

Memorandum

6 February 2012

From: David Bussard

Director, Washington Division

National Center for Environment Assessment

U.S. Environmental Protection Agency

To: Diana Wong, Ph.D

Designated Federal Officer

Science Advisory Board

U.S. EPA

Subject: Data request from the SAB for the external review draft Toxicological Review of Libby Amphibole

We understand the SAB panel has requested additional information on the exposure-response modeling presented in Appendix E of the External Review Draft of the Toxicological Review of Libby Amphibole Asbestos currently under review. According to your e-mail (4.25pm on 3 Feb2012) the following has been requested:

1. Mean exposure by decile for the subcohort and prevalence in that decile. The figure in the draft is by quartiles so it might be helpful to have those estimates as well. But the deciles will give Panel Member a better feel of the dose-response.
2. There are many other details Panel Member would also like to see; Among the more important is the counts in the TFSE vs exposure quintiles (prevalences in those cells would be interesting too), better understanding of the exposure data and the role of lagging (histograms and/or rich distributional statistics plus a scatterplot of unlagged vs lagged exposures for individuals (focusing on no lag vs. 10 year lag if only one such plot; include a 1:1 line for sure and possibly a best fit line).
3. Model results for the full cohort similar to attachment 3 for the subcohort. And along with that, a similar set of by decile of exposure summary statistics would inform her judgment (along with prevalence and mean TSFE in each decile).

You also mentioned that Panel Member realizes this may be too much to get in order before the meeting.

In the brief time since your request we were able to generate the following information responding to Panel Member request 1 and mostly responding to Panel Member request 2. We will forward information on the third request under a separate memo.

We have attached following tables and figures:

1. Table 1. Localized pleural thickening (LPT) prevalence, and mean CHEEC (unlagged) by decile* of exposure) for the full cohort and the subcohort.
2. Table 2. LPT prevalence by quintiles* of exposure and time from first exposure (TSFE). All CHEEC values are in units of fibers/cc-yr. All TSFE values are in units of years) for the full cohort and the subcohort.
3. Table 3. Descriptive statistics for CHEEC with various lags for the full cohort and the subcohort.
4. Figure 1. Scatterplots of CHEEC (unlagged) versus CHEEC with lags of 5, 10, 15 and 20 years, for the full cohort. Each plot has a LOESS best-fit line, with 1 degree for the local polynomial (i.e. linear fit).
5. Figure 2. Scatterplots of CHEEC (unlagged) versus CHEEC with lags of 5, 10, 15 and 20 years, for the subcohort. Each plot has a LOESS best-fit line, with 1 degree for the local polynomial (i.e. linear fit).

Please contact us if you need additional information regarding the enclosed tables and figures,

Sincerely,

David Bussard

Table 1. Localized pleural thickening (LPT) prevalence, and mean CHEEC (unlagged) by decile* of exposure. All CHEEC values are in units of fibers/cc-yr.

	Number of non-cases	Number of LPT cases	Prevalence of LPT	Mean CHEEC (unlagged)
Full Cohort (n=434)				
Decile 1	41	2	0.0465	0.0109
Decile 2	42	1	0.0233	0.0444
Decile 3	43	1	0.0227	0.0912
Decile 4	40	3	0.0698	0.1259
Decile 5	37	6	0.1395	0.1729
Decile 6	34	10	0.2273	0.2497
Decile 7	38	6	0.1364	0.4811
Decile 8	32	11	0.2558	1.3752
Decile 9	34	10	0.2273	4.6877
Decile 10	32	11	0.2558	19.9230
Subcohort (n=118)				
Decile 1	10	1	0.0909	0.0145
Decile 2	13	0	0	0.0378
Decile 3	10	1	0.0909	0.0687
Decile 4	12	0	0	0.1088
Decile 5	12	0	0	0.1394
Decile 6	10	2	0.1667	0.1778
Decile 7	12	0	0	0.3038
Decile 8	10	2	0.1667	0.4205
Decile 9	10	2	0.1667	0.6254
Decile 10	7	4	0.3636	2.3951

*Deciles calculated using the RANK procedure in SAS, among all participants (cases and non-cases)

Table 2. LPT prevalence by quintiles* of exposure and time from first exposure (TSFE). All CHEEC values are in units of fibers/cc-yr. All TSFE values are in units of years.

