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Where Are Mesothelioma Claims Heading?

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I. Introduction

Annual filings of asbestos claims have declined in recent years. Much of the decrease has occurred in nonmalignant claims, and is principally believed to result from recent state tort reforms and a reaction to Judge Jack's silica multi-district litigation ("Silica MDL") decision. The downward trend is not as clear for mesothelioma claims, however. Given that they are the most serious, expensive and persistent asbestos-related cases, the future liability of defendants depends on determining where these mesothelioma claims are heading.

A 2004 projection of mesothelioma incidence in the United States reported *higher* estimates of future incidence than previously projected—fueling fears that total future indemnity costs for asbestos claims were currently being underestimated because mesothelioma liabilities were on the rise. In this article we assess whether those fears are warranted by examining: mesothelioma filings, using the Manville Trust data; projections of mesothelioma incidence; and actual mesothelioma incidence, from the Surveillance, Epidemiology, and End Results or "SEER" program of the National Cancer Institute of the National Institutes of Health. Our analysis shows that:

1. Adjusting for a surge in 2003, mesothelioma claims have been in decline in recent years;

2. The SEER data cannot be used to reach a conclusion about the trend in the incidence of mesothelioma in recent years; and

3. A widely-cited 2004 mesothelioma forecast overestimates the future incidence of mesothelioma by assuming that all female incidence is due to background risk.

II. Background

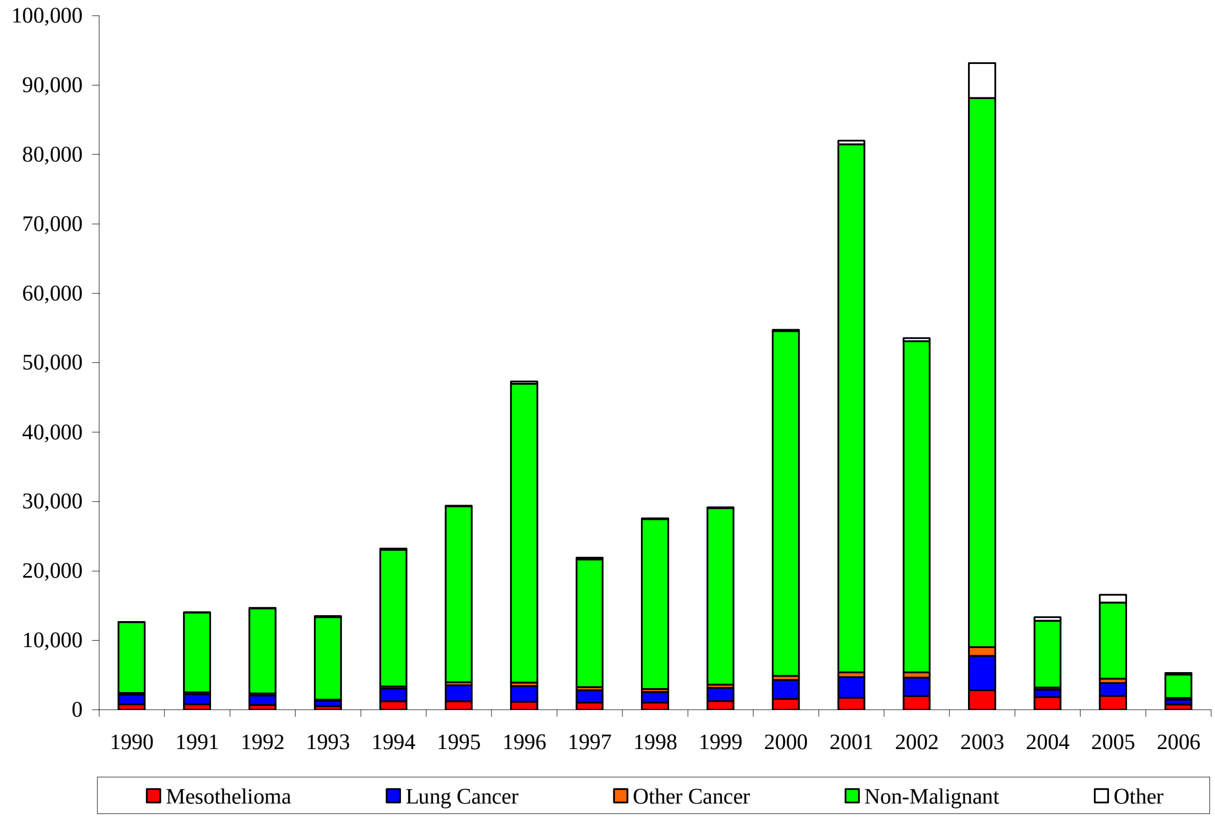
The decline in recent filings is particularly striking for the Manville Trust, which historically was believed to have received nearly all asbestos claims. The Manville Trust received 9,580 nonmalignant claims in 2004 from claimants with U.S. exposure, 10,962 in 2005, and 3,393 for the six months ending June 2006. This is in contrast to an average annual number of 67,609 nonmaligant claims in the years 2001-2003.

Several changes led to a significant decline in the number of nonmalignant claims brought against the Manville Trust, both impaired and unimpaired. These include: 1) the enactment of the 2002 Manville Trust Distribution Procedure ("TDP") with stricter exposure and medical requirements; 2) Judge Jack's 2005 decision in the Silica MDL, which raised concerns about the credibility of a group of doctors who were then banned from providing diagnoses to support claims brought against the Manville Trust and led to a reduction in mass screenings; and 3) tort reforms in key states such as Texas, Ohio, Georgia and Florida that made it unprofitable for claimants without medical evidence of impairment to file claims.

The pattern exhibited by mesothelioma filings tells a somewhat different story. Figure 1 depicts Manville U.S. filings by year and disease from January 1990 to June 2006. Mesothelioma filings increased from 2,001 in 2002 to 2,816 in 2003, with an average of 2,184 during the period 2001 to 2003. While filings dropped to 1,817 in 2004, they rose again to 2,036 in 2005 and appear to be lower this year, with 752 filed in the six months ending June 2006.

