



Colorado Department
of Public Health
and Environment

CITIZEN'S SUMMARY

Two documents reporting the health study findings of populations residing near the Rocky Mountain Arsenal (RMA) are being released for a 45-day public comment period ending November 25, 1995. The identity and a summary of the key findings of these studies are provided on the following pages. One of these studies was conducted by the Colorado Department of Public Health and Environment (CDPHE) in collaboration with Colorado State University (CSU); the second was conducted independently by CSU. Both studies were supported by grants from the Federal Agency for Toxic Substances and Disease Registry, U.S. Department of Health and Human Services.

Document 1: The Rocky Mountain Arsenal Pilot Exposure Study Part II: Analysis of Exposure to Diisopropylmethylphosphonate, Aldrin, Dieldrin, Endrin, Isodrin and Chlorophenylmethylsulfone

Disease Control and Environmental Epidemiology Division, Colorado Department of Public Health and Environment in collaboration with Department of Environmental Health, Colorado State University and the Agency for Toxic Substances and Disease Registry, U.S. Department of Health and Human Services.

In response to evidence of chemical concentrations off-site, known pathways of exposure, potentially exposed populations, subjective information indicating acute adverse health effects, and risk assessments, an exposure study was conducted in communities surrounding RMA. The goal of the study was to determine whether exposures to several chemicals were greater among persons who resided there than among residents of a comparison area. Areas 1 and 2, north and west of the RMA, were considered potentially exposed; Area 3 was 12 to 15 miles north and northeast of RMA from the RMA and served as the comparison area. The study was begun in December, 1989; additional analyses were completed in May 1994.

The findings of this study have been reported in two parts. The results of Part I, analyses for arsenic and mercury, were published in 1993. In the current report, Part II, participants were screened for four organochlorine pesticides (dieldrin, endrin, aldrin, and isodrin); and diisopropylmethylphosphonate (DIMP), a byproduct of nerve agent manufacture at RMA. Participants were later screened for chlorophenylmethylsulfone (CPMSO₂), an oxidation product of an intermediate in the synthesis of nitralin, an herbicide also manufactured at the RMA.

Key Findings

- 1) Laboratory interferences introduced unresolvable uncertainties about the analysis for DIMP; therefore, no useful data were derived.
- 2) There was no evidence found in this study that the low level presence of dieldrin in serum was related to the RMA. No acute health effects are anticipated from dieldrin at the levels found in this study.
- 3) No confirmed evidence of aldrin, isodrin or its metabolite, endrin, was found in the serum from study participants.
- 4) A total of 274 participants was evaluated for CPMSO₂. Urine from 121 persons in Area 1, 117 persons in Area 2, and 36 persons in Area 3 was tested in the CSU laboratory in April, 1992. In this initial analysis, CPMSO₂ was detected in six of the 238 samples tested from Areas 1 and 2 and in none of 36 comparison samples. The six samples from Areas 1 and 2 were retested at CSU in April 1994; two of the

six were reported to have detectable CPMSO₂. Confirmatory analyses were performed at the Centers for Disease Control and Prevention in May 1994. One of the 2 samples reported positive in both 1992 and 1994 was found to contain low levels of CPMSO₂; the remainder were negative at a detection limit of 0.2 ppb.

The CPMSO₂ findings are difficult to interpret due to the low rate of detection, the small number of comparison subjects, the elapsed time between collection of urine and the laboratory analyses and uncertainty regarding background concentrations of CPMSO₂ in the general population.

Recommendations

The following recommendations were submitted to ATSDR for their consideration.

- 1) Urine obtained from persons residing near the RMA during the course of future studies should be tested for CPMSO₂ in order to further evaluate the findings of this study. Urine samples should be subdivided and stored at -70 degrees C until tested.
2. Wells used for domestic consumption at homes where CPMSO₂ has been detected in household residents should be tested for CPMS and CPMSO₂ to assure that they are free from contamination with these chemicals.

Document 2: Reproductive, Neurobehavioral and Other Disorders in Communities Surrounding the Rocky Mountain Arsenal

Department of Environmental Health, Colorado State University in collaboration with the Agency for Toxic Substance and Disease Registry, U.S. Department of Health and Human Services

A study of health conditions was conducted between October 1991 and September 1994 in communities living in the vicinity of the RMA. The study population was grouped in the same manner as reported in the study above; Areas 1, 2 and 3. The health related objectives were to compare the prevalence of symptoms and clinical disorders, reproductive outcomes and neurobehavioral disorders among persons potentially exposed to RMA contamination to a reference population. As a follow up to the 1993 CDPHE cancer incidence study in communities surrounding the RMA, a case-control study of bladder cancer was also conducted in Adams County.

Key Findings

- 1) The study provided little indication that the prevalence of symptoms and disease was elevated among persons who resided near the RMA. Only the prevalence of self-reported "low muscle strength" among both men and women in Area 2, west of RMA, was statistically significant. There was no corresponding increase in prevalence of related symptoms such as numbness, paralysis, tremors or tiredness. The observation of an increased prevalence of low muscle strength in Area 2 may be due to chance.

The prevalence of low muscle strength was significantly higher among persons who used groundwater for domestic purposes in Area 1 and Area 2 when the groups were combined. It is not known if the association between well water use and low muscle strength are directly related. Data collected in Area 1 do not support this association.

- 2) Statistical analyses of reproductive outcomes did not reveal significant associations with residence near the RMA. Both women and men living in Area 2 did report an increase in infertility, defined as difficulty in achieving conception when compared to the reference population. A lower mean number of pregnancies and number of children born was also reported. The origin of the reported excess in infertility among Area 2 residence is unknown. No other indicators of reproductive health and outcome were remarkable.
- 3) No statistically significant difference in neurobehavioral performance was found among persons living near the RMA compared with Area 3.
- 4) In a study of bladder cancer in Adams County, CO, residence near the RMA was weakly correlated. The association was not statistically significant. The correlation was stronger for persons who had a residence time of 20 or more years but still not statistically significant. However, statistically significant associations were observed between bladder cancer and the two risk factors "history of bladder infections" and smoking.
- 5) The ability of this study to find statistically significant associations was limited by the relatively small numbers of persons studied in each area (approximately 100 per group).

No health-based recommendation were made.

TO SUBMIT COMMENTS

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Document 2: Reproductive, Neurobehavioral and Other Disorders in Communities Surrounding the Rocky Mountain Arsenal

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The 45-day public comment period ends November 25, 1995.

For additional copies of either report, please call 692-2646.