	Number of non-cases	Number of LPT cases	Prevalence of LPT
Full Cohort (n=434)			
Quintile 1, CHEEC (0.0001-0.0640 f/cc-yr)	83	3	0.0349
Quintile 2, CHEEC (0.0650-0.1390 f/cc-yr)	83	4	0.0460
Quintile 3, CHEEC (0.1420-0.3200 f/cc-yr)	71	16	0.1839
Quintile 4, CHEEC (0.3380-2.2420 f/cc-yr)	70	17	0.1954
Quintile 5, CHEEC (2.2490-34.1520 f/cc-yr)	66	21	0.2414
Quintile 1, TSFE (0.42-9.00 yrs)	85	1	0.0116
Quintile 2, TSFE (9.41-23.14 yrs)	78	2	0.0250
Quintile 3, TSFE (23.42-29.77 yrs)	87	7	0.0745
Quintile 4, TSFE (29.78-36.30 yrs)	69	18	0.2069
Quintile 5, TSFE (36.37-47.34 yrs)	54	33	0.3793
Subcohort (n=118)			
Quintile 1, CHEEC (0.001-0.051 f/cc-yr)	23	1	0.0417
Quintile 2, CHEEC (0.0520-0.1230 f/cc-yr)	22	1	0.0435
Quintile 3, CHEEC (0.1280-0.1980 f/cc-yr)	22	2	0.0833
Quintile 4, CHEEC (0.2000-0.4730 f/cc-yr)	22	2	0.0822
Quintile 5, CHEEC (0.4810-5.5120 f/cc-yr)	17	6	0.2609
Quintile 1, TSFE (23.14-25.57 yrs)	20	3	0.1304
Quintile 2, TSFE (25.64-26.81 yrs)	24	0	0
Quintile 3, TSFE (26.85-29.45 yrs)	22	2	0.0833
Quintile 4, TSFE (29.50-30.79 yrs)	21	3	0.1250
Quintile 5, TSFE (30.83-32.63 yrs)	19	4	0.1739

*Quintiles calculated using the RANK procedure in SAS, among all participants (cases and non-cases)

Table 3. Descriptive statistics for CHEEC with various lags. All CHEEC values are in units of fibers/cc-yr.

	Mean (SD)	Min, Max	Median	25 th , 75 th percentiles
Full Cohort (n=434)				
CHEEC	2.7038 (6.4248)	0.0010, 34.1520	0.1970	0.0900, 1.1490
CHEEC, lag 5 years	2.5952 (6.2897)	0, 34.1520	0.1695	0.0570, 0.9860
CHEEC, lag 10 years	2.2274 (5.7238)	0, 34.0260	0.1300	0.0140, 0.6660
CHEEC, lag 15 years	1.7868 (5.2392)	0, 33.8990	0.0775	0, 0.3460
CHEEC, lag 20 years	1.6333 (5.1671)	0, 33.7700	0.0525	0, 0.2120
Subcohort (n=118)				
CHEEC	0.4158 (0.7666)	0.0010, 5.5120	0.1605	0.0660, 0.4170
CHEEC, lag 5 years	0.3996 (0.7574)	0.0010, 5.4360	0.1500	0.0660, 0.3900
CHEEC, lag 10 years	0.3660 (0.7421)	0.0010, 5.3100	0.1270	0.0640, 0.3100
CHEEC, lag 15 years	0.3298 (0.7249)	0.0010, 5.1830	0.0990	0.0590, 0.2490
CHEEC, lag 20 years	0.2895 (0.7079)	0.0010, 5.0510	0.0665	0.0370, 0.1520

Figures. Scatterplots of CHEEC (unlagged) versus CHEEC with lags of 5, 10, 15 and 20 years, for the (1) full cohort and (2) subcohort. Each plot has a LOESS best-fit line, with 1 degree for the local polynomial (i.e. linear fit). All CHEEC values are in units of fibers/cc-yr.

Figure 1. Full cohort

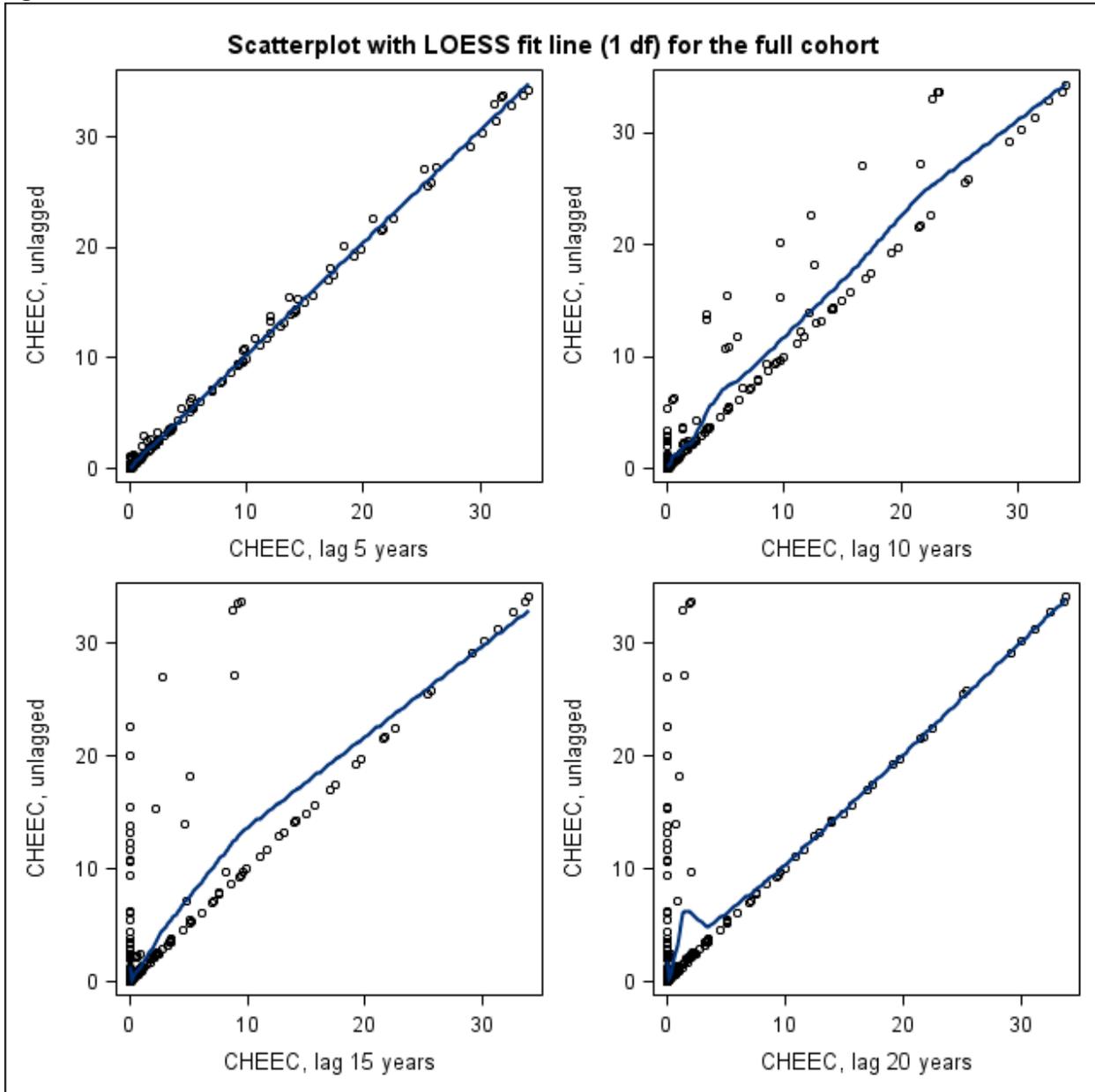


Figure 2. Subcohort