Figure 1

Manville U.S. Claims by Disease and Year Filed
January 1990 – June 2006



III. Evidence on Mesothelioma Incidence from Claims Data

For most individual defendants, it can be difficult to discern a trend in future mesothelioma incidence just by observing recent annual filings. Part of the challenge is that filings vary from period to period for reasons unrelated to the underlying rates of incidence. Another challenge can be sparseness of data. Relative to monthly data, for instance, annual observations tend to reduce volatility in the counts from period to period but at the cost of providing fewer observations with which to identify recent trends.

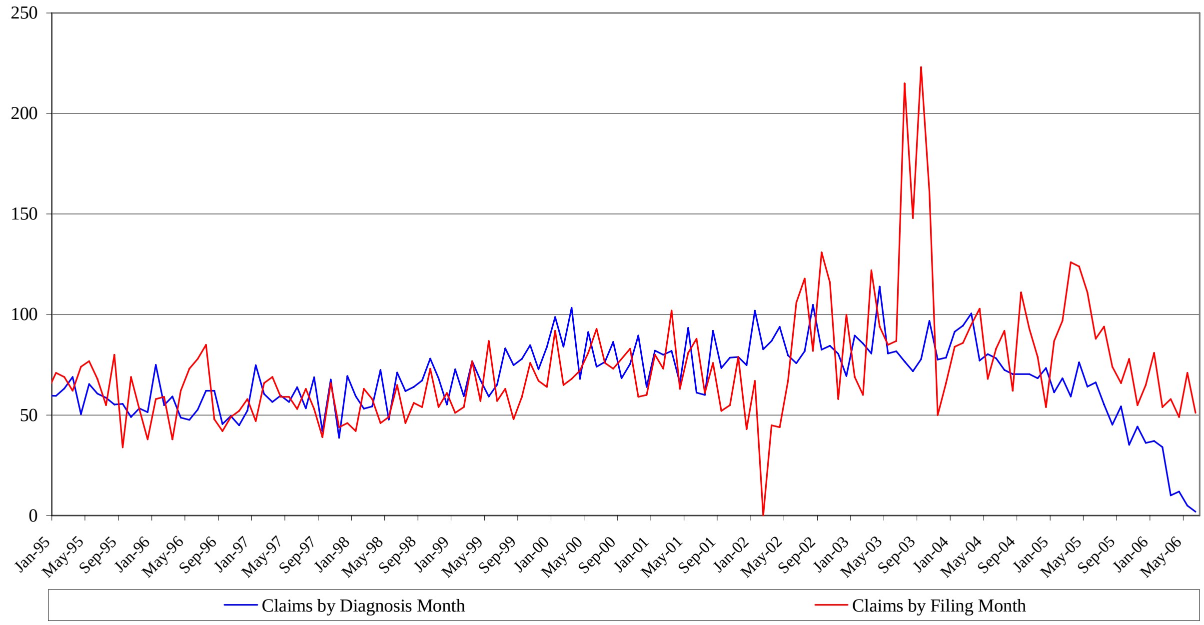
Historically, one exception to this generalization has been the Manville Trust claims data. As noted above, it has been widely used as a benchmark for claims experience in general. However, the introduction of the 2002 TDP in October 2003 was an intervening factor that caused an acceleration of claims of all diseases prior to the effective date.[1] This event makes it harder to evaluate trends based on underlying epidemiology even using the Manville Trust data.

One theory of the surge in claims is that plaintiffs' lawyers accelerated their filing of claims, drawing in claims that absent the change in the TDP would have been filed later. To test this theory, we classified claims by diagnosis date rather than by filing date. This has the advantage of removing volatility in filings from period to period caused by changes in the average time between diagnosis and filing. Figure 2 shows that the resulting pattern of claims is much more stable than the monthly filings which peaked in September 2003 at almost 5 times the previously typical monthly level. This classification of the claims also entirely eliminates the apparent surge in filings prior to the introduction of the new TDP.

[1] Claims filed prior to October 10, 2003 with diagoses prior to September 1, 2002 were paid under the 1995 TDP. Manville Trust Financial Statement, December 31, 2003.

Figure 2

Monthly Manville Mesothelioma Claims Reported by Filing and Diagnosis Dates



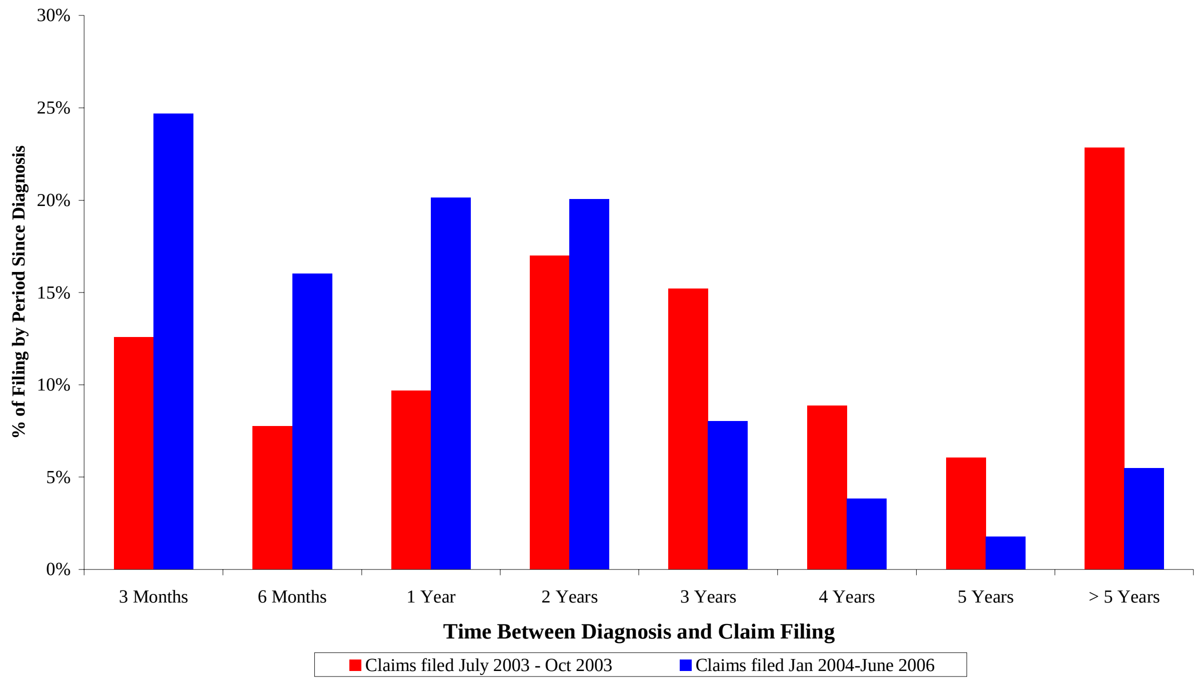
Notes and Sources:
Claims by diagnosis month include estimated diagnosis months for claims with missing dates.

Closer examination of the claims filed during the surge shows that these were not an acceleration in filings but, instead, a large increase in filings on behalf of claimants who had been diagnosed years earlier. Figure 3 shows how the mix of claims with different amounts of time ("lags") between diagnosis and filing (the "lag distribution") changed before and after the effective date of the 2002 TDP. In the second half of 2003, about half the claimants were diagnosed more than two years prior to that time, while since then 80 percent of claimants filed within two years of diagnosis.[2]

[2] This analysis was performed using the Manville Trust June 2006 Claims extract.

Figure 3

The Surge in Manville Mesothelioma Claims in 2003 Resulted from Older Cases Being Filed



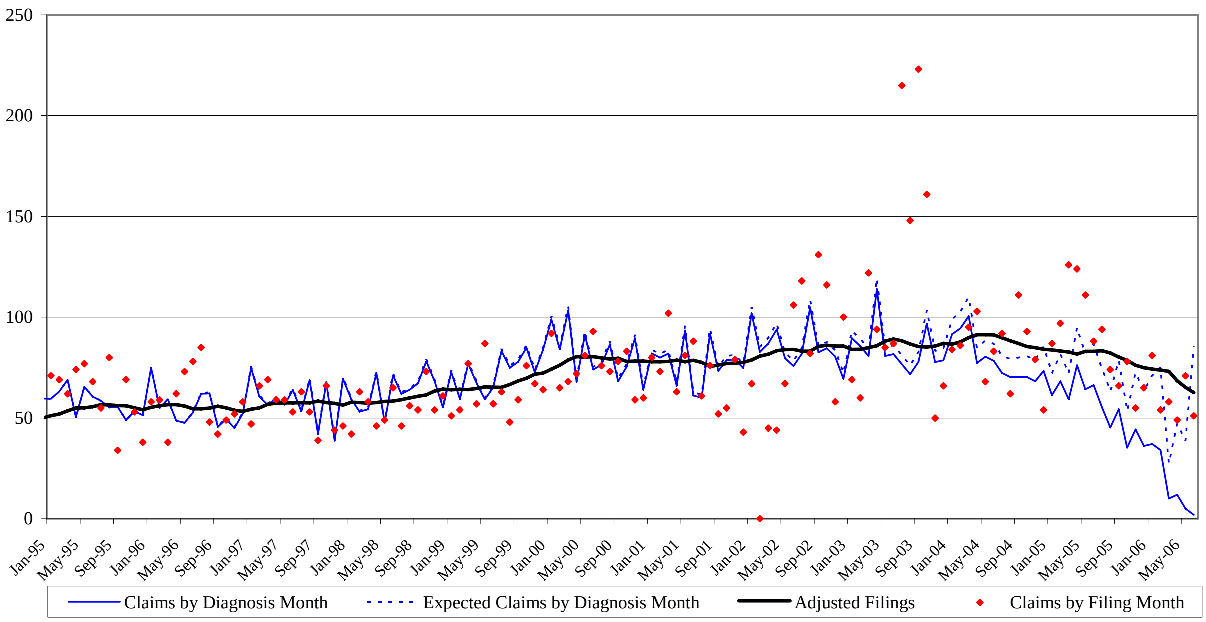
Two adjustments to the data are necessary to support this analysis of claims by month of diagnosis. First, for claims with missing date of diagnosis, we estimate dates based on the distribution of diagnosis dates observed for claims in the same year of filing.[3] Second, some cases that will ultimately be filed but that have recent diagnoses have not yet shown up in the claims data. Only a small proportion of claimants file their claims in the same month in which they are diagnosed. Thus the claim counts by month of diagnosis through June 2006 are adjusted upwards by the fraction with diagnoses in each month expected to have filed by June 2006 (using the recent lag distribution). This adjustment results in the dashed line on Figure 4. We then

[3] Each claim is assigned a probability distribution of likely diagnosis months by subtracting from the filing month the probability distribution of years between diagnosis and filing for all claims with diagnosis dates that were filed in the same year.

apply the recent lag distribution between diagnosis and filing to estimate in which month after diagnosis these claims would have been filed. This results in the black line in Figure 4 and represents our estimate of the monthly filings had there been no changes in the lag distribution over time due to the introduction of the new TDP or other institutional factors.

Figure 4

Monthly Manville Mesothelioma Claim Filings Reported by Diagnosis and Adjusted Filing Date



Notes and Sources:

Claims by diagnosis month include estimated diagnosis months for claims with missing dates.

Expected claims by diagnosis month are adjusted upwards to account for claims expected to be filed after June 2006.

Adjusted filing are estimated from expected diagnosis dates applying the lag distribution between diagnosis and filing for Jan 2004 - Jun 2006.

Our estimate of monthly filings shows a small monthly decline in the rate of filings since the end of 2004. This finding is consistent with, though not proof of, the hypothesis that the peak in mesothelioma incidence has passed and that claiming rates for mesothelioma cases are not increasing.

IV. Adjusting SEER to Estimate National Mesothelioma Incidence

The most important source of data on cancer incidence in the United States comes from the Surveillance, Epidemiology, and End Results ("SEER") program of the National Cancer Institute of the National Institutes of Health. Annual observations of U.S. mesothelioma incidence from SEER provide a basis for assessing mesothelioma trends. However, the raw data, which is a sample reported from 17 registries across the country, must be expanded to estimate the rates of mesothelioma in the U.S. as a whole. How the national estimates are computed from the sample data can change the conclusions drawn from these data.

A. The SEER data is not a random sample

Interpretation of the SEER data requires a basic understanding of the structure of the SEER program. For almost three decades, SEER has reported on cancer incidence, mortality and survival for the whole range of cancers, including mesothelioma.[4] SEER is organized around a set of "registries." These registries are mostly geographic areas, with some being states as in the case of Iowa and Utah, some being metropolitan areas, such as San Francisco and some being individual counties and groups of counties within a state. Further, two registries reflect the Native American populations of Alaska and Arizona. Within each registry, SEER is intended to be a census; for the areas covered by the program, every cancer case is meant to be recorded in the SEER database. As of 2003, the SEER registries represented about 13 percent of the total U.S. population.[5]

While the SEER registries were established to cover a cross-section of the U.S. population, they were never intended to be a random sample. Consequently, simple extrapolation of the statistics from the raw data will not give reliable estimates of the population statistics.

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[4] The Surveillance, Epidemiology and End Results (SEER) program; National Cancer Institute, Incidence: Mesothelioma, available at http://seer.cancer.gov/faststats/html/inc_mesoth.html. See details of the SEER program at http://seer.cancer.gov/csr/1975_2003/results_figure/sect_01_intro_21pgs.pdf.

[5] The "SEER 17" registries for which major statistics are currently calculated by SEER comprise Connecticut, Hawaii, Iowa, New Mexico, Utah, Kentucky, New Jersey, Louisiana, Detroit, Atlanta, San Francisco-Oakland, Seattle-Puget Sound, Los Angeles, San Jose-Monterey, the remainder of California, a set of rural counties in Georgia and the Alaska Native Registry.

The number of SEER registries has increased over time. Until 1992, the key SEER statistics were reported for the "SEER 9" registries. From 1992 onwards, data are available for the "SEER 13" registries, while from 2000 on data are provided for the "SEER 17" registries. The expansion of coverage has led to substantially broader representation in the SEER data today than in the past.

B. Age- and gender-adjusted SEER mesothelioma estimates

SEER reports age-adjusted incidence rates for different cancers. Age adjustment is potentially important for examining trends in cancer incidence because many types of cancer have higher incidence in older populations and the U.S. population has been getting older over time. An age-adjusted incidence is a weighted average of the age-specific incidences, where the weights are the proportions of persons in the corresponding age groups of a standard population. When comparing rates across time (or countries), age-adjusted rates, using the same standard population, are generally used to avoid the potential confounding effect of different age distributions. In contrast, some other studies used crude incidence or numbers of mesotheliomas in their analyses, and some used mortality rather than registry (incident) cases.

The age adjustments are done relative to different "standard populations." For example, one commonly used standard population is the United States 2000 population. Each standard population is simply a list of relative weights for different age categories. Categories are not divided by gender or race. The age-adjusted incidence rate is calculating by taking the incidence by age inside the SEER population and calculating a weighted average using the weights in the standard population. This age-adjustment allows for incidence trends to be measured in a consistent manner over time. Obviously, different standard populations would tend to have different age distributions, leading to different age-adjusted weighted averages that, in turn, would lead to different conclusions concerning overall trends.

Nonetheless, the age-adjustment holds constant the population age distribution which is, in fact, changing over time. This source of potential error is of greater importance when attempting to establish counts classified by gender or race. For example, because the United States 2000 standard population represents the entire U.S. population and women are longerlived than men, an attempt to extrapolate to the count of mesothelioma among U.S. males based on the SEER age-adjusted incidences would lead to an over-count.

To avoid this problem, we extrapolate to U.S. population counts by combining SEER raw incidence by age and gender with census data on the population broken out by age and gender. This adjusts the SEER data to be representative in terms of the age and gender distribution in the U.S. population. For example, one cell would be males aged 40-44. The SEER incidence for this group is multiplied by the U.S. population of males aged 40-44 in a given year to produce an estimate of the count of mesothelioma cases in this group. All such groups are then summed to produce an estimate of the total incidence.

C. Adjusting the SEER population estimates for location of occupational exposures to asbestos

Mesothelioma differs from many other cancers because, in addition to gender, age and race, geographic location also affects incidence. To examine geographic variation in incidence, we compared incidence rates across the 17 SEER registries over 2000-2003.[6] Other authors have noted, for example, that mesothelioma incidence is higher in the SEER registries that are coastal.[7] In the 2000-2003 period, male mesothelioma incidence was nearly 60 percent higher in coastal registries as opposed to inland registries.[8] This difference is highly statistically significant. This pattern could be caused by exposure to asbestos in shipbuilding—one of the largest occupational exposure categories. Further, there tends to be more general industrial employment in the coastal areas represented in SEER as opposed to the more rural inland registries, such as Iowa and Utah.

To evaluate the possibility that the coastal effect may be caused by general industrial activity, we examined the correlation of mesothelioma incidence across registries with the fraction of employment in manufacturing in the 1950s and 1960s.[9] While incidence is indeed

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[6] The last year for which SEER data have been released is currently 2003.

[7] E. Stallard, K.G. Manton and J.E. Cohen, *Forecasting Product Liability Claims*, (Springer, 2005, p. 238.

[8] Coastal registries are defined as regions with some ocean coastline.

[9] Even though some of the registries were for a subdivision smaller than a state, the state figure was used because of limitations in the data from the Bureau of Labor Statistics.

