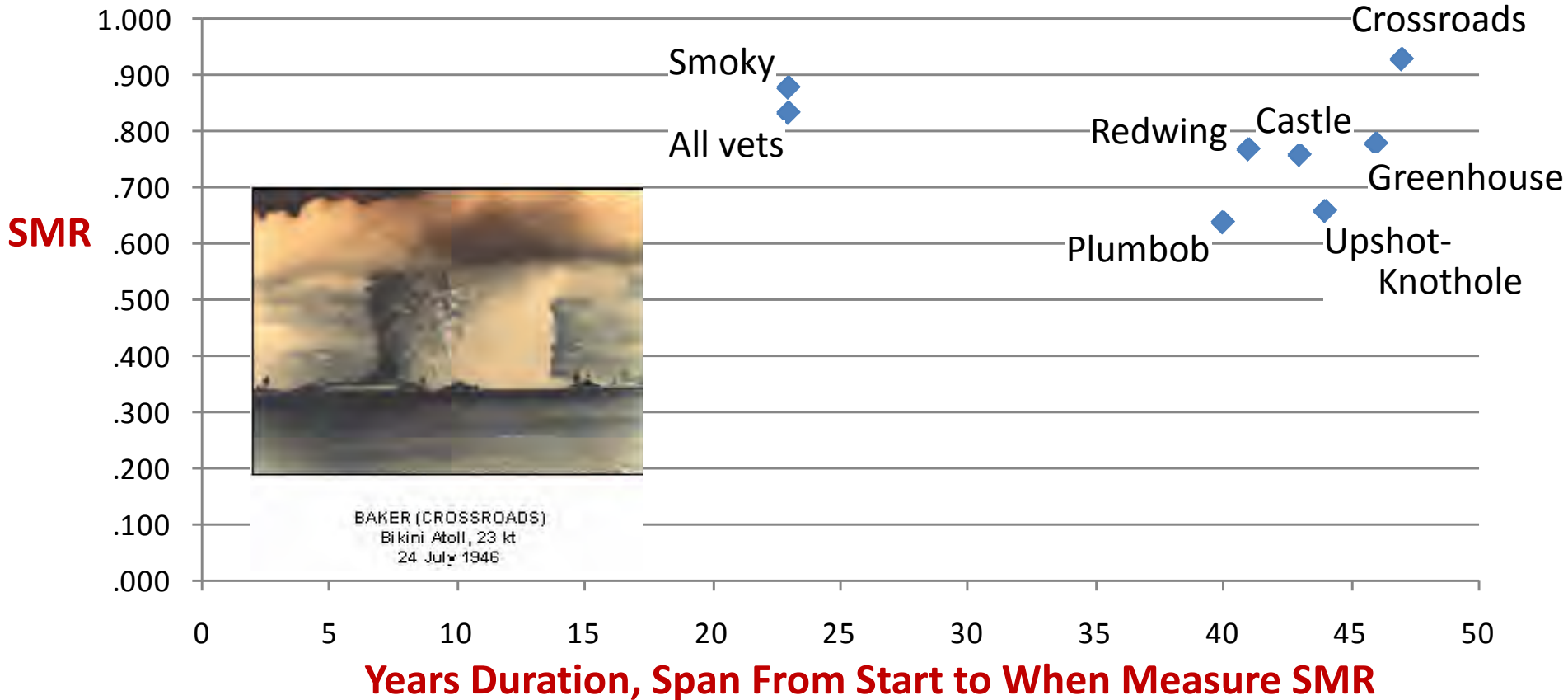
BAKER, Bikini Atoll, 23 kt, 24 June 1946

- **For 8 studies we have 8 SMR's**
- **The 8 studies varied in the length of time over which the SMR was calculated.**



Source		Starting Year =====>														Ending Year =====>					N Yrs	SMR		
		1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	58-'68	1969	1979	1992	1996						
'96 IOM	Crossroads														12 yrs		10 yrs		13 yrs				47	.931
Seltzer & Jablon	All vets														12 yrs								23	.835
5-Series															12 yrs		10 yrs		15 yrs		4 yrs		46	.780
5-Series															12 yrs		10 yrs		16 yrs		4 yrs		44	.660
5-Series															12 yrs		10 yrs		17 yrs		4 yrs		43	.760
5-Series															12 yrs		10 yrs		18 yrs		4 yrs		41	.770
5-Series															12 yrs		10 yrs		19 yrs		4 yrs		40	.640
Caldwell															12 yrs		10 yrs						23	.880

# If We Plot SMR's:



- .78 = geometric mean of all 8 SMRs
- .75 = geometric mean of the 6 SMRs with longest durations: 40 – 47 yrs
- .78 = geometric mean of the 4 SMRs with longest durations: 43 – 47 yrs
- .78 = geometric mean of the 3 SMRs with longest durations: 44 – 47 yrs
- .85 = geometric mean of the 2 SMRs with longest durations: 46 – 47 yrs

**The  
representative  
SMR chosen is  
0.78 (78%)**

# Fighting the Age Effect:

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- Even though there's no systematic effect on SMR from 23 to 47 year durations
- We can't apply an SMR over our long range: 1945 – 2011 = 66 yrs
- SMR logic would have us say: vets born in 1910 would have all died by 2011 if they were typical U.S. males, but no, they are vets, so only 78% of them would have died,
- So I assumed: SMR holds until the vet is 70, then linearly goes away by the time he is 90.







# Applying the Same Logic to Future Years:

