

procedures listed on the certificate could have occurred prior to admission to the hospital. Thus, the answer "none" could imply no procedure at any time, or no procedure during the time in the hospital immediately prior to birth.

The percentages of monitoring in this paper are the best statewide estimates available at this time. There appears to be some hospital-to-hospital differential in reporting of monitoring which may add some small bias to the monitoring estimates. Availability of monitoring information on the birth certificate, however, provides a ready means of determining the association of various monitoring procedures on the outcomes of pregnancy and should prove of considerable utility in future studies.

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Economic Impact of a Community-Wide Waterborne Outbreak of Gastrointestinal Illness

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In August 1975 an outbreak of acute gastrointestinal illness occurred in Sewickley, Pennsylvania, a middle-upper class suburb of Pittsburgh. Sixty-one per cent of the town's 8,800 residents were ill for an average of two days. Epidemiologic investigation clearly implicated the municipal water supply as the source of a biological agent which has not yet been identified. Efforts to isolate the agent are still underway.

The illness was sufficiently severe to result in ill persons missing work for 1-2 days and sufficiently widespread to result in high absenteeism rates in the area businesses. To assess the economic impact of the epidemic on the community, a survey was conducted in the fall of 1975. The assessment of costs follows the traditional health economic framework.^{1, 2}

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Methods

Direct costs included: medical expenditures, physician visits, prescription drugs, emergency room visits, cost of hospitalization or of prolongation of hospital stay in those cases occurring in hospitalized patients, and home visits by nurses. Physician visits and prescriptions were accounted for by surveying 20 of 22 practicing physicians in the Sewickley area. Emergency room visits, hospitalization, and home nursing visits were obtained from the Sewickley Valley Hospital and the Union Aid Society. Other direct costs included the cost of bottled water (obtained by surveying local suppliers) and costs entailed in the investigation of the outbreak (five agencies were involved, and costs were obtained by surveying the agencies for an accounting of personnel, laboratory, travel, and other costs incurred during the investigation).

The assessment of indirect costs was limited to two categories of economic loss—lost wages (output) due to missed workdays, and business—and losses other than lost output. Lost wages/output was summarily accounted for by applying 1970 Census data on average income and number employed in Sewickley to the data on workdays missed as obtained in a community survey. Wages were inflated to 1975 level by adjusting the 1970 Census figures.³

Business losses other than lost output were estimated from responses to a mailed questionnaire (58 responses from 120 businesses) that was intended to account for: 1) additional costs of production or doing business occasioned by having to pay overtime, hire additional temporary workers, etc.; and 2) lost sales (presumably not merely postponed sales).

Results and Discussion

Cost calculations are spelled out in Table 1. This brief epidemic of gastrointestinal illness in this small community led to estimated indirect costs of over \$220,000 and a total cost of nearly \$340,000, almost \$40 per capita.

Direct costs were almost equally split between investigative costs to various governmental agencies and medical expenses for affected individuals.

The largest single isolatable cost was in lost wages as estimated for the 2,117 employed persons who were ill and missed 2,511 days of work, an estimated \$155,000 in lost wages or output, 46 per cent of the total estimated costs.

Data on business losses are unreliable due to the low response rate to our questionnaire (48 per cent) and the in-

ability of businessmen to quantify their losses. This difficulty has been noted in previous studies.^{4, 5}

Although this study has several methodological shortcomings, it emphasizes the importance of preventive measures directed at maintaining municipal water systems. As the complexity of biological and chemical hazards to safe drinking water increases, more complex methodologies will be required to protect the public health. In our view, the increased cost of such methods is justified in light of the severe economic and social impact of contamination of a municipal water system

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TABLE 1—Economic Costs of an Epidemic of Gastrointestinal Illness, Sewickley, PA., August, 1975

DIRECT COSTS		
Medical Care		
Physician visits (N = 532)	\$ 6,275	
Prescriptions (avg. cost = \$10)	19,870	
Emergency Room Visits (N = 177)	4,956	
Prolonged hospital stays or costs of hospitalization (97 days)	11,700	
Home visits by nurses (N = 10)	340	
Total Medical Care		43,141 (12.8%)
Bottled Water Cost		8,694 (2.6%)
Investigative Costs		
Allegheny County Health Department	40,706	
Center for Disease Control	9,685	
Pennsylvania Department of Environmental Resources	9,000	
Environmental Protection Agency	3,120	
Pennsylvania State Department of Health	400	
Total Investigative		62,911 (18.6%)
TOTAL DIRECT COSTS		114,746 (33.9%)
INDIRECT COSTS		
Wages/Output	155,330	(45.9%)
Lost business	68,000	(20.1%)
TOTAL INDIRECT COSTS		223,330 (66.1%)
TOTAL COST (DIRECT PLUS INDIRECT COSTS)		\$338,076