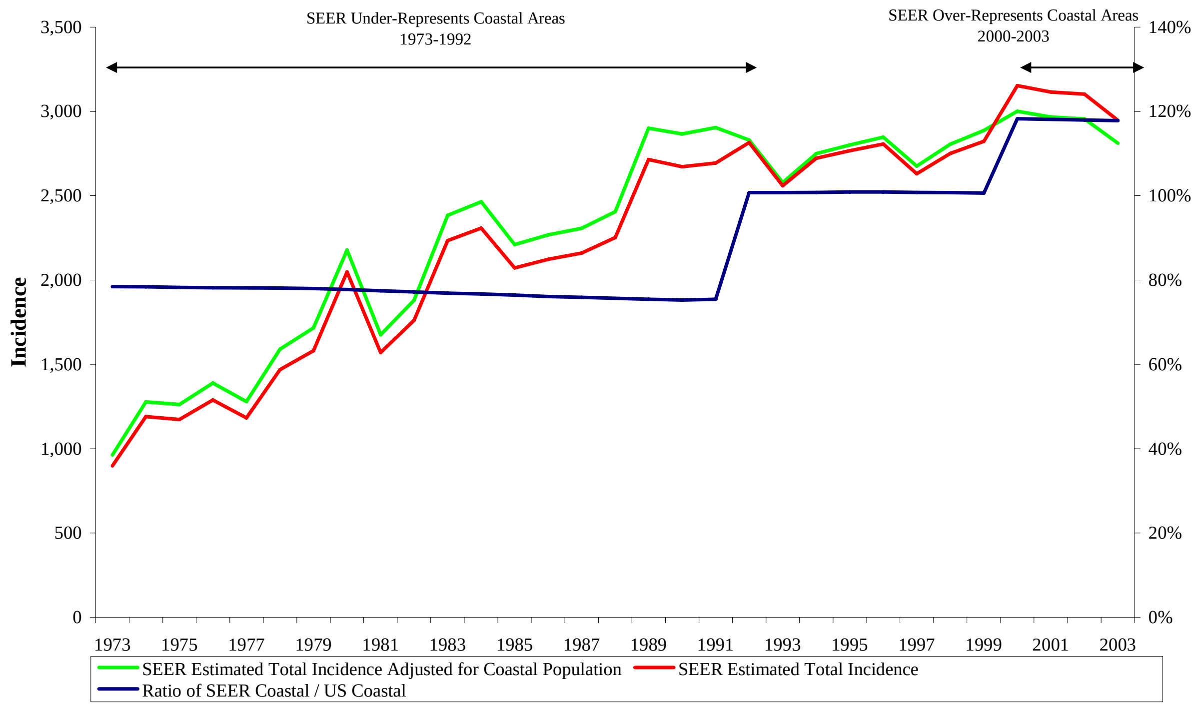
positively correlated with manufacturing employment, the correlation is of marginal statistical significance. This may simply be a function of the fact that we have only 17 data points with which to analyze differences across the registries. Multiple regression analysis indicates that the coastal effect dominates.

The SEER data can be adjusted for this coastal effect by using the relative incidence for coastal areas as opposed to non-coastal areas. The SEER 13 registries are very nearly representative of the fraction of the U.S. population living in coastal states. The SEER 9 registries (used for the longest term incidence comparisons that SEER releases) under-represent the U.S. coastal population and thus likely underestimate the total U.S. incidence. The SEER 17 registries used in the most recent data over-represent coastal areas and thus likely overstate U.S. incidence. Figure 5 compares the estimated mesothelioma counts for the U.S. (extrapolated to the U.S. population by the method described above) to the counts when adjusting for the coastal composition of the SEER registries. This adjustment only affects one dimension of the differences among the SEER registries.[10] Nonetheless, it provides a more accurate picture of U.S. incidence than using the raw SEER data.

[10] It also may be possible to create a more refined adjustment using the county-level data in SEER.

Figure 5

SEER Coastal Adjustment



Notes and Sources:
SEER data (6/30/06) is adjusted using the 17 available registries and by reweighting values across registries in costal states and inland states in proportion to US population.
The ratio is an indicator of how representative SEER coastal data is of the United States' coastal population.

The combination of the coastal adjustment and the age-gender adjustment above leads to the estimated U.S. incidence series depicted in Figure 5. An important feature of this series is that while it shows a rapid increase through the 1970s and 1980s, it has been flat, with ups and downs, but no discernible trend, from the late 1980s through 2003. While the 2003 incidence, after making the coastal adjustment, has dropped, it is too early to call this a trend. An analysis of the SEER data, then, does not allow us to reach a conclusion about the recent trend in mesothelioma incidence.[11]

[11] Price & Ware (2004) reached a conclusion based on SEER data that mesothelioma incidence has reached a plateau. They, further conclude that decline has already begun based on a cohort model of incidence. Price, Bertram and Adam Ware, "Mesothelioma Trends in the United States: An update Based on Surveillance,

V. Occupational Versus Background Rates of Incidence

The earliest forecasts of mesothelioma incidence were developed assuming that asbestos exposure was the only cause of the disease. Several epidemiological studies in the 1970s and 1980s projected asbestos-related diseases, including mesothelioma, in the United States. The most widely cited study is that of Nicholson et al. (1982). The Nicholson study projected the number of excess asbestos-related deaths from three types of cancers: mesothelioma, lung cancer, and gastrointestinal and other cancers. Nicholson estimated the incidence of these cancers in industries and occupations in which workers were exposed to asbestos. The Nicholson estimates and various updates have become the most common epidemiological basis for estimating future asbestos-related cancer claims. Stallard and Manton, building on the work of Nicholson, produced a forecast in 1993, which was calibrated to SEER incidence. This forecast increased the estimate of future cases by accounting for exposure after 1979.

