

EVE 491/591
Toxicology

Case Study #1. "Mary Beth"

Part 3. Cancer risk?

The Federal Coal Mine Health and Safety Act of 1969 recognized the cause of black lung and established safety and health standards for the mines, provided free chest X-rays, and set up a compensation fund for miners disabled by black lung. But the safety standards came too late for Mary Beth's dad. However, he did receive a monetary supplement to his normal pension check because of the severity of his disease.

Mary Beth wondered whether there were consequences for the other residents that had been exposed to the coal mines and the polluted run-off in Sulfur Creek. She recalled many times during her childhood when the water from her kitchen tap had smelled like rotten eggs, a possible sign of sulfuric acid contamination. There certainly had been a lot of people on her street that had had cancer; Mr. Stack, her mother's best friend Mrs. Kits, Mr. Slagle, their long time next door neighbor Martin Roberts and now her mother. That just seemed to her to be too much misfortune for one little street.

"Is my mother another victim of coal mining or is it just a coincidence that all these people on my street have had cancer?"

Questions

1. Do you agree with Mary Beth that something seems off-base with the number of cancer cases? How would you determine if there were more cancer deaths than could be accounted for by chance?
2. What information about Mary Beth's mother and the other victims of cancer would be needed for us to evaluate the cause of her cancer?
3. List potential carcinogens linked to coal mining and all possible routes of exposure.
4. What are the logical target organs for cancer related to coal mining? Can you think of others?
5. Describe a mechanism for one of the potential cancers that were suggested in questions 3 and 4.