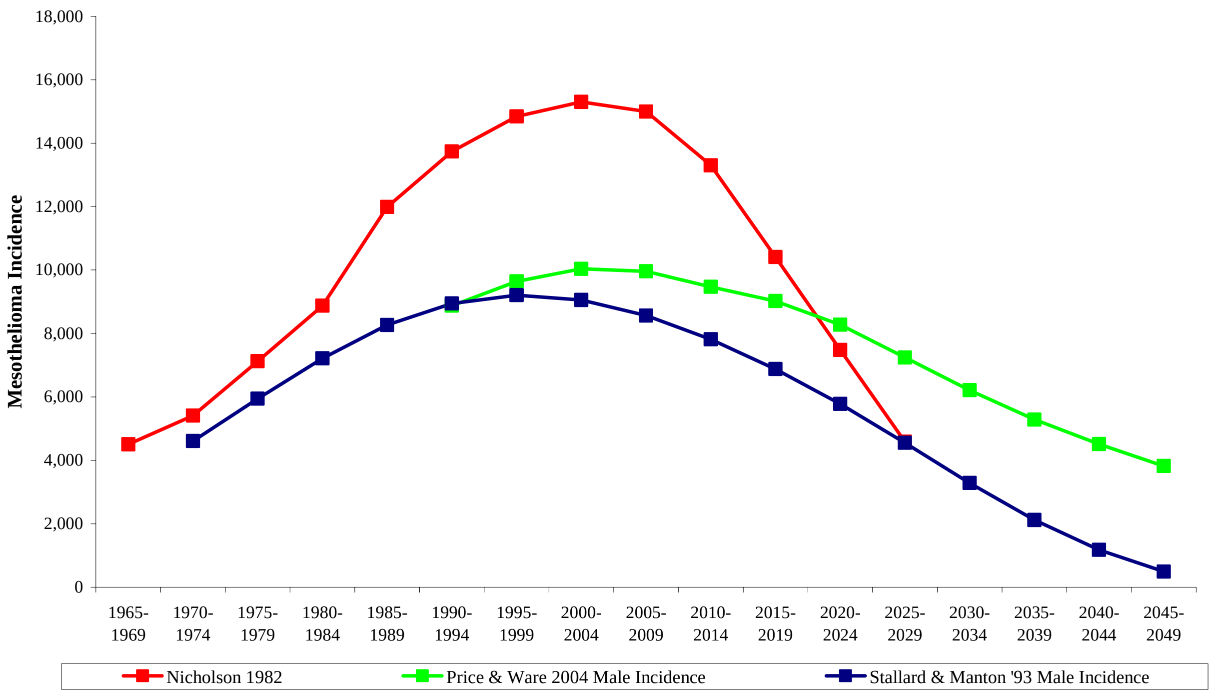
A recent mesothelioma forecast by Price and Ware in 2004, also reportedly based on SEER data, projects a greater number of future mesothelioma cases than earlier forecasts.[12] The Price and Ware forecast is compared to the Nicholson and Stallard and Manton forecasts in Figure 6. Price and Ware used natality data, mesothelioma probability by age cohorts and mortality rates for future birth cohorts to project the annual number of mesothelioma cases for men and women.

Epidemiology and End Results Program Data for 1973 through 2003," *American Journal of Epidemiology*, Volume 159, Number 2, January 15, 2004 ("Price & Ware").

[12] Ibid.

Figure 6

Comparison of Male Mesothelioma Incidence Forecasts



Notes and Sources:
(Price & Ware); "Mesothelioma Trends in the United States: An Update Based on Surveillance, Epidemiology, and End Results Program Data for 1973 - 2003", American Journal of Epidemiology; Vol. 159, No. 2, 2004. Price & Ware data was obtained from Rand Report MG 162, Carroll et al. May, 2005.
Stallard, Manton, Cohen; "Forecasting Product Liability Claims: Epidemiology and Modeling in the Manville Asbestos Case", Springer, 2005, New York, NY, Table 6.11.

Using 1973-2002 data on the incidence of mesothelioma that were released by the SEER in April 2003, Price and Ware estimated the parameters of a birth-cohort and age model to determine whether previously reported patterns of mesothelioma in the United States had changed. The authors conclude that:

> The annual number of male mesothelioma cases, which increased steeply from the 1970s through the mid-1990s, has leveled off in terms of both the age-adjusted rate and the absolute numbers of cases. After a peak of approximately 2,000 cases [in 2000-2004], a return to background levels is expected by 2055.

While earlier forecasts of mesothelioma assumed that occupational exposure to asbestos was the only cause of the disease, the medical community now generally believes that there are other causes of mesothelioma, though the nature of those causes remains subject to debate.[13] Accounting for background incidence changes estimates of future cases. In particular, as time passes since the use of asbestos was regulated and later discontinued, the effects of occupational exposure to asbestos will decline. Background cases in the general population, which may not decline over time, are therefore expected to become a larger proportion of annual incidence as the number of occupationally-related cases declines. As a result, accurate estimation of background rates of mesothelioma is important for estimating future incidence.

A. Background versus asbestos-related incidence among women

The incidence reported in SEER for women has appeared relatively unchanged over the last 20 years. By contrast, the male rate has increased, reflecting occupational exposure to asbestos in preceding decades. Some have suggested the rate of mesothelioma among women can be used as an estimate of the background rate.[14] If female cases were solely the result of background, however, they would be expected to increase in line with the population and average age of women. This expectation is not borne out in the data.

As seen in Figure 7, which plots the SEER data for men and women on different axes, there have been increases in the incidence of mesothelioma for women as well as for men. Further, since 2000, 14 percent of mesothelioma claims with U.S. exposures filed with the

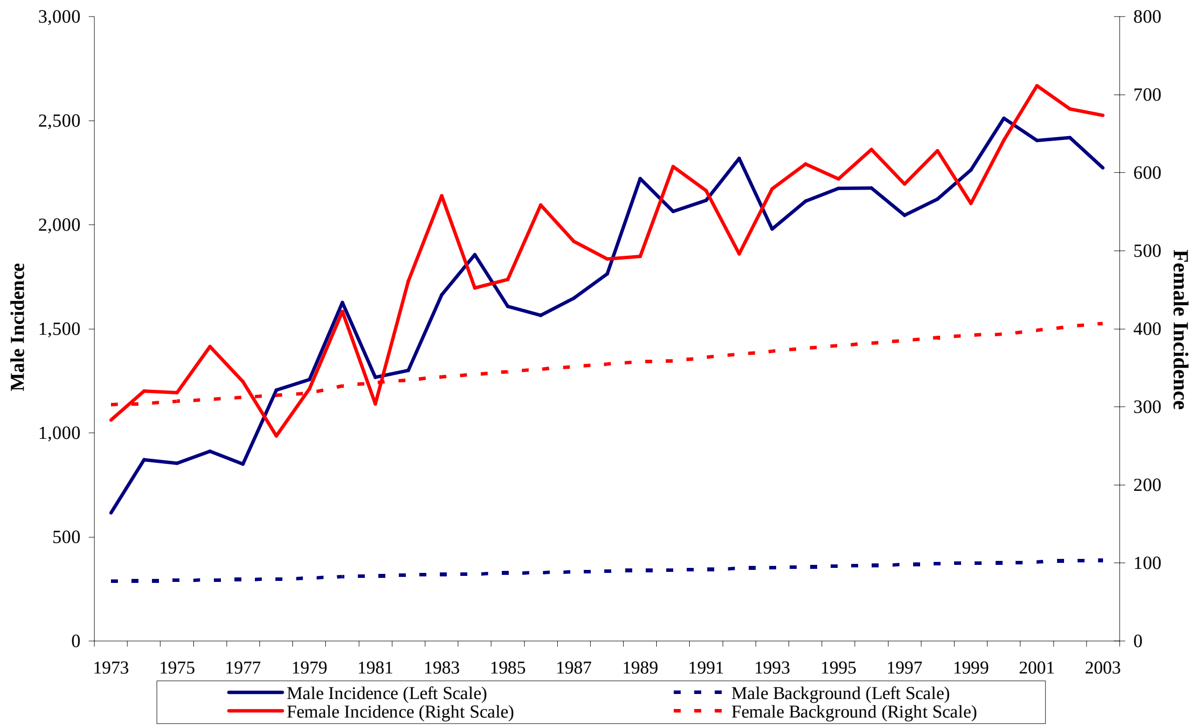
[13] See, for example, A. Greenberg, T.C. Lee, W.N. Rom, "The North American Experience with Malignant Mesothelioma," in *Mesothelioma*, B.W.S. Robinson, and A.P. Chahinian, eds., (Martin Dunitz, 2002). The authors cite four pieces of evidence for a background rate for mesothelioma: the identification of cases in the late 19th century before industrial use of asbestos could explain the cancer, the smaller increase in mesothelioma rates for women as compared to men, the existence of rare childhood mesotheliomas, and the results from lung burden analyses that do not find asbestos fibers in the lungs of some mesothelioma victims.

[14] See, for example, B. Price and A. Ware, "Mesothelioma Trends in the United State: An Update Based on Surveillance, Epidemiology, and End Results Program Data for 1973 through 2003," *American Journal of Epidemiology*, 2004, pp. 107-112. See p. 111 for a discussion of background rates: "probabilities for males in future birth cohorts starting with 1965–1969 were set equal to the averages for females, which we interpreted as background rates for mesothelioma." Also see H. Weill, J.M. Hughes & A.M. Churg, "Changing Trends in US Mesothelioma Incidences," *Occupational and Environmental Medicine*, 61:438-441, 2004, available at http://oem.bmjjournals.com/cgi/content/full/61/5/438#R2. Weill *et al.* argue that the different ratio of peritoneal tumors to pleural tumors in men as opposed to women, combined with a relatively low fraction of women with evidence of occupational exposure argues for the existence of a background rate. They further theorize that some of this background may actually represent a different disease.

Manville Trust have been for women. Manville Trust claimants are required to provide evidence of exposure to Manville asbestos, so that, at least in principle, individuals without occupational exposure should not be able to claim. If the Trust enforces that requirement, the SEER rate reported for women will overestimate the background rate: some of the female cases must instead be due to identifiable asbestos exposures.[15]

Figure 7

SEER Mesothelioma Incidence for Men and Women and NERA Estimates of Background Incidence



Notes and Sources:
Surveillance, Epidemiology, and End Results (SEER) data (6/30/06) is adjusted using the maximum available registries. SEER 9 - 1973-91, SEER 13 - 1992-99, SEER 17 - 2000-03.
SEER Incidence rates by age and sex have been extrapolated to the United States population, using data from the US Census.
Background incidence is calculated by comparing the fraction of female mesothelioma claimants with the Manville Trust to the fraction of females in SEER.

More generally, the SEER data provide an estimate of the total U.S. incidence of mesothelioma but do not distinguish between cases that were related to occupational exposure to

[15] Women exposed to asbestos fibers carried home by spouses with occupational exposure to asbestos are considered to be secondary or indirect occupational exposure for purposes of this discussion.

asbestos. This makes estimating the background rate problematic. Using data from claims filed with the Manville Trust as a representative of all mesothelioma cases among those identifiably exposed to asbestos, we observe a different mix of male and female cases than is present in the SEER data, which includes background cases. By combining these observations together it is possible to impute the background rate that would have to exist to explain the greater fraction of female cases in the SEER incidence data as opposed to the fraction in the Manville claims data.[16]. Using this approach, we estimated the mesothelioma background rate.

As seen in Figure 7, by 2003, we estimate an annual background incidence of mesothelioma of approximately 400 cases among women and a similar number for men. This represents a little more than half the overall rate for women in 2003.

B. Using background incidence to explain Price and Ware versus Stallard and Manton

The use of the female SEER incidence as an estimate of background cases results in an overestimation of future mesothelioma cases. The rate of mesothelioma from occupational exposure to asbestos ("excess incidence") will decline in future years as the historically exposed workers age. However, background incidence will continue to rise with population growth. These trends are illustrated in Figure 8, which plots the Stallard and Manton forecast,[17] based on SEER incidence reported for the period 1990-1994, with a Price and Ware forecast,[18] based on the SEER 2003 data.

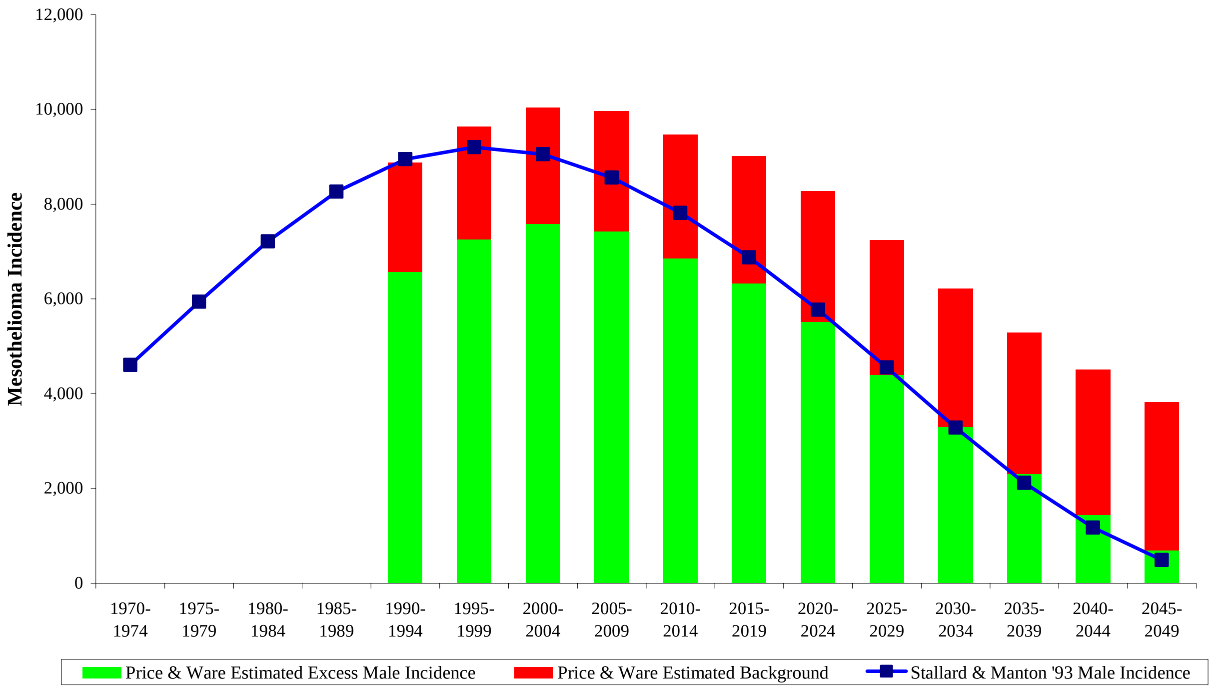
[16] The background rate is assumed to be common to men and women and to the general population as opposed to the occupationally exposed population.

[17] Stallard, Manton and Cohen; "Forecasting Product Liability Claims: Epidemiology and Modeling in the Manville Asbestos Case," (Springer, 2005), New York, NY, Table 6.11.

[18] Price & Ware "Mesothelioma Trends in the United States: An Update Based on Surveillance, Epidemiology, and End Results Program Data for 1973-2003," *American Journal of Epidemiology*; Vol. 159, No. 2, 2004.

Figure 8

Background Risk Raises Mesothelioma Incidence Forecasts



Notes and Sources:
We use female incidence to approximate the Price & Ware Estimated Background. Excess Incidence is total incidence less Estimated Background.
(Price & Ware); "Mesothelioma Trends in the United States: An Update Based on Surveillance, Epidemiology, and End Results Program Data for 1973 - 2003", American Journal of Epidemiology; Vol. 159, No. 2, 2004. Price & Ware data was obtained from Rand Report MG 162, Carroll et al. May, 2005.
(Stallard & Manton) Forecast is calibrated to SEER in the period 1990-1994 and assumes zero background risk.
Stallard, Manton, Cohen; "Forecasting Product Liability Claims: Epidemiology and Modeling in the Manville Asbestos Case", Springer, 2005, New York, NY, Table 6.11.

Stallard and Manton assumed there was no background incidence and as such attributed all SEER cases to excess incidence caused by exposure to asbestos. Stallard and Manton impute a population of exposed workers from which the dose-response relationship for mesothelioma would yield the observed cases and then age this population forward to estimate future cases. The last mesothelioma cases in this forecast arise in 2049.

By contrast, the Price and Ware forecast incorporates an estimate of background incidence based on the assumption that none of the cases in women are caused by excess risk. Using the incidence of female cases as a proxy for their estimate of male background cases,

Figure 6 shows that the remaining excess cases decline in a similar pattern to the cases forecast by Stallard and Manton but the estimated male background cases rise to an average of approximately 630 a year between 2045 and 2029.[19] These cases represent the background cases for the entire U.S. population, and so are not all attributable to those people who were exposed to asbestos in the workplace. However, according to Stallard and Manton, there is no longer a population of men with occupational exposures to asbestos who will still be alive in 2049.

The difference in assumptions about the background incidence of mesothelioma made by Stallard and Manton versus Price and Ware explains most of the difference between the two forecasts. Once this background incidence is accounted for properly, the two studies are not inconsistent in terms of the incidence of disease forecast to occur in the exposed population. As such, the Price and Ware forecast does not show that previous forecasts of mesothelioma incidence in the occupationally exposed population are too low and fears to the contrary are unwarranted.

The existence of background cases for the non-occupationally exposed population has not been widely appreciated historically. As time passes and these background cases become an increasing share of the total, stricter exposure requirements may be needed to ensure only those with mesothelioma caused by occupational exposure to asbestos are compensated.

[19] RAND estimated the 2045-2049 female incidence to be 3,135. Rand Report MG 162, Carroll et al., May, 2005